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## **THE CONCEPT OF THE DIGITAL SIGNAGE SYSTEM IN THE CONDITIONS OF ŽILINA TOWN**

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The tremendous development of technological wave, in particular to digital signage technology, has brought advertising activities into a new era. Current research is keen to investigate the relationships between customers - passengers and this new technology in real environment. This article aims to discuss the future directions for advertising practices in Žilina town. Based on the analysis of opportunities this technology in advertising practices, our marketing research investigates how passengers accept virtual advertising technology in urban transport. Authors highlight the advantages of interactivity between virtual advertising technology and consumers. This paper triggers further investigations in the area of the interactions between the digital advertising technology and passengers, and the passengers’ perception and acceptance of shopping activities on the basis of advertising in digital signage medias.

**Keywords:** digital signage, marketing digital media, transport system

### **1. Introduction**

Advertisement is all around us. We cannot avoid the contact. Products and services do need advertisement to increase their awareness. Marketers utilize all possible places and methods to catch customers’ attention. One of the perspective marketing techniques is the **digital signage**. It is a type of out-of-home advertising. Some companies use different names for digital signage to differentiate from others. Therefore we can come across names like narrowcasting, screen media, place-based media, digital merchandising, digital media networks and digital out-of-home or captive audience networks. Disregarding various names it is still just one product of mass marketing [5]. There are many possibilities where to implement digital signage. The list is not completed and places depend on the company, which is installing this type of advertisement. However, there are certain places where we come across digital signage more often. One of the common applications of digital signage is for public information. Municipalities install interactive touch screens on the places with high visit rate. Inhabitants and tourists can easily find shops, historic monuments, sport centres or even look for free job positions. This type of digital signage considerably complements info centre and increases amount of points of contact with citizens [2]. Digital signage is implementing as internal information channel in companies. Employees are informed about corporate news, goals, missions, visions and internal rules via digital screens placed on frequented areas in company buildings. “Flasma” is another innovative method of digital signage implementation. The idea arises from the walls overloaded with commercial messages. Customers therefore walk with their eyes stick to the floor. And floor has not been utilized for commercial purposes enough yet. This innovative approach can be successfully used in shopping malls and pedestrian zones.

### **Global Entertainment Media**

GEM is a shortcut for Global Entertainment Media. It is a software solution, which enables its users to display different type of digital content on the screens. It is most suitable for public locations, e.g. urban mass transportation, train or bus station, airport or even shopping malls. This concept has got its origin in Slovenia. Therefore the first testing took place in Ljubljana, capital of Slovenia.

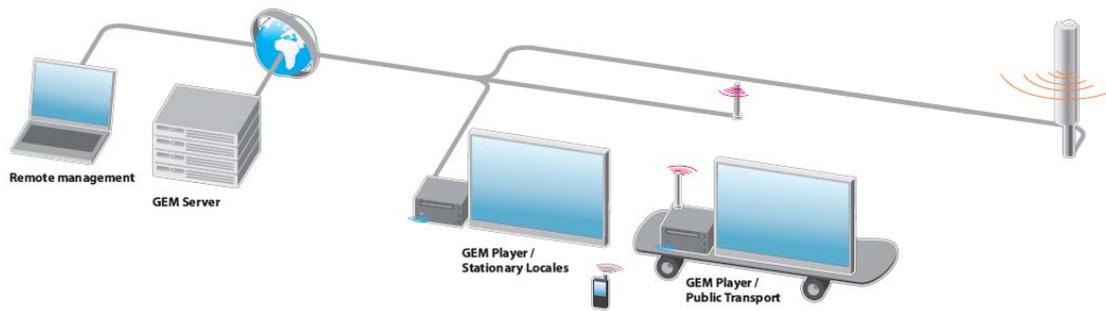


Figure 1. GEM Interactive communication

GEM combines *three technologies* in one solution. Firstly, there is positioning, usually GPS. If you want to deliver up to date content according to the place, you need to know what your actual position is. Secondly, there is mobile telecommunication. As long as the concept is interactive, there has to be a possibility for back coupling from the users. And, finally, there is digital signage.

