

UNIVERSAL PERSONAL TELECOMMUNICATION (UPT):

A SERVICE TO INCREASE USER MOBILITY



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IN THE NEAR FUTURE, PROFITS MADE BY TELECOMMUNICATION OPERATORS WILL MORE AND MORE BE INFLUENCED BY THEIR ROLE AS SERVICE PROVIDER. FOR KPN (ROYAL PTT NETHERLANDS) IT IS VERY IMPORTANT TO OFFER ADVANCED SERVICES, IN ORDER TO STAY AHEAD OF THE INCREASING COMPETITION IN THE SERVICE PROVISION FIELD. IMPROVED AND NEW NETWORK TECHNOLOGIES ARE VERY PROMISING FOR THE INTRODUCTION OF ENHANCED AND NEW SERVICES. SERVICES WHICH WERE NOT CONSIDERED FEASIBLE ONLY A FEW YEARS AGO. THE SERVICE 'UNIVERSAL PERSONAL TELECOMMUNICATION' (UPT) IS A PRIME EXAMPLE. THIS KIND OF SERVICE FULLY MATCHES WITH THIS TIME ERA, IN WHICH INCREASING MOBILITY IS EMPHASIZED.

What is UPT ?

UPT enables a user to make and receive calls at any terminal he prefers (home terminal, carphone, mobile phone, etc.) on the basis of only *one* personal number. Based on this personal number, the user is able to use any terminal as if it is his own. The personal number is uniquely allocated to the user, and this is the number others dial when they want to call the user. The number is independent of the user's location and independent of the used terminal (voice, fixed, mobile, fax, data).

UPT is built upon the following features:

- The personal number
- Registration
- Incoming calls
- Outgoing calls
- Personal preferences
- Additional features

The personal number

This number is independent of the used terminal. This means that a caller doesn't need to know the user's location in order to make a call to the user. It implies that the number no longer refers to a terminal access, but instead it now refers to a person.

Registration

The registration feature enables a user to associate his personal number with a terminal. This registration action can be performed from any desired terminal. The association is valid for incoming calls. With some security precautions the association may also be valid for outgoing calls. In the more advanced implementations of UPT, registration - and the necessary identification and authentication - will be done with the use of a smartcard. Simple mechanisms like PIN codes are also considered for early implementations.

Incoming calls

A user associates a terminal with his personal number by means of a registration action. Subsequently, all incoming calls for that user will be directed to the appropriate terminal.

Outgoing calls

The user will be able to make calls from any terminal, while the incurred costs are charged directly to that user's account. No costs are charged to the account of the terminal owner. This simplifies the use of terminals at locations abroad: e.g. in hotels no special rates are charged and no coins are needed.

Personal preferences

The incorporation of personal preferences enables a user to 'personalize' a service (or a set of services) to his personal liking. The personal preferences are catered for by a so called 'service profile', in which the user's preferences are recorded. Preferences pertain to routing, subscribed features, language of announcements, security options, itemized billing, etc.

Additional features

UPT will also offer numerous new features, some listed below:

- Interrogation and modification of the user's service profile;
- Pick up of incoming calls at a terminal when alerted e.g. on a pager;
- Automated routing of incoming calls to the desired terminal, based on the time of the day, the day of the week, the origin of the call, etc., or combinations of these. This means an improvement of communication efficiency;
- Integration with other services, for example a voice mailbox service, a delivery service, or a paging service. This increases the call success rate;
- A comprehensive set of call billing options.

An impression of the features (or sometimes also called 'services') offered by UPT is given in figure 1.

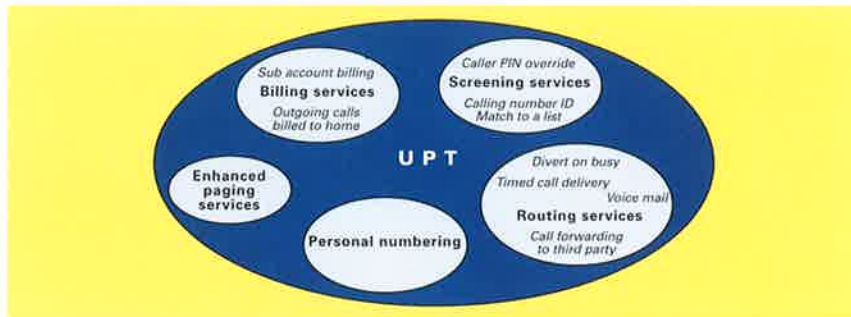


Figure 1:
Services offered by
UPT

Surplus value of UPT

- The type of mobility offered by UPT (the so called user or personal mobility) should not be confused with 'terminal mobility', which will be provided by other services. However, both types can be combined as shown in the following example: A European UPT user can rent a mobile terminal in the USA and have his personal number applied to the communications. There is no need to inform his business relations about his temporary mobile phone number. They just dial his personal number. The costs made by making outgoing calls are charged on his European account.
- Services are packed and all reside under *one* 'account', namely the Personal Number. Managing the services is eased. The user gets a package of features/services, each feature can individually be activated or deactivated at will.
- The routing of incoming calls can be controlled from *any* terminal, not only from the terminal at the 'home location'. Additionally, the UPT service will protect the third party from unwanted registrations on his terminal. If the third party finds a redirection to his terminal undesirable, a UPT user is able - via the UPT service - to prevent people from doing so. Non UPT users can contact their network operator.
- UPT will allow the use of personal preferences for outgoing calls: just one outgoing call, a fixed number of them, or outgoing calls before some deadline, or only national calls allowed, or more or less permanent facilities for outgoing calls. The subscriber or the user will be given the choice between those possibilities.
- The service is enriched with a strong identification and authentication procedure which prevents the UPT service and its users from misuse.

