E-Ticketing Systems In Culture And Tourism: Experiences From Croatia

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Abstract: - As the process of producing and selling tickets for an event, ticketing covers a broad set of activities, like ticket printing ("hard tickets"), payment processing, engagement of IT, software and personnel, sales management, account, reporting etc. Nowadays, during a broad use of ICT, electronic ticket is considered as a contract, in digital format, between the user and the service provider. Also, e-ticketing combines the issue and delivery of ticket into a single operation. This paper shows basic ticketing implementation concepts and shows some examples of ticketing system implementations in culture and tourism sectors in Croatia.

Key-Words: - Computer Ticketing System, Electronic ticketing, E-Commerce, Culture, Tourism

1 Introduction

As the process of producing and selling tickets for an event [1], ticketing covers a broad set of activities, like ticket printing ("hard tickets"), payment processing, engagement of IT, software and personnel, sales management, account, reporting etc. Nowadays, during a broad use of ICT, an electronic ticket is a digital contract between two parties, that is, the user and the service provider. An agreement between them is established in order that the user can receive the desired service [2]. Also, an electronic ticketing system consists of three main phases: e-ticket payment, issue and verification [2]. E-ticketing by definition combines the issue and delivery of ticket into a single operation [3]. Electronic ticketing has been developed as an evolution of credit cards with magnetic stripe due to concerns of inefficiency in information management and control of the operations. The technological platform registers users, controls ticket sale, loads credits on board the bus and issues management reports allowing accurate monitoring of data [4].

2 Advantages and Disadvantages of E-Ticketing Systems

2.1 Advantages

The e-ticket concept is attractive for both customers and service providers. From a customer view, it provides the following advantages [5]:

- Faster and more convenient verication of a ticket;
- Saving on travel expenses due to the "pay-as-you-go" feature (paying for the actual distance travelled);
- The ability to profit from a exible fare pricing scheme (with possible individual discounts and special offers);
- Revocation of lost tickets and their replacement;
- Increased usability:
  - no need to have change for e.g. a local ticket issuing machine (for instance, for customers only sporadically using the transport service or while being in another city);
  - no need to carefully study complex fare pricing schemes: the system can automatically choose the best option and possibly suggest a discount (e.g. based on customer's travel habits);

2.2 Disadvantages

Along with tangible benefits, the concept of e-ticketing raises several concerns [5]. For a customer, it is in the first turn privacy-related issues, namely:

- Ubiquitous customer identification;
- The possibility of customer profiling (creation of movement patterns, etc.);
- Resulting privacy violation through increased surveillance ("The Big Brother" problem).

3 Principle of E-Ticketing

A simplified general scheme of e-ticketing in an urban public transport is shown on the following figure [6]:

The e-ticket can be checked by inspectors just by reading an SMS message to prove the payment and validation of ticket via portable device. Thus goes for journeys by bus, trolleys, light metro or tram. In the case of necessity to access metro or city rail stations, e-ticketing might be performed via Bluetooth technologies to open and pass a turnstile [6].
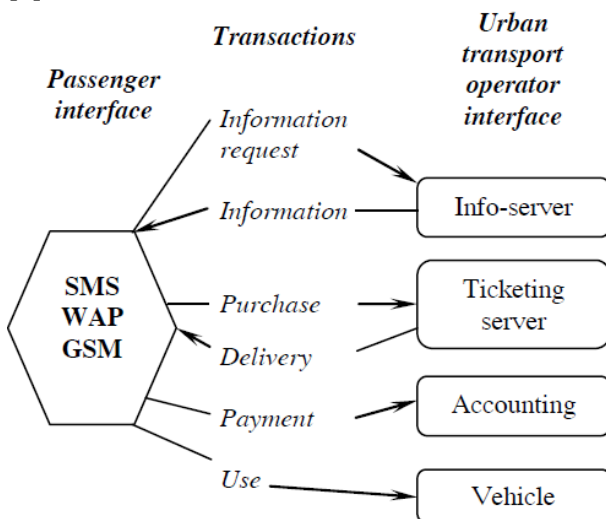
Figure 1 A generic example of e-ticketing

According to [7], electronic ticketing can be regarded as a payment system which enables a person to pay in a simple, secure and efficient way for a service used. Electronic ticketing is associated with travel and specifically with the use of a transportation service. The payment system is based on electronic information transferred between the various operators in the system.

The customer obtains an electronic ticket medium (smart card) which is the storage location for electronic tickets. When a ticket is sold, it is registered in the ticket medium and validated before use. In connection with the sale and use of tickets, electronic information is stored and processed for the purpose of producing:

- Billing data;
- Revenue data;
- Statistics (about the sale and use of tickets).

