

**Zeitschrift:** Comtec : Informations- und Telekommunikationstechnologie = information and telecommunication technology  
**Herausgeber:** Swisscom  
**Band:** 78 (2000)  
**Heft:** 2

**Artikel:** Prepaid roaming services : challenge and chance  
**Autor:** Cavin, Ernest  
**DOI:** <https://doi.org/10.5169/seals-876419>

### **Nutzungsbedingungen**

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

### **Conditions d'utilisation**

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

### **Terms of use**

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

**Download PDF:** 12.02.2026

**ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>**

# Prepaid Roaming Services – Challenge and Chance

**"Taking Roaming into the future", this was the topic of the 4th Annual Conference on 2<sup>nd</sup> and 3<sup>rd</sup> of November 1999 at "The Barbican" in London. It showed how to create, win, and dominate mobile markets.**

Just a few years ago, the mobile phone was reserved for the business market and was merely an "executive toy". Today, mobile phones have become a common sight. They are getting smaller

---

ERNEST CAVIN, BERNE

---

and smaller, networks have better coverage and service quality, with millions of people taking advantage of mobile communications. People want to take their mobile phones wherever they travel. The roaming capability of the GSM standard allows the mobile customer to travel from one country to another. Therefore, a subscriber can make and receive calls while on another network. The notion of freedom of movement has never before been so important and meaningful to human beings. In 1991, the first roaming agreements were signed by Deutsche Telekom, France Telecom and Swisscom (Swiss PTT at the time). Since then, hundreds of roaming agreements have been signed between GSM network operators.

## The first Prepaid Services – Tapping into new Markets

In the meantime, the mobile communications market has become highly competitive. Network operators offer all kinds of services with different tariff models. Most started with postpaid mobile services where the customer had to sign a contract and to pay a monthly subscription fee. The calls were charged differently according to the mobile service chosen. After the TELECOM 95 exhibition, prepaid services were implemented and commercially launched by the first GSM network operators around Europe.

The first prepaid service was introduced by the German network operator T-Mobile and was called D1-Club. In autumn 1996, Swisscom commercially introduced

its prepaid service "NATEL easy". Neither of these services could match the success of the Italian mobile network operators Telecom Italia Mobile (TIM) and Omnitel. In September 1996, TIM introduced its first prepaid services based on a sales campaign which exceeded all expectations. During the first three months, more than 600 000 prepaid cards were sold in Italy. TIM offered two different packages. One included a SIM card and a mobile phone, the other one just the SIM card. After this tremendous success, TIM received the award for the best product of 1997 from the GSM MoU Association. Just seven months later, TIM's competitor Omnitel launched its first prepaid service called "Omnitel Ricaricabile". Unfortunately, this prepaid card works in newer-generation mobile (GSM Phase 2). Despite this disadvantage, Omnitel's prepaid system offers customers full cost control because the call charges are debited from the remaining credit during the call and this remains visible on the phone's display. Soon after the introduction of the first prepaid service, Omnitel launched a real breakthrough in the mobile market, the first prepaid roaming service. This prepaid roaming service was called "Valore Ricaricabile".

The costs of roaming are debited from the credit card registered to the user but no money is debited from the prepaid service when roaming. Therefore, this service was a kind of prepaid postpaid service, with some advantages of the prepaid philosophy being limited by this service.

## Prepaid Services – a Market Need

There were several reasons for GSM network operators to offer prepaid services. One of them is to attract new market segments. Another reason is that some people wish to control their costs or to use their mobile phones merely from

time to time and don't wish to pay a monthly subscription fee.

On the other hand, the GSM network operators also gained their own benefits. The administrative effort was reduced and the billing process simplified. The customer simply had to go to a local dealer and purchase a prepaid package including the SIM card and the mobile number. Depending on national legislation, registration is sometimes necessary. However, the convenience of prepaid mobile services is also based on the slogan "buy, plug and phone".

