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**THE DETERMINANTS OF THE  
DEVELOPMENT OF THE RUSSIAN  
ASSISTIVE TECHNOLOGIES  
MARKET IN THE CONTEXT OF  
THE INTERACTION OF VARIOUS  
GROUPS OF AGENTS**

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## **THE DETERMINANTS OF THE DEVELOPMENT OF THE RUSSIAN ASSISTIVE TECHNOLOGIES MARKET IN THE CONTEXT OF THE INTERACTION OF VARIOUS GROUPS OF AGENTS**

This study identifies the key determinants of the development of the assistive technologies market in Russia and the trends that are expected to determine the dynamics of the Russian market over the next 10-15 years.

Based on an analysis of international research experience and data obtained from in-depth interviews with Russian experts in areas associated with assistive technologies and devices (ATD, or technical rehabilitation aids (TRA)) (such as the manufacturers of assistive devices, representatives of the Federal Bureau of Medical and Social Expertise, representatives of disabled people's organizations and policy makers dealing with the issues related to the social support of disabled people), the key determinants of the market have been classified into demographic, economic, political, social, technological, and infrastructural.

The study of the determinants and trends is implemented in the context of their impact on the supply and demand for ATD, taking into account the fact that for various groups of the population demands are determined by different needs (from the desire for social inclusion to the desire to be independent) and the fact that supply of different types of assistive devices may be affected by various groups of factors.

The interaction of various agents operating in the ATD market in Russia is analyzed within the theoretical framework of Porter's five forces<sup>4</sup>.

JEL Classification: I18.

Keywords: assistive technologies and devices, technical rehabilitation aids, disabled persons, disabilities, technological advances, social policy.

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## Introduction

The modern world is a world of rapidly developing technologies, in which ideas for the creation of new and the development of existing devices which make people's lives more comfortable and easier are constantly generated. However, while for some individuals technological solutions (including electronic and digital ones) is a way to free up personal time or a type of leisure time, for others it is a way of maintaining personal functional capacities and independence in everyday life. Assistive technologies and devices (ATD) or technical rehabilitation aids (TRA) help people with disabilities, for example, wheelchairs and prostheses facilitate movement, hearing aids, proofreaders and correct vision, facilitate communication. The development of technologies helps involve certain groups in public life and integrate them socially.

Persons with disabilities are not the only, but the core group in need of ATD. As recipients of state social policy programs, they are eligible for assistance in the provision of technical aids that help partially or fully overcome their disabilities. Therefore, it is impossible to discuss ATD outside the context of disability.

In 2012 the Convention on the rights of persons with disabilities<sup>5</sup> was ratified by Russia, it states the need to ensure access to ATD. According to the Federal State Statistics Service, on January 1, 2017 in the Russian Federation 11.93 million people were recognized disabled. The number of individual rehabilitation programs (IRP) containing the TRA needs of the disabled, is about 40% of the total number of such programs, and about 73,4 billion rubles of public expenditure 2013-2015<sup>6</sup>. During this period, the costs of providing the disabled with TRA increased on average by more than 3,000 rubles per person while these costs varied by region from 9-65,000 rubles in 2015. In other words, these figures signify a reduction in spending due to budget cuts in this sphere.

However, against the background of these sums, it is especially important to note that not all people with disabilities are included in the list of beneficiaries and are provided with TRA.

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<sup>5</sup> The Convention on the rights of persons with disabilities.

URL: [http://www.un.org/ru/documents/decl\\_conv/conventions/disability.shtml](http://www.un.org/ru/documents/decl_conv/conventions/disability.shtml) (date of access: 14.06.2017)

<sup>6</sup> A report on the results of the control event "Audit of the use of Federal budget funds allocated in 2013-2014 and during 2015 for the provision of state social assistance to separate categories of citizens on sanatorium-resort treatment, including journey to a place of treatment and back, and providing disabled people with technical rehabilitation aids (jointly with control accounts bodies of the Tambov region, Krasnodar territory and Saint-Petersburg)".

