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GSM - A FACTOR IN EXPANDING THE TOURISM OF THE REPUBLIC OF CROATIA AND HER INTEGRATION IN THE EUROPEAN DEVELOPMENTS IN TOURISM AND TRANSPORT

SUMMARY

The paper examines the effects of implementing the pan-European mobile cell system - GSM (Global System for Mobile Communications) in the total tourist trade of the Republic of Croatia, the procedure of its planning and integration in Croatia's telecommunication network and the influence on the European and world-wide developments in trade and tourism.

Special emphasis is laid upon the accessibility and range of mobile services that result from adequate network planning and the control of network traffic flow.

The essential factors that influence service quality from the user standpoint are identified.

1. INTRODUCTION

Ever since 1982, when the European administration for posts and telecommunications (CEPT) formed a special group of experts (Groupe Speciale Mobile) with the task of creating a new, joint mobile system in Europe, and its commercial release in 1991 under the name GSM (Global System for Mobile Communications), the number of mobile subscribers has been and is growing at an enormous rate.

In many cases this pan-European mobile network presents competition for fixed networks and wireless telephones since it supports other types of services in accordance with the principles of a "multiservice" integrated digital network (ISDN-Integrated Services Digital Network), as well as tele-services (telephony, teletex, facsimile etc.)

Apart from international "roaming" (uninterrupted communication in any country signatory of the GSM standard - MoU Memorandum of Understanding), mobility is further enhanced by the subscriber chip card (SIM - Subscriber Identification Module). This means that European tourists can rent a mobile terminal (at a reasonable price) at the tourist office, catering establishment, airport or marina, keeping

their subscriber's number and freedom of communication.

In a certain sense, the GSM system should not be considered unique because, by accepting the GSM standard, individual national mobile networks function as components of the unique GSM system.

Today, over a hundred countries in Europe and the world support this standard.

Tourism is an important part of economic trade in the Adriatic region and telecommunications are a major constituent that form and organise the tourist trade. The accessibility of GSM services in the whole of Croatia, mainly at the coast, will enable Croatia's tourist trade to be included with competence and on an equal footing with the European and world tourist trade.

The tourist market which is included directly in the international market, is the fastest to react to world trends in development and hence to the development of mobile telecommunication systems. Presence on the European and world market is possible only by eliminating all the technical barriers, which means ensuring high quality accessibility and range of services in the whole of the Republic of Croatia, especially at the coast.

2. THE BASIC STRUCTURE OF THE GSM NETWORK

In order to understand the following terminology and functioning of the system, Fig. 1 shows the basic structure of the GSM system with the corresponding subsystems.¹

The architecture of the GSM system as a cellular network system is designed in such a way that it enables international "roaming" which presents a technical advantage in relation to other mobile communications systems. International "roaming" allows the

