

# THE MODEL OF COORDINATION OF COMMUNICATION CHANNELS FOR SMALL TOURIST COMMUNITIES

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## Abstract

By including e-business, small tourist communities were allowed, apart from their classic offers, to appear on the global market, but that caused the need for automation and coordination of booking capacity tasks. Advertising and booking in these communities are performed by a conventional agency arrangement, the Internet, mobile services or by tourists themselves upon their arrival in the local community where they can reserve the accommodation. The possibility of booking accommodation capacities in many ways creates additional benefits for considerable usage of excess capacity, but as a side effect there is a problem of coordination of communication channels in order to avoid double-booking. On the other hand, the local administration has a problem with the registration and the payment of the tourist tax, particularly if the tourists do not stay long. With the automation and coordination of communication channels, conflicts can be completely avoided, and the reservation system informs all interested parties and reports to the local administration.

**Keywords:** local communities, local administration, communication channels coordination, mobile services.

## 1. Introduction

The development of the Internet and its services, mobile technologies, mobile services, GSM technology and the advancement of information and communication technology had a big influence in the area of electronic commerce which affected also the field of tourism and changed the ordinary clichés.

Tourist destinations often offer services and advertise themselves in local communities. These communities form a group of independent (individual) identities with a larger number of facilities (buildings or rooms for rent), motels, bed and breakfast, and, as the part of their offer, are all available tourist facilities. This is especially noticeable in areas which are less developed and outside the standard travel directions. For these communities, the Internet and mobile phones have become important channels of communication through which they offer information about their own capacities, and allow tourists to learn and be informed about the tourist potential and offers. Jobs automation and transition to the Internet technologies have created prerequisites for the whole system to be linked, and created a unique one which is capable of preventing multiple bookings of the same capacity. With the adoption of technological solutions (mobile phones, Wi-Fi, Mesh, Wappo, Bluetooth, NFC) preconditions were created for these communities to offer new possibilities of presentation to their customers.

Improved information and coordination within the local tourist board is enabled by mobile technologies. This is particularly important for the tourists who are traveling through the country, because in this way they can get information about the places of interest in the region they visit. On the assumption that tourists make decisions on the basis of currently available information, mobile services can significantly contribute to increased visits. The literature also indicates that travel is a sense-making process, in which travelers construct the tourist experience by learning, understanding and feeling the places visited and the culture embedded in these places (Jennings and Weiler, 2006).

Previous researches show that smartphones with additional applications can significantly contribute to tourist satisfaction by providing them with a lot of information. Even more important, these researches have shown that tourists can easily modify their plans on the basis of this information. Other researches (Tussyadiah and Fesenmaier, 2009; Wang, Park, and Fesenmaier, 2010) show that smartphones can, as a device, encompass both the behavioral and psychological dimensions of the touristic experience by facilitating information search, information processing, and information sharing, by enabling a traveler to learn about new travel opportunities and to know better a destination, and by sharing photos and other 'social' activities at any time during the trip.

This is especially important for tourists who are just passing through the country, because in this way they can be informed about what is on offer in that area. On the main roads there are billboards that are used to inform tourists. They contain a few advertising slogans that can be read, and some pictures, but most of the informa-

tion which can attract their attention and allow direct contact with service providers remains inaccessible. New technologies of mobile services in combination with billboards and info kiosks create conditions for a significant improvement of tourism and tourism tax collection control. Through mobile phones (Wapp, Bluetooth, NFC), tourists can download a lot of information, get travel guides with instructions on what they can see as well as detailed maps of the advertised destination. In this way, tourists are not only informed about the potential destination, but they are allowed to receive information about available capacities, and they can reserve accommodation (Wapp technology).

However, the development of local tourism communities, despite the use of new technology, entails the disconnection problem, which results in lower placement efficiency and control of tourist offer. Coordination between local communities and travel agencies is minimal and conflicts often occur because the channels of reservation work individually. Information systems exist but they are closed, so there is no immediate insight into the complete offer and number of available capacity. Another problem is that users accept new technologies slowly, and the lack of confidence in the new technology is always present (Pan, MacLaurin and Crotts, 2007).

The above problems result in weaker usability of a tourism potential, and, therefore, in the slower economic development of local communities. Bearing in mind that each community has its own characteristics in terms of economy, tourism, technological capacities, it is necessary to carefully design the automation of key processes.

