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## **Virtual digital assistant market – current state and outlook**

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## **Introduction**

In recent years the world has transformed into a semi-virtual reality from which the media can no longer be excluded. Today's community is connected to their gadgets as the humanity was always connected to their relatives and friends: the media are needed to write down plans and to mark important things to do in order not to forget about them and to be reminded of the need to complete them after. All these facts are the reasons why the Virtual Digital Assistants, automated software applications or platforms that assist the human user by planning the time and scheduling responsibilities, are becoming more and more popular.

This paper's **goal** is to review the current situation with the Virtual Digital Assistants (VDA) on the digital market and to predict possible development trends.

**Aims** of this work are the following:

- to understand what is a Virtual Digital Assistant,
- to analyze the functionality of the VDA,
- to examine the existing Virtual Digital Assistants on both markets and worldwide,
- to explore the usage of the VDA in Germany and in Russia,
- to compare both markets,
- to make a market outlook,
- to draw conclusions.

The first part of the paper intends to clarify the application's purpose, describe its functions, set aspects of the VDA's usage and review the most popular or famous assistants. In the second section, we're going to examine the digital market's development in Germany and in Russia in terms of exploitation of the Virtual Digital Assistant. In this part, two markets will be compared with the aim to find similarities and differences between them. In the last part, an analysis will be conducted and the conclusions will be made.

Thereby, the **object** of the research is the modern auxiliary application Virtual Digital Assistant, the **subject** is determined as the utilization of the VDA and its usefulness or uselessness for a modern human being.

The **acuteness of the topic** is explained by a rapid implementation of the application in daily life, the technology giant's interest for this type of the application, VDA's fast development and its growing popularity.

The **research background** is formed in the large part by the analytical articles and studies, as well as annual reviews of media analyst companies such as German Goldmedia and British Oxford's research center Reuters Institute and essays by such authors as Choochart Haruechaiyasak, Alisa Kongthon, Sarawoot Kongyoung and Anthony O'Donnel Chatchawal Sangkeettrakarn.

The course paper's **structure** includes an introduction, three topics and two subtopics in the second section, as well as a conclusion and a bibliography. The total amount of the course work counts more than 20 pages of printed text.

## What is a Virtual Digital Assistant

A Virtual Digital Assistant (VDA) is a piece of automated software that interacts with customers through natural language in written or spoken form and assists human users by planning and self-management<sup>1</sup>. In specific environments, the VDAs mediate our linkages with resources available via the Internet, making life easier and changing the way we interact with businesses and services<sup>2</sup>. By using the VDA, one can simply make a note, mark a date in the calendar, generate a reminder and call a person one needs to talk to without opening the contacts book – all these actions can be performed by just talking to your gadget and asking it to execute the commands.

Today, most of the Virtual Digital Assistants exist in the form of smartphone applications, i.e. as gadget-based software and are known as the best and most popular assistant offerings. But at the same time, the assisting programs are penetrating other types of devices such as PCs, fitness trackers, smart watches, automobiles and, according to the latest reports, smart home systems<sup>3</sup>. Accelerated innovation and scalability of underlying technologies including natural language processing (NLP) and artificial intelligence (AI) cause rapid VDA application's usage proliferation and contribute to their further development.

However, the VDAs are instantly gaining traction in the fields of consumer and business markets. Lots of business leaders believe that Virtual Digital Assistants will be helpful and valuable in the future. Because of this, many of world's technology giants are supporting the VDA fields in order to take noticeable market share at the very early stage of VDA area establishing<sup>4</sup>. The

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<sup>1</sup> Tractica. Virtual Digital Assistant. [Electronic resource]: <https://www.tractica.com/research/virtual-digital-assistants/> (date of access: 23.04.2017).

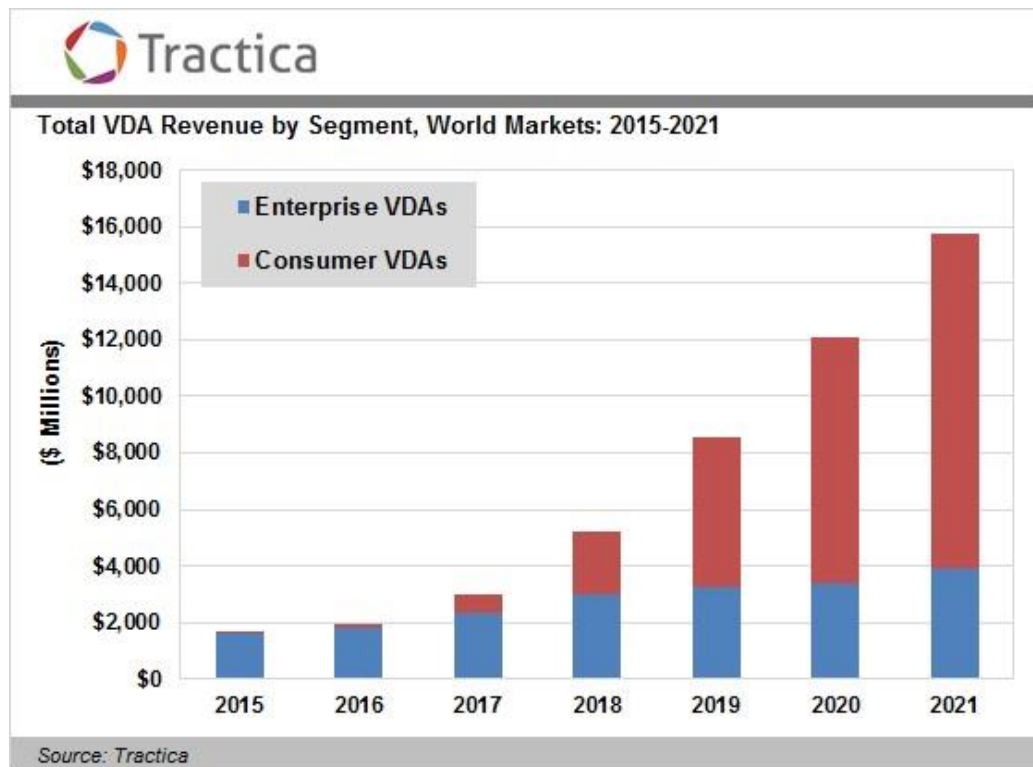
<sup>2</sup> BBVA Research. Digital Economy Outlook, October 2016. Virtual Assistants: artificial intelligence at your service. [Electronic resource]: [https://www.bbva.com/wp-content/uploads/2016/10/DEO\\_Oct16\\_Cap5.pdf](https://www.bbva.com/wp-content/uploads/2016/10/DEO_Oct16_Cap5.pdf) (date of access: 23.04.2017).