Billing data are used in the sharing of ticket revenues among the various operators involved in the ticketing system. An electronic ticketing system may also incorporate a number of other functions [7]:

- Ticket inspection function
- Internet services (for example online sales of tickets)
- Driver settlement functions
- Cash deposit functions for drivers
- Etc.

4. Trends in E-ticketing - Cloud ticketing

In the cloud [8], ticketing system architecture is based on consuming services organized in a layer available in a cloud platform. The services have published interfaces. These interfaces support the development of personalized ticketing systems. The main effort is the definition and development around the implementation of services. Cloud platform is important to reduce/manage hardware costs and to publish the transport operator's services. Therefore, the cloud ticketing has the following benefits:

- Reduce system development cost;
- Code mobility;
- Focused developer roles;
- Support for multiple client types;
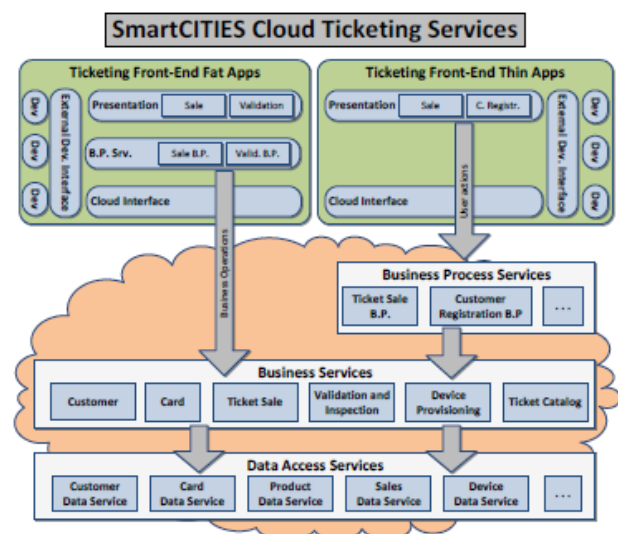- Service assembly;
- Better maintainability.

Figure 2 – Cloud Ticketing Architecture

5 Ticketing systems in culture and tourism in Croatia

5.1. Vatroslav Lisinski Concert Hall

The production and organization of superb musical and also numerous multimedia events have assured the Vatroslav Lisinski Concert Hall the leading position in the concert activities of Croatia, as well as the immediate region. This temple of music is exceptionally aesthetically and acoustically

designed, and features the latest technical equipment.

Conceived as a multifunctional space, in addition to top concert events, the Hall organizes film premieres, interesting exhibits, and is often the host to international congresses and meetings, thereby systematically cultivating congress tourism while promoting the ecnomic and tourism potentials of Zagreb and Croatia. The Vatroslav Lisinski Concert Hall has long surpassed the confines of Zagreb and Croatia, and is now a place where Croatian culture encounters other cultures. During the past 38 years, Lisinski has organized an impressive number of world-class concerts and performances by top international soloists and ensembles, thereby enriching the local cultural scene.

The Vatroslav Lisinski Concert Hall includes the Main Hall (1,874 seats), Small Hall (304 seats), four conference rooms, a large functional foyer (1,888 m² of horizontal and 300 m² of vertical exhibition space), and three snack bars [9]. Vatroslav Lisinski has box office ticketing, online ticket sales, retail outlet network and access control.
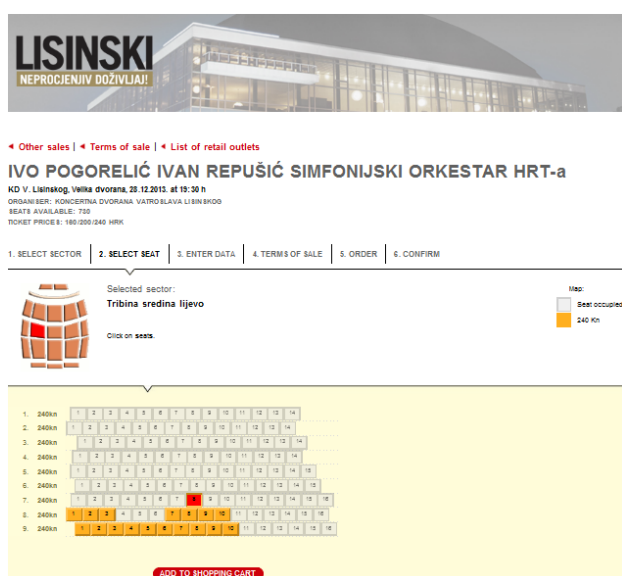

Figure 3 – online ticketing for Vatroslav Lisinski Concert Hall

5.2 National park Krka

As published on the official website [10], Krka National Park lies within Šibenik-Knin County, and covers a total area of 109 km² of the loveliest sections of the Krka River, and the lower course of the Čikola River. The Krka National Park was proclaimed in 1985, as the seventh national park in Croatia, though certain sections of the Krka River were already protected as early as 1948.

