

# Personalization and User Profile Management for Public Internet Access Points (PIAPs)

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## **Abstract**

As communications and other IT usage becomes an integral part of many people's lives and the available products and services become more varied and capable, users expect to be able to personalize a product or service to meet their individual needs and will no longer accept "one size fits all". Personalization can range from simple cosmetic factors such as custom ring-tones to the complex tailoring of the presentation of a shopping web site to a user's personal interests and their previous purchasing behaviour. Behind every instance of personalization is a "user profile" that stores details of the user, their preferences and other information that can be used to deliver a user experience tailored to their individual requirements, and that maximizes the commonality of their experience to improve their acceptance of new product introduction and deployment.

The European Telecommunications Standards Institute (ETSI) Specialist Task Force (STF) 265 has finalized a guideline document on "User Profile Management" [ETSI (2005)]. It has been proposed that further work in this area should be done in order to produce standardized user profile components that should help provide the optimum user experience.

ETSI has submitted to the EC and EFTA a proposal to fund a Specialist Task Force (STF) under the eEurope e-Inclusion initiative, to draft an ETSI Technical Specification on Public Internet Access Points (PIAPs). The proposal has been favourably assessed by the EC/EFTA services. ETSI work on user profiles, together with work on multicultural issues [ETSI (2006)] in the provision of information and communication services and a Universal Communications Identifier (UCI) [ETSI (2002), ETSI (2003), ETSI (2004)] has developed a range of beneficial guidelines for easy access to and use of online services. This work will be important for achieving more effective use of PIAPs and in maximising their benefits.

**Key words:** Personalization, Profile, User Profile, Public Internet Access Points (PIAPs), Human Factors, Management, Design, Security, Languages, Standardization, Guidelines, Personalization, Quality of Experience (QoE).

## **1. Introduction**

Effective user profile management will be critical to the uptake and success of new communication products and services and it is therefore important to focus on the users' requirements. ETSI, with funding from the eEurope program, put together a Specialist Task Force (STF265) to develop guidelines [ETSI (2005)] relevant to users and their need to manage their user profiles to enable them to personalize services and terminals, and optimize their quality of experience. Intended readers of this guide are standards developers, manufacturers, service creators and service providers.

An important European policy goal is that all people should be able to be part of the new eSociety, which assumes access to online information. This puts a requirement on PIAPs to be accessible by all users. The need for personalized services and devices is particularly important when using PIAPs which need to be, by the evident nature, accessible by all users. The user profile concept provides means to achieve this important goal.

## **2. Social issues related to PIAPs**

The eEurope initiative set out goals, among others, to support e-Government and to provide online health care. The eEurope Action Plan had an objective to integrate everyone, particularly people with disabilities and older people into the information society. None of these objectives can be fully met unless PIAPs can be provided in a form accessible to all users including elderly and disabled people.

The provision of PIAPs in accordance with the guidelines developed by this work will support e-Government and the provision of online health care and also give all citizens, irrespective of age, disability or cultural background easy access to PIAPs. Buyers of PIAPs, most notably public authorities, will be able to use the guidelines as a basis for requirements written into public procurement agreements for the purchase of PIAPs.

This initiative strongly supports the eEurope 2005 objective "to give everyone the opportunity to participate in the global information society" [European Commission (2002)], which includes easy access to Public Internet Access Points (PIAPs), preferably with broadband connections, in their municipalities.

The ability of all users to make effective use of PIAPs will be one of the most important factors that determines how successful PIAPs will be in extending e-Inclusion to maximise the number of users who are able to make full use of e-Government, e-Learning, e-Health and e-Business services. Whilst there is already widespread provision throughout Europe of Public Internet Access Points (PIAPs), most of them do not offer ease of access to disabled and elderly users. The wide provision of PIAPs cannot be properly effective unless they are readily accessible to elderly and disabled people.

A major area of concern with Public Access points is authentication and privacy when they are used to access sensitive personal or financial information. This will have to be presented to users in a way in which they can be given a meaningful indication of the real levels of risk that they may encounter.