<sup>3</sup> Tractica. Virtual Digital Assistant. [Electronic resource]: <https://www.tractica.com/research/virtual-digital-assistants/> (date of access: 23.04.2017).

<sup>4</sup> Ibid.

assisting applications are disposed of cooperation with a specific project by using channels that the enterprises usually control, e.g. smartphone software, interactive voice response (IVR) systems, websites, shops and other opportunities. According to the global market examining report conducted by Tractica, the number of unique active VDA consumers will rise from 390 million worldwide in 2015 to 1.8 billion by the end of 2021<sup>5</sup>. During the same time, unique active enterprise VDA users will count around 843 million by 2021, while in 2015 its volume reached 155 million users<sup>6</sup>. In short, the Tractica 2015 report contains an analysis of market drivers and problems, technological issues and key enterprise players<sup>7</sup> which demonstrate the field's changes (see the graphic 1).

Graphic 1.



Source: *tractica.com*

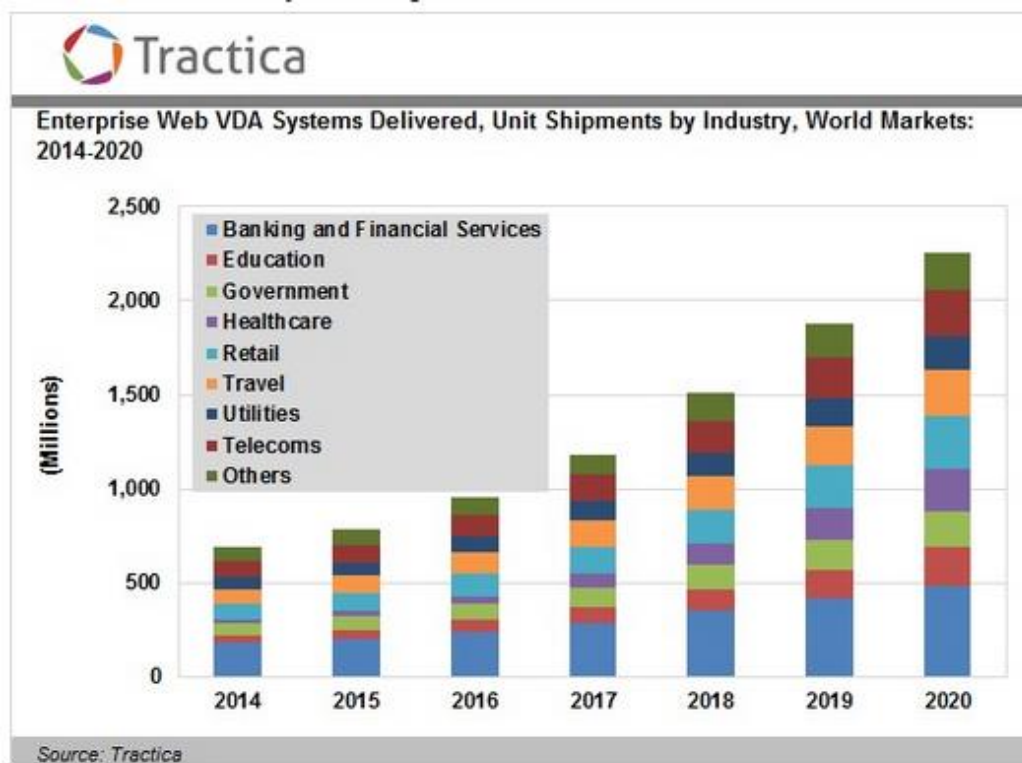
<sup>5</sup> Tractica. Virtual Digital Assistant Analysis. Virtual Digital Assistants: Virtual Agents, Chatbots and Virtual Assistants for Consumer and Enterprise Markets [Electronic resource]: <https://www.tractica.com/newsroom/press-releases/the-virtual-digital-assistant-market-will-reach-15-8-billion-worldwide-by-2021/> (date of access: 23.04.2017).

<sup>6</sup> Ibid.

<sup>7</sup> Ibid.

In 2014, one year before the last report, Tractica also identified the development of each subject and topic which are covered and managed by the VDAs (see the graphic 2).

Graphic 2.



