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VIRTUAL REALITY AS THE INDICATOR OF THE MODERN BANKING

WIRTUALNA RZECZYWISTOŚĆ JAKO WYZNACZNIK NOWOCZESNEJ BANKOWOŚCI

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Summary: The dynamism of changes occurring in the social-economic space determines need for the systematic development, understood as seeking innovative solutions. Given that 46% of the world population uses the Internet and the 31% declares that they are active users of social media, no rationally formulated corporate strategy can omit the potential of computer technologies. One of the advanced solutions which are successively adapted in the sector of banking services is virtual reality. It seems that every industry from video games developers to healthcare is looking for innovative ways to integrate some sort of virtual reality platform into their day-to-day systems. The aim of the article is the presentation of the concept of virtual reality in the context of banking. The article proves the implementation of VR in banking generates competitive advantage. Additionally, it presents various aspects of applications, market trends and forecasts of the subsequent development of this phenomenon. Moreover, there is an attempt to answer a question, whether virtual reality improves the effectiveness of the banking activity.

Keywords: virtual reality, banking, innovation, information technologies.

Streszczenie: Dynamizm zmian zachodzących w przestrzeni społeczno-gospodarczej determinuje konieczność systematycznego rozwoju, rozumianego jako poszukiwanie innowacyjnych rozwiązań. Zważywszy na fakt, że 46% ludności świata korzysta z Internetu, a 31% populacji świata deklaruje, że jest aktywnymi użytkownikami social mediów, w żadnej racjonalnie skonstruowanej strategii przedsiębiorstwa nie można pominąć potencjału technologii informatycznych. Jednym z najbardziej zaawansowanych rozwiązań, które sukcesywnie adaptuje się w sektorze usług bankowych, jest *virtual reality*. W artykule zaprezentowano analizę pojęcia *virtual reality* w kontekście nowoczesnej bankowości. Przedstawiono różne aspekty zastosowań, tendencje rynkowe oraz prognozy dalszego rozwoju tego zjawiska. Jest to próba odpowiedzi na pytanie, czy wirtualna rzeczywistość poprawia efektywność działalności bankowej.

Słowa kluczowe: wirtualna rzeczywistość, bankowość, innowacja, technologie informatyczne.

1. Introduction

The innovation constitutes one of crucial factors determining the development of the enterprise at present. Quoting Oslo Manual, the textbook of statistical surveys recommended in EU countries and the oases of the OECD, regards getting used as the innovation of new or indeed of improved product (of the product or the service), of the new or indeed improved process, the new method of marketing or the new method of the organization in business practice, the organization of a place of employment or the relation with the external environment [OECD 2005]. At present, a solution about innovative character is virtual reality (VR). The idea of virtual reality relates to technology which enables interaction between users and digital world thanks to the special visual, aural and kinesthetic tool [North, North 2016]. Banks and financial institutions as one of the first groups of companies, noticed the potential from VR. The Goldman Sachs results estimates that to 2025 the VR market will be worth 25 billion dollars.

This new model of interaction with human, previously reserved for video games, is currently used and tested in the banking in the relation with the customer, or also a recruitment and trainings of recruits. A determinant of changes associated with the implementation of VR is not so much a need of getting the competitive edge above other companies but the necessity to meet requirements of clients called Millennials¹. As, a result of investigations 31% of them is holding a view that in the near future banks will not already be needed in the business space. Having analyzed Millennial Disruption Index (MDI)², should state that the nearest years will be the greatest challenge for the banking industry. The majority of respondents cannot see a difference between the bank they have their account in and the offer of remaining banks available on the market. About 70% of respondents think, within 5 nearest years the way we pay for goods or services will completely change, as well as the access to cash (68% of respondents) [Kemp 2016]. The application of VR in the banking constitutes the reply of changes of socio-economic area. Virtual reality became a part of modern world, offering the sequence of applications for users. This tool works among others in the following fields: in the tourism, insurance, medicine and managing the financial risk. VR works particularly in retail sales, where it

¹ Millennials is a generation born 1981-2000 and more than 84 million strong in the U.S. alone, using technology, collaboration and entrepreneurship to create, transform and reconstruct entire industries.