In order to increase the importance of tourism in local communities and, therefore, the tourism tax collection, a research has been conducted with the aim of integrating different technologies of mobile services. The findings of this research are presented below.

According to the data as of March 2013, 147,937 tourist arrivals were registered in accommodation facilities in the Republic of Serbia, which is an increase by 2.7% compared to the same period of 2012. Comparatively with March 2012 the number of foreign tourists arrivals increased by 6.4%, while the number of domestic tourists arrivals increased by 0.4%. In March 2013, regarding the country of origin of foreign tourists staying overnight, tourists from Bosnia and Herzegovina made up the largest share (8.1%), followed by tourists from Italy (6.4%), Germany (6.1%) and Croatia (5.9%) (Monthly Statistical Bulletin, 2013).

The paper analyzes in depth the impact of the Internet and mobile services on the community development and its potential use for improving tourism offer. The problems in functioning of small tourist communities and further directions of research are discussed from the point of view of new technologies usage. The paper also presents the model of communication channels coordination in small tourist communities. The problem of tourist tax evasion has been identified, and its potential solutions analyzed. The conclusions are derived at the end of the paper, and they make possible an effective elimination of the identified problems and further development of tourism offer as well and of the economy of local communities.

### 1.1. Theoretical framework

Mobile device has become the main communication device, which exceeds all known technologies by the amount of its usage. The younger generations have accepted it and mobile phone has become an integral part of their environment. Older generations become accustomed to the use of these devices, but they do not use all the potentials that this technology provides. In everyday life, the phone has become an irreplaceable device, and average users carry it everywhere, including in tourist trips. The penetration of mobile devices is:

Table 1: The penetration of mobile devices

Mobile-cellular subscriptions	Per 100 inhabitants								
	2005	2006	2007	2008	2009	2010	2011	2012*	2013*
Developed	82,1	92,9	102,0	108,3	112,5	115,0	119,0	123,6	128,2
Developing	22,9	30,1	39,1	49,1	58,3	69,0	78,3	84,3	89,4
Worldwide	33,9	41,7	50,6	59,8	68,1	77,2	85,5	91,2	96,2

Source: International Telecommunication Union, 2013

This spread gives potential to mobile device to become one of the main channels for tourists to get informed and to be attracted to interesting destinations. Although the technology is widespread, there are a number of limitations that need to be overcome in order to implement it in the tourism industry. The limitations are: technological, educational and organizational.

Technological limitations are reflected in the fact that the participants have mobile devices of different generations that have different features. Thus a solution that works with all generations of phones existing on the market has to be found.

Educational limitations are reflected in the fact that the participants in the business have different levels of knowledge in using the technology, which is important for them to remain in contact with the customers. This particular situation refers to the population of elderly owners of guest houses and apartments, who are not able to use at full potential the new technologies.

Organizational problems refer to connecting all the participants and to routing messages for them to safely arrive at the destination and provide feedback. This is particularly important for the booking systems in order to correctly inform the local owners of the received reservations.

The basic hypotheses on which the paper is based are:

Hypothesis 1: New solutions, based on mobile communications and Internet technologies, can significantly improve coordination and management of local tourist offices.

Hypothesis 2: Monitoring and collecting local taxes is easier to control. In this way, the collection rate of local taxes can be significantly increased.

Hypothesis 3: It is possible to create a system that will operate based on simple technology solutions.

Hypothesis 4: The applied technology must be simple to use, easily available and it should not require much knowledge or special training.

## 1.2. Research methodology

In order to improve the quality of the information placing process a survey related to current ways of promoting tourism was conducted. This is primarily related to the dissemination of information to tourists who pass through the country in order to reach the desired location. Since Serbia is a country that many tourists pass through, a part of the research is related to identifying ways to better disseminate information on the main roads. Another important issue which is also analyzed is the problem of not declaring guest checking in order to avoid payment of taxes. After that, suggestions for improving the process by the use of modern technology are presented, as well as a method for the coordination of communication channels in order to improve the entire process. This includes the whole process, from the dissemination of information and finding suitable accommodation, to informing tourists about available facilities at the selected location. Technical solution for the creation of the model is also presented.