Source: *tractica.com*

These statistics show that the consumer VDAs are in great demand than the enterprise VDAs which can be explained by reexamination of the assistant's functions. Apparently, the management of the notes, calendar, calls etc. belongs to the category of personal, private usage and is not so useful in case of collective utilization. This would lead to

Another aspect that can be observed while exploring the VDA market is a tendency of the first assistant's producers to represent the VDAs as a human being, giving them a name and choosing a human picture as an avatar<sup>8</sup> while the last releases do not have this "humanoid" characteristics. This observation is especially

<sup>8</sup> BBVA Research. Digital Economy Outlook, October 2016. Virtual Assistants: artificial intelligence at your service. [Electronic resource]: [https://www.bbva.com/wp-content/uploads/2016/10/DEO\\_Oct16\\_Cap5.pdf](https://www.bbva.com/wp-content/uploads/2016/10/DEO_Oct16_Cap5.pdf) (date of access: 23.04.2017).

true for the earlier online versions of the VDA applications. It can be explained by the following reasons: the Virtual Digital Assistant's makers had a task to provide a friendlier interface than ordinary question-answer databases<sup>9</sup>. Today, its main goal is to make using the gadget easier, faster and more convenient. One of the firstly released tools that had the functions that today's VDAs usually possess and also was presented as a human being was the IKEA's **Anna** that was introduced to the market in 2005 and has been in service for more than 10 years<sup>10</sup>. Anna was the world's first customer service bot animated as an active character that engages website users in conversation to answer their questions and help them find required products on the website. Anna has set the vector of the helping apps' developing. Subsequently, the rapid evaluation of the VDA programs was caused by the advance of technologies and possibilities related to the General Artificial Intelligence (these are among others Deep Learning and natural language processing) and interactive conversational systems related to voice response and voice recognition<sup>11</sup>. According to the experts, the next step of VDA's development and growth is the more successful usage of voice in the human-machine interaction.

In the next paragraphs, we're going to review today's most popular Virtual Digital Assistant applications (Apple's Siri, Amazon's Alexa and Google's Assistant supported by the Google Home smart speaker).

The first popular voice-activated and managed Apple assistant **Siri** is widely used by the owners of iPhone or another Apple product. Siri is an acronym for *Speech Interpretation and Recognition Interface* and was originally created by the US non-profit research institute called **SRI International**<sup>12</sup>. In April 2010, Apple has bought the SRI's assistant and started to insert it into different iOs platforms. Siri can assist customers by using almost every application and function of Apple

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<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> "Products and Solutions". SRI International. Retrieved 2014-05-17. [Electronic resource]: <https://www.sri.com/engage/technology-for-license> (date of access: 25.04.2017).



products and cooperates with such services as OpenTable, Google Maps, MovieTickets, and other taxi-calling, delivery, tickets-buying etc. applications<sup>13</sup>. Since 2016, this app is also working in collaboration with neobanks<sup>14</sup> N26 and Monzo<sup>15</sup>. It means that Siri supports online financial transactions, i.e. transferring money between accounts, paying bills and checking the statements making the managing of private tasks easier (today, Amazon's Alexa also works together with the Capital One bank in the same way and enables most of these functions too)<sup>16</sup>. Thereby, Siri represents the Virtual Digital Assistant of the future which can not only speed and optimize the searching process but also control your finance and other personal aspects. It is noteworthy that Siri never had "a face", it always existed as a non-humanoid voice-driven helping bot.

The name of another worldwide used assistant is **Alexa** and it is the Amazon software. Alexa was announced in November 2014 as a voice-recognizing helping app powered by Echo<sup>17</sup>. So, this assistant was always connected to its user and listened to his voice through the Echo application, but since the recent time the bot doesn't need the Echo anymore and is always catching customer's messages started with its name while being used<sup>18</sup>. Alexa was firstly invented to accelerate and simplify the search on the Amazon website. Nowadays, Alexa's other functions are inter alia the playlist control, the heating thermostat handle using the voice recognition and special instructions and assistance by searching for a specific

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<sup>13</sup>Apple's Siri. [Electronic resource]: <https://www.apple.com/ios/siri/> (date of access: 25.04.2017).

<sup>14</sup> A neobank is a new type of app-only bank with no branches, eg Tandem, Mondo new type of app-only bank with no branches (Collins Dictionary <https://www.collinsdictionary.com/submission/17738/neobank>).

<sup>15</sup> BBVA Research. Digital Economy Outlook, October 2016. Virtual Assistants: artificial intelligence at your service. [Electronic resource]: [https://www.bbva.com/wp-content/uploads/2016/10/DEO\\_Oct16\\_Cap5.pdf](https://www.bbva.com/wp-content/uploads/2016/10/DEO_Oct16_Cap5.pdf) (date of access: 23.04.2017).

<sup>16</sup> Ibid.

<sup>17</sup> Alexa. Amazon Developer. [Electronic resource]: <https://developer.amazon.com/alexa> (date of access: 26.04.2017).

<sup>18</sup> BBVA Research. Digital Economy Outlook, October 2016. Virtual Assistants: artificial intelligence at your service. [Electronic resource]: [https://www.bbva.com/wp-content/uploads/2016/10/DEO\\_Oct16\\_Cap5.pdf](https://www.bbva.com/wp-content/uploads/2016/10/DEO_Oct16_Cap5.pdf) (date of access: 23.04.2017).

request<sup>19</sup>. Alexa recognizes simple voice commands, handles the gadget's applications and determines which one the user needs to use in each special case. For example, when Alexa hears the command "Turn up the volume", the software understands that the consumer means the Spotify app and not the thermostat controlling which can apropos be activated by saying "Alexa, raise" or "Lower the temperature". Alexa doesn't have a "human face" too.

