customer journey (карта взаимодействия клиента и продукта), на основе чего возможно сформировать «бесшовный» контакт с клиентом. Так, К. Кариа называет этот процесс IoT Omnichannel эволюцией, он также сформулировал 3Р процесса взаимодействия с клиентом в условиях IoT Omnichannel эволюции:

1. Proactive experience – проактивный опыт, основанный на предсказании необходимых приобретений клиентом в будущем различных товаров и услуг, планирование;
2. Predictive experience – упреждающий опыт, связанный с предупреждением каких-либо действий со стороны пользователей, в частности, снижающий риск дорожно-транспортных происшествий;
3. Personalized experience – персонализированный опыт, является одним из главных трендов развития торговли, направлен на формирование индивидуального предложения потребителю на основе его предыдущего опыта [5].

Таким образом, можно отметить, Интернет вещей является основой развития торговли как в онлайн, так в оффлайн формате, создает основу для анализа поведения клиента и формирования индивидуального предложения для него. Данная технология затрагивает все возможные аспекты коммерческой деятельности торговых предприятий, значительно повышая их эффективность.

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The role of artificial intelligence in cognitive marketing

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Abstract

This article is about innovative instruments of market analysis and their effectiveness in terms of information activity. Nowadays rapidly changing economic tendencies make companies do constant investigations of consumption behavior in order to retain regular and attract new clients. For this reason today marketing emphasizes the study of consumers' cognition with potential introduction of Artificial Intelligence.

Keywords: Artificial Intelligence, marketing, consumer, company, cognitive, effective.

The history of Artificial Intelligence does not go back as long as the history of Mathematics or Psychology and is considered to be comparatively new field of science. Prerequisites for appearing this interdisciplinary scientific study were formed in the middle of

the twentieth century based on accumulated by many scientists knowledge. The complex work developing the theory and practice of AI combined such fields of science as Philosophy, Psychology, Neuropsychology, Mathematics, Physics and disciplines related to these directions. The series of theories investigating the structure and processes of human comprehension and intelligence faculty integrated with the theories of mathematical computations made the appearing of algorithm theory and computers possible. Soon it was discovered that capabilities of computers in the sphere of calculation speed were much higher than human ones. That was how the first thoughts about extraordinary power of artificial intelligence appeared. A well-known pioneer in this field trying to predict potential power of Artificial Intelligence was the British mathematician Alan Turing. Turing test is based on the capability of machine to have conversation with a human being so that the latter could not make the difference between this machine and an ordinary man talking to him from the next room [6]. Since then a simple but ingenious method of discovering either AI have surpassed human mental power still exists but anyhow comparable to human intelligence system has not been invented yet. Many specialists and researches argue that boundless abilities of human brain, mind and intelligence could ever be exceeded by artificial machinery algorithms at all. From my point of view, the human intelligence created by God, space dust or as a result of systematic Darwinian evolution which took millenniums and millions of years is the highest possible state of the mind on the Earth. However, we cannot deny rapid pace of Artificial Intelligence advance and actually the profit of AI and in many cases preference of it to a man. Nowadays emphasis that is put on AI is much greater than ever else in History. The projects for AI advance are being developed on the government level of different countries with big investments. The reason is clear: Artificial Intelligence enables to work more effectively a large variety of components in Economy and Politics. AI and robotechnics today are becoming inevitable in the production sector of the Economy to provide public and private companies with competitive products for the globalized market. Automation of production sector in many industries and substitution of human repetitive routine operations at plants guarantee less amount of accidental errors and consequently leads to the shortage of wastes. That is one of the main reasons of effectiveness of Lean Production management concept. Another group of robotechnical devices with AI is related to the sector of service. And despite obvious human – AI rivalry the latter is becoming the closest friend of a human being. I mean the increasing usage and use of AI in the field of Medicine. Many medical diagnostics and imaging facilities which undisputedly prolong our lives are the result of AI development. Furthermore, new models of robots to serve patients and elderly people are invented on a yearly basis. Artificial Intelligence for service has already extensively spread to such fields as transport, commerce, finance, telecommunication, online clients support services etc. So that the question I intend to answer in the current article is: «what is the future of Artificial Intelligence in marketing»?