An example use of a pack of UPT services is presented in figure 2. In this figure, an incoming call activates a sequence of call screening services. When a call can be delivered to the subscriber, the Time of Day routing service is consulted in order to derive the appropriate terminal. Of course, the subscriber or user decides which services will be activated.

Why would anybody want the UPT service ?

There are very good reasons why customers would want a UPT service. Some reasons are mentioned here:

- *Reachability* is greatly enhanced; especially the ease with which this is accomplished. Furthermore, UPT will be offered in the international telecommunications world and will not be limited to the 'home country' or one service provider;
- *Cost effectiveness*. This kind of service offers mobility without the often prohibitive costs of services offering terminal mobility;
- *Simplicity and security*: one personal number, independent of a network, good security measures, use of a smartcard;
- The set of *new services* offered.

The benefit for the operator is expected to come from: increasing accessibility of telecommunication services and equipment and an increasing number of successful call attempts due to higher reachability of the user.

UPT potential

Recent international studies - as summarized in [1] - predict that the UPT penetration in the next decade shall be: 45% of the workforce, 65% of the business and 30% of the population.

Task of PTT Research

- UPT is one of the many new services that will emerge, and is also expected to be one of the earliest. For KPN (Royal PTT Netherlands) it is of prime importance to keep up with the developments in this fast moving world. PTT Telecom has asked PTT Research to gain knowledge of the new concepts and technologies. For PTT Research, UPT provides a vehicle for research projects on various topics (Intelligent Network, smartcards and UPT, security) that allows PTT Research to gain knowledge and experience in this area. This in turn, helps PTT Research in supporting PTT Telecom in its role as service provider not only on the subject of UPT but also in the area of other (IN) services or user mobility.
- Strictly on the subject of UPT, the amount of work to be done on the evolution (from an initial limited form to the extended form in a later phase) is huge and far from trivial. Here, PTT Research plays an important role too.
- To date, most of the work has been allocated to the subject of standardization. This is very important: UPT is a promise for international cooperation on the network level.

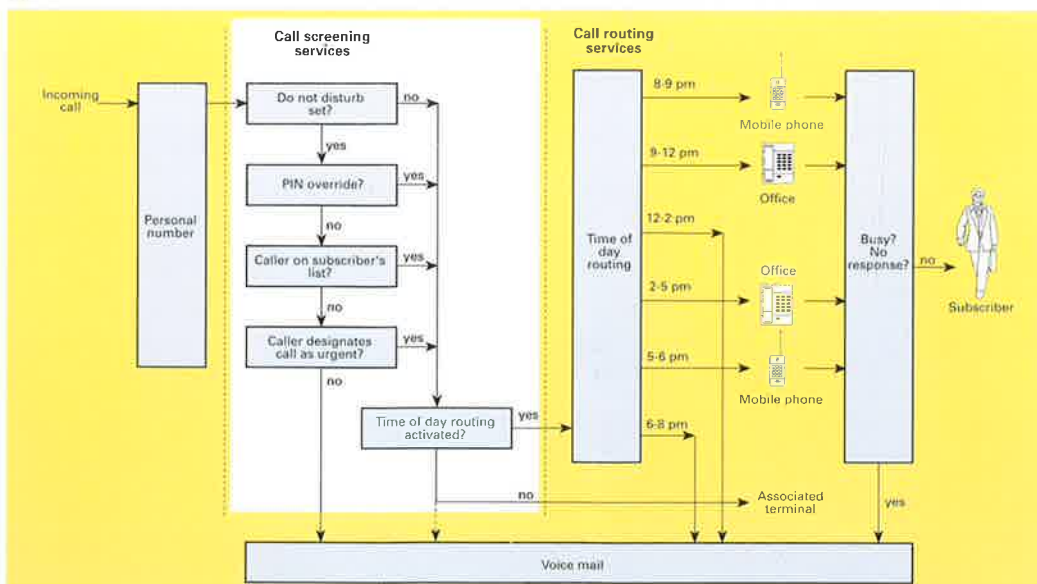


Figure 2: Example usage of a UPT incoming call

Field trials

The prime examples of services which are similar to UPT are given by offerings in the United States and in Europe. In the US the Personal Number Service (1-700) is in operation. In August 1993 Norwegian Telecom and Ericsson announced an agreement to cooperate in a pilot UPT project. The objective of this project is to identify the greatest possible end-user benefits. Beside these, some other countries expressed their interest to offer UPT.

Developments

Network and regulatory issues prevent the initial versions of UPT from being very advanced. Therefore, the development and introduction of UPT is phased: with evolving technology, like calling cards and Intelligent Network concepts and implementations, the UPT service will become increasingly mature and deliver its full potential in both national and international environments. This will lead to a range of implementations from low end (early phase) to high featured (later phase) UPT services where UPT will become generalized: the service will be accessible from many networks (voice, fax, data) and in many countries.



A non UPT user



A UPT user

Summary

UPT is a new service concept that allows users with a personal telecommunication number to access a range of new features/ services designed to increase user mobility. It also allows the user to personalize his telecommunications by storage of the user's preferences in a so called 'service profile'. UPT will offer a multitude of features and a good perspective on integration with other - new - services, it provides security mechanisms and protects third party rights. All under *one* personal number. It is expected that within a decade a substantial number of people will use some form of UPT. PTT Research will be supporting PTT Telecom in the development of this UPT service. PTT Research will keep up with the latest developments in this field, and wherever appropriate guide new developments.

[1] 'Personal Numbering Services: the business opportunities for UPT', Michael Grant and Martin Garner, Ovum 1993.; sec. N.

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