One of the lately announced but already prevailed VDAs is the **Google Assistant** which is now working with a smart speaker gadget Google Home. Google Assistant came on the market one year ago, in May 2016<sup>20</sup>. Unlike the previous versions of Google's assistants, the latest one can engage in dialogue and recognize a large number of different language accents<sup>21</sup>. The assistant can pull information, check plans, messages, notes, search for the required data and collaborates with Android-powered smartphones. To use Google Assistant on iOS platforms, users have to download a special application and start the helper by opening the program and saying "Allo" or the well known "Okay Google". It is planned that the Google Assistant will be able to control the smart home technic. Thus, a few days ago, LG has announced a new generation of home appliances that will be possible to operate through Google Assistant<sup>22</sup>.

Unfortunately, the VDA market is quite a young digital market and although the VDA's are widely used by people all over the world, we could not find the statistics showing which one of the VDA leaders is the most popular among their users. However, it is clear that the voice-driven Virtual Digital Assistants will keep

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<sup>19</sup>Business Insider. Amazon has outflanked Alphabet, Microsoft and even Apple. [Electronic resource]: <http://www.businessinsider.com/a-lot-is-happening-in-the-market-for-virtual-digital-assistance-2017-1>(date of access: 26.04.2017) .

<sup>20</sup> Google Assistant. [Electronic resource]: <https://assistant.google.com/> (date of access: 26.04.2017).

<sup>21</sup> Ibid.

<sup>22</sup> Ferra.ru. [Electronic resource]: <https://www.ferra.ru/ru/byt/news/2017/05/19/lg-google-home-assistant-appliances/> (date of access: 26.04.2017).

on improving fast and cover more fields<sup>23</sup>. After the survey of persons working for media (press: online and “offline” newspapers and magazines; television, radio) in Germany and Russia, we came to the conclusion that the VDA isn’t used as a helper for editorial offices due to the above-mentioned reasons. Nevertheless, many of them use the integrated into the smartphone operating systems assistants without recognizing that they are actually utilizing the Virtual Digital Assistants.

In the next section of this paper, we will make a review into the VDA markets in Germany and in Russia with the aim to consider the national VDA and identify the interest to the VDAs’ usage of Germans and Russians. We’ll also try to compare the German and the Russian markets in order to find similarities and differences between them.

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<sup>23</sup> Nic Newman. JOURNALISM, MEDIA, AND TECHNOLOGY TRENDS AND PREDICTIONS 2017. The Oxford Reuters Institute. Pdf-version. Pages 17-19.

## **Current situation on the market**

As mentioned above, the Virtual Digital Assistants are filling the modern digital market due to its convenience in use and the self-management's acceleration. The digital market's specificity is that it cannot exist in the same geographic region and it is filling the world's market with its products and features. This is the reason why the described Virtual Digital Assistant platforms are available in most countries across the planet (the exceptions are the countries which government decided to close the access to the free World Wide Web). However, every country strives to create its own application which should be more useful for the specific region it was created for because of considering its peculiar properties and interests and preferences of its population (the same rules work for the local press model). In the subtopics of this section, we will review the national Virtual Digital Assistants on the German and Russian markets.

### **In Germany**

After the VDA's implementation on the digital market, German software developers reacted to this global trend by creating their own national assisting systems. Today, there are 5 German VDA successfully operating on the local digital market: My-VPA (previous name: Mein-VirtuellerAssistent, eAssistentin, Manage-My-Business-De, Virtuelle Helfer and MeinAssistentOnline<sup>24</sup>).

#### **1. My-VPA**

My-VPA<sup>25</sup> is one of the first German Virtual Digital Assistant's that was released in 2010 under the name Mein-VirtuellerAssistent. Today, six years after the app's creation, My-VPA assistant is the market leader in the German-speaking world and one of the high-quality Virtual Personal assistances in Germany. This

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<sup>24</sup> T3n Digital Pioneers. Virtuelle Assistenten in Deutschland [Electronic resource]: <http://t3n.de/news/virtuelle-assistenten-deutschland-506137/> (date of access: 10.05.2017).

<sup>25</sup> My-VPA website. [Electronic resource]: <http://t3n.de/news/virtuelle-assistenten-deutschland-506137/> (date of access: 10.05.2017).

VPA includes more than 50 Virtual Personal assistants (VPAs) that are able to administer traditional office management, a wide variety of operating tasks and can also work as a personal secretary. Today, My-VPA is still one of the most used Virtual Digital Assistants in Germany. However, the usage of this helper is fee-based: the consultation will cost between 15 and 22 euro per one hour<sup>26</sup>.

## **2. eAssistentin**

The next German Virtual Digital Assistant's name is eAssistentin<sup>27</sup> and this helping software offers a lot of functions such as consulting, research, office work assistance, networking, data processing etc. eAssistentin appeared on the market in 2010 too, and since that time this assistant competes with My-VPA but also won customers in the fields that are not covered by the My-VPA platform. The usage of this helper will cost about 5-7 euro per hour<sup>28</sup>.

## **3. Manage-My-Business-De**

The Manage-My-Business-De<sup>29</sup> is another German virtual helper that is based on the same platform as the two above-mentioned software and uses the same logic: The VDA is available via its website. Among Manage-My-Business-De's functions are SMM and general virtual assistance, research and text processing. This German VDA offers different packages of payment which cost 17 euro for 1-5 hour assistance per month till 19 euro for up to 20 hours assistance per month<sup>30</sup>. This platform has been working for several years. However, we could not find the certain release date not on the application's website nor among other resources.