### **GEM Usage - Public transport**

One of the most suitable places where to apply GEM Interactive is urban mass transportation. Anyhow all kinds of public transport are appropriate for digital signage. There are clearly several benefits for passengers.

Travelling and especially commuting could be tiresome. In public transport there is no time and no place to start any kind of work. Passengers are therefore looking around for some entertainment. Advertising posters become boring very soon. Changing them every other day is very expensive and therefore impossible.

Advertisers are searching for new ways of delivering the content to the customers more effectively. They discovered opportunity in using digital screens on frequented places, e.g. buses, trams or trains. They can capture broad masses of different segments of customers. It is much easier to deliver the right content to the right segment because it is predictable who is travelling on which bus line on which time.

GEM Interactive is based on two different triggers – time trigger and GPS trigger as you can see on Figure 2. *GPS triggers* initiate advertising content with regard to the location. As the bus enters the geographic cell of opera house for example, its computer gets information about it. As the result the commercial for new opera play appears on the digital screen. Passenger can even book the tickets via SMS.

Very efficient method how to attract customers is offering them bonuses. Shops in big malls can use GEM Interactive to offer discounts in the form of number code as a counter value for SMS. In the geographic cell of shopping mall the commercial for clothing store appears on the screen. It invites passengers to visit the store. If they send SMS with the key word on the given number they receive SMS with number code which can be used for discount in the store.

Second type of trigger is based on time. In some areas where no shopping malls, no theatres and no other amusement facilities are is no need for commercials. For that reason news or weather information can be shown. *Time triggers* initiate the content according to expected time in timetable. However this type of trigger is not that reliable because of traffic jams, for example.

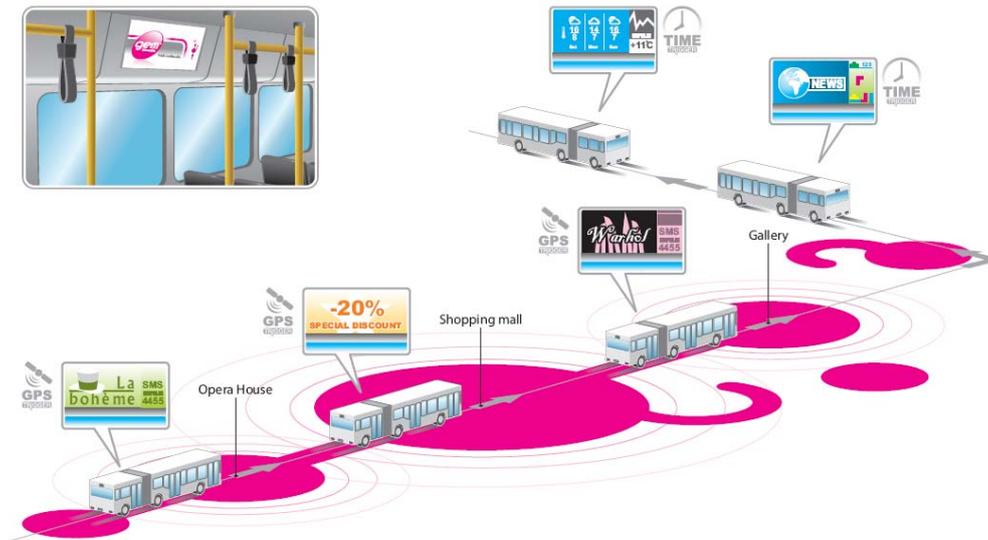


Figure 2. GEM Interactive triggers (Source: GEM Interactive concept. [Online].[Quoted 2013-03-05]. Available at: <[http://www.gem.si/en/active\\_locations/](http://www.gem.si/en/active_locations/)>)

### **GEM usage - Stationary locations**

Every frequented location or even a place where people are waiting in the line is a great opportunity where to capture customers.

Digital screens are appearing on newsstands, in stores, in stations, on squares or in the airports. It is not enough to bring the content to the customers. However GEM Interactive brings new ideas. Accordingly to that it is more attractive for advertisers.