URL: <http://audit.gov.ru/upload/iblock/439/43947816235d34700912b77028f9769b.pdf> (date accessed: 30.04.2017)

Because of privacy protection and the inconsistency of information on the status of disabled persons available from public bodies (for example, the Social Insurance Fund or the Bureau of Medical-Social Expertise)<sup>7</sup>, researchers use surveys for data collection. For example, according to the Sample Selective Monitoring Survey of the Quality and Accessibility of Services in the Areas of Education, Health and Social Services, Employment Promotion (2015)<sup>8</sup>, the number of persons in need of ATD is higher than the number of the actual recipients, 51.1% of all those recognized as disabled (61.7% among those with disabilities of group I<sup>9</sup>).

In this regard a number of questions arise. Why is the demand unsatisfied? Is this the result of organizational and procedural errors or lack of funds (in the treasury or among the population)? Given that the ATD market is not limited to government purchases and is larger than what the official statistics show, does the state act as the main agent determining the development of the ATD market in Russia? What contributes to the development of this market, and what is slowing it down?

Despite the economic nature of these issues, it is also relevant to analysis the social context, since it is a market of technological solutions that provide for disabled people and their families the opportunity to become involved in socio-economic processes.

This issue has gained the attention of social scientists, but Russian researchers usually turn to the topic of the development of ATD in two contexts: when it comes to introducing new devices promoting inclusion in education [for example, see Arhipova, Sergeeva, 2015; Samarina et al., 2015] and the labor market [Shoshmin, Besstrashnova, 2014, etc.], or in relation to the theme of technological breakthroughs and know-how [Karpov, Ronzhin, 2014, etc.]. Obviously, the first group has more to do with social policy and sociological research, however, it focuses only on one specific goal of ATD provision (for example, increasing the number of students involved in inclusive education or the share of those employed among the disabled), while the social significance of ATD is much wider. Researchers of technology typically omit the social

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<sup>7</sup>The single comprehensive source of statistical information in Russia did not exist at the time of the survey. Since 2017 the state information system "Federal Register of Disabled Persons" (URL: <https://sfri.ru/>) has been enforced, the full use of information from the register for providing state services to disabled people is scheduled to begin in 2018.

<sup>8</sup> A Sample Survey of the Quality and Accessibility of Services in the Areas of Education, Health and Social Services, Employment Promotion was carried out in 2015. The sample consisted of 115 856 individuals, including 6 847 persons with disabilities, including children with disabilities.

<sup>9</sup>In the Russian practice of assessment of the severity of persistent violations of the human body functions caused by diseases, consequences of traumas or the defects, there are 4 degrees (groups):

I group - persistent minor violations of the functions of the human body in the range from 10 to 30%;

II group - moderate persistent violations of the functions of the human body in the range from 40 to 60%;

III group - resistant functional disorders of the human body in the range from 70 to 80%;

IV group- persistent significant functional disorders of the human body in the range from 90 to 100%.

aspect, concentrating exclusively on the engineering and economic aspects of the problem (discussing, as a rule, devices designed to compensate for only one category of restrictions – for example, hearing, vision impairments).

There is a wide range of research dealing with the integration of disabled people into society, but to a large extent with an emphasis on ethical issues, the social acceptance of disabled people, and social policies in relation to persons with disabilities in forms of support measures and programs [Rasell, Iarskaia-Smirnova, 2013; Iarskaia-Smirnova et al., 2015, etc.]. In this case, the issue of technological progress remains uncovered.

In this paper, we study the ATD market in relation to the demographic, social and economic factors which determine the development of the ATD market, and which in the long run can be transformed by new technologies. For example, there is reason to believe that a more accessible physical environment for disabled people greatly increases the numbers of those who are ready for inclusion in education or the labor market. The proposed approach compensates for the lack of a comprehensive study of the Russian ATD market, and for the first time indicates options for its development in the short and medium term. Under the determinants in this study, we investigate the combination of the main trends and factors influencing the development of the ATD market.