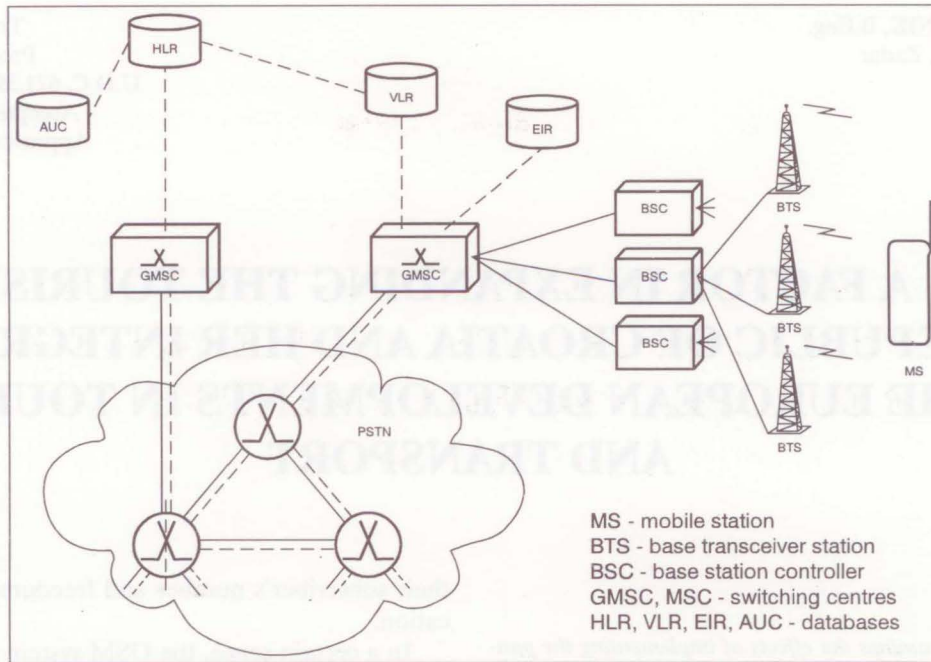


Figure 1 - The architecture of the GSM system according to ETSI

subscriber to use the mobile apparatus in all countries of the GSM network.

In order to obtain a more complete overview, the GSM system can be divided into three sub-systems:

- the switching centres (MSC) with databases (HLR, VLR, EIR)
- the radio networks sub-system (BSC and BTS equipment)
- the accounts and services sub-system (Billing centre)

The architecture of the system is similar to other mobile cellular systems (it "relies" on a fixed network infrastructure), but it has many advantages, the most important being:

- a completely digitalised system
- taking into consideration the co-existence of the present mobile systems
- international compatibility (international roaming)
- large capacity (number of subscribers)
- variety of new services and network opportunities
- improved speech quality
- high level of safety and protection
- portable low power terminals
- operating frequency range of 900 MHz

2.1. The SIM card (Subscriber Identity Module)

The SIM card is the subscriber identification card and gives the mobile station identity. Without it, the mobile station (MS) is not usable i.e. calls cannot be made (except emergency calls).

This is an intelligent card with a built-in microcomputer and memory chip the size of a credit card. Before using it, the MS card must be inserted into the "scanner" of the mobile station.

Data on the subscriber and other information such as telephone numbers, short messages, numbers for quick dialing etc. are stored on the SIM card.

The SIM card has the function of identifying the network subscriber so that when travelling, for example, it is not necessary to carry the whole MS but only the SIM card and the MS can be hired. The cost of each telephone call is added to the subscriber's bill at home regardless of where the call was made from.

The card also contains the PIN (Personal Identification Number) and the PUK (Personal Unblocking