Potential customers very quickly understand how prepaid works and what its advantages are. Basically, a prepaid service is a service which has to be paid in advance, where the customer buys a certain amount of airtime. This airtime is stored in the Subscriber Identity Module (SIM) based on a smart card. Moreover, the prepaid service is a rechargeable service, as soon as the customer runs out of airtime, different recharging options are available. Mobile network operators seek different advantages from offering prepaid services. Customer acquisition costs can be kept low and there is no need to subsidise mobile phones. Customers pay for their airtime in advance so that the mobile network operator does not have to collect any money afterwards. Finally, mobile network operators can reduce their billing, customer care and administrative costs. Prepaid customers are in fact very profitable because the costs of acquisition (COA) are up to 40% less than that of a normal subscription. It is assumed that the acquisition costs for a normal subscription range from 500 to 600 US-\$ in Europe. In contrast, the average revenues per user (ARPU).

## The Crisis-Proof Winner – Prepaid Services

Prepaid services changed the mobile markets for good. Mobile network operators have to find new ways to compete successfully against their competitors as margins are shrinking and churn rates are changing constantly. Network opera-



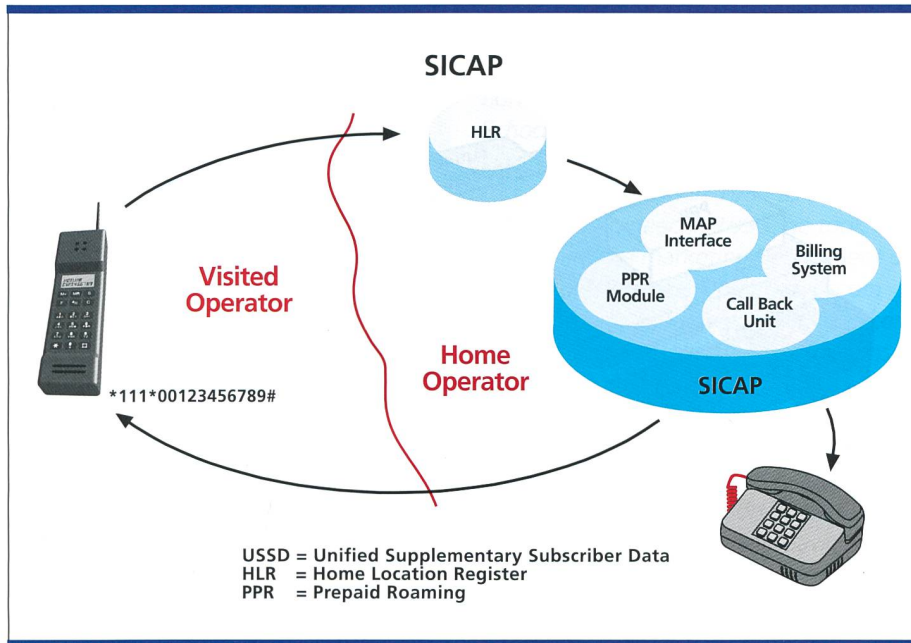


Fig. 1. SICAP – the prepaid roaming solution.

tors which offered prepaid services early, such as those in Portugal and Italy, have seen 4–5 times higher subscriber growth than in previous periods. In other countries, the prepaid segment represents over 60–70% of subscriber growth. Prepaid services can be found in a steadily increasing number of countries. During the first nine months of 1998 alone, more than 100 new prepaid services were commercially launched by mobile network operators worldwide. Some of them allowed international calls or roaming as a supplementary service. Mobile network operators follow several strategic options for competing successfully within the mobile market. First, prepaid services are excellent services for segmenting existing markets. A lot of customers did not consider mobile service because they would not use it regularly. Second, mobile network operators got a wonderful opportunity to penetrate consumer markets where purchasing power is limited. Therefore, customers just have to pay the airtime in advance, without a binding contract or monthly subscription fees. Mobile network operators see several advantages in introducing prepaid services within their existing portfolio:

- Segmentation of existing markets
- Penetration of the consumer market
- Development of new distribution channels
- Reduction of acquisition costs
- Generating new revenue streams.

On the other hand, prepaid services can be designed to focus on new customer segments such as:

- Young people who are not allowed to sign contracts
- Customers who do not want to sign a contract
- Customers who do not want to do a credit check
- Customers who like to control their costs

In Portugal, the mobile network operator TELECEL introduced several prepaid services to attract different market segments at the same time. The prepaid service Vitamina T attracts first-time customers to mobile communications. TELECEL introduced two prepaid services Vitamina K and R, which are designed for kids and youth. Another prepaid service, Vitamina P, is positioned within the business market where several supplementary services are available. The supplementary service "Roaming" in particular attracts a lot of business customers.