It is not necessary to bring the advertising content. Using GEM Interactive in stations and terminals can make the waiting less boring. Offering passengers pricing games, news, voting and content influence makes the travelling and commuting more interesting and it can create lifetime relationship. People tend less to switch to private transport when it is possible.



Figure 3. Examples of GEM Stationary kiosk in Ljubljana (Source: GEM Interactive concept. [Online].[Quoted 2009-03-12]. Available at: <<http://www.gem.si/en/news/293,2008/detail.html>>)

## **2. Methodology of Research**

Nowadays companies, especially because of the complicated economic situation, consider their investment very carefully. Although marketing research cost money as well it can save much more than money when it is accomplished right. Companies that do plan to implement digital media network as their marketing tool need to perform in-depth study. As digital signage is not wide spread in Slovakia and nor in Žilina we need to collect information about the awareness among residents and their interest in this advertising tool.

There are many types of *marketing research process methods*. They are basically the same and differ only in the number of steps. On Figure 4 we can see one of the possibilities of marketing research process.

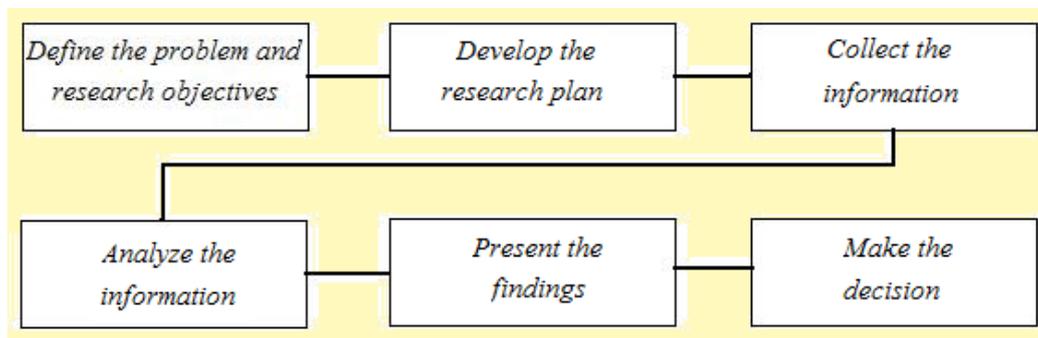


Figure 4. Marketing research process (Source: KOTLER, P., KELLER, K.: Marketing Management, twelfth edition. Upper Saddle River, NJ, USA: Prentice-Hall, Inc., 2006, p. 103)

This *six steps* method includes many subparts. We will go through the first five steps and will skip the last one. As this is marketing research focused on awareness of the digital signage it will not contain calculation of the digital network implementation. The last step will be skipped because it is not in our competency to make decision whether implement the system or not.

### Defining the problem and researching objectives

To define the problem properly can help researchers to find the way how to solve it. Although it appears that this step is very easy, most of the failures of researches arise from bad definition of the problem. Sometimes managers set the problem too broadly and therefore get information they do not need. On the other hand problem defines too narrowly does not bring enough information to solve it [1]. As digital signage is not widely used in Slovakia and is only at the beginning of its era we will consider on *three problems*:

- Do customers use urban mass transportation lines in Žilina, which can be effectively involved in digital media network?
- Do customers know about digital signage and how do they perceive it in comparison with printed posters?
- Would passengers use the opportunities that are offered by digital signage?

We will consider on implementation of digital media network in urban mass transportation in Žilina, as GEM System is designed for public location and urban mass transportation. The testing period in Ljubljana was good success and brought a good start point for system expansion.

### Developing the research plan

Researchers can utilize two types of information, primary data and secondary data. *Secondary data* represent information that was collected for other purposes. This type of data is available for free or for a fee. Researchers use this information usually at the beginning of the project. They try to find secondary data that will help to solve the problem at the lowest cost. However this type of data is often obsolete, incomplete and not too suitable as they were collected for other purpose. Researchers are therefore compelled to collect primary data. *Primary data* represent information that is collected for special reason for the first time. There exist several types how to gather primary data e.g. observation, focus groups, experiments and more [3].