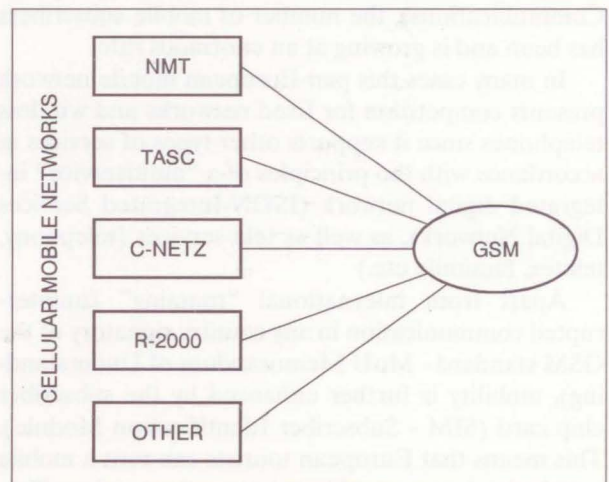


Figure 2 - The integration of mobile cellular networks

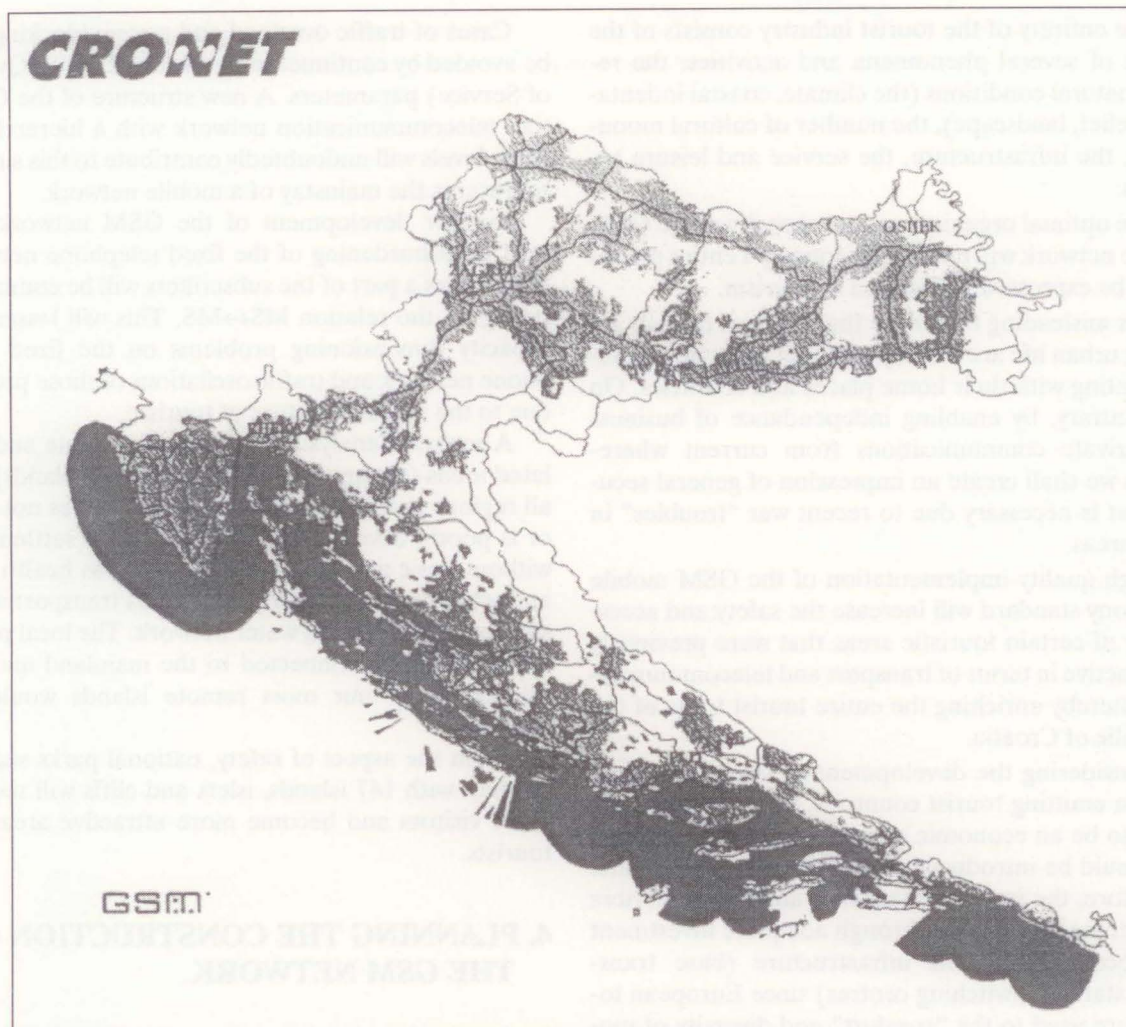


Figure 3 - Coverage areas of the CRONET (GSM) network - February 1997

Key), secrets and numbers known only to the subscriber which protect the card from misuse.

The implementation of the GSM system in Croatia's telecommunication network results from European and world-wide efforts in creating a unique public system of fixed and mobile communications, in other words, in integrating mobile and fixed communication services on land, sea and air into one compatible global communication system in which the GSM represents the first level of integration (Fig. 2).

3. TOURISM, THE TOURIST MARKET: THE ROLE OF GSM

The word tourism, which comes from the French word "tour" and denotes a walk, outing, ride, journey, part of a journey, stage, implies the major characteristics of this first-rate modern social and economic phenomenon. Tourism represents the imperative of a

modern lifestyle and a criterion of socio-economic progress of a country and region.

Since it affects the general population, it is being increasingly transformed into a complex economic activity. The economic features and the importance of tourism as an inspiring factor of economic development of a country's progress are reflected in the following:

1. Tourism is an important factor in expanding economic relations with foreign countries thereby affecting the growth of domestic national product and the improvement of our country's balance of payments and foreign exchange.
2. Tourism influences regional progress and economic opening of individual areas and regions and the creation of new jobs in service, e.g. tertiary trades.
3. Tourism enables extra sales of goods and services.
4. Tourism enables valorisation of our country's economic and cultural-historic values and their presentation to the international public.