#### Prepaid Roaming Services – a Boundary is gone

Today, mobile network operators have signed a lot of roaming agreements worldwide. Additional roaming agreements offer additional revenues. As long as prepaid customers use their service within their home network, the billing system can immediately collect the Call Data Records (CDR). In order to prevent lost revenues, those CDRs will be billed

from the available airtime account of the customer in real time. If a prepaid customer goes abroad, the mobile network operator will get those CDRs with a delay of 24 to 36 hours from the roaming partner. Basically, that is the main reason why mobile network operators do not offer prepaid roaming services. Consequently, they block roaming by using a flag in the Home Location Register (HLR). In the meantime, mobile network operators have made roaming available to those customers which registered with a credit card. However, this solution does not consider the prepaid philosophy that customers can use their prepaid service like "buy, plug and phone". Consequently, it is not surprising that some network operators have not had much success in offering prepaid roaming services which are basically prepaid postpaid services.

#### Prepaid Roaming Services – different Solutions

The British mobile network operator Cellnet offers a prepaid roaming service called "easylife". The customer can make and receive phone calls in more than 78 countries. However, there are some limitations, since the phone calls can only be made between the UK and those 78 countries, the mobile has to be a Philips C12 and it is SIM card locked. Consequently, the roaming facility is limited. Moreover, the tariff scheme contains several tariff zones although the customer can only make phone calls back to UK from other countries. In the meantime, most of the mobile network operators decided not to implement a special platform which would allow them to offer prepaid roaming services. They extended their national prepaid service with roaming but the customer had to register. The fraud risk was limited because the customer has to register with his credit card. As already mentioned, the whole prepaid roaming philosophy was missed: "Buy, plug and phone." It is said that the new protocol Customized Applications for Mobile network Enhanced Logic (CAMEL) will offer a new way to implement prepaid roaming services. CAMEL is an IN standard for GSM and could help GSM to attract new market segments because roaming customers will have full access to their enhanced services, including virtual private networks (VPNs) and single number service. Moreover, special contracts have been set up between mobile network



operators so that CAMEL can implemented fully.

Swisscom has developed yet another first – a secure, global roaming solution. The service is based on the versatile SICAP (Solutions for Innovative Communication Applications), which continues to maintain its status as the leading platform for prepaid services. Ordered by more than ten operators, this platform now supports about 10 million prepaid subscribers.

This revolutionary application, developed by Swisscom Mobile International Business, gives prepaid customers a chance to explore the global GSM network. Compliant with the GSM standard, Swisscom's prepaid roaming solution takes advantage of the possibilities afforded by the Unstructured Supplementary Service Data (USSD). The SICAP prepaid billing system handles Call Data Records (CDR) in a proven highly secure manner, verifying remaining credit and monitoring costs.

#### **GSM CARD easyRoam – the first Prepaid Roaming Service**

Swisscom commercially launched its first prepaid roaming service called "GSM CARD easyRoam" on April 1st 1999. This time, the marketing strategy of Swisscom is focusing on the international mobile market.

GSM CARD easyRoam offers more than 200 roaming agreements in about 100 countries. After the customer has bought the packages, which include the SIM card and the user guide, the SIM card simply has to be plugged into the mobile phone. Moreover, the SIM card is already charged with 800 units so that the user can make phone calls right away.

Usually, the phone number is dialled and the call is set up. Not in this case! All outgoing calls are blocked by Swisscom because of fraud prevention. As the CDRs are delivered within 24 to 36 hours, no mobile network operator can charge the prepaid customer in real time. Instead of dialling the ordinary phone number, the customer has first to dial a prefix and then the phone number e.g. \*111\*0041793001723#. After the "ok" or "J" button is pushed, a USSD signal will be sent to the Swisscom HLR. The remaining credit is immediately checked by the SICAP billing system. If there is enough credit left, the prepaid roaming customer will be called back by the pre-