In our research we will collect primary data. This sphere of marketing and advertising has not been investigated enough yet. Digital signage in urban mass transportation is sort of innovation in Slovakia. For the purposes of the research we will consider on two customer's segments. Segments will be divided on the basis of demographic – specifically on the age. *Millenials* is the so-called demographic group, which members were born between 1979 and 1994 [4]. This group is very promising for marketers. More than 90% members of this group use Internet and therefore we will conduct online survey. 80% members have mobile phones. These findings help us to solve two problems we have established in the first step of our research process. As Millenials is big group we will divide it in *two subgroups*. First subgroup

*Segment A* - will include 18 to 24 years old people. Second group *Segment B* - will include 25 to 33 years old people.

The questionnaire includes *eleven questions*. We can aggregate questions in *four parts*. Three parts help us to solve the problems we have determined; and the fourth part separates respondents into two subgroups according to their age.

### Urban mass transportation in Žilina

The first part of the questionnaire is oriented on the public transportation. We need to know whether Millennials use urban mass transportation in Žilina and if so how often they travel. There is one question oriented on the lines, which serve areas with shopping malls as we can see on Figure 5.



Figure 5. Map of the urban mass transportation in Žilina (Source: imhd. [Online]. [Quoted 2013-06-17]. Available at: <<http://imhd.zoznam.sk/za/mapa-schema-fullscreen/606/Linky-MHD-20121103.html>>)

In Žilina there are five *existing shopping malls* that can utilize digital media network in urban mass transportation and few shopping malls is *under construction*. Already existing shopping malls are *OC Atrium Dubeň*, *ZOC MAX Žilina*, *TESCO Hypermarket*, *Aupark Žilina* and *OC Mirage*. *Aupark Žilina* has a place for hundred and thirty shops. *TESCO hypermarket* does not include variety of different shops but it is a part of successful business chain. Line number 99 is serving the area of these shopping malls (*Aupark* and *TESCO*) for free and it is called *TESCO bus*. Other lines are called *MAX BUS* and *MIRAGE BUS* that serves the area of *ZOC MAX* and *OC MIRAGE*. To enable its services to more customers, owners of *ZOC MAX* and *OC MIRAGE*, supports these lines.

*OC Atrium Dubeň* offers seventy-four shops and services for its customers. *ZOC Max* offers even more – over eighty shops and services and five cinemas. This represents huge concentration of potential digital media network advertisers on one place.

*OC Mirage* is new shopping mall situated in the centre of Žilina town. It offers ninety shops and four cinemas for its customers.

There are also future plans for other shopping malls in Žilina. One of them called *multipurpose project Štadión* will be completed in next five years. Not only can shopping malls exploit the opportunities of digital signage in public transport. Cultural and sports centres can display advertising for their events as well. However shopping malls represent areas with great density of shops and services in more or less small place. Therefore bus lines, which serve shopping malls areas, create great opportunity for digital media network.

### Awareness of digital signage

The second part of questionnaire is dedicated to awareness of digital signage. Although people come across this type of marketing tool they often do not realize it is digital media network. Digital

signage is mostly compared with printed posters as we have already mentioned in introduction section. As printed posters have been here for a long time so far it is necessary to understand whether people are ready to accept *new type of advertising media*. Another aspect that is investigated by these questions is interest in present advertisement in urban mass transportation. If we want to implement new type of advertising tool we need to be sure that the previous one draws enough attention. Afterwards digital signage with its target marketing and interactive content will create even greater effect.

### ***Opportunities for passengers***

If investors in digital signage make decision about the project they need to know whether it will have sufficient response. GEM System offers two opportunities for viewers how to interact with it. SMS field which enables displaying content created by customers e.g. greetings and interactive field which navigates viewers how to communicate with GEM System. Both services are provided by *SMS communication*.

### **Collecting the information**

Survey was conducted *online* and was available at:  
<http://fped.uniza.sk/TakeSurvey.aspx?SurveyID=m4KImm2>

It was created on April 3<sup>rd</sup> 2012. To reach relevant results, we needed to collect two hundreds responses all together, one hundred for each age segment. Another specification was that respondents have to live in Žilina so they are familiar with situation in urban mass transportation. The respondents of the questionnaire were the representative sample of population from Žilina (we set confidence interval estimate at 95% and acceptable margin of error at  $\pm 7\%$ ).

