PERSPECTIVES OF USING AUGMENTED REALITY IN PROMOTING COMPANIES' ACTIVITY

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Abstract: *The paper aims at determining the attitude of the managers of companies from the center of Romania, with a turnover of more than 100,000 euros, regarding the collaboration with the Transilvania University of Brasov in order to create a promotion catalog that uses augmented reality. During the research, the degree of knowledge of the augmented reality concept was identified, as well as the opinion of the subjects regarding the attractiveness, the effectiveness and utility of this technology in promoting the company's image and activity.*

Key words: *augmented reality, marketing research, promotion, online catalogue.*

1. Introduction

Currently, the great potential of the online environment is mainly used in advertising. Although offline advertising tools are not so widely used nowadays, some companies use offline media such as catalogs, magazines or brochures to promote a site or even an online application. Regardless of the environment in which a message is transmitted, in order to be ideal, it must "attract attention, arouse interest, stimulate the appearance of desire and give impetus to action (the AIDA model)". The content of the message should include "a unique selling appeal, theme, idea or proposal (PUV)" (Lefter et al., 2006).
Using the Internet will offer more benefits to consumers than companies because they will be able to customize their desired product, increase price transparency and customers will no longer be bothered by the large number of ads. There are advantages for companies that will adapt to technological progress, but also disadvantages. The Internet development can also lead to losses for certain economic entities because they may become outdated with the evolution of the Internet and the emergence of electronic commerce (Kotler, 2006).
Augmented reality (AR) is a form of experience in which the real world is enhanced by computer-generated content, which depends on certain locations and/or activities. In

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other words, augmented reality allows digital content to be superimposed and combined with human perceptions of the real world. In addition to 2D and 3D objects, digital goods such as audio and video files, written texts and even olfactory or tactile information can be integrated into users' real-world perceptions. All of these augmentations can increase individuals' knowledge and understanding of what is happening around them (Yuen et al., 2011).

2. Literature review

Although the term augmented reality has become widely known only in recent years, it has been defined by researchers since 1994, when Milgram, Takemura, Utsumi and Kishino approached augmented reality in two ways: a broad approach and a narrow one. Broadly speaking, AR has been defined as "amplifying natural feedback to the operator using symbols", while the restrictive approach highlights and defines AR as "a form of virtual reality in which the image displayed to the participant is transparent, allowing a vision clear on the real world ". Three years later, the researcher Azuma defined augmented reality on the basis of a system that fulfills three criteria: the real-virtual association; interactive in real time; 3D representation of virtual and real objects (Ali et al., 2013).

In a simpler form, augmented reality "is a real-time visualization of a real-world physical environment, which has been enhanced by adding virtual elements to the computer. AR is interactive, contains 3D elements and combines real and virtual objects" (Yuen et al., 2011).

Both the authors of the publication "Reality technologies, systems and applications" (Carmigniani et al., 2011) and those of "Mobile Augmented Reality - the potential for education" (Ali et al., 2013), consider that the most representative features of augmented reality are represented by combining virtual 3D objects with real ones, making this modern technology interactive in real time.

A major difference between augmented reality and virtual reality is that the latter transposes the users into a synthetic environment, which is unrelated to the real world, while AR increases the quality of users' perception and interaction with the real world. The authors' opinion is: "we do not consider augmented reality to be limited to a certain type of display technology, nor do we consider it to be limited to the sense of sight. AR can be applied to all senses, amplifying the smell, touch and hearing."(Anisetti et al., 2010).

3. Research methodology

In order to achieve the aim of the paper, the authors conducted a research involving companies with a turnover of more than 100,000 euros, placed in the center of the country, in the following counties: Alba, Braşov, Sibiu, Mureş, Harghita and Covasna. The sample was determined according to the researchers'requirements, using a non-random sampling, having in the end a sample of 463 respondents. The data were collected between April and June 2019.

The research method used by the author is a survey. The data collection was done using 2 methods: electronic survey and phone interviews. A questionnaire with 33 questions structured on 4 sections was designed. The section that follows the attitudes of companies' managers regarding the use of augmented reality in advertising their activity comprises 6 questions. The following types of scales were used: single and multiple choice nominal scale, proportional scale with direct measurement, dichotomous scale and numerical scale.

The data collection was done in a self-administered way, by filling in the online questionnaires for the electronic survey and through the interview operators for the phone survey. The operators were students from the Faculty of Economic Sciences and Business Administration from the Transilvania University of Brașov who contacted companies' managers and applied the questionnaire. If the subjects did not agree to respond immediately, they were offered the possibility to send the questionnaire in electronic format by e-mail.

4. Results

One of the research main goals is to assess the managers interest of being included into a free catalogue provided by Transilvania University of Brasov, which aims at promoting the companies activity based on the augmented reality. Inside the research questionnaire, one section was dedicated strictly to the augmented reality topic andthe results are presented below.

Although social networks are often used, many users have never wondered what kind of technology stays behind the applications. As for the degree of knowledge of the term augmented reality, this is relatively low. Only one third of the respondents (32.10%) know the meaning of this term.