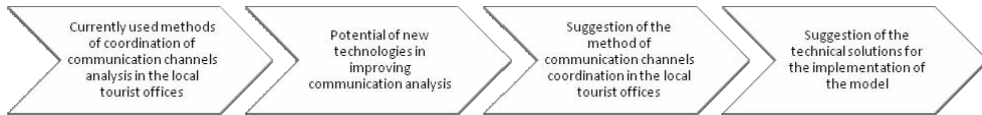


Figure 1: Research methodology

## 2. The influence of the Internet and mobile services on the development of local communities

In the modern context, tourists use Internet as a primary tool for informing themselves (Pan, MacLaurin and Crotts, 2007). They use Internet to facilitate travel for different reasons, being influenced by the availability of a variety of information related to knowledge, utility increase, novelty, creativity, hedonic pleasure and social activities (Cai, Feng, and Breiter, 2004; Cho and Jang, 2008).

The great potential of e-business becomes obvious once we become aware of the progress made from the first SMS back in 1992 to the contemporary GSM mobile network (Internet over GPRS, Internet over EDGE, MMS, SMS, e-mail, voice mail and various VAS services), which has been developed almost to perfection (Roggenkamp, 2004). The development of these services and technologies can be a very effective way of solving problems in the tourism industry and, at the same time, simplifying the procedures when the business is based on Mobile Tourism (Schwinger *et al.*, 2002).

Smartphones, as one kind of new media, can now provide a wide range of information services to support not only main travel activities such as planning, reservation and navigation, but many “micro-moments” within the travel process such as finding gas stations, estimating waiting time of rides etc. (Wang, Park and Fesenmaier, 2010).

### 2.1. Electronic commerce management in local tourist communities

Tourism comprises a wide range of activities, such as sightseeing, relaxing, shopping and visiting friends. However, as tourism can be a part of a business trip, the line

between work and leisure is often blurred. The most common encountered problems are with reservations, booking accommodation, changes, cancellations of booking etc. An additional problem is registration of tourist tax, which directly affects the development of the local tourist boards and public administration.

The adoption of new technologies is followed by a significant improvement in the promotion of tourism in local communities. For example, everyone has a website, Skype account, mobile phone number, home number and high-speed Internet. However, all the existing services can be viewed as isolated information islands. Therefore, it is necessary to link all the information islands into one information system.

Another important issue is the way advertising is conducted by local tourism offices. Advertising through print and electronic media does not generate the right effect. One way of changing this is by using new technologies such as advertising on the website, SMS newsletter, messages, info-kiosks, WAP portal from billboards placed next to the highways, e-mail, MMS etc. Billboards can provide information but they cannot contain enough information. Combining Bluetooth and WAP with billboard content can be the solution that can be developed and adapted to the existing tourism offer of the local community (Reilly *et al.*, 2005).

Another important problem regards tourist applications where wrongdoing can happen because of disunity and incoherence of the system in one unit. Tourists make reservations over the Internet, SMS, e-mail etc., and local community simply does not have access to reports on how many tourists have been signed.

## ***2.2. The opportunities of new technology application in the comprehensive information of visitors***

Potential opportunities for the application of new technologies for informing visitors are unlimited (Brown and Chalmers, 2003). Typical examples are: weather information via SMS, cultural and sporting events, information about the level of pollen in the air, access to the cameras which show different kinds of events (for advertising purposes), MMS, movement in accordance with the GPS electronic map in mobile devices, billboards along the roads etc. (Morrison *et al.*, 2011) (see Figure 2).

The advancement of the existing technologies is one of the factors that will enable the implementation of a business model adapted to the tourism industry and the local community. Technology that we are referring to is GSM with its related services. HSDPA speed increased significantly, which improved the user experience and thus facilitated the sustainable development of mobile broadband and proposed business model. Higher data rates will allow users a high-speed connection. When a user clicks on the web link at this rate, he will be lead to an instant page loading, even if the website is visited simultaneously by numerous users. Realization of 4G mobile broadband network brings high-speed data transmission, increased interactivity and quality of the content provided. With the real time data and several times higher speed of data transfer, users will always be informed about the touristic offers of local communities, even if they are on the move (for example, tourists in cars passing by billboards).

