Mobile Visitor Information System on Available Accommodation Capacity

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Abstract. *Market transparency is one of the key success factors in the hospitality industry. Foreign visitors rely less and less on the services of tourist agencies, whereas travelling in organized groups to predetermined destinations is not as popular as it used to be. Modern tourists, especially younger population, increasingly choose their holiday destinations at the last moment, travelling on their own, frequently like nomads who change the resort several times during their holiday, and thus also their accommodation. In such conditions, especially in high season during summer, when accommodation occupancy rates are very high, efforts should be made to help the visitors find adequate lodging. Given the ubiquity of mobile phones which allow digital exchange of data, they can be easily used in conjunction with other information and communication technology to solve the problem of transparency for accommodation capacities. To do this, a simple system of digital exchange of data between visitors i.e. mobile phone users and the system for recording available accommodation could be developed and put to use.*

Keywords. Tourism, SMS, Web and walk, Information and communication technology, Database design.

1. Introduction

One of the major trends in tourism in recent years is individualization of travel, i.e. tourists travel on their own, frequently without mediation of agencies, and this approach is accompanied by a last-minute decision on the holiday destination, frequently when already there. In Croatian circumstances, one can witness during Italian holiday season *Ferragosto* a great number of Italian visitors going through our coastal towns individually or in small groups, looking for accommodation. Unfortunately, the lack of transparency regarding free accommodation often causes the guests to fail in their attempt to find the place to stay, while the free capacities remain empty.

All the above indicates a clear need to devise a model of informing the visitors on currently available accommodation capacities. In addition to personal information within local Tourist Board offices and tourist agencies, a rational solution is offered by information technology, especially mobile phones and their potential in digital transfer of data. Thus by using potentials offered by SMS, as well as by the Web and walk concept, it is possible to offer two information systems regarding free accommodation, at the request of visitors themselves.

The crucial aspect of these concepts is their simplicity, broad accessibility and possibility to be used by visitors without any prior training. In today's world it is virtually inconceivable to have visitors without at least one mobile phone. It would be equally difficult to find a landlord who does not use a mobile phone. Obviously, practical technological preconditions for full implementation of the digital data exchange concept regarding free accommodation are in existence. The only thing remaining is to

implement the concept in the real world. Since this is a very simple and inexpensive concept, there are no real obstacles for its implementation in practice.

2. Research Methodology

Information superiority is a basic requirement for the success of modern tourism. Keeping visitors continuously informed on free accommodation is the precondition for successful sales of free tourist capacities. Taking into consideration the initial issue, i.e. the need to continuously inform visitors on free capacities, we propose the following hypothesis:

Usage of modern digital technology for mobile exchange of data between tourist supply and demand can improve the sales of available accommodation in pragmatic conditions.

With regard to the above hypothesis on one hand, and constraints on the length of the paper on the other, we aim to present a conceptual model of a visitor information system through SMS and Web and walk technology. In addition to its theoretical value, this model should also have a pragmatic value in terms of creation of an applicative programme solution, whose prototype was made within the conducted research.

Considering the nature of the problem, the research will be conducted deductively; starting from the above hypothesis, the research will take global trends into consideration and define the necessary structure, events and processes which define the conceptual model of the visitor information system. The main method used to achieve the research goals is the modelling method, which models global events and processes descriptively and creates a conceptual model, on the basis of which a prototype of a part of the conceptual model is created. This prototype is a pragmatic system of information about accommodation capacities in holiday resorts. To properly define the analogies in the process of modelling between the original and model, we shall use the systematic approach that (through systematic analysis and synthesis) ensures dynamic modelling of processes and events that are important for the creation of the model. Apart from these fundamental research methods, we shall use other scientific methods such as the abstraction method and the derived methods of classification, generalization, aggregation, specialization and composition; historical method, dialectic method etc.

The results presented in this paper represent research efforts that have lately been in the focus of authors' attention, and are oriented towards discovering optimal usage of the potential of mobile phoning in Croatia. We present here a conceptual model of a mobile tourist Info-centre that is currently being implemented only as a test model.

3. Work Principles of a Mobile Info Centre for Accomodation Capacities

Starting from the need to solve the problem of transparency of accommodation capacities in Croatian tourism, we have devised a flexible conceptual model that uses the potentials of mobile communication technology, especially in the part regarding digital exchange of data. The model envisages two forms of communication:

1. landlord – accommodation capacities database
2. accommodation capacities database – visitor

Within the first communication form there are the following cases:

1. Landlord registering in the database
2. Daily registering of free accommodation, and
3. Cancellation of free accommodation.