At first glance Artificial Intelligence in marketing as a field of science is not a thing of the first necessity. Probably, this perception is a result of underestimating the science of marketing itself. The matter is that the final product (tangible or intangible) or influence of its product is visible for the eye of the customer. However the whole range of preliminary work to create the product customer will like is usually somewhere far from the thoughts of the client. Nevertheless, the importance of marketing systems and concepts cannot be underestimated when it comes to both private and public organizations. Any company, any start-up project should be based on the proper analysis of exactly that segment of the market where this product is supposed to be consumed. Therefore, marketing plan is highly advisable for every production, commerce or service company. I pay a lot of attention to the meaning of marketing for every company as many start-up projects and small businesses in Russia are doomed due to the lack of attention to market analysis. There are 2 main reasons for such disastrous neglect. The first one is good command of marketing or a big budget which is necessary for a complex marketing plan. And the second is based on prejudices that the

progress and success of business depends on big start investments, large advertisement budget or the luck in general. Consequently, we ought to eliminate these factors which interfere with successful launch of business. Also an extra obstacle to a well-planned start is the belief that intensification of commercial activity is currently the key factor for enlarging sales volumes. Undoubtedly, the psychological and sales concepts in management do perform for commercial growth, however the rule today is: «the company with detailed proper marketing plan, but without high-skilled sales managers can progress in long-term prospect. However, when it comes only to emphasis put on commercial intensification, in long-term prospect it fails». The matter is that the art of sales is not the only field rapidly developing today; the Art of consumption is on the progress list too, graduating highly sophisticated clients for the current market. It is getting more difficult to persuade a customer to come up with a buying decision right on-spot. Customers are becoming no longer victims of correctly structured job of persuasive sales people and are slowly turning into educated experts of analysis and comparison. Accordingly, commercial tools of marketing are slowly passing by with the increasing importance of marketing concepts related to the investigation of customer's behavior, ways of thinking, methods of collecting and processing information etc. The basic marketing aim of satisfying needs and demands is more than ever related first to the client's and only then to the offering side. The market is overfilled with different brands in every segment of the Economy, so long-lasting prospering only on quantity or commercial efforts is no longer possible. For this reason scientists research the market and the customer from different sides in order to come up with a new effective marketing strategy. Accordingly, nowadays more precise emphasis is put on the complex investigation of cognitive marketing as a new technique of customer's analysis. Nowadays cognitive marketing is one of the most popular and prospective direction of innovation marketing. The matter is that in the 21 century transformations and changes of the main actors' behavior in the market are happening quicker than ever due to rapid progress of information technologies, globalization of market and Economy in general, increasing customers' demands for ecological safety of a product, rising prospects' emphasis on not only company's product, but more on the portrayal and business reputation among competitors. Consequently, these transformations triggered the sequence of inevitable changes in standards and philosophy of consumption. Nowadays it is no longer possible to prosper on basic marketing strategies. Moreover, the prior goal of innovation marketing today is to deal with the teaching and controlling customers actions in the field of product and service consumption. Also, cognitive marketing is compatible to current innovative nature of economic and business affairs based on absorption of up-to-date information and communication technologies what proves its place in the centre of innovation marketing.

The tendencies of 21 century are that qualitative changes at any field of research or science are becoming possible in the light of complex and comprehensive investigation of various closely related spheres. Cognitive marketing is not an exception. Being interdisciplinary branch of scientific research it combines common marketing direction of science with cognitive psychology. Cognitive psychology studies human cognition processes (processes aimed at discovering new things or analysis of already learnt ones) of memory, attention, feelings, information visualization, imagination, logical thinking, ability of making decisions etc [4]. Cognitive psychology uses empirical method of investigation and mathematical modeling of thinking processes to create a logical algorithm of human cognition models. The choice of Economy-Psychology combination in innovation marketing is reasonable and, from my point of view, the most ambitious direction in the science of market investigation. The main idea is that Economy itself is incapable of discovering and making models of customer's consumption behavior and processes in charge of consumers' economical choice without the help of Psychology. Therefore, social and psychological aspects of cognitive marketing require detailed investigation. Minding the fact that cognitive marketing is a brand new discipline of the 21 century both theoretical and practical sides of