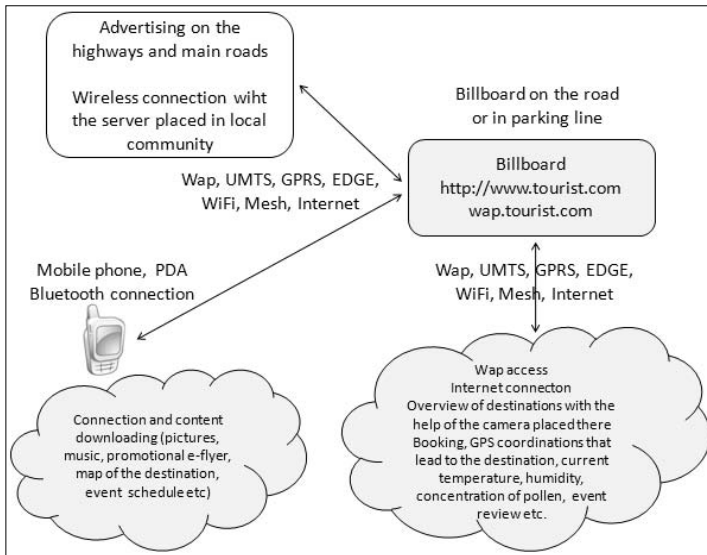


Figure 2: Integration of mobile services for comprehensive tourist information

The first prerequisite for the implementation of the system is to enter into the database the relevant information about tours, hotels, motels and private houses. The database should be regularly updated with all the changes that occur. Owners and authorized persons will be allowed to update all the information about their facilities by accessing a protected area of the site or by SMS messages (protected). On the other hand, it is necessary to have an accessible mobile service operator with VAS (Value Added Services). This primarily refers to the SMS service, which gives customers information about the current temperature, relative humidity, exact time, air pollution and pollen concentration in the air (Wasserman, 2011).

Allergic diseases are now classified as diseases of the developed world, and they are increasingly taking on the characteristics of a pandemic. According to the World Health Organization (WHO), about 20% of the world population is allergic to certain allergens, and approximately 300 million people worldwide suffer from asthma. WHO estimated that by the year 2010 three billion people would suffer from some kind of allergy worldwide. Data about concentration of pollen, allergens and air pollution will be available on the tourist community website (Figure 3).

### 2.3. Benefits from the standpoint of the interests of tourists and local community

The reservation system should enable agencies, individual hotels and guest houses owners to register and make a reservation. In this way information is immediately visible to all other participants to the market. Also when a guest leaves, he is checked-out and information about free capacity is immediately visible to all other participants. This means that booking the same capacity twice is not possible, and, in addition, there are conditions for a better utilization of the available capacity.

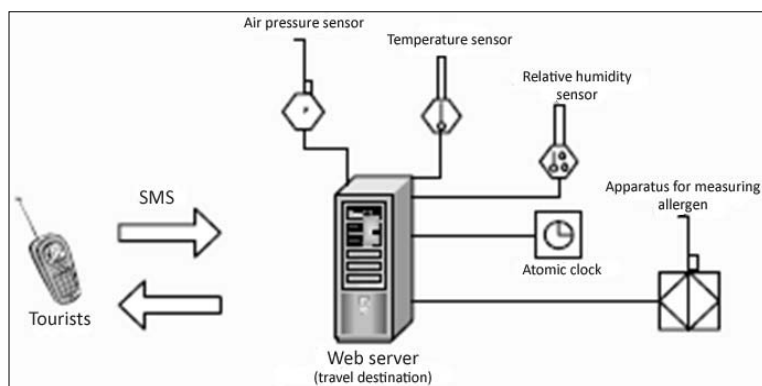


Figure 3: Information placement on air pollution and allergens

Additional information about the quality of tourist offer can help promoting the business. Agencies can have access to available data about the concentration of allergens via the web, and data can be used for marketing purposes. Information about air quality, low concentrations of pollen, air pollution and other allergens for every season enables development of health tourism. Based on the map of allergens per season, tourists can inform themselves and decide whether any of the destinations are acceptable for them from the health point of view. Data analysis can improve tourist offer designing campaigns aimed at specific target groups. Tracking where tourists are coming from enables an efficient market analysis, and repeated arrivals of the same guests can lead to the creation of a loyalty scheme program.