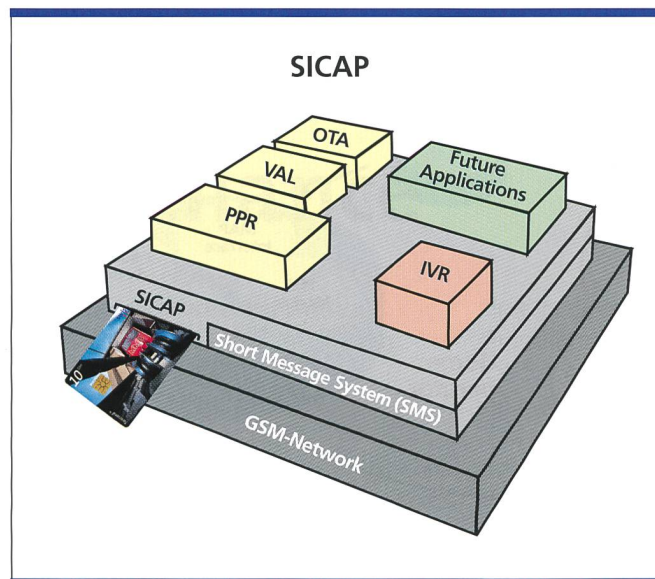


Fig. 2. SICAP (Solutions for Innovative Communication Applications).

paid roaming system. A voice informs the customer how much airtime is available based on the remaining credit. A call cannot exceed 30 minutes because of fraud security reasons. In the meantime, the call to the other party is set up. Although this process seems to be unconventional at first sight, customers quickly get used to this dialling procedure. The real advantage, just having to buy the package and immediately being able to use the prepaid service without additional registration for the credit card, outweighs the uncommon dialling procedure.

As usual, the customer can recharge his SIM card anytime and anywhere where roaming is available. There are currently three different kinds of value cards: 200, 500 and 1000 units. The cards can be bought wherever the prepaid roaming service GSM CARD easyRoam is available. The customer can also check the remaining credit by sending a USSD signal like \*147\*#. The remaining credit will immediately be sent to the display of his or her mobile phone by a short message (SMS).

#### **One Tariff Zone worldwide – the Key to Success**

Most of the mobile network operators are busy establishing roaming guides which include the latest tariffs. Therefore, some network operators have already written small booklets because they have signed more than 150 roaming agreements. It is amazing how complicated it is for roamers to study all those different tariffs when travelling. As more roaming agreements are provided

to customers, the more complicated it gets to find out the right tariff. This is the big advantage offered by the GSM CARD easyRoam service.

The SICAP system allows the simplest tariff schemes to be implemented immediately. Therefore, it is possible to offer a flat rate around the world. This makes it much easier for the customer to control his costs. Consequently, Swisscom offers one worldwide tariff structure for incoming and outgoing calls!

#### **Faster, better, easier, cheaper – the Key to Success**

Combining roaming agreements together with prepaid services generates new business opportunities for mobile network operators. Moreover, specific market segments can be attracted in niche markets like travellers. Instead of fighting for residential customers, mobile network operators can now access international markets. Consequently, the market potential will immediately be extended by millions of customers who need to be reachable whenever they travel. Moreover, prepaid roaming services are a win-win deal for the mobile network operator as well as for the customer. The mobile network operator can increase revenues and has better usage of its roaming agreements. Acquisition costs can be kept low and the fear of bad debt is reduced. New distribution channels can be accessed worldwide, attracting new customers of different cultures. On the other side, prepaid roaming customers benefit from a unique mobile service which allows cost control and no monthly subscription fees. Most of



**Sicap – the Prepaid Roaming Solution**

- minimal changes in network
- no capacity problems
- remaining credit visible on display
- easily and flexibly rechargeable
- independent billing system

the mobile network operators say that they will wait until CAMEL is fully implemented within the next few years, also by other mobile network operators. As long as market analysts are looking at existing markets and recommending that people wait and perhaps rethink their marketing strategy, mobile network operators will not succeed in implementing and offering new, innovative mobile services worldwide. Eventually, they will find themselves in a ruinous price battle with no end.