the science in Russia and in the world in general requires development of concepts. Nevertheless, nowadays already there are several scientific publications denoting mostly theoretical parts of the discipline. They include classifying of its categories, peculiarities of definite product perception and analysis of modern consumption technologies. In any case at the moment we are aware of problems and goals of cognitive marketing. The first one is the investigation of cognitive systems of a consumer. Then goes design and invention of models which are capable to control cognitive system of a consumer. Accordingly, the next step is to develop the right combination of marketing instruments in order to influence cognitive system of consumer. So that final and major goal is to become able to teach clients in the field of consumption culture by the means of different marketing devices. The object of cognitive marketing is inner cognitive experience of a consumer in the field of economic choice, product and service consumption. The subject of cognitive marketing is development of marketing models stimulating cognitive system of consumers psyche in the direction of persuasion for positive for a company choice based on a buying decision of its product [7]. So that the strategic goal of cognitive marketing is achievement of company's long-term financial goals as the result of establishing lasting, affiliate to consumers' relationships and capability to take control over customers' consumption actions related to the product of the company as a result of influence on cognitive models of a consumer. Innovative nature of cognitive marketing can be also proved by the fact that it gives a complex perception of potential market demand based on systems of consumers' cognitive processes. The main thing is that cognitive marketing is not restricted by studying only processes of cognition, but also aimed at developing practices and actual ways of influence on consumers' market demands. Consequently, functions of cognitive marketing are formulated to implement all the range of its innovative components related to each company and each product. There are usually three common functions of cognitive marketing in the science: informational and cognitive, stimulating, controlling. The first one is based on investigation of ways consumers get the information about the company's product. The emphasis is put on the ways, algorithms consumers use to process collected information in their cognitive system in order to apply it to their actions of making up with a marketing decisions. The main task of stimulating function is to achieve implementation of persuasion influence on consumers cognition system based on created by every company, specific range of marketing instruments. The main attention is paid to the influence on the cognitive map of a consumer where it is getting possible to regulate the route of a consumer in relation to the company's product. The last and key function cognitive marketing appeared for is controlling function. The aim of it is to teach consumer and increase the level of their consumption culture. This function enables to influence the market of consumers, develop potential market demand on the company's product and control reproduction of market demand by the way of well-structured teaching of consumers in the field of new tendencies and standards of consumption the company's philosophy is based on. So that cognitive marketing comprises the whole complex of marketing components which should be properly investigated before launching any business. This interdisciplinary direction includes creation and offering of a product, development of market demand and price policy, search of the most effective distribution channels, sales policy, product advertisement based on long lasting partnership with a consumer as a result of positive influence on their cognitive system.

Nowadays market analysts are overwhelmed by big data in the field of consumption; however they often face the lack of actually useful information. Moreover, a lot of data revealing significant aspects about potential consumers is scattered throughout numerous sources of information in different formats (texts, images, photos, videos) [2]. It is impossible for a human to process all this complex and endless streams of data manually in order to make up a system of algorithms or processes responsible for cognition of a consumer. This is the very reason why nowadays market analysts need new instruments for processing big data in short periods of time, getting really useful information from different data formats, detecting

potential clients among widely spread social networking sites. From my point of view, Artificial Intelligence is the most innovative and helpful structure which can deal with big data processing to systematize cognition mechanisms of a consumer for designing compatible marketing strategies. The use of Artificial Intelligence lets market analysts to analyze all formats of data automatically for short periods of time. Also it makes possible to embed analysis tools into processes of cognition making marketing plans more accurate, consumer oriented and as a result more effective and profitable. Artificial Intelligence is a mathematical structure imitating definite aspects of human brain working and demonstrating such capabilities as non-formal learning, generalization and classification of chaotic information and forecasting. The main difference of AI with human brain is the absence of necessity for knowing a model of cognition in advance. Artificial Intelligence creates this model only on the basis of defined information. Therefore Artificial Intelligence has become widely integrated into systems with complex algorithmic tasks in order to deal with complicated classifications and forecasting. The intelligence function of AI is defined as computational component of capability to achieve goals. The inventor of AI term John McCarthy interpreted it as a science and technology of intelligence computer program creation [5]. The basic function of AI is systematizing. The main task is the processing of all possible images and formats of data. This is implemented by capability of AI for learning and extraction of consistent patterns from great amounts of information. If there is even hardly visible correlation between input data and output data which cannot be found by traditional correlation methods, Artificial Intelligence is capable to discover it with defined degree of accuracy. Furthermore, AI makes it possible to assess comparative significance of different types of input data in order to confine the number of suitable sources of data from the very beginning. Consequently, Artificial Intelligence started to be introduced into many spheres where big data processing is necessary. Actually, in my opinion, AI could improve almost any field of our life. Today it is already impossible to do without AI in marketing and advertisements in particular. Owing to the synthesis of deep learning technology, machine vision and cognitive neurobiology AI can be used in market and consumption examination. AI is capable to improve data analysis processes to make the company's marketing strategy more personalized. It helps to identify the circle of your potential clients more precisely and consequently define the scope of persuasion influence on them without unnecessary expenses. Studying modern direction of AI application to marketing, the most integrated fields are web design, target and contextual advertising, analysis and evaluation of advertising campaigns. One of the most prospective directions of AI application to marketing is the capability to personalize advertising content of the company's product in order to find the right compatibility of advertising offer and consumption demand. In different words AI assists marketing to find accurate connection between a product and a consumer reducing unnecessary expenses for the scope of various marketing instruments and practices (determination of potential demand, setting advertisement campaigns to a high number of uninterested in product consumers). In the field of Internet advertisement modern AI technologies have already been used for several recent years. However the implementation of cognitive marketing tasks with the help of AI nowadays is a very prospective field of research which can provide innovation marketing with the instruments of a new level. The main cognitive marketing functions (cognitive, stimulating and controlling) would achieve their goals in a quicker and more effective way. The synthesis of Artificial Intelligence and cognitive marketing will also enable companies to deal with finding out of unsatisfied consumers demands that will make possible to modernize and invent 100% suitable products. Also this integration will contribute to attracting more clients as a result of personalized approach to every consumer which will be reflected in preferences, price and sales policy. Moreover, the company will prosper on more affective correlations with regular customers due to investment in highly detailed analysis of their changing consumption demands. The matter is that current companies should precisely understand who their client is in order to