When it comes to the interests of the local community, efficient collection of tourism tax creates the conditions for investment in it. Therefore, it is important to provide complete and continuous monitoring of the occupancy rate of tourism facilities, as well as to facilitate and improve the collection of the tax. This can easily be accomplished, if automatic registration and recording in the appropriate database of all tourists is provided. In this case, inspection authorities can check “on line” the occupancy rate, and improve communication with the providers of tourism services.

### 3. The analysis of the current situation in Serbian small tourist communities and possible solutions

The main problem of tourism in Serbia is that this area of business was neglected, and funds were not invested in tourism for years. Serbia is placed on the central road which leads from Central Europe to Greece, Turkey and the Middle East (roads E70 and E75), and almost all visitors cross its territory with a short stop.

There is little information about the tourist destinations on the roads, and the already existing information is not sufficient. This refers to the small local tourist attractions (spas, rural tourism, historical sites and natural phenomena), which are away from the main roads, but represent quality tourist destinations (Nikezic, Dordjevic and Bataveljic, 2012). It should be noted that the main roads are placed in the central part of Serbia, and most of the local destinations are less than 100 miles away from

these roads. There are signposts on the main roads, but they do not contain enough information about what tourists can visit, and especially why it would be interesting for them. Local tourist communities have a small amount of money for advertising, informing and attracting tourists. The Internet has significantly contributed in advertising these places, but it is still not enough for tourists to be widely informed. Mobile phones have proved to be excellent devices to extend the advertising of these destinations. It should be emphasized that the combination of different channels, Internet and mobile phone access capabilities through Wap and Bluetooth make possible to dislocate advertising campaigns along major roads, linking with loyalty schemes, and thus increasing the visits to small communities.

Another important issue that should be solved is the situation when service providers do not register the guests in order to avoid paying tax. This is a very significant problem, especially in cases when guests are not staying for a long time at a particular location. In order to reduce costs of renting providers directly charge services and they do not report having overnight guests, or they charge full price including local tax and do not report guests so they can keep the difference in price. This is a violation of the law, and, in most cases, it is impossible to prove it because guests are gone. In this way, the profit of local community is reduced and, therefore, there are fewer funds for advertising local tourist attractions.

### *3.1. E-technology for improving tourist offer*

Modern e-technologies provide a solution to the observed problems. Application of e-technology enables B2B business model because agencies that work with destinations have access to the information and can make a direct reservation and book facilities.

On the other hand, by applying B2C model, the users are enabled to book accommodation independently via the Internet or mobile service. Also, they can buy tickets for an event or reserve a seat in the restaurant. B2C model comes to the fore particularly when Wapp and Bluetooth technology are involved. For billboards placed on highways, roads and within the facilities of local communities, Wapp and Bluetooth interfaces can be installed providing potential tourists the opportunity to receive information about their potential destinations of interest which are not included in the written marketing materials (flyers, brochures etc.) (NFC Forum, 2011).

If B2G model is used, local administration is allowed to have direct access, control and supervision of its members, and the relationship and trust between the local administration and the business environment is improved. Also, the revenues of the local administration increase due to better tax collection. Control by the local administration and tourist claims are carried out online via Internet or mobile services. In this way, intervention is faster and the response to events is easier and more rapid in the tourist destination.

New technology application enables access to smart services anywhere and anytime, and intelligent software technology will enable new mobile services in a personalized context.

### ***3.2. Coordination method of communication channels in small tourist communities***

Previously, it was emphasized that the basis for the functioning of the system is the creation of a unique database for all tourist agencies with their offers. Therefore, the first condition is that all travel agencies and other providers of tourist services to be registered. Any agency or supplier who can offer a tourist destination registers to the site and receives a password in order to log protected on the site later. Based on this data, significant statistics can be generated about the offers in tourism, and agencies can be encouraged to increase the occupancy rate and get certain bonuses in return (loyalty scheme).

When selling a tour package, the price includes the value added tax (VAT). Linking the information systems of government and local communities would resolve the problem of fees and taxes that are not paid by residents. Another way to solve this problem in the future is linking earlier mentioned information systems with mobile operators' information systems. In this way, precise information can be obtained about the number of tourists, because everyone has a cell phone today. Roaming is the function that solves these problems. Similarly, in some Western European countries and the USA the motorcade speed, number of moving vehicle etc. are measured in this way (Ericson).