Section 1 contains the literature review covering the determinants of the development of the global ATD market. The section also presents the concept of Porter's “five forces” which we use as a theoretical framework to evaluate the influence of different determinants of the market development in the context of interaction among the main market agents. Section 2 describes the empirical data, which includes in-depth interviews with experts in the Russian ATD market. Section 3 interprets the data with the chosen theoretical framework, taking into account the idea of complex interaction of diverse trends. Section 4 discusses which determinants have the greatest impact on the current and future state of the ATD market in Russia.

## **1. Theoretical framework: Determinants of the development of the ATD market in the scope of multidisciplinary research and Porter's five forces model**

ATD are the object of research in numerous scientific works in various fields – from medicine to sociology and applied psychology. Taking into consideration the experience of international organizations and scientific institutions, this study looks at the five key groups determining the development of the ATD market: demographic, economic, political, social and infrastructural.

The most important group is a result of modern demographic trends related to aging and increased life expectancy [Khosravi and Ghapanchi, 2016; Sugihara et al., 2013; World Health Organization, 2013].

Population aging is an increase in the number of elderly people in the population due to a growth in life expectancy. In 2015, one in eight people in the world were over 60 years old, by 2030 this is forecast to be one in six and by 2050 one in five [the United Nations Department, 2015]. Disabled and elderly people are the main consumers of ATD [Tebbutt et al., 2016]. Contemporary assistive technologies can help elderly people lead an independent life much longer and make medical and other services accessible by means of mobile equipment and continuous monitoring [Khosravi, Ghapanchi, 2016; Hawleyhague et al., 2014; Dunnebeil et al., 2012].

Another important trend is the decrease in infant mortality rates. Improved modern perinatal medicine means there has been a growth in the number of successful pregnancies which were threatened with miscarriage or complications. Many children with serious intrauterine and prenatal illnesses have survived [Lorenz et al., 1998]. These result in increasing rates of disabled children in developed countries.

Economic *determinants*, as well as demographic ones, are very important due to their influence on ATD consumption and production [World Health Organization, 2013]. From the supply side, key problems include special expenses in research and production, volumes and conditions of state subsidies, customs taxes, the availability of less expensive analogues in the market [World Health Organization, 2011]. High prices in the ATD market hinder their wider

use by the elderly and disabled people [Ahn et al., 2008; Lee, 2014; Kang et al., 2010]. In other words, the problem of financial accessibility is a key problem.

The dependence of ATD consumption on the number of social workers and the cost of services in comparison to the devices is seen as the confluence of the political and economic groups of determinants. The disproportion between the comparatively low expenditure on salary and subsidies to people providing care services and the high cost of ATD (especially in the field of robotics) leads to the economic removal of expensive modern ATD from the care market [Organization for Economic..., 2012]. Social workers' lack of knowledge and their inability to work with ATD create one of the barriers to a more active take-up of devices while caring for disabled people [World Health Organization, 2013; Sugihara et al., 2013]. Bureaucratization and the inflexibility of state policy in providing ATD and approving the register of technical means of rehabilitation subsidized by the government and offered to disabled people negatively affects the development of this sphere [Henschke, 2012; World Health Organization, 2013].

Among the key social determinants of the development of the ATD market is access to education and the labor market, the participation of elderly people and persons with restricted abilities in social and cultural life. According to WHO assessments, education level and the interest in education of disabled people will increase [World Health Organization, 2013], resulting in growing demand for ATD. Individual knowledge of how to use ATD (including mobile devices, tablets and wearable technologies) in order to lessen or eliminate functional restrictions, sensor, cognitive or movement disabilities, allows those individuals to participate more easily and autonomously in society, including in education, occupation, and leisure activities [Sullivan and Sahasrabudhe, 2017; Blazun et al., 2012]. Thus, the development of the ATD industry will significantly lessen the inequalities and barriers faced by disabled people. It also can help include the disabled in all spheres of life [Tebbutt et al., 2016].