enhance their competitiveness and financial effectiveness. Wishes, demands, capabilities and any peculiarities of a client need constant investigation. The reason of it caused by rapidly changing processes in globalized Economy. Nowadays government cannot take full control of its national Economy due to high level of integration into international economic processes. For this reason in order to track and analyze the whole range of economic changes companies are forced to invest money in everlasting researches and marketing investigations. The biggest part of companies nowadays collects information about consumers based on surveys and questionnaires [1]. However, this widely spread type of getting the information involves great financial expenses and time costs. Moreover, the real accuracy of such researches and effectiveness of them is highly dubious. The matter is that people psychologically tend to obscure many details and far not always are willing to tell the truth during such surveys. Furthermore, influence of testing effect, role selection, trends and other factors makes people to convey their ideals rather than necessary for marketing actually true information. Consequently, accuracy of this usual kind of getting information is often cannot exceed even 50%. According to practical experience related to collecting and processing information of consumers and potential clients the different method is more effective. It is based on data analysis of regular clients and potential consumers «digital footprints» (likes, reposts etc.) left on social networking sites [3]. However, this method is also far from perfection and comprehensiveness. Main reasons: the number of active social sites users is much fewer than the number of Internet users, and analogically proportion of population and Internet users also cannot be compared. At the moment innovation marketing has been rapidly transforming from product-oriented to customer-oriented with the main emphasis put on study of consumers cognition processes based on big data processing where AI is a system of great assistance. Technology combining cognitive marketing and Artificial Intelligence will soon become a substitution of traditional methods of collecting information and market investigations. Nowadays even being introduced by small amount of companies this technology requires improvement and development. Artificial Intelligence and neural network in marketing are assumed to be responsible for data which being collected becomes the basis for decisions. These decisions in turn are used for system self-innovation in order to provide a company with constantly updating contextual recommendations which enable the company to form consumption experience and adjust it effectively. So that the value of company's goods or brands increases, correlations with consumers get more effective what in general enables a company to achieve its long term strategic financial marketing goals faster.

All thing considered, current business is getting as seriously dependent on marketing investigations as never else. Nowadays complex and extensive market research is demanded in order to establish a company that will provide with it product a great number of sophisticated consumers in long term prospect. Accordingly, new directions of scientific approaches to the problem of market analysis are being currently developed. One of the most innovative and prospective, in my opinion, is cognitive marketing. It combines the study of consumer's behavior cognition with marketing instruments in order to reach the right compatibility of a product and a potential client. Emphasizing the functions of cognition (collecting information), stimulating consumption market and finally controlling clients' economic choice in relation to company's product cognitive marketing is assumed to deal with task of consumers teaching in order to educate consumption group for the company. Judging by the functions of cognitive marketing the initial and the most complicated task is the collection and processing of big data that can give us useful information about consumer's cognition models. Traditional ways of getting information from surveys and questionnaires currently used in marketing is not comprehensive and can hardly provide the company with results of high accuracy. Therefore, Artificial Intelligence can be used as the most effective substitution to ordinary time and financially demanding manual way of collecting marketing information. Being information technological analogue of biological neural networks AI can perform all necessary tasks automatically with similar to human brain computational

algorithms. However AI does not need models of cognition, AI creates it. Moreover, artificial Intelligence has capability for self-learning that enables it to provide information of current interest. The next major advantage of AI is a capability to collect and operate big data for short periods of time incomparable to human abilities. All in all, Artificial Intelligence integrated in cognitive marketing is bound to enhance effectiveness of a company by providing fast-accurate analysis of consumers' unsatisfied demands that gives certain information about the characteristics and definitions of a necessary product. AI enables a company to save its budget spent for expensive and inaccurate informational surveys, extensive and ineffective advertisement campaigns. Actually, nowadays AI has already been introduced into different Internet advertisement tools like Google Adwords, Yandex Direct (Russian browsers adds tool), Facebook adds as the main component of contextual and target advertisement. However, at the moment there are no widely spread AI based marketing tools or systems which could operate the investigation of consumption experience and creation of constantly changing models of consumption behavior. For this reason the role of AI in cognitive marketing cannot be underestimated and this field of Science is on the list of the most innovative researches which can improve effectiveness of any business.

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