### ***3.3. Principle of system functioning***

Functioning of the system involves two most common scenarios. In the first scenario, a tourist goes to a travel agency which is an intermediary between him/her and the service provider. In the second one, a tourist goes directly to the service provider.

If a tourist goes to the agency and asks for a reservation, the employee of the agency enters, using prior authorization for access, the protected part of the site which is reserved for this type of work and creates a query for the specific travel destination to check if there is available accommodation. The system responds to this request and lists all available accommodation in the requested category. If tourist wants to see room details, like the room view, the agency employee makes them available to the tourist on the Internet site. In addition that, over the Internet (website) and SMS he/she can get information, which is an additional value to the offer, like concentration of the allergens. If the tourist has opted for an accommodation offer, the agency employee immediately reserves that accommodation and all other parties see it as occupied. In this way, it is prevented the situation when different agencies sell the same room more than once for the same period of time. In the moment the reservation is made, the system generates a SMS and an e-mail message (using SMS and e-mail gateway) and sends them to the person responsible in the hotel or private accommodation that awaits guests and performs other formalities like keys handing.

When a guest checks in directly, system generates all the information needed for the payment of tourist tax and continues to monitor him until he checks out and leaves. When guest wants to check out, apartment owner or the person in charge of guests needs to do that over the Internet by sending a text message which is automati-

cally accepted by the system. In this way, the database is updated and that change is immediately visible to all the other parties. The system also works in cases when reservation of a capacity is made in advance for a certain period of time (Figure 4).

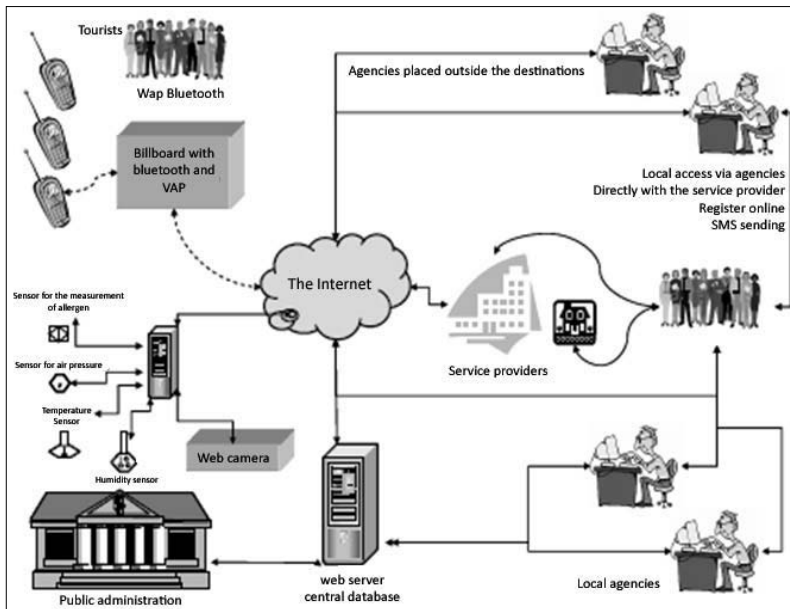


Figure 4: Mobile services in function for coordinating communication channels of tourism entities

In the case a guest comes directly to the room (suite) owner and wants to make a reservation, the owner (responsible person) sends a message and creates the query to check if someone has already reserved the space. If the system confirms that it is available, he forwards the text message that updates the database and prevents other members to reserve already occupied accommodation.

It is observed that tourism stakeholders model of communication channels coordination can enable an effective and reliable control of multiple placements of relevant information. Potential risks and limitations of the proposed model are minimal. They are primarily reflected in the possibility of interruption of the telecom operators functioning due to some technical reasons (for example, in Croatia VIP Operator has no contract with M:tel player from the Republic of Serbia). Another potential limitation is represented by bad applications, but this can be quickly removed, so it is a temporary problem. The problem also, may be the disruption of Internet traffic due to some technical reasons (termination of fiber optic cable, or a longer power shortage), but these are problems which are solved in 24 to 48 hours. Generally the proposed model does not have any major risks or limits.