The entirety of the tourist industry consists of the results of several phenomena and activities: the regions natural conditions (the climate, coastal indentation, relief, landscape), the number of cultural monuments, the infrastructure, the service and leisure activities.

The optimal organisation and capacity of the GSM mobile network will enable the country's entire potential to be expressed in the area of tourism.

It is misleading to believe that modern tourists escaping urban life are also trying to get away from communicating with their home places and countries. On the contrary, by enabling independence of business and private communications from current whereabouts we shall create an impression of general security that is necessary due to recent war "troubles" in these areas.

High quality implementation of the GSM mobile telephony standard will increase the safety and accessibility of certain touristic areas that were previously unattractive in terms of transport and telecommunications thereby enriching the entire tourist trade of the Republic of Croatia.

Considering the development of telecommunications in emitting tourist countries, the tourist market can also be an economic segment in which new services would be introduced first and at the fastest rate. Therefore, the implementation of additional services needs to be accelerated through adequate investment in telecommunications infrastructure (base transceiver stations, switching centres) since European tourists are used to the "comfort" and diversity of mobile services provided by their domestic mobile network. Here, it is necessary to reduce the range of promotive activities for this type of services because the bulk of tourists comes from countries in which the GSM network is entirely developed, with a whole range of mobile services (ISDN).

Since there is an interactive relationship between telecommunications and tourism, an inadequate application of the GSM standard, especially as regards the accessibility and range of services, could become the limiting factor in the development of tourism.

The contribution of a "boundless" mobile communication mode is in higher efficacy and business results of all economic parties especially tourist organisations as they are directly involved in the business of internal or external information transfer.

In the initial stage, emphasis needs to be put on the size of the coverage area that enables the telecom operator to offer speedy basic (telephone) service. Later, the system capacity should be increased (cell splitting) through increased traffic and an analysis of the focus of demand for services.

Cases of traffic overload and system blocking will be avoided by continued supervision of QOS (Quality of Service) parameters. A new structure of the Croatian telecommunication network with a hierarchy of three levels will undoubtedly contribute to this since it represents the mainstay of a mobile network.

Further development of the GSM network will lead to disburdening of the fixed telephone network (PSTN), as a part of the subscribers will be communicating on the relation MS \leftrightarrow MS. This will lessen the capacity dimensioning problems on the fixed telephone network and traffic oscillations of those present due to the seasonal nature of tourism.

A separate analysis is needed for remote and isolated areas (distant and thinly populated islands), i.e. all regions in which telephone network does not exist or is poorly developed, and for all small settlements without basic and public services such as health care and schooling, with poorly developed transport infrastructure, electric and water network. The local population would be connected to the mainland and depopulation of our most remote islands would be stopped.

From the aspect of safety, national parks such as Kornati with 147 islands, islets and cliffs will receive more visitors and become more attractive areas for tourists.

4. PLANNING THE CONSTRUCTION OF THE GSM NETWORK

As with other mobile systems, the construction of basic system entities is carried out first. Covering the costs with services, which is sufficient in the beginning of commercial business, is first ensured in major cities, on more important traffic routes, at airports, tourist centres, coastal sailing routes and the like.

Such an approach has technical and economic justifications.

Visiting subscribers (tourists) can use services of the digital mobile GSM network as "travelling" users (roamers) using their own GSM terminal in our country or by hiring one (rental users) at airports (the case in Moscow), harbours, marinas (in addition to other services such as water, electricity etc.) and catering establishments. This gives them the ability to communicate as in their native country.

In order to ensure service accessibility, first of all, radio-signals should "cover" the largest marinas and tourist places with the most "tourist-days" and coastal sailing routes and then areas which do business only during the summer months. Attention should especially be given to possible traffic centres (bridges, channels, bays, large bathing resorts).

In the actual planning of coverage areas, the so-called umbrella cells play an important role making the network construction significantly faster, simpler and economically sound. The term "cell" denotes an area covered by one base transceiver station. Umbrella cells are large cells ($R > 10$ km) which contain small cells ($R > 2$ km) and microcells ($R > 0.5$ km).

These cells cover small cells and microcells and the area between them. The transmission power is far greater than that in a microcell and the frequency is different. If the connection request cannot be realised in the microcell owing to insufficient signal power or an insufficient number of radio-channels, the "umbrella" cell can be used as an alternative.