Infrastructural determinants have received less attention in the literature [Field et al., 2015]. Environmental inaccessibility is another important barrier to the integration of disabled people into society. Here we mean public places, organizations and public transport, places of accommodation, not adapted to the disabled people. Such determinants as accessibility (physical and financial) of the relevant state institutions and ATD services centers also play an important role [World Health Organization, 2013].

However, in our opinion, simply searching for and describing the main determinants of the development of the ATD market is insufficient to form a deep understanding of the problem. Such an understanding of the influence of different factors can be obtained by analyzing them in the context of the interaction among the market's main agents.

For this purpose, Porter's five forces analysis model can be used [Porter, 1980], representing the market situation with the following scheme (Fig. 1).

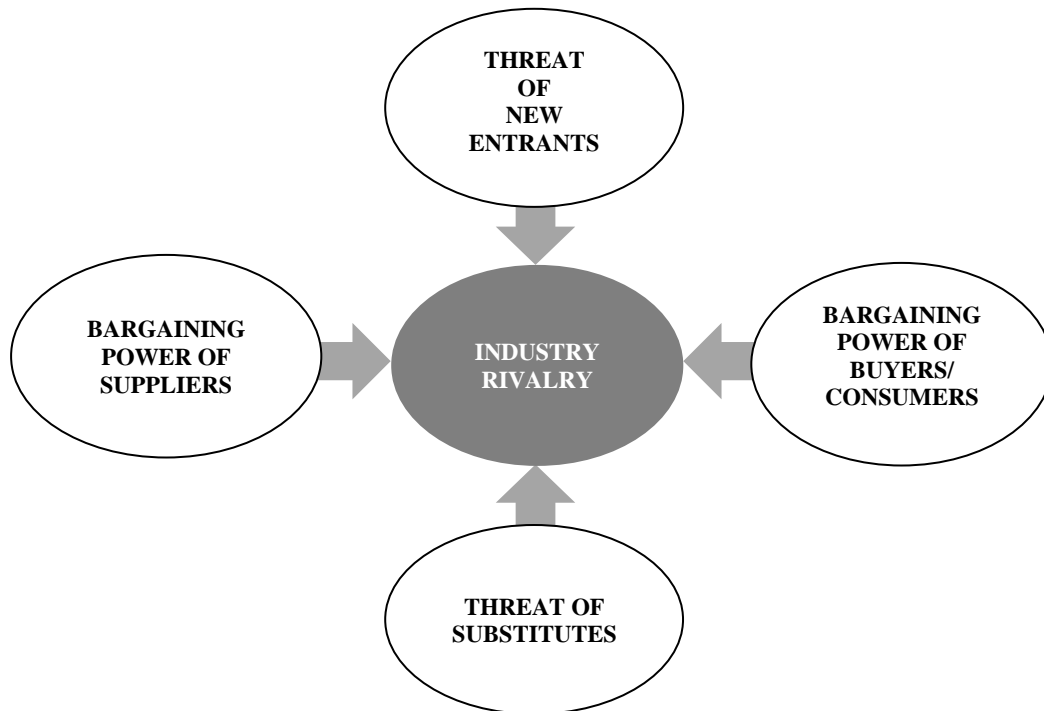


Fig. 1. Porter's five forces model chart  
Source: [Porter, 1980]

Porter's model is most often used by economists and serves as a tool to represent a competitive situation and to build a promotion strategy for individual players. However, this concept has also been applied to describe the socio-economic development of market trends, for example, in the tourism services market [Andriotis, 2004], educational services [Ronquillo, 2012] or medical care [Pines, 2006]. In such studies, attention is paid not only to the competitive struggle per se, but also to the social effects that arise in the process of balancing the five forces.

This conceptual scheme depicts the market situation and, in our view, is also suitable for describing the strength of various determinants. In addition, the use of Porter's model for the analysis of the Russian ATD market is useful as the specific nature of its functioning is determined mainly by the unique disposition of forces (including active roles of the state and



public organizations). Consequently, presenting the results of the analysis using this theoretical framework will allow us to describe in more details the current situation and the prospects for its development in the future.