### 3.4. Creating a database as a unique resource significant for tourism development

Using the information gathered over a long period of time, an evaluation of tourist offer can be performed. Strategy for the tourist offer development should be also

based on the analysis of obtained results. Therefore, interests' compliance matrix can be proposed to certain stakeholder groups in order to improve tourism, increase revenue and achieve greater tourists' satisfaction with the provided services. Example of one of the possible matrices is shown in Table 2. Parameters in the interests' compliance matrix are constantly growing, and new information is obtained which allows better realization of the tourism development strategy in local communities.

**Table 2:** The interests' compliance matrix of certain stakeholder groups

	Number of achieved tourist tax application	Analysis of the advertisement place performance	Subject of interest for tourists	Best-selling products/services	Etc.
Tourist community		x	x	x	
Tourists			x	x	
Local government	x	x	x	x	

Long-term strategy based on the use of mobile services and systematic analysis of the collected data, service providers and local communities can:

1. efficiently and qualitatively respond to the guest requests;
2. proactively determine the most promising target group of users, by offering services specifically tailored to their needs;
3. establish an electronic database for long-term relationship with the users, keeping it even if the transaction does not occur; and
4. ensure efficient collection of tourist tax which allows further development of the local community.

#### **4. Conclusion**

While most suppliers of tourism services in small communities have good quality sites, it appears that their impact, especially on tourists who are passing by, is not satisfactory. In order to attract more visitors to the local tourist destinations, it is necessary to increase access to information about the touristic opportunities by using a standard mobile phone. This recommendation rests on the studies which show that mobile phone penetration exceeds one per capita in Europe. Marketing through mobile service offers the possibility to provide information along the central roads (parking lots, rest areas). In this way, through gift package, prizes and interactive marketing campaigns, tourists' attention can be attracted, and they can be interested to visit some of these destinations. This especially applies to the ability to link several smaller destinations, with the purpose of providing substantial benefits to tourists.

Given the integration of tourism offer and the use of Internet and mobile services in the automation of activities of the local tourist boards, communication channels synchronization appears as a problem. Local tourist offices have a jagged network for occupying the rooms that includes various technologies. All these technologies have to update a single database in order to prevent "channel conflict", when the same room is simultaneously reserved from different channels. In addition, the automation

of the booking system and the formation of a central database create preconditions for the full monitoring of the occupancy rate.

A particular problem is the attitude of the local tourism community regarding the local government administration. Monitoring and collection of tourist taxes have always been major problems. The absence of effective mechanisms of monitoring the number of overnight stays in the local community has a negative effect on collecting taxes. The introduction of mobile service for booking and reporting brings an additional quality in the process of monitoring and supervision of the local tourist boards.

Proposed model for coordination of communication channels provides the presumption of effective offer by the local tourism community, particularly:

- the identification of devices used by potential users of tourist offer by monitoring activities under each communication channel;
- the identification of the interests of users for specific tourism offers;
- the possibility of tourism community to respond automatically and immediately to the interests shown by users; and
- the possibility to plan future tourism offers on the ground of interests expressed by users.

Coordination of communications channels, registering and monitoring the activities of tourists will raise the awareness of providers of other services from local tourism community on the necessity of issuing fiscal receipts to all users of services.

Comprehensive approach of information via all communication channels and their integration enable synchronization of the database of users of tourist services, as well as an increased collection of taxes. By analyzing results, it is possible to provide tailor-made future tourism offers on the basis of gathered and integrated data.

Two goals can be achieved by introducing a SMS service for communication within the local community. The problem of obsolescence of used devices is avoided by introducing technology that is available on all mobile phones. Another important aspect is that everybody knows how to send and receive text messages. In this way, the need for training users is avoided. This is particularly important in less developed areas with older owners of guest houses and apartments.

It can be concluded that the improvement of tourism in local communities based on the use of modern mobile communication solutions provides strategic planning and development of tourism and of the entire community.

In realization and the use of system, the simplest and generally accepted technologies are used which do not require from users any special skills and knowledge. Of particular importance is the fact that SMS is used as a system for providing information to owners renting their apartments since it is the technology familiar to all. Administration and maintenance of system is centralized and automatic, and it does not require the active involvement of a service provider.

Further researches regarding this subject will regard promotion of local tourism destinations. Special attention will be given to the use of wireless sensor networks, M2M (Machine-to-machine) and IOT (Internet of Things) solutions.

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