## **3. Key Areas addressed by the ETSI work**

Key areas addressed in the user profile guidelines:

- the user profile concept;

- administering profiles that reflect users' needs, lifestyles and situations;
- the benefits of user profiles to a range of different people;
- scenarios in which user profiles bring benefits;
- administering automatic activation of user profiles;
- optimizing the way that user profile management guidelines are presented in order to make compliance easier and desirable;
- social and regulatory concerns for the privacy of user data.

There are very many ease of use aspects for PIAPs which include:

- minimum up-front effort to start usage - e.g. PIAPs that are ready for use with some service options already visible;
- simplified service log-in - e.g. for services that need to clearly identify the user, the means of login should be secure but easy to use and should consider the usage of different methods such as Smart Cards and biometrics;
- services that suit the needs and abilities of the user - e.g. content that matches the language and literacy skills of the user [ETSI (2006)];
- multimodal and/or alternative means of access to key services - e.g. full conformance to the WAI Guidelines [W3C (2006),] as a minimum requirement;
- accessibility support solutions - e.g. provision of or support for enhanced accessibility software and/or devices.

#### **4. Benefits of user profiles**

The output of the ETSI user profile work will benefit communication products and services that rely on user profiles (such as the ETSI Universal Communications Identifier (UCI) [ETSI (2002), ETSI (2003), ETSI (2004)] and it will contribute to the work of the Third Generation Partnership Program (3GPP) [3GPP (2004), 3GPP (2005a), 3GPP (2005b)], and the Open Mobile Alliance (OMA) [Open Mobile Alliance (2003)]). It will provide the following advantages for users:

- Allowing reuse of users' existing experience and knowledge to help them manage new terminal devices and services, thus leading to faster and easier application of new technologies and better user confidence.
- Synchronization and harmonization of profiles across services and terminals allowing much faster and easier use and optimization of the services and devices.
- Elements within a user profile, that suit a specific situation but relate to many different areas, will only need to be defined once.
- Enhancement of emergency telecommunications, in which the user might allow emergency services to have access to useful information in their user profile that would help them to provide appropriate aid.

From the manufacturers' and service providers' point of view:

- User profile management will be critical to the uptake and success of new and advanced communication services, especially among the larger market of the non-technically astute, or the non-technically inclined by simplifying their need to self-configure services and devices.
- Development costs can be reduced.
- Time to volume markets can be decreased.

For a single product or service it may be difficult for a user to manage all of the information needed in their user profile. They will need to:

- check what information is in their profile;
- add, change or delete information in their profile;
- know when other entities access or attempt to modify their profile;
- understand how their profile affects the service or capabilities that they experience.

## **5. User Profile Concept**

The concept of a user profile usually refers to a set of preferences, information, rules and settings that are used by a product or service to deliver customized capabilities to the user. In practice, many products and services already contain profiles that are specific to that product and unrelated to any other. In addition, these profiles are frequently sub-divided into several profile components.

Commercial and technical constraints will dictate that having profile components associated, and co-located, with each product or service is likely to remain a common model for profiles. This model is reflected in proposed new system architectures such as the 3GPP Generic User Profile (GUP) [3GPP (2004), 3GPP (2005), 3GPP (2005)].

There will be a number of user characteristics and preferences that will apply independently of any particular product or service (e.g. users' preferred language or their need for enlarged text). One key objective is that users should not be required to provide this information more times than is necessary.

Users frequently find themselves moving from one situation to another throughout a typical day (e.g. at home, driving, working). In each of these situations, users will have different needs for how they would like their communications arranged. At present, an increasing number of products already provide the user with proprietary ways of tailoring their preferences to these different situations. This work identifies how to make it easy for users to specify their situation-dependent communication needs in ways that require the minimum need to understand details of the potentially wide range of such products.

Common user profiles also hold the promise of improving the uptake of new technologies and of allowing greater access to their benefits. This work focuses on presenting guidelines to manufacturers and service providers to help them shape their product and service requirements in ways that maximize human and social benefit.

In order to deliver this kind of coordination across device and service personalization, the functionality of a user profile agent will be required.

## **6. Scenario Based Concept Development**

The Specialist Task Force STF265 developed a number of user scenarios [ETSI (2005)] to collect user input and to analyze requirements. They subsequently used them to illustrate the suggestions made in the guidelines.