² Millennial Disruption Index (MDI) is an indicator describing the way into which enterprises are being made to get back by their customers. Analyzing the opinion of 10 000 respondents it is possible to state, which brands are positively being get back by customers, and which the breakdown is threatening with. The index is being drawn up based on data in three years period. The subject of analyzes are 73 enterprises in 15 industries. According to, the newest findings, banking is the sector most threatened with the breakdown, and as far as the 73% of respondents is convinced of the superiority of financial services offered by Apple, the Google or Amazon over traditional banking.

facilitates decision-making processes of the purchase for the customer, through the visualization of choice. The aim of the article is the presentation of possible implementations, market trends and forecasts as for the subsequent development in the context of new banking. Researches have provided bases at the actual literature and analyses of examples from the industry space (especially banking) from the last two years, when VR and AR technology is actively developed and implemented.

2. Virtual reality as a determinant of growth

The financial sector for approximately four years has been in the phase of the research of two kinds of this technology: virtual reality (VR) and augmented reality (AR). This kind of technologies based on the principle of interaction on the line of human and computer, undoubtedly constitutes the phenomenon of the development. The advantage of VR and AR above other multimedia consists in creating images or events which simultaneously enable interaction with the simulated environment by stimulating and exploiting human senses [Salem Press... 2016]. VR and AR are exerting the significant effect on the quality and the style of human life. A potential of VR and AR means the improvement of interaction between customers and banks via special dedicated equipment. Moreover, it is significant for banks interested in bringing VR into their business because it is one of the most innovative ways to tap into the mind of the customer through VR.

The systems of virtual reality consist in the synthesis of real surroundings and conditions of computer technologies in order to generate the artificial environment, constituting the kind of simulation of desired conditions. In this case, using virtual technology consists in leading the user in three-dimensional, virtual, but most importantly interactive world. The tool allows for creating the computer vision of objects, events or the space. VR blocks external stimuli, therefore a possibility of the total commitment of human senses exists into the simulation. VR enables the improvement in the perception and supplementing the knowledge with existing facilities or processes [Jung et al. 2014].

Myron W. Krueger is considered as the precursor of virtual reality. In 1983 he published a book in which he described the technical term – “artificial reality”. Jaron Lanier is treated as a continuator of examinations of the object and he popularized comprehending of virtual reality. The first definition of VR was a result of research provided by Lanier in cooperation with NASA. The definition is as follows: “The virtual reality is instructions for use of the computer technology in creating the effect of interactive, three-dimensional world, which objects are giving the impression in spatial (physical?) presences” [Gaudiosi 2016]. The arrival of virtual reality aroused the interest of artists, engineers and directors of companies, but it did not last long. The prototypes of devices enabling the virtual simulation, resulted in disturbing the awareness and the row of adverse effects for users, hence the pace of research works much slowed down. This situation lasted till 2012, when the popularity of technology

of virtual reality appeared. Then IT Oculus Rift goggles appeared on the technology market and from that moment the VR market has been increasing its value, and an idea has been implemented in the next areas of life every year [Wolf et al. 2016].

In accordance with one of the briefest definitions, the virtual reality consists on: immersion, interaction and imagination. The current level of the technological progress allows for using in virtual environments: visual, sound and motor effects, not to say (at least on much smaller scale) aromatic ones. In this way VR is much realistic to users. Creating virtual world is a resultant of factors, i.e. of the appropriate speed and the computing power, high-speed image processors and of data, the broadband of the transmission and the advanced software. The additional equipment is dependent on the kind of reality we want to show or on donating the device.

In conclusion, virtual reality is a simulation, using and developing human senses, however, separating the user from external stimuli above all. It gives the impression of the real scene, with the possibility of entering interactions with digital world. Augmented reality is a derivative of virtual reality. AR in contrast with VR is a real-world image, received in the real time, on which virtual image is additionally put. Therefore perceptual possibilities of the user are being widened. Saying more precisely, in the moment of vision additional components are added this way, to the image accepted by the human eye, and so an impression occurs, as if they were “natural” with the elements of surroundings. In this case immersion is also held using glasses with the Android system, and with applications enabling e.g. to take photographs, searching for objects, etc. [Massis 2015].