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<sup>26</sup> T3n Digital Pioneers. Virtuelle Assistenten in Deutschland [Electronic resource]: <http://t3n.de/news/virtuelle-assistenten-deutschland-506137/> (date of access: 10.05.2017).

<sup>27</sup> eAssistentin website. <http://www.eassistentin.de/> (date of access: 10.05.2017).

<sup>28</sup> T3n Digital Pioneers. Virtuelle Assistenten in Deutschland [Electronic resource]: <http://t3n.de/news/virtuelle-assistenten-deutschland-506137/> (date of access: 10.05.2017).

<sup>29</sup> Manage-My-Business-De website. [Electronic resource]: <http://manage-my-business.de/> (date of access: 10.05.2017).

<sup>30</sup> T3n Digital Pioneers. Virtuelle Assistenten in Deutschland [Electronic resource]: <http://t3n.de/news/virtuelle-assistenten-deutschland-506137/> (date of access: 10.05.2017).

<sup>30</sup> eAssistentin website. <http://www.eassistentin.de/> (date of access: 10.05.2017).

#### **4. Virtuelle Helfer**

As other operating German Virtual Digital Assistants, Virtuelle Helfer<sup>31</sup> began to work in 2010 and is quite popular among the population of Germany. A distinctive feature of this helper is that it offers consultation in both German and English languages. However, the translation into English costs 0,03 per one word while the assistance itself will cost about 19 euro per hour<sup>32</sup>. The offered functionality covers general virtual assistance; email, private and travel assistance, digitization and translation services, proofreading and web shop helping. Thereby, Virtuelle Helfer suits into the German nationwide tendency.

#### **5. MeinAssistentOnline**

MeinAssistentOnline<sup>33</sup> is one of the last releases on the German digital market. This software offers private and business consultation and messenger service assistance. It also covers one of the unusual for the German market areas – the field of event management. MeinAssistentOnline works online and offline which makes it into an individual Digital Assistant in Germany. The MeinAssistentOnline help will cost circa 15 euro per hour in ordinary cases and up to 25 euro per hour in specific cases<sup>34</sup>.

#### **Features of the German market<sup>35</sup>**

According to the Goldmedia Trendmonitor 2017, the most popular Virtual Digital Assistants on German market are the international ones: Siri, Alexa and Google Assist. These platforms are usually used by smartphone owners as basic helpers and planners. This reflects the worldwide tendency to cooperate and

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<sup>31</sup> Virtuelle Helfer Website. [Electronic resource]: <http://www.virtuelle-helfer.de/index.html> (date of access: 10.05.2017).

<sup>32</sup> T3n Digital Pioneers. Virtuelle Assistenten in Deutschland [Electronic resource]: <http://t3n.de/news/virtuelle-assistenten-deutschland-506137/> (date of access: 10.05.2017).

<sup>33</sup> Mein Assistent Online Website. [Electronic resource]: <http://www.meinassistent-online.de/> (date of access: 10.05.2017).

<sup>34</sup> T3n Digital Pioneers. Virtuelle Assistenten in Deutschland [Electronic resource]: <http://t3n.de/news/virtuelle-assistenten-deutschland-506137/> (date of access: 10.05.2017).

<sup>35</sup> Goldmedia Trendmonitor 2017. Digitale Sprachassistenten. Pdf-version. Pages 13-16.

consolidate by using the same software everywhere without being forced to learn new national systems and their specifics in case of a business trip, moving to another country or just guest visit. This tendency impacts and intensifies the for a long time obvious intention for globalization and unification of not only the digital market but also other types of markets and the area of culture<sup>36</sup>.

However, the national German Virtual Digital Assistant market differs from the usual one. Firstly, the biggest German VDAs function as websites and not as mobile applications or background software. Most of them, according to their websites, are powered by human being solving the problems of the VDA's clients. It should also be noted that German VDAs charge hourly while the worldwide VDAs work for free or the customer has to pay once for the application's purchase. As our research shows, German VDAs have profiles and pages in social media such as Facebook or Twitter but do not hold mobile app versions.

According to the economic and business news magazine *Wirtschaftswoche*, the VDA is going to substitute the human assistants and secretaries<sup>37</sup>. The magazine claims that all the private plans and things to do can be successfully managed by using the Virtual Digital Assistant's tools which are finally available for usage in Germany and in German language. This must have a positive impact on the business itself and on its owner because the costs of human assistant will be reduced and the person that will use the VDA and manage the plans on his own will be more productive and successful because he'll have all his responsibilities in front of himself and won't forget about any of them.

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<sup>36</sup> Goldmedia Trendmonitor 2017. Digitale Sprachassistenten. Pdf-version. Pages 13-16.

<sup>37</sup> *Wirtschaftswoche*. Wie Virtuelle Persönliche Assistenten das Sekretariat ersetzen. [Electronic resource]: <http://www.wiwo.de/erfolg/arbeits erleichterung-wie-virtuelle-persoенliche-assistenten-das-sekretariat-ersetzen/5579162.html> (date of access: 10.05.2017).

## **In Russia**

The Russian market in general and the digital market, in particular, have always been different by comparison to the European and American ones. The difference is caused by lots of factors such as historical, geographical, political, dimensional, mentality and development elements. Obviously, Russia lags behind Europe which, in its turn, lags slightly behind America. This statement can be proved by the time when Internet started to be a widely used feature: in America – in the 1970s, in Europe – in the beginning of the 1980s. In Russia, the Internet appeared for the first time in the end of 1980s – the beginning of 1990s. This slight lag of the newest application's development on the Russian market can also be noticed in the fields of Virtual Digital Assistant market. While first American VDAs of modern “helping generation” were announced in 2010, Russian VDAs are coming a little bit later – in 2012-2015. In this paper's section, we will examine some of Russian Virtual Digital Assistants in order to find their differences from the leaders of this field.