Each of these forms of communication can be performed by an SMS or by filling in a Web form, either using a mobile phone or through the Internet. Since both methods of filling in the form are carried out in the same way (i.e. on the mobile phone and on a PC), the usage of a Web browser on a personal computer will not be explained here.

When making an SMS registry, the landlord first enters his/her basic data, i.e. name and family name, and the phone number. Both methods of registry are shown in Figure 1:

As shown in Figure 1, the landlord fills in the same data, regardless of the path of registry (SMS or a Web form):

1. Family name (surname) and first name,
2. Postal city code, and
3. Telephone number where visitors can contact him.

Once the server has received the data, the user-landlord is entered into the database. The landlord then receives an SMS or an answer in the Web browser on his mobile phone with a 5-digit identification number (username) and a password to be used in future communication with the server, i.e. the database. Figure 2 shows the answer from the server after the landlord's data have been registered.

Figure 1. Landlord registry by an SMS and the Web browser on a mobile phone

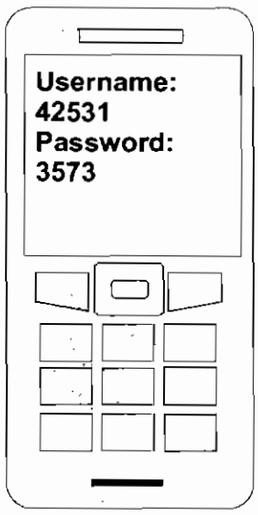

Figure 2. Server's reply after registering the landlord's data, received as an SMS or on a Web browser

Once the landlord is registered into the database, he needs to register his accommodation capacities as well. For each room or condominium he has to write in:

1. ordinal number of the accommodation
2. Username (identification number)
3. Password
4. Type of accommodation (S - room, A – condominium)
5. number of beds
6. Address of accommodation

After filling in the required data and sending them to the server, the data will be returned as an SMS or through the Web browser, so that the landlord can check whether the data are correctly entered. Possible errors can be corrected so that the same data are entered again and resent to the server. If a landlord wishes to erase the data, he should send an SMS (or fill in a Web form) with the first three of the six items above. In an SMS, data are separated by commas, whereas in the Web form one fills in appropriate fields.

Following the described pattern, landlords can always add, delete, or change the data on their accommodation capacities. However, for deleting and removing their basic data (identity) from the database, they should send an SMS with the following data:

1. Username (identification number)
2. Password
2. the word «OBRISI» (delete)

The data on free accommodation are entered daily by sending an SMS containing the following:

1. Letter «S» - free
2. Username (identification number)
3. Password
4. Ordinal number of the accommodation.

After the sent SMS, or the submitted Web form, the landlord will receive a reply informing him that the data on free accommodation have been entered into the database. The data on free accommodation are active from noon of the current day till noon of the following day, which is the length of a day in tourist accommodation. Landlords are thus obliged to update daily the data on free accommodation and, if they do register their free accommodation via SMS, to repeat that for every free accommodation they wish to register. The same goes for the registration via a Web form. It is in the landlord's interest to make the registry as soon as possible every day (at noon or immediately afterwards), since accommodations listed for visitors will follow the order of landlords' registrations on a particular day. It is also in the landlord's interest not to register occupied accommodation, and to cancel the accommodation occupied in the meantime for the following reason: if it is discovered that a landlord has attempted to give false data on the occupancy (e.g. through guest registry), he/she is automatically deleted from

the database, and is banned from using it for a certain period of time. To register the occupancy of an accommodation, a landlord has to enter the following data through an SMS or in the Web form:

1. Letter «Z» - occupied
2. Username (identification number)
3. Password
4. Ordinal number of accommodation

If a landlord wishes to check which of his accommodation capacities have been registered as free on a particular day, he can send an SMS or fill in the Web form with the following data:

1. Sign «?»
2. Username (identification number)
3. Password

The landlord will then receive a list of registered free accommodation capacities with the following data:

1. Ordinal number of the accommodation
2. Type of accommodation
3. Number of beds
4. Address of the accommodation

In addition to the administrative part of the system which allows landlords to register into the database and to update the data on their accommodation capacities, the application contains the part oriented towards the visitors, providing them information on request on available accommodation in the area. To receive a list of available tourist accommodation, a visitor should send an SMS to the server or fill in the Web form with the following data:

1. Postal code of the city/village
2. Type of accommodation required (S – room, A – condominium)
3. Number of beds required.