After being explained about the meaning of augmented reality, one out of 4 managers became interested in the opportunity that his company could be promoted using that idea of high-tech catalogue. The results from the figure below show that around 28.8% of all respondents consider that augmented reality could be usefull in promoting their image, their activity and their products or services.
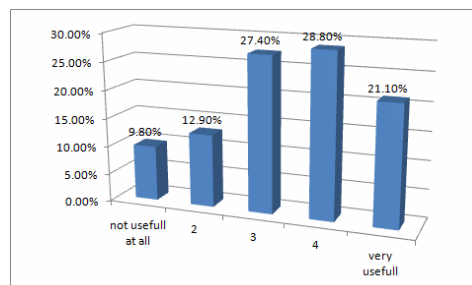

Fig. 1. *The level of AR utility in promoting companies' activity*

Almost half of the respondents (49.8%) consider the augmented reality in advertising accessible or very accessible, according to the figure below. Other 111 managers

(29.92%) stated that the use of augmented reality in promotion is accessible. On the other hand, 19.9% of managers did not want to respond to this question.
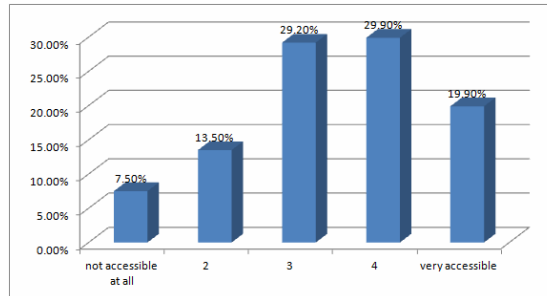

Fig. 2. *The level of AR accessibility in promoting companies' activity*

Being asked about how effective would be using augmented reality in advertising their company, the highest percent was registered by the option "so, so" selected by 29.7% of the respondents, according to the figure below. This percent shows a neutral attitude regarding the analysed aspect. Only one out of 5 managers considers that using augmented reality in promoting the company is highly effective.
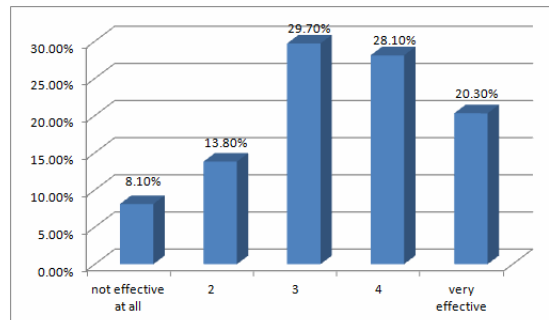

Fig. 3. *The level of AR effectiveness in promoting companies' activity*

The managers were asked to rate the the attractivness of augmented reality technology on a scale from 1 to 5. A high percentage of respondents consider attractive (28.8%) or very attractive (27.9%) using augmented reality for promoting the company activity, according to the results from the figure below.
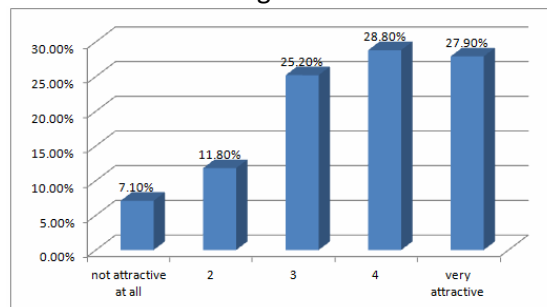

Fig. 4. *The level of AR attractiveness in promoting companies' activity*

The calculated mean of 3.59 shows that the general opinion about this attribute tends to be a positive one, the respondents considering this technology somehow attractive.

Analysing the reasons why a company would adopt a promotion strategy based on the augmented reality, 27.8% of respondents chose the answer: "for attracting potential clients". Another reason, selected by 25.3% of respondents is "improving the company image", followed by "differentiation from the competitors" (23.4%) and demand stimulation (22.4%). An interesting proposal of managers is using augmented reality for recruitment process.

Being asked about their intention of investing in the next 2 years in promotion campaigns based on augmented reality, 32.14% responded affirmative, 43.4% dintre respondens are not sure yet, based on various reasons: they do not know the technology, they do not have information about the costs, they are confused about the AR benefits.

But, in the end, 3 out of 4 managers would like to collaborate with Transilvania University of Brasov for being included in the presentation catalogue (free edition).

The research method has some limits that should be considered. The sampling method is not random, so the research results cannot be extrapolated for the entire group of companies from the Centre Region of Romania. There was a large number of refusals and superficial completion of certain questions in the questionnaire, which could lead to the distortion of the answers. The interview operators faced some difficulties in persuading the respondents to answer in certain situations. Some telephone calls were interrupted before the investigation was completed. The questions could not be accompanied by some samples during the phone survey.

5. Conclusions

In conclusion, better information on how to apply augmented reality technology and its benefits could change managers' opinion and would no longer be reluctant to adopt it. The concrete exemplification and presentation of already used applications, which have had a real success, will influence in a positive way the managers' decision of being present inside the catalogue.

Based on the research results, the authors recommend for Transilvania University of Brașov to create a physical catalog, where some information about the companies wishing to collaborate will be briefly presented. By scanning a code or a figure using the mobile phone, the user will be able to access an online page where an interview or a video presentation could be included. This way, all the companies that have expressed their desire to collaborate with the university will be present in the online environment. Essential details will be available, such as: the location, the exact address, a map with directions to reach the destination, the option of calling directly the company. If the companies agree, images and videos with their products and services could be displayed, as well as any other information.

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