We used many types of communication tools to reach people. *Facebook* as social network offers lot of possibilities for marketers. We could send the link directly to people who live, work or study in Žilina. Not only to those who are in our private network but also to anyone else who has created online profile on Facebook and filled the information about the hometown or joined the group that is connected with Žilina. Good example is group *Žilina Slovakia* that connects people living in this city. We could utilize the so-called *wall* to place the link publicly or choose members of this group to send them *private message*. As we needed just certain age segment we chose the second option – private message to people.

We had to control proportion of each age segment to have enough responses for both. At the end of this step of marketing research process we were ready to analyse the information.

## **3. The Results of Survey**

### **Analyzing the information**

When we collected enough responses we could move to the fourth step of marketing research process – *analyse the information*. At the beginning we needed to create the *code list* for the questionnaire. We set numerical codes to every question. To easily work with the responses we did the same with the answers. After that every word answer was transformed into numerical answer. When code list was done we started to process the responses. Last question was about the age of participants. This helped us to divide the *Millenials* group into two subgroups. Segment A included responders in the age 15 to 21 years. This subgroup got numerical code 1 in last question. Numerical code 2 was given to segment B that included the older subgroup, responders in the age 22 to 30 years.

Outcome of the fourth step of marketing research process was *research matrix*. It gave us greater opportunity to work with the responses much faster and use simple mathematic calculations to get the results. We used spreadsheet program to analyze the responses and create outputs. When the responses are in the form of research matrix we can use different angles of vision on the problems and find the best possible solution.

### **Presenting the findings**

As we have already mentioned in previous chapter, we aggregated questions into four parts. Last part has already helped us to separate respondents into segment A and segment B so we can compare them. *Average age* of segment A was nineteen years and eight months. Average age of segment B was twenty-three years and four months.

Other three parts are composed to find the answers on these problems:

- Do customers use urban mass transportation lines in Žilina, which can be effectively involved in digital media network?
- Do customers know about digital signage and how do they perceive it in comparison with printed posters?
- Would passengers use the opportunities which are offered by digital signage?

### ***Travelling by urban mass transportation in Žilina***

As investment into digital media network requires lot of money and effort we wanted to be sure that urban mass transportation is suitable for that. Advertisers are looking for places with big amount of passing people who spend some time there. 85% of respondents use urban mass transportation in Žilina on a regular basis. 3,5% of respondents use it sporadically and only 11,5% of respondents do not use urban mass transportation at all. On Figure 6. we can see the frequency of travelling. We can state that in town Žilina exists potential for usage of digital signage advertising in urban transport.

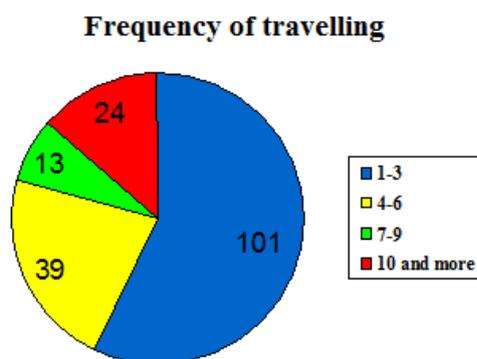


Figure 6. Frequency of travelling

The *most utilized bus line* is *number fourteen* which serves the area of ZOC MAX and TESCO hypermarket. Second one is *line number four* which serves the same area. The bus lines *number three and five* are on the third place that operates in the area of OC Aupark. On the fourth place is the bus line *number six*, which operates in the area of OC Atrium Dubeň. As we can see the most utilized lines serve areas with existing shopping malls. Implementing the digital signage in these lines at the beginning of the project would have impact on many passengers and potential customers of shopping malls. It might be interesting to investigate whether the amount of passengers of lines, which will serve, are of *Štadión project* would increase when the shopping mall will be finished.