Both virtual reality and augmented reality constitute the wide area of the development for the IT technology. The potential from this type of tools has been found and is still finding application in many fields of life. It should be noted that thanks to VR and AR the progress in curing many illnesses, increasing the effectiveness of learning and a possibility of predicting and preventing adverse effects of some events e.g. appearing in communicative cases or disasters took place.

3. Virtual reality as the innovative tool about the sequence of applications

Virtual reality is making a profit on meaning in the business context and solutions from this scope are next leading to industries and companies. In this context the pioneers were: Google, Microsoft and Sony. The role and applying this technology are changing dynamically. In the last four years the role of VR and AR has significantly risen within the banking sector being a determinant of success and indicator of new business. Since banking is one of the most important sectors of economy, the implementation of new technology is very difficult. Legislation is in this case crucial. However, the development of banking is required by customers and market [Zaleska (ed.) 2013].

One of the first fields in which VR found application was the army. At first in the United States, today worldwide, soldiers are trained with the help of VR simulators. During such a simulation a soldier equipped among others with the rifle and a helmet is moving all over the virtual battlefield. With regard to compatibility of many training positions connected into one computer network, there is a possibility of training even an entire branch simultaneously. Insurance is the next essential field of application of virtual reality. The analyst has a possibility of reconstruction of accidents in 3D technology, with the aim of establishing causes and an event similar to the original one to reduce the risk in the future. An employee of financial institutions monitoring the risk will also be acting on the similar principle. However, their analysis will have a direct character. The wide field of application is being assigned to VR in the context of medicine. To mention here it is possible, among others: curing pain, performing representative operations, therapy of fears and depression and diagnosing illnesses. Since VR is a simulation, therefore it is an excellent tool at retail: e.g. hotel services are checked. The customer has a possibility of a virtual visit in a hotel, in which they are going to spend holiday. VR is especially used by media industry, creating productions in the technique of 360 degree [Tomaszek 2016].

Through virtual reality users are entering interaction with the computer-simulated environment. VR enables the simulation of conditions occurring in the real world, is facilitates the process of selection and streamlines processes of teaching and trainings. A tool constitutes futures and fixing new standards. Within a banking sector there is a need, which is called – competition. Since non-banking companies such as: Facebook, Google etc. represent very dynamic strategy regarding financial services, it is necessary to find areas to build a competitive advantage.

4. VR applying in banking – overview of current trends

There is no wonder that virtual reality is a hot topic in banking with the rise of artificial intelligence and innovation labs. VR technology, based on the effect of the immersion i.e. the dive in the virtual world, is gaining more and more popularity. Contemporary VR systems are already able to generate virtual environments about the quality letting in the credible way simulate diverse working conditions and lives of people, and hence effectively support processes in different complex situations [Bull 2016]. The potential of virtual reality, relies on the simulation of conditions or events, at using specialist equipment. VR is implemented more and more widely in the banking industry. The problem of implementation of VR into banking is currently investigated in the following institutions: Wells Fargo, BNP Paribas or Citibank. The results of implementations are as follows (June 2017):

- BNP has introduced virtual reality right into a mobile banking app.,
- Wells Fargo and Citibank are using VR in their marketing schemes, to develop customer relationships with their brands.

A wide range of VR applications has contemporarily been revolutionizing business comprehension. VR dedicated for Wealth Management enables data visualization for investors, with the aim of the effective portfolio management of assets. Capital panel which is created to administer needs, shows prices of advantages, market trends and dynamics of changes in prices e.g. action. An idea developed by Fidelity Investments is a tool called StockCity for Oculus Rift. It presents a portfolio in a virtual city, in which every advantage builds about parameters, constituting representatives of the price, the trading volume and the number of remaining contributions. Since VR constitutes a kind of simulation in real terms, it works in staff trainings and education, what was used in the context of banking. The tool is to facilitate acquiring and transmitting new information. Therefore the process of teaching is much shorter, and in consequence much more effective [Lau 2015]. VR can also be used by banks and financial organizations as a tool of recruitment. Creating artificial environment, being a model causes reality that the potential candidate is able to present their abilities, and recruiters inspection, or a given person is able to cope with their duties. As an example an application, can be provided created to the Commonwealth Bank of Australia. The purpose of the application is recruitment of technological talents. In this virtual journey users are invited to join a team of designers, drawing the application for one business customer of the bank. Another example is an idea implemented by a EON Reality company, the supplier of 3D software, consisting in drawing a virtual simulator of an interview. Candidates had the task of cooperating from a few avatars, controlled by the representative of the department.