## **2. Data and methodology**

From the earliest stages of the study, there was no empirical evidence about the determinants of the Russian ATD market, and one of the first tasks was to select the relevant method to collect information. The study of a loosely formalized and forward-looking subject (the determinants of future market changes) can be carried out by analyzing the opinion of the professional staff working in this area. They can fill the lack of or inconsistency of other sources of information with their knowledge, intuition, experience of solving similar problems, and their reliance on industry-specific tacit knowledge [Van Audenhove, 2007; Ivanchenko, Leontief, 2006; Flick, 2009].

In fact, the only appropriate option in this context was an expert survey – obtaining information from people who are well informed about the market situation and able to present it in all its complexity. We aimed to form a sample of specialists with deep knowledge of the research subject, who are able to assess the state of the Russian ATD market and indicate the trends in its development in the coming decades.

The experts were representatives of the Bureau of Medical-Social Expertise, public associations of the disabled people, manufacturers of ATD, and policy makers dealing with issues related to social support of disabled persons (note that some of our experts have a disability).

The search for informants was carried out using snowball sampling with multiple entry points. Given the low accessibility of the informants, and the specifics of the topic, data collection was conducted using individual in-depth interviews using guides with a basic part and an additional part specially prepared for conversations with a specific experts.

The guides were developed from an analysis of foreign research on the ATD market and contained questions associated with the identified determinants – demographic, economic, political, social, technological, and infrastructural – but gave the experts the opportunity to

identify additional factors. The questions were formulated to identify the determinants of the development of ATD market and to present through which agents, according to the Porter's forces model, they affect, or will affect, the Russian ATD market.

There were 12 semi-structured in-depth interviews lasting from 1 to 1.5 hours. Data collection carried out in October-November 2015<sup>10</sup>.

### **3. Main Results: Determinants of the development of the Russian ATD market using Porter's five forces model**

The Russian ATD market has great potential and it is characterized by constantly increasing demand. According to our experts, the number of disabled people seeking technical means of rehabilitation has been increasing steadily over the last 10 years. This is associated with an increase in the number of persons with disabilities and an expansion of the coverage of those who need ATD due to their increasing awareness of such opportunities, and to the emergence of new or alternative options in the ATD market. The experts believe that this trend will continue for 10-15 years.

This was the only conclusion concerning transformations associated with all five forces of Porter's model; changing the positions of consumers, suppliers and manufacturers of new and alternative products that, at first glance, cannot affect the nature of market competition. However, such a conclusion would be premature. Let us examine the situation in detail, referring successively to each of the five forces and describing the determinants of the Russian ATD market.

#### **3.1 Analysis of the bargaining power of buyers/consumers**

Buyers (those who choose ATDs and pay for them) in the vast majority of cases are not the final consumers, but are federal and regional state organizations (the Social Insurance Fund, Ministry of Labor and Social Protection). Thus, the biggest buyer of all kinds of devices are the consolidated state agents. The choice of agent is shown in the Registers of the devices, provided to disabled persons from the state budget. Accordingly, its purchasing power is seriously restricted by budgets, which change annually.

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<sup>10</sup> Data collection was carried out by employees of the HSE Centre for Studies of Income and Living Standards.

Due to the complexity of the objectives of these market agents, analysis of their position will be made in two directions: 1) ATD distribution to final consumers, and 2) ATD procurement.

***Buyers market power concerning the distribution of ATDs to final consumers***

**Political determinants** define the conditions and procedures to provide persons with ATD. Nowadays demand for ATD can be satisfied in three ways:

1. Supply from the state budget to only those persons with disabilities who have received an Individual Program of Rehabilitation (IPR), specifying the needs of the disabled person included in the federal register of rehabilitation activities, technical rehabilitation aids and services given to disabled persons [The Russian government decree, held 30.12.2005 №2347-p];
2. TRA acquired by disabled persons on their own, with partial subsequent financial compensation;
3. TRA fully acquired by disabled persons on their own. This is, our experts say, the smallest share of the total volume (approximately 21-23% of the total market volume<sup>11</sup>).