### **Dusya**

Dusya<sup>38</sup> is one of the progressive Russian Virtual Digital Assistants which works on the Android platform and allows the background using. Dusya doesn't possess an interface application and looks as an icon on the smartphone's desktop by clicking on which the user can select the required function. Dusya can be activated by calling her name or just starting to dictate a text, by shaking the smartphone, imitating a call phone and other actions. Dusya can be fully customized in accordance with preferences and needs of its consumer. Dusya has different scripts which can be additionally installed<sup>39</sup>: Those are the taxi-calling script, music and video searching and playing script, maps and a separate chatbot.

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<sup>38</sup> Dusya Assistant. [Electronic resource]: <http://dusi.mobi/> (date of access: 12.05.2017).

<sup>39</sup> VC.ru. Обзор российских голосовых помощников: «Дуся», «Ассистент на русском», Speaktoit и «Собеседник HD». [Electronic resource]: <https://vc.ru/p/voice-assistant> (date of access: 12.05.2017).



The last one was created for that kind of users that likes to communicate with their assistants. Dusya itself can not maintain a conversation because it was conceived solely as a helping bot. What makes Dusya to a very comfortable Virtual Digital Assistant is a possibility to use the bot offline or connect it to other gadgets like smart watches. Dusya is constantly being updated and can already compete with the worldwide used “classic” assistants for its functionality. Download of the app will cost 90 roubles (about 1,5 euro) and can be used for free anytime after the download is completed<sup>40</sup>.

### **Assistent Na Russkom (Assistant in Russian)**

Assistent na russkom<sup>41</sup> is the next Russian DVA which functions not only as a simple helper but also as a software that can be integrated into other applications when needed. The application’s advantages are among others the full recognition of Russian speech and understanding of language logic and working with synonyms. Every user can also create a personal app’s supplement and add the list of devices and apps that the user want to control by voice<sup>42</sup>. That means that Assistent na russkom covers such gadgets as TV, smart watches and PCs while being utilized on the smartphone.

### **Sobesednik HD (Companion HD)**

Sobesednik HD<sup>43</sup> is usually called Russian Siri for realization the same functions that Siri does. This feature can easily be explained: The app was created by the Russian iOS applications developer (iDeveloper) when Siri couldn’t support Russian language. Among Sobesednik’s functions are message texting, alarm clock

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<sup>40</sup> VC.ru. Обзор российских голосовых помощников: «Дуся», «Ассистент на русском», Speaktoit и «Собеседник HD». [Electronic resource]: <https://vc.ru/p/voice-assistant> (date of access: 12.05.2017).

<sup>41</sup> Assistant na russkom Website. [Electronic resource]: <http://voiceassistant.mobi/> (date of access: 12.05.2017).

<sup>42</sup> VC.ru. Обзор российских голосовых помощников: «Дуся», «Ассистент на русском», Speaktoit и «Собеседник HD». [Electronic resource]: <https://vc.ru/p/voice-assistant> (date of access: 12.05.2017).

<sup>43</sup> Sobesednik HD. [Electronic resource]: <http://sobesednik.idevelops.com/> (date of access: 12.05.2017).

setting, planning, making notice, handsfree calling and emailing etc. After the first release, the software was blocked by the Apple employees because of copying Siri. After, the VDA became available for downloading in Russia. The Sobesednik app has the advantage of new words and new commands learning which are carefully selected and approved by the platform founders in order to exclude the saving of profanity and indecent requests<sup>44</sup>. The app has two versions: a fee-paying one that possesses a bigger amount of functions and a free one which can be simply downloaded from Google Market or App Store.

Thereby, the specificity of Russian digital market consists of the need to translate the international applications into Russian which isn't always provided in the original versions of software and Russian customer orientation. Comparing to the German market, we pay special attention to the following: Russian applications in most cases “copy” their American and European “colleagues” and function as separate applications, not as websites. Russian Virtual Digital Assistants are mostly bots powered by different scripts and supplements while German VDAs are realized as a platform to find a person or a command which can assist by resolving the required questions and tasks. Moreover, Russian VDA can be tailored to the user's needs and interests and also include some features that “classic” and German assistants do not have.

All this shows that every national market has their own specificity which manifests itself by application's type, themes, and scripts but also seeks to the unification with the world market by copying or developing its tendencies and working on the same platforms.

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<sup>44</sup> VC.ru. Обзор российских голосовых помощников: «Дуся», «Ассистент на русском», Speaktoit и «Собеседник HD». [Electronic resource]: <https://vc.ru/p/voice-assistant> (date of access: 12.05.2017).

## **Outlook: development trends and prognosis**

As already mentioned in the first paragraph of this paper, the Virtual Digital Assistants have changed the situation on the digital market worldwide and simplified and developed the helping software. According to different studies, this tendency will be increased in the next 3 to 5 years for more than 10 times.