The visitor will then receive a reply containing the following (see Figure 3):

1. Family name and first name of the landlord
2. Phone number
3. Address of the accommodation.

Any visitor will be sent maximum three SMS messages with a list of free accommodation, i.e. that many items in the Web form. If a visitor wishes to have a longer list, he should send an SMS with the word NEXT, or he should choose the adequate option for continuation of listing in the Web form. The visitor can then call the landlord or simply go to the address he received in the message

In order to implement the modelled system successfully, it would be advisable to organize the SMS system within the dialling code 060 which ensures that the costs of sending and receiving messages will be charged to the visitor, i.e. the landlord.

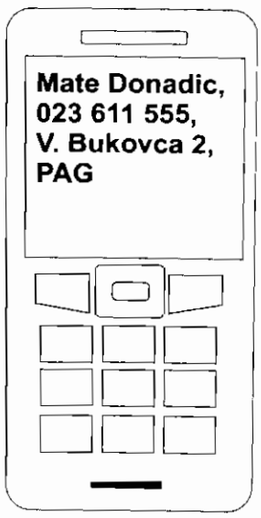

Figure 3. Data on free accommodation received as an SMS

4. Technical Peinciples of the Mobile Info Centre for Accomodation Capacities

There are two parties in the conceptual model of a mobile information centre: first, there is the telephone used by the tourist to get the required piece of information through SMS or the Web form, i.e. the user, and, at the other end there is the service provider – the information system, which takes requests from the service user, processes them, returns replies in the form of SMS or Web pages. Figure 4 shows that the basic structure, which has been used in the development of the prototype, consists of these hardware components:

- GSM modem and
- 2x PC server.

Although it is possible to use only one PC server for the functioning of the system, in order to achieve more economical processing, one PC server is used for its Web server and SMS server resources, whereas Database server is used on the other PC server. Control and communication with GSM modem is provided by the SMS server. The GSM modem in Figure 4 is a device through which data exchange between the computer system and mobile phones is performed.

The SMS server exchanges data with the GSM modem, and informs the user application about that. The data exchange with the GSM

modem goes through protocol-defined input and output files, and the file with registered errors. The communication system between the SMS server of the user application functions in the way that the user application reads the data recorded by the SMS server in the file with registered errors and in the input file, analyzes them, and based on the recognized instructions performs set actions. The replies and possible errors are recorded in the output file, whose content is forwarded to the GSM modem through the SMS server, and then distributed as an SMS message to phone numbers from which inquiries were sent.

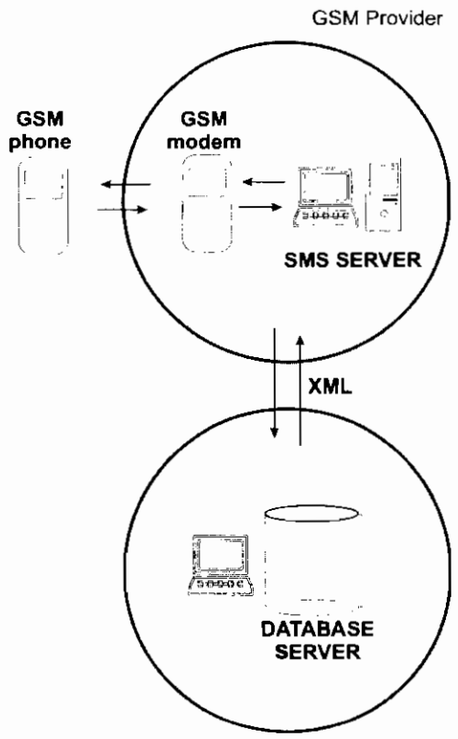

Figure 4. The principles of functioning of the mobile info-centre

In the prototype developed here, the mobile info-centre used the free SMS server programme package distributed for Linux operational system in the original code, which is also applicable on the Microsoft platform. The user application, written in script PHP programme language, as seen in Figure 5, comprises the following subsystems:

- Subsystem for SMS messaging,
- Subsystem for Web messaging,
- Subsystem for content management.