### ***Awareness of digital signage***

Digital signage is implemented in many different spheres of use. However people often do not realize it actually is digital signage. Average age gap between segment A and segment B was three years and eight months. This *age gap* represents considerable difference in awareness of digital signage between the segments. 59% of all respondents did not come across digital signage or were not sure about that. However, it was 64% in the segment A. On the other hand in the segment B it was 10% less that means 54% respondents of segment B did not have experience with digital signage. This might be caused by greater opportunities of the older segment to travel abroad, for example, because of exchange studies or internships. This segment contributes of employed members more than segment A. As we have already mentioned digital signage is utilized in companies to inform their employees about actual events in the company or on the market.

Figure 7 shows *awareness of the digital signage* and places where respondents came across it. As we can see people have already noticed multimedia screens in shops. Many of them, especially in segment B, know digital signage from *foreign countries*. Many respondents *commute to Žilina* and have noticed the screen in train station, which display short informative presentations about railways. Printed posters still have strong position on the advertising market. However the power of *moving pictures* is stronger. Both segments, as we can see on Figure 8, are attracted with digital signage more than with printed posters.

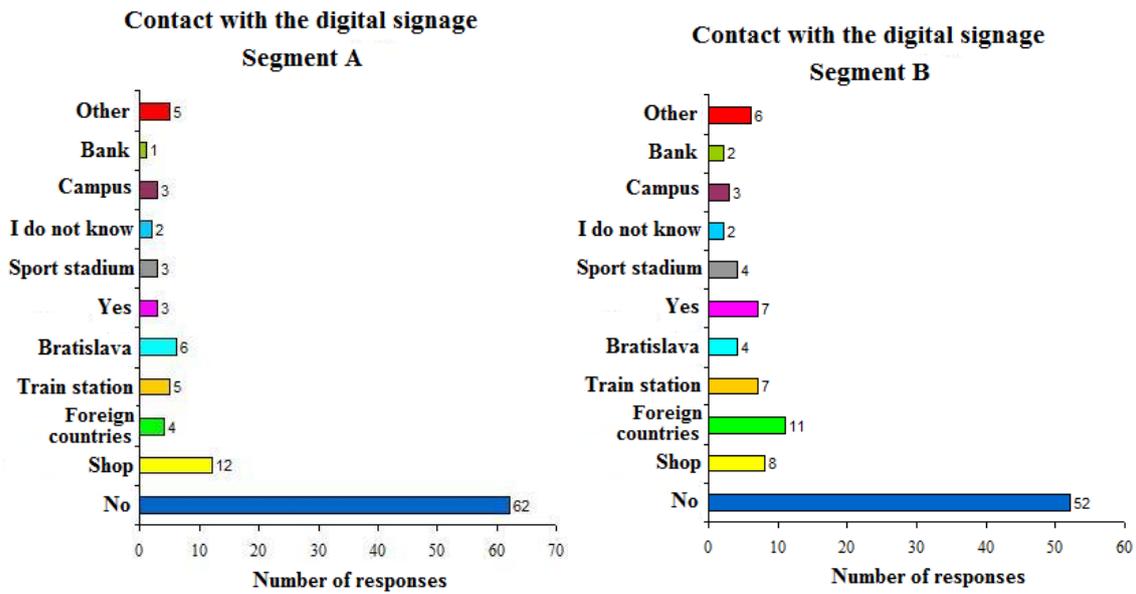


Figure 7. Contact with the digital signage. Segment A and B

Another question was dedicated to interest in printed posters in buses. This helped us to ensure that advertisement in urban mass transportation has impact on viewers and still captures their attention. 25% of respondents notice printed posters regularly and 71% notice just sometimes. Only remaining 8% do not pay attention to printed posters in buses at all. When advertisers would be able to bring more attractive commercial content to the buses they could gather even more viewers and therefore customers. Digital signage offers this in one solution and urban mass transportation provides viewers, which have to stay at the same place for a longer time.