The Ovum TMT intelligence reports that the VDA market will continue growing and adding new features as included tools. The Ovum aims that the digital assistance will exceed 7.5 billion active devices by 2021 which is more than the today's world population. Probably, all the plans and to-do lists will be controlled and managed by the artificial intelligence (AI) and the AI-based applications will dominate with more than 23,3% of market share. The Ovum report supports that the usage of Apple's Siri will lie at about 13,1%, of Amazon's Alexa by 3,9% and of Microsoft's Cortana by 2,3%. For now, most of tablets and gadgets all around the world are connected to the Siri software and the Google Assistant. *“However, the use of AI in conjunction with other devices greatly increases consumer engagement and is set to unlock new opportunities, particularly in the home”*, the research reads. The AI-powered devices will offer a larger opportunity, accounting for 57% of that installed base in 2021<sup>45</sup>. By this time, the VDAs will definitely cover the control of set-top boxes, smart TV devices, smart watches, fitness trackers etc.

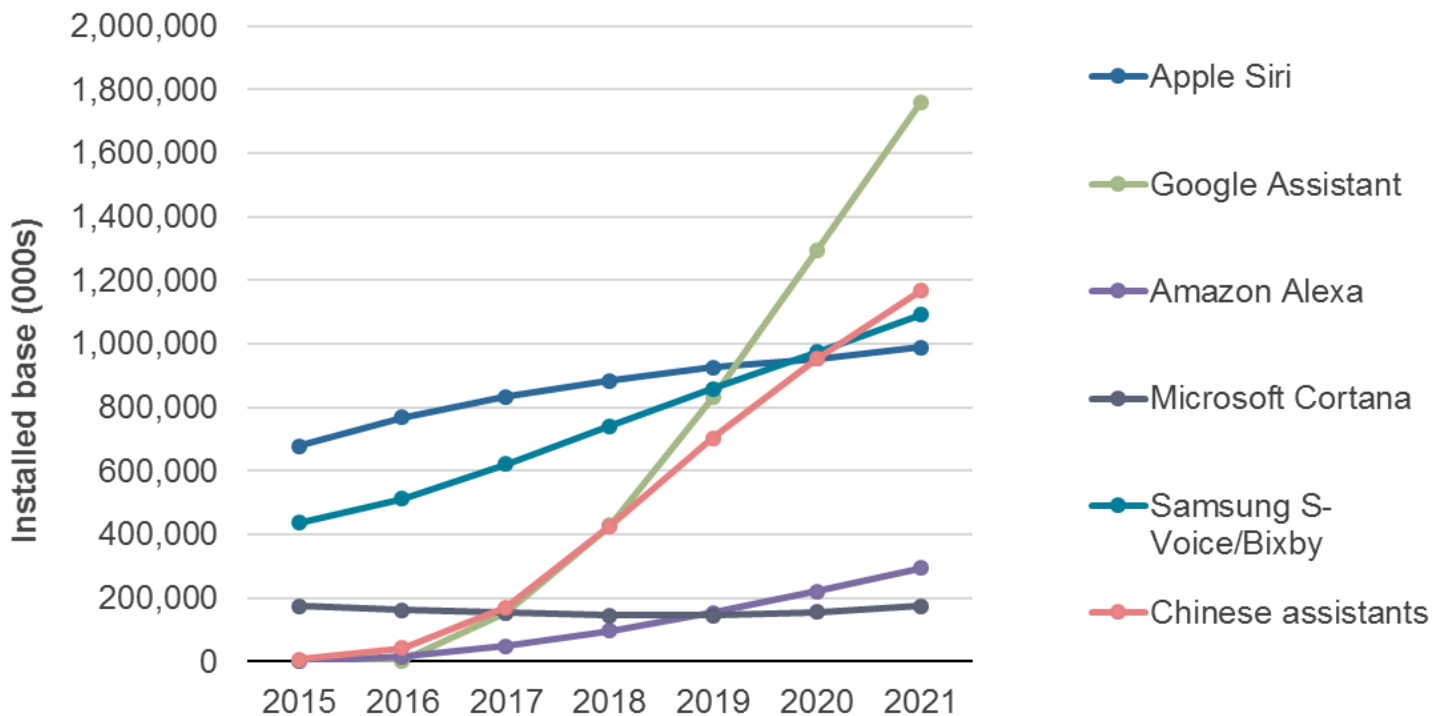
According to Ovum, the main goal of the VDA's producers will be to conquer the consumer and attract more people to use exactly their software. Interestingly is that the popularity of one or another assistant tool is somehow connected not only to the nationality or other “national” and probably cultural reasons but also to the geographical position. *“At the end of 2016, over 95% of the installed base for Amazon's Alexa and Google Assistant was in North America,*

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<sup>45</sup> Ovum TMT intelligence. Virtual digital assistants to overtake world population by 2021. [Electronic resource]: <https://ovum.informa.com/resources/product-content/virtual-digital-assistants-to-overtake-world-population-by-2021> (date of access: 15.05.2017).

compared to 24% for Apple's Siri. By 2021, 47.6% of voice AI-capable devices in use will be in Asia & Oceania. With an active installed base close to 1.2 billion devices in 2021, digital assistants of Chinese origin are set to be as powerful as Apple's Siri or Samsung's Bixby. They already accounted for close to 43 million devices in 2016, led by companies such as Baidu and iFlytek”<sup>46</sup>.

Graphic 3



Source: ovum.informa.com

The Ovum also made a review and prediction about how the today existing Virtual Digital Assistants may progress<sup>47</sup>. According to the statistics above, the most popular DA in 2021 will be the Google Assistant which is already showing a great leap forward in comparison to its forerunner Google Now. Siri will still be in demand but will lose its development speed. The reasons for that phenomenon are the following: Apple products are and will be the most popular gadgets so its “basic” assistant will be in use. Alongside this, the other VDAs which aren’t

<sup>46</sup> Ovum TMT intelligence. Virtual digital assistants to overtake world population by 2021. [Electronic resource]: <https://ovum.informa.com/resources/product-content/virtual-digital-assistants-to-overtake-world-population-by-2021> (date of access: 15.05.2017).