9.3

*Ernest Cavin, following a formal education in micro-mechanics, joined the School of Engineering in Biel, Switzerland, where he majored in microelectronics. He graduated in 1989 as a microelectronics engineer. In 1995, he took up a position in the marketing department of the Mobile Business Unit at Swisscom Ltd. (formerly Swiss Telecom PTT), where, as a product manager, he was responsible for paging services, in particular service implementation based on the ER-MES (Enhanced Radio Messaging System) standard. After starting a Masters of Business Administration at the City University, Washington, Mr. Cavin moved to the International Business department of Mobile. In summer 1998, he was promoted to Personal Assistant to the Director of International Business at Mobile, where he also heads the International Service Providing unit.*

Michael Esser

**Der Griff nach den Sternen**

Eine Geschichte der Raumfahrt  
Birkhäuser Verlag, Basel, 1999. 200 S.,  
103 Farb- und 80 SW-Abb., geb.,  
Fr. 58.–, DM 68.–, öS 497.–,  
ISBN 3-7643-5940-4.

Seit auch der hinterste Winkel unseres Planeten erforscht worden ist, gehört die Eroberung des Weltraumes zu den letzten grossen Herausforderungen der Menschheit. Doch was früher nur ein Traum war, ist in den letzten fünfzig Jahren Stück für Stück Realität geworden. Am Anfang standen Versuche mit Raketen und Satelliten, aber schon in den 50er-Jahren begannen die Vorbereitungen für die bemannte Raumfahrt. 1961 umkreiste mit Juri Gagarin der erste Mensch die Erde im Weltall. Das ist erst 37 Jahre her, und doch scheint es eine Ewigkeit zu sein, vergleicht man die heutigen Vorhaben mit den Anfängen der Raumfahrt. Eine riesige neue Raumstation ist in Planung. Der Planet Mars soll von Menschen betreten und langfristig vielleicht kolonisiert werden. Kühne Zukunftspläne sehen sogar unbemannte Missionen vor, die Planeten fremder Sonnensysteme erforschen sollen. Michael Esser hat sich zum Ziel gesetzt, diese rasante Entwicklung zu beschreiben. Seine Geschichte der Raumfahrt gibt die wichtigsten Ereignisse und historischen Zusammenhänge wieder, erläutert aber auch mit einfachen Worten technische wissenschaftliche Hintergründe.

**Informationstechnik kompakt**

Theoretische Grundlagen der Informations- und Nachrichtentechnik  
Hrsg.: Otto Mildenberger. Vieweg,  
GWV Fachverlage, Wiesbaden, 1999.  
XII, 368 S., 142 Abb., brosch., DM 54.–,  
ISBN 3-528-03871-3.

Das Buch stellt die theoretischen Grundlagen der Informations- und Nachrichtentechnik zusammen und vermittelt einen Überblick über die wichtigsten Bereiche der Informationstechnik. Es liefert wertvolle Hinweise auf Schwerpunkte einzelner Gebiete und Literaturhinweise für die Weiterarbeit. Berücksichtigt werden derzeit besonders wichtige Gebiete der Informationstechnik mit einem Akzent auf der digitalen Nachrichtentechnik.

**Zusammenfassung****Prepaid Roaming Services – Herausforderung und Chance zugleich**

“Taking Roaming into the future” war das Thema der vierten Jahreskonferenz, die am 2. und 3. November 1999 im Londoner “The Barbican” zu Gast war. Die Teilnehmer konnten sehen und hören, wie man einen Mobilkommunikationsmarkt aufbaut, erobert und beherrscht. Vor wenigen Jahren noch war das Funktelefon der Geschäftswelt vorbehalten und galt als Spielzeug der Manager. Heute ist es ein alltäglicher Anblick. Seine Abmessungen sind immer kleiner geworden, während die Abdeckung der Mobilfunknetze immer grösser und ihre Qualität immer besser geworden ist. Kein Wunder deshalb, dass die Anhänger der Mobilkommunikation nach ein paar Jahren schon nach Millionen zählen. Die Leute wollen ihr Mobilfunkgerät überallhin mitnehmen, es soll sie auf ihren Reisen von Land zu Land begleiten, und genau das macht die Roamingfunktion des GSM-Standards möglich. So braucht der Abonnent nicht auf sein Handy zu verzichten, wenn er fern vom heimischen Netz Anrufe tätigen oder Anrufe empfangen möchte. Nie hatte die Bewegungsfreiheit für die Menschheit so viel Gewicht, nie war sie so selbstverständlich wie heute. 1991 unterzeichneten die Deutsche Telekom, France Telecom und Swisscom, die damals noch Teil der schweizerischen PTT-Betriebe war, das erste Roaming-Abkommen. Heute, nicht einmal zehn Jahre später, sind es Hunderte.