### **6.1 Scenario – Public Internet Access Points (PIAPs)**

Roberto from Italy is on holiday in Sweden at the invitation of his friend Ingrid. One day, they decide to visit Copenhagen and Roberto remembers that he read some interesting information

about places he wanted to visit. The problem is that he does not remember the names of the places, neither does he remember on which websites he read the information. Fortunately, he bookmarked the websites that contain information about places to visit. When Ingrid shows him the library in Kungsparken, he gets the brilliant idea to use the library PIAP to read the websites he previously bookmarked.

His profile is automatically activated when he logs on. As Roberto is dyslexic, he finds it difficult to read information presented on certain colours of background, but he likes to read with a light cyan background. The background colour of the PC is automatically set to light cyan as this preference is defined in his user profile.

Roberto automatically gets information in Italian, when available, or otherwise in English, thanks to the language preferences in his user profile. He finds all the interesting websites he bookmarked in Italy because his profile can contain his bookmarks, which makes them accessible wherever the internet is available. He shows the websites to Ingrid and they plan which places they will visit tomorrow.

## **6.2 Scenario - A Typical Working Day**

Issues addressed in this scenario include:

- situation dependent profiles;
- profile hierarchy with several more specific profiles building on a less specific profile;
- transitions between states;
- automatic activation;
- events;
- intelligent house and house profiles;
- intelligent car.

The following scenario about a typical day in the life of a business woman, Anne, illustrates how states, including default states, might be activated and how the transitions between these states might be triggered.

Anne has defined a set of profiles that she finds very useful. They cover both her private role and her professional role. She found it easy to define them as she was guided by a wizard that asked her questions in order to propose appropriate templates related to her lifestyle. These templates proposed some default values based on the choices she made during the guided setup. She accepted some of the proposed defaults and decided to select her own values for other preferences and settings. The wizard also proposed options for activation of her profiles.

### **6.2.1 At home**

Anne is at home and her profile is in the "at home (awake)" state. There are sensors in the house that can detect Anne's presence. Her calls are directed to the home fixed phone.

### **6.2.2 Leaving home - Outside**

When Anne leaves the house and locks the door behind her, her "smart key" sends a message to her smart home that she has left the house. At this transition of the smart home state, the profile agent (which manages all profile related operations) checks all the entities associated with Anne to determine her current state. As the current state of the entities might not match those described for any of the defined user states, the profile agent would need to select one of the default states. Anne has previously defined that the "outside" profile should be activated

after leaving the house, leaving work and leaving the car (i.e. when all of the "at home" states, all of the "at work" states or any of the "car" states cease to be valid). As Anne is the last person leaving the house, the house's "all left" profile is activated. This ensures that the heating is set to "energy saving", the alarm is on, the shutters are closed, and the doors locked. As Anne is leaving the house, her "outside" profile is activated which ensures that calls are directed to her mobile phone.

### 6.2.3 In car

When Anne enters the car she places her mobile phone in the car handsfree/charger mount. Placing the phone in the mount generates a change of entity state that is sent to the profile agent. The profile agent again checks the state of the entities associated with Anne and tries to find a match to a current user state. In this case the "driving my car" state only requires that the mobile phone is in the handsfree/charger, so the profile agent chooses the "driving my car" state and activates that profile. Seat and mirrors are adjusted to her preferences, calls are directed to the car handsfree, she will listen to incoming emails, her favourite radio channel is selected and the volume is set to her preferred level.

### 6.2.4 Leaving car

When Anne removes the phone from the handsfree/charger, this state change is communicated to the profile agent and the profile agent again checks the states of the entities. The "driving my car" state no longer applies and the states of the various entities do not match those defined for any of the other states. As previously described, Anne agreed that the profile agent should select the "outside" state when she leaves the car, so the state is now set to "outside" and the "outside" profile is activated again which results in calls being directed to her private mobile phone.

### 6.2.5 At work - at office

As soon as Anne enters her work premises by using her smart badge, her profile agent is notified of this event. Anne's state is set to "at work" as this state is the default state that is activated when the event from the smart badge has been received (the state of the entities do not match those required for any of Anne's other more specific at work states). As soon as Anne enters her own office and places her mobile phone in the desk charger, the charger sends an event to her profile agent. The profile agent checks entity states and determines that the "in my office" state applies, as this only requires the phone to be in the desk charger. The "large fonts" preference is activated on her PC, her preferred language is set and her calls are directed to her office fixed phone.