A special potential resulting from VR is noticeable on the relation bank-customer. The group of banks has an application of the AR type, facilitating the contact with the bank and e.g. finding the ATM in the most immediate surroundings for customers already in its services [Zaleska (ed.) 2013]. While moving all over the city, the user can see on the screen of a phone information about putting the bank branch in the real time and arranging the visit. On the same principle, a tool used by Halifax banks and Australian Commonwealth operates in the sector of real estate. A potential buyer cannot only examine a real estate in 3D format, but can simultaneously use the virtual mortgage calculator. Additionally, there is a possibility of comparing offers available on the market.

A high probability exists that virtual banking will reduce the need for the physical existence of branches. This answer is intended for customers who e.g. because of travelling cannot turn up at their bank. The solution consists in creating avatar controlled by the personal banker who is able to describe a current offer, to provide advisory services and the current service [West 2011]. A significant cost cutting is an undoubted advantage of such a solution. The expenditure for the purchase of the essential equipment for the VR service is much smaller than the ones which are assigned for a building site and equipping next branches.

Why is virtual or augmented reality one of the most spectacular tools in the banking industry? A solution of this query is the influence of the effectiveness of daily

business in many dimensions. As it results from current experience the technology helps to reduce cost of business i.e. salaries, operational costs, maintenance. In addition, VR improves communication of customers and banks. There is a significant way to change traditional banking and implement digital solutions within the whole sector. An important fact is that VR is the answer for the requirements of the huge group of customers – Millennials. VR and AR make banking services simply and easily attainable. VR systems are very useful within the bank as a company. It improves internal processes, recruitment and assimilation of new joiners and trainings for employees. The implementation of this kind of technology is a need of new age, age of automatization and digitalization.

Virtual reality and augmented reality are fixing a new standard in the customer service and functioning of banks. VR and AR constitute the potential, which by competent using can help banking to survive in difficult times. While the most influential group of customers of the generation of the Millennium is holding a view that in the future banks practically would not have to exist, one should seek solutions which will constitute the panacea to the dislike of consumers for banking.

5. Conclusions

Virtual reality undoubtedly constitutes the technology of the future. The potential of VR results above all from the spectrum of applications and possibilities the technology of this type delivers. The idea of VR enables the immersion to employ human senses with the aim of total integration with virtual world. Besides derivative virtual there is widened reality. AR enables putting oneself images – real and digital, generated with the help of specialist applications and the equipment. The difference between VR and AR consists in the fact that virtual reality is a simulation of the determined state, and AR constitutes the extension of visual field of the user for additional functions, in a way as if they were its natural element. The systems of this type have become a phenomenon of today, which found the wide application among others in: medicine, tourism, sale and military science. Advantages of VR were noticed also in the context of banking service and managing the financial risk. It is estimated that the global VR market is at present (state from December 2016) of guards of c. 37 m USD, and how the Goldman Sachs shows in the report, in 2025 its value can reach 80 bn USD and exceed the value of the television market [Kostro 2016].

Virtual reality and augmented reality appoint the new quality in different fields of life and human activity. Based on the research provided by the International Telecommunication Union in the years 2000-2015³, a percentage share of the

³ Individuals using the Internet (% of the population) are an indicator which shows the percentage share of active Internet users in the population. Internet users are individuals who have used the Internet (from any location) in the last 3 months. The Internet can be used via a computer, mobile phone, per-

individuals using the Internet is constantly growing. For this reason, there is a need to develop banking services, especially to meet the requirements of Internet users.

Virtual reality technologies are now affordable and functional for financial services and especially for banking, which is in need to meet growing requirements of clients. Systems which are discussed in this paper compromise the spectrum of opportunities successively revolutionizing the socio-economic environment.

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