Including the submerged part of the river at the mouth, the Krka River is 72.5 km long, making it the 22nd longest river in Croatia. It springs in the foothills of the Dinara mountain range, 2.5 km northeast of Knin. With its seven waterfalls and a total drop in altitude of 242 m, the Krka is a natural and karst phenomenon. The travertine waterfalls of the Krka River are the fundamental phenomenon of this river.

Tickets can be purchased at National Park Krka's box offices, according to season's price list. Tickets are also validated with mobile access control devices.

5.3 Dubrovnik Summer Festival

The Dubrovnik Summer Festival [11] presents a rich programme of classical music, theatre, opera and dance on more than 70 open-air venues over 47 days in summer each year. The planning of each year's Festival is an ongoing process. Projects and programmes are developed with orchestras, soloists, dance and theatre companies... often one or two years in advance.

Tickets can be purchased at venue's box offices, online or at retail outlets/hotels in Dubrovnik.

5.4 Dubrovnik City Walls

Dubrovnik City Walls [12] are considered to be one of the most grandiose fortification monuments in Europe. They are an example of how fort architecture was developed.

The first fortifications were built already in the 8th century, but the most intense construction took place from the mid-15th to the end of the 16th century. The huge earthquake in 1667 did not do much damage.

The ramparts are 22 metres high in places, and from 4 to 6 m. thick on the landward side and from 1-1/2 to 3 m. thick on the seaside. In front of the main wall on the mainland side is an outer wall with 10 semi-circular bastions, in front of which used to be a moat. The main wall has 14 quadrangular and 2 circular towers, 2 angular fortifications and 4 bastions.

There are three entrances to the city ramparts: on Stradun by the Pile gate, by Fort St. Johns and by Fort St. Luke, Od sv. Dominika street).

Individual entrance tickets are available for the following categories: adults, children and young people from 5 - 18 years of age, students, journalists, Croatian Army soldiers, policemen and disabled persons and esidents of Dubrovnik-Neretva County. Beside box offices, tickets can be also purchased online on Dubrovnik City Walls' website.

Figure 3 – "Buy tickets" link on Dubrovnik City Walls' website

5.5 Dubrovnik Cable Car

As listed on official website [13], the best views of Dubrovnik and the surrounding area are, without doubt, experienced from the top of the Srđ Hill. The Dubrovnik Cable Car was built back in 1969 and was always enthusiastically used by more than 2.5 million visitors who wanted to enjoy the most beautiful panoramic views. On a clear day, you can see up to 60 km (37 miles).

Tickets can be bought at the lower station of the cable car, also online and in retail outlets in Dubrovnik and Croatia. According to timetables and schedules that were set up, fares for season 2013's cable car are organized in the following categories: adult round-trip ticket, adult one-way ticket, child round-trip ticket (4 - 12 years) and child one-way ticket (4 - 12 years). Also, lower station has an tripod (turnstile) which enables access control and ticket validation.

5.6 Dubrovnik Museums

Today Dubrovnik Museums are a complex regional establishment comprising five specialised museums: the Cultural History Museum, Maritime Museum, Archaeological Museum, Ethnographic Museum and Museum of Contemporary History. Their ample holdings are on show in buildings that are themselves heritage structures of the highest order of importance. The Cultural History Museum is located in the Rector's Palace, seat of government and residence of the Rector of the Dubrovnik Republic. In its permanent display, an endeavour has been made to conjure up the authentic space of historical events, and in the presentation of artworks from the collection, to represent the rich cultural, artistic and historical heritage of the Dubrovnik Republic [14].

Entrance tickets can be purchased at museums' box offices. They allow the following: group visits (10 or more persons), museum permanent displays and archaeological exhibitions (adults, schoolchildren and students), for Cultural History Museum in the Rector's Palace, Maritime Museum in Fort St John (sv. Ivan), Ethnographic Museum in the Holes granary, Archaeological exhibitions "Early Medieval Sculpture in Dubrovnik" and "Revelin – Archaeological Research/Spatial Development/ Foundry", "Virtual Museum of the City of Dubrovnik in Revelin Fort", and exhibition "Dubrovnik in the Homeland War 1991-1995" in Fort Imperial on Srđ.

6 Conclusion

E-ticketing is an alternative to the conventional way of proving the availability and validity of travel permission (e.g. paper tickets) through transferring the necessary information to an electronic medium (e.g. an RFID card) [8].

Electronic ticketing is a ticket sales information system, which is a tool and a basis for improvement of ticket sales and payment. In addition with access control and ticket sales management (reporting, accounting etc), it helps institutions cultural, tourism, sport and all other institutions to browse transactions, to get know their customers and to increase their revenues.

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