### 6.2.6 At work - default

When Anne leaves her office and is not yet at a meeting, her profile agent sets the default "at work" state which results in calls being directed to her work mobile phone.

### 6.2.7 At work - meeting

Anne has a meeting scheduled for 14:00 and this has been entered into the calendar application on her PC. The PC notifies her profile agent 5 minutes before the meeting is due to start that she should be in a meeting. The profile agent sends an instant message to Anne asking if the meeting is still taking place (Anne has said that she wishes to confirm scheduled meetings as they are often cancelled or postponed). When she confirms that the meeting is taking place, her state is set to "in a meeting" at 13:58.

As she enters the smart meeting room at 13:59 the room detects her smart badge and sends an "entering meeting" event to her profile agent. As the profile agent has already set the state to "in a meeting" it does not need to take any new action but it notes that the meeting is in a smart meeting room. As not all meetings will be in smart meeting rooms the profile agent needs to look at two sources of meeting related events - calendar based and smart room based.

The meeting profile sets her mobile phone to silent mode, calls will be directed to her voice mail but an exception is made that allows her most important client to phone her as she hopes to sign an important contract very soon.

The meeting ends later than scheduled but the profile agent maintains the "in a meeting" state longer than was indicated in the calendar schedule as it has not received a "leaving a meeting" event from the smart room.

#### 6.2.8 At work - default

When Anne leaves the meeting, the profile agent receives the "leaving a meeting" event and examines the state of the entities associated with Anne. As these entity states do not match those specified in any of Anne's states, and because no "leaving work" event has been received, the profile agent restores the default state "at work" which results in calls being directed to her work mobile phone.

#### 6.2.9 Leaving work

As it is now so late, Anne wants to go home. As she leaves the work premises the building detects her smart badge leaving and notifies Anne's profile agent. The profile agent sets the default "outside" state.

Anne's journey home from work goes through the same familiar states - "outside", "driving my car", "outside" and "at home (awake)".

#### 6.2.10 Sleeping

After a busy day it will soon be time for Anne's state to be "asleep", which results in heating being set to "energy saving", the shutters are closed, the doors locked and her calls are redirected to an automated answering service which nonetheless offered callers a chance to ring through if the matter is urgent.

## 7. Standardization of Components Needed

The need for a new Specialist Task Force that builds on the results from the user profile management project has been identified and the process for requesting it has begun. With the goal of obtaining maximum benefits for users, profiles would not be limited to today's ICT market, but would also embrace ubiquitous services and applications, and be able to communicate with a wide range of current and future devices in digital homes/buildings.

The work will provide standard definitions for:

- profile objects (including settings, values, operations and relations) related to user profile management;
- a rule definition language for defining automatic activation of profiles;
- common terminology.

## 8. Participation is welcome

We invite you to participate in this work. Contributions to "PIAP" can be made to Pluke ([mike.pluke@castle-consult.com](mailto:mike.pluke@castle-consult.com)) and to "Personalization and User profile Management Standardization" can be made to Françoise Petersen ([Francoise.Petersen@apica.com](mailto:Francoise.Petersen@apica.com)).

## 9. Conclusion

User profile management will be critical to the uptake and success of new and advanced communication services. User profiles promise to ease the conflict between the benefits of common technology deployments versus diverse social and cultural demands, and variations in individual physical and cognitive abilities. In addition, use of communications technology in widening areas of human activity (such as outdoors, travelling, in emergencies and in crises) blurs the lines between various levels of cognitive ability – in the dark anyone will be vision challenged, in a noisy environment everyone will be hearing challenged, in a very cold environment, everyone will have dexterity issues.

The increasing complexity of new technologies demands the ability to adapt capabilities and operations. User profile management makes this possible and allows simplification of the user experience without the user losing self-determination or feeling excluded.

It is a very important goal that PIAPs are accessible by all users in order to achieve the goal that all people should be able to be part of the new eSociety. The need for personalized services and devices is therefore particularly important when using PIAPs which need to be, by the evident nature, accessible by all users. The user profile concept provides excellent means to achieve this important goal. Coordinated requirements will be input into relevant technical standards bodies for implementation.

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