The user application thus represents a cohesive part, which on one hand communicates indirectly with the SMS server providing data exchange between the SMS server and the data base, and on the other hand communicates with the web server through which the data base content is controlled, i.e. the information and the services available to the visitor. In principle, the communication process between the service user and the user programme application functions according to the following process:

- a user sends an SMS or Web message with the characteristic content
- the GSM modem receives the message and forwards it to the user application through the SMS server
- the user application analyses the received message, generates the output SMS or Web pages and sends it to the telephone from which the service was requested, through the SMS server and the GSM modem. Considering the limited length of SMS messages of 160 alphanumeric signs, the reply has to be in the adequate concise form, and if necessary, more than one message can be sent.

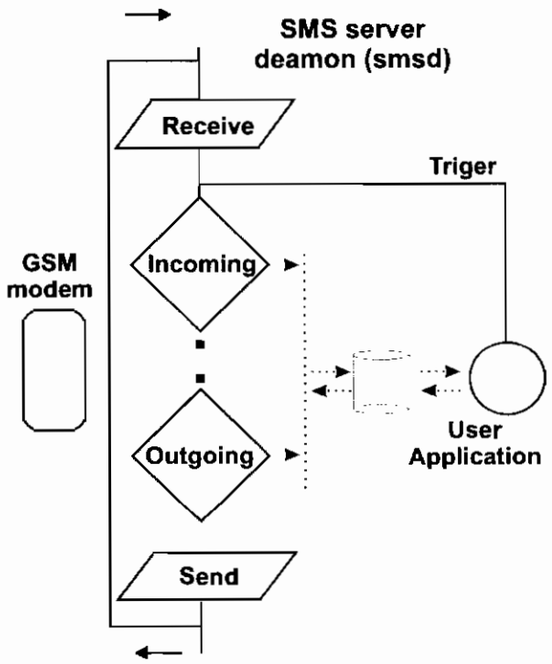

Figure 5. Basic structure of mobile-Info application

To get help in using the system, visitors can send an SMS with the sign ? to a particular number, and they will receive written instructions how to use the system. On the other hand, landlords should receive printed instructions on using the system, to be distributed by the legal entity or institution that will organize and maintain the defined system. It would be best if local branches of the Croatian Tourist Board could take on the system implementation and maintenance, given their status as the main organizer of tourist activities at the local level.

5. Conclusion

Tourism is one of the most important export products of the Republic of Croatia. Most revenues from tourism are received during summer months in the domain of the so-called Summer tourism. Since the summer season is very short, and given the anomalies in occupancy rates caused by events outside the control of tourism officials in Croatia, it is very important to create such conditions in which all the potentials will be used, and accommodation capacities filled as much as possible. This is especially valid for high summer season, since the income from accommodation is still in the domain of primary sources of income, if not the most significant source in tourism.

The greatest number of unfilled accommodation capacities on the Croatian coast at high season is in privately-owned boarding houses scattered over a wide area. While big hotels usually work with big tour operators, small private renters are normally oriented towards individual travellers and rent out their accommodation through local tourist agencies. Occasionally erratic situation in the field, poor knowledge of occupancy at a particular moment, and low transparency of free private accommodation, are all to blame for the situation when some accommodation remains empty even at a time of great demand.

The situation is further complicated by new global trends in tourism, such as increasing individualization of travel, where visitors, especially younger ones, come individually or in small groups, avoiding the mediation of travel agencies, and look for accommodation going from door to door. They do this most frequently in high season, with halfway success.

The solution to this problem lies in increased transparency of accommodation capacities, by building a visitor information system on accommodation occupancy. The technological solution chosen for this model consists of two modalities of digital data exchange supported by digital mobile communication technology. Communication is possible through SMS, but also through Web technologies adapted for use on a mobile phone. This technological solution was chosen for pragmatic reasons, since today's mobile phones are so widely used by both tourists and landlords, and their usage is simple enough for any age group regardless of their technical knowledge. This goes both for digital message exchange and for mobile Web system. In principle, the idea of information system is based on daily registering of free accommodation into a database done by landlords through a mobile phone as an input subsystem. The other side is providing information on request to visitors on available accommodation, on the basis of entered data. The system is very simple to use and can be implemented with very limited funding. It could be organized locally, but it could easily cover a much bigger area as well. Given the programme solution, the system maintains itself, and needs no special control or maintenance.

6. References

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