5. GSM AND THE QUALITY OF SERVICE

The Adriatic coast is one of the world's most beautiful and best-indented coasts. Standard approaches in the tourism concept need to be complemented in many aspects as the dynamic western market constantly needs new and original ideas and concepts. In these terms, investment in marketing backup represents the basis for the progress of tourism. The GSM mobile network will complement the range and quality of the tourist trade and, as such, needs to be presented to the European and world tourist market in an adequate way.

Here, it is important to identify the basic factors that determine the quality of service from the users point of view. These are:

Reliability

denotes service fulfilment - correctly and on time. This especially refers to the visible part of services (the promptness and correctness of the bill, the procedure of hiring or purchasing a terminal etc.)

Responsiveness

refers to the desire and capability of personnel to offer services.

Competence

means possessing the adequate knowledge and skill to offer services. This refers to operational and contact personnel.

Accessibility

includes:

- pleasant and accessible contact with personnel
- maintaining GOS (Grade of Service) parameters at a normal level (blocking probability)
- adequate capacity (number of radio channels)

Courtesy

includes politeness and tactfulness of the personnel (equipment renters, operators etc.)

Communication

means informing tourists in the language which they understand. This includes listening to their comments

and suggestions. The guest is the boss. The language in which news and possibilities are presented needs to be simple and understandable to the average user without too much technical terminology.

Advertising material, posters and leaflets must have the GSM logo, price list of services in each network, coverage areas, places where a terminal can be hired and the like.

Credibility

means placing the users' interests first and foremost. Credibility is additionally achieved through:

- the name and reputation of the telecom operator
- personal characteristics of contact personnel.

Security

As was said earlier, the complete implementation of the GSM system will contribute to the sense of security and amicability towards guests from abroad.

This includes:

- physical security (the ability to communicate in all situations and in all places)
- financial security (the bill will be paid upon returning home)
- ensuring privacy (the conversations are not tapped).

Understanding

includes considering their specific needs (types of additional services, special types of users) and satisfying these needs.

Tangibility

Tangibility manifests itself through the presence of physical service (the environment in which services are offered, "tangible" service support, visualisation).

6. CONCLUSION

Efforts made by the Croatian telecom operator and dispenser of "mobile" services (HPT) to follow the European and world trends in mobile communications resulted in the implementation of the GSM system into Croatia's mobile telecommunication network in 1995. The GSM system is developing simultaneously with the analogous NMT-450 system ("mobicel") which is still registering a positive trend in growth although of lesser intensity.

Economic and political reforms in Croatia have undoubtedly contributed to the rapid development of the GSM digital mobile network.

Democracy certainly includes competition and choosing the most favourable and most profitable area of working. Our economic, geo-transport and general inclination towards Europe remains confirmed once more in terms of telecommunications.

Since telecommunications systems e.g. mobile systems, represent the most dynamic and most propulsive area of progress and high technology application, em-

phasis is on the necessity of integrated functioning of technical and marketing factors (synergistic effect). The recognition and satisfaction of the basic and limiting factors in the quality of service are an important feature in this.

Within the frame of efforts to participate as successfully as possible in the European tourist and transport developments, the introduction of new mobile system and technologies has to be supported constantly. The appetites of the "information society" of the developed Europe have long since exceeded "standard" tourist services. In this context, it is necessary to co-ordinate goals, needs and activities between the service provider and tourist operators and companies.

SAŽETAK

GSM - ČIMBENIK PROŠIRENJA TURISTIČKE PONUDE RH I NJENOG UKLJUČIVANJA U EUROPSKE TURISTIČKE I PROMETNE TOKOVE

U radu se razmatra utjecaj implementiranja pan-Europskog mobilnog ćelijskog sustava - GSM (Global System for Mobile Communications) na ukupnu turističku ponudu Hrvatske, postupak njenog planiranja i uključivanja u hrvatsku telekomunikacijsku mrežu, kao i utjecaj na europske i svjetske gospodarske i turističke tokove.

Poseban naglasak je na dostupnosti i asortimanu mobilnih usluga što je rezultat adekvatnog mrežnog planiranja i kontrole mrežnih prometnih tokova.

Identificirani su ključni čimbenici koji imaju utjecaj na kvalitetu usluge sa stajališta korisnika.

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