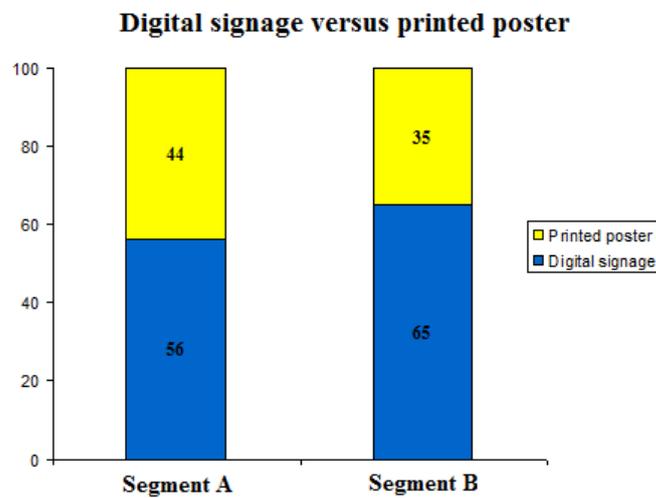


Figure 8. Digital signage versus printed poster

**Opportunities for passengers**

It is necessary to make sure whether passengers even want to have digital media network in buses and whether they would utilize the services that are offered by digital signage. It is common that younger generation is more open for new technologies and new appliances [6]. They connect with their friends online and share their opinions and feeling publicly.

As Figure 9 shows more than three quarters of all respondents would appreciate digital signage in public transport in Žilina. The difference between segment A and segment B is 11%. This confirms the theory that younger generation is waiting for new trends and is ready to implement them in their daily life. More than three quarters of all respondents also give investors good point to think about the digital media project more deeply.

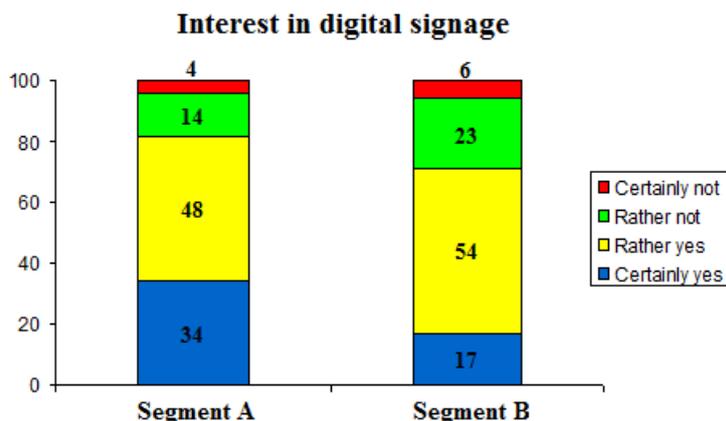


Figure 9. Interest in digital signage

GEM System offers *two opportunities* for passengers how to interact with it. The first is *entertainment SMS*. Interest in this service is almost the same in both segments. 53% members of segment A and 52% members of segment B would use this service. However, the difference is in the certainty. More members of segment A are sure they would use entertainment SMS if available than members of segment B. Figure 10 shows us the opinions of respondents about entertainment SMS.

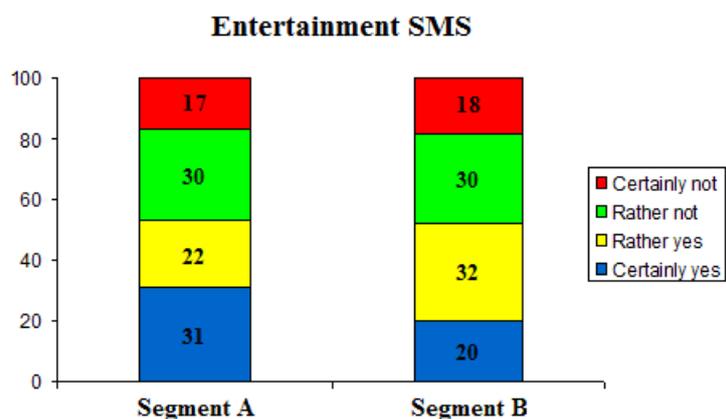


Figure 10. Entertainment SMS

The second opportunity for passengers offered by GEM System is *discount SMS*. This service is offered in cooperation with advertisers. 63% respondents from segment A are ready to use the opportunity to obtain discount as a counter value for sending SMS according to instruction on digital signage. 50% respondents from segment B are ready to do the same. Offering discount and small presents would lure more customers to the shopping malls. Figure 10 shows us the amount of respondents, which are or are not ready to utilize the opportunity of discount SMS.