<sup>47</sup> Ibid.

probably linked to operating systems will have a rapid increase in its quality and processing speed what will, in its turn, attract new customers and ensure their growing popularity. The next platform that will continue to grow is the Samsung S-Voice/Bixby which isn't actually widely used in Germany and Russia. Amazon Alexa won't leave the Virtual Digital Assistant market and will win a certain number of users by the continuation of software's improvement. However, it will barely exceed the mark of 200,000 customers<sup>48</sup>. Microsoft's Cortana will remain at the same level not attracting a big count of new consumers but also not losing today's users. The Ovum surmises that the product that will "blow up" the Virtual Assistant Market will come from China. As the graphic shows, the Chinese VDAs will succeed and involve five times as large audience as they're monitoring today<sup>49</sup>.

The Tractica forecasts that the VDA will keep being a very useful tool whose users' amount will only rise from year to year. In that way, the consumers of the VDA applications will grow from 390 million in 2015 to 1.8 billion worldwide by the end of 2021. And the unique active enterprise VDA users will rise from 155 million in 2015 to 843 million by 2021<sup>50</sup>.

In addition, we would like to underline that not only the field of the Virtual Digital Assistants' applications is nowadays very perspective<sup>51</sup>. A raising interest is caused by the chatbox software which some of the business news from the last year confirm (2016: the release of Microsoft's Tay and after Zo,

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<sup>48</sup> Ovum TMT intelligence. Virtual digital assistants to overtake world population by 2021. [Electronic resource]: <https://ovum.informa.com/resources/product-content/virtual-digital-assistants-to-overtake-world-population-by-2021> (date of access: 15.05.2017).

<sup>49</sup> Ibid.

<sup>50</sup> Tractica. Virtual Digital Assistant. [Electronic resource]: <https://www.tractica.com/research/virtual-digital-assistants/> (date of access: 23.04.2017).

<sup>51</sup> Tractica. Virtual Digital Assistant Analysis. Virtual Digital Assistants: Virtual Agents, Chatbots and Virtual Assistants for Consumer and Enterprise Markets [Electronic resource]: <https://www.tractica.com/newsroom/press-releases/the-virtual-digital-assistant-market-will-reach-15-8-billion-worldwide-by-2021/> (date of access: 23.04.2017).

Facebook's Messenger assistant)<sup>52</sup>. The growing popularity of the messaging tools is giving the chatbots big changes to become an alternative to voice interaction and the digital market leader, especially in the field of mobile communication. And, as research has shown, many users find the chatbots "*more user-friendly than apps*"<sup>53</sup> because there is no need to download and to provide a special connection to the Internet<sup>54</sup>.

We can assume that the German helping application market will in the majority be presented by international Virtual Digital Agents as far as the national, local assistants will be website-based and fee-paying. The situation on the Russian market is different: the assistants that were created in Russia are in demand and will probably only increase their population through the addition of new tools, scripts and opportunities and through the correlation with the requests and needs of the national market's consumers.

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<sup>52</sup> BBVA Research. Digital Economy Outlook, October 2016. Virtual Assistants: artificial intelligence at your service. [Electronic resource]: [https://www.bbva.com/wp-content/uploads/2016/10/DEO\\_Oct16\\_Cap5.pdf](https://www.bbva.com/wp-content/uploads/2016/10/DEO_Oct16_Cap5.pdf) (date of access: 23.04.2017).

<sup>53</sup> BBVA Research. Digital Economy Outlook, October 2016. Virtual Assistants: artificial intelligence at your service. [Electronic resource]: [https://www.bbva.com/wp-content/uploads/2016/10/DEO\\_Oct16\\_Cap5.pdf](https://www.bbva.com/wp-content/uploads/2016/10/DEO_Oct16_Cap5.pdf) (date of access: 23.04.2017).

<sup>54</sup> Cognizant The Coming Intelligent Digital Assistant Era and Its Impact on Online Platforms. [Electronic resource]: <https://www.cognizant.com/whitepapers/the-coming-intelligent-digital-assistant-era-and-its-impact-on-online-platforms-codex2447.pdf> (date of access: 18.05.2017).

## **Conclusion**

To sum up, we would like to reiterate that the Virtual Digital Assistant market is one of the most rapidly developing modern market types which is caused by the convenience of usage of the assistant software which was created to control the user's plan and to-do lists and to remind him of important things.

Today, the worldwide most used Virtual Digital Assistants are Apple's Siri, Amazon's Alexa and Google Assistant. These applications become an example for smaller and younger VDA's developers.

German VDA market is mostly presented by the helping teams that are "based" on the websites and are in most cases controlled and managed by a real person, not a computer. Germans are also actively using the international VDAs on their smartphones and other gadgets.

Russian VDA market also consists of international and national VDA models where the local platforms enjoy almost the same success as the international do. This is explained by the specific of Russian market and the necessity to translate the application's features into Russian language which isn't supported by some of the worldwide market leaders.

It is also markedly that a Virtual Digital Assistant is rather a private, personal tool than one which could be used collectively. That's why the VDAs aren't used in big companies or in the editorial offices.

The research show that the VDA market will keep on developing and increasing itself during the next 3 to 5 years. It will most likely reach the mark of more than 1,500,000 users and exceed 7.5 billion active devices by 2021.

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