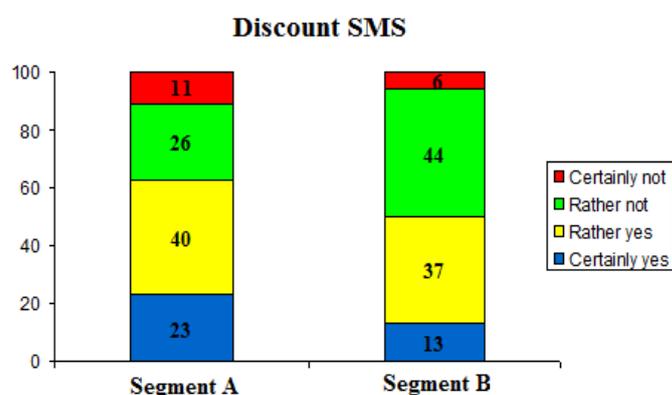


Figure 10. Discount SMS

#### 4. Conclusions

This research is dedicated to the advertisement and new methods of delivering commercial content to the customers. We mentioned many possibilities that can be utilized to capture people “on the go”. This gave us good overview of the present and future situation on the commercial market. We introduced very effective digital signage system called GEM Interactive. We consider on the implementation of this media in urban mass transportation in Žilina. We conducted survey among “Millenials” in order to gather the necessary information. It is group set by the age of its members. It contributes only by people who were born between the year 1979 and 1994. It is a segment of people who are very open to new technologies. According to the responses we were able to help to find the answers to the problems we had set at the beginning of the marketing research process.

However the results presented in this paper are only introduction to the whole concept. Before the investment into digital media network in urban mass transportation further investigation is needed. We considered only on passengers. Whether there even is interest into digital signage. Now as we know that people are ready to accept this type of advertisement and would like to use its opportunities it is desirable to focus on advertisers, shopping malls and provider of public transport in Žilina. This might be topic of another research. Financial calculations are needed as well. Although we pointed out that ROI of digital signage is much bigger that ROI of printed posters it is necessary to support the project with other calculations according to the conditions in Slovakia and Žilina.

Findings on survey verify the interest in digital signage among people living in Žilina. Interest in GEM System’s products for passengers is over 50% in both cases. This means that conditions of Žilina town are suitable for implementing digital signage advertising system in urban transport. Most utilized bus lines serve the areas of shopping malls that even strengthen the impact of digital media network. The significant challenge is in knowledge of digital signage forms. A lot of respondents from both segments do not know the digital signage advertising system, so there is a key success factor of this project. If the passengers will know then will trust this forms of advertising in urban transport system. The great opportunity for passengers is a possibility to interact with this advertising system. There are two forms of interaction entertainment and discount SMS. The results of the research shows that passengers want to use these forms of sales support. They prefer the discount SMS more than entertainment SMS. But there is a significant finding that passengers from older segment do not accept discount SMS rather younger segment. It looks that older population of Žilina town has a more experiences with discounts and they are a little bit conservative with discounts. Again there is more space to convince citizens of Žilina town about the credibility of the digital signage advertising system. All these findings ensure us that implementation of digital signage in urban mass transportation would be a success among passengers.

This article also suggests future development of transport advertising system in Žilina town. Development of urban transport advertising system should bring the new forms of interaction between passengers and urban transport system. Therefore, the authors aim to trigger further investigations in the areas of interaction between passengers and transport advertising technology in two ways, (1) the relations between the advertising technology and passengers (I-It relation); and (2) passengers’ perception and acceptance of shopping activities on the basis of advertising in different forms of digital signage medias. This agenda aims to contribute for future development on urban transport advertising technology in correlation with shopping practices and to suggest a viable research direction for further investigation on this topic.

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