The first method of provision of ATD, and part of the strategic priorities of state policy, a number of interviewed experts pointed out, means that rehabilitation and assistive devices should be aimed at people of active working age.

*While evaluating subjective needs – who needs technical devices more – I would say, people at active working age [...] I wish they were provided with all technical rehabilitation aids to be professionally self-fulfilled (An employee of the All-Russian society of the blind).*

This point of view is reflected even in the position of representatives of the Bureau of Medical and Social Expertise. They describe the determinants taken into consideration by that state body about the supply of modern technical devices to a disabled person.

*A similar prosthesis could be given not only to this young man, but also to a retired person of 60 years old. But nobody will give him this prosthesis. Nobody. Because they do not see any economic benefit. He is not going to use it to go to work (A representative of Bureau of Medical and Social Expertise).*

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<sup>11</sup> The project of Strategy of development of industrial production of technical rehabilitation aids toward 2025.  
URL: [http://minpromtorg.gov.ru/common/upload/files/docs/Project\\_REAPROM\\_until\\_2025.pdf](http://minpromtorg.gov.ru/common/upload/files/docs/Project_REAPROM_until_2025.pdf) (date accessed: 14.06.2017)

This example shows how the problem of priority in the supply to specific groups of disabled persons is reflected in state policy. It is important to understand that this way of ATD supply, as provided by the state budget, dominates now. It is connected with the fact that families with disabled persons and those who need technical rehabilitation aids, as a rule, have low income and limited possibilities of employment. These key aspects make up **economic obstacles** for disabled people to buy assistive devices on their own.

In general, the interview data are similar to the sample surveys results. According to Complex Observation of Living Conditions of Population (COLD), 2014<sup>12</sup>, the share of people with an average income below the minimum subsistence level<sup>13</sup> is about 12-14% among disabled persons of groups I and II, and 17% among disabled people of group III. Among disabled people of group III there is also a bigger segment of those whose income ranges from 1.0 to 1.5 MSL (almost 29%).

Trends in disabled people's labor market participation serve as a source of information about their self-sufficiency and independence from social assistance. We consider this subject in the context of the **social inclusion** of disabled people. During the interviews, we also tried to find out whether it is possible to change demand for ATD by transforming the attitudes of people to disability inclusion in leisure activities, the labor market and education. Despite disabled people in Russia forming a stigmatized group [see Rasell and Iarskaia-Smirnova, 2013], general public has recently started reacting quietly at people with restricted abilities using assistive technologies and devices. However, as the interviews showed, the general population still needs to be taught tolerance towards persons with restricted abilities. Besides, the state and society must help disabled persons feel comfortable while using ATD.

*Many people, especially those who have a minor restriction of hearing, don't feel comfortable wearing a hearing-aid. Well, they can hear something wrong, understand something wrong, but they feel more comfortable saying that they haven't heard (An employee of the All-Russian Society of the Deaf).*

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<sup>12</sup> A Comprehensive Monitoring of Living Conditions was conducted in September 2014 with the participation of 60 thousand households across the Russian Federation. The size of the representative sample consisted of 113 138 individual, including 9 762 disabled persons, including disabled children. The survey covered a wide range of issues related to health status and access to health care, public services.

<sup>13</sup> The subsistence minimum in the Russian Federation for the 4th quarter of 2014 was 8234 rubles per capita.

Experts expect an increase in the number of people with disabilities willing to start work, with changes in attitudes, although this change is expected to be slow as few employers are ready to hire disabled persons.

*You have to talk to them [employers] for a very long time. You must show them the disabled persons who are able to do something using TRA, that they are not just crying for a salary as dead wood, but really doing something (An employee of a public organization of disabled people).*

It was also emphasized, that disabled people can be involved in the labor market more actively. TRA are necessary for disabled people to join the labor market, so that they can start paying taxes and become less dependent on state assistance. The interviewees said that the state must boost the employment of disabled people, which will increase effective demand for ATD.

*A person is given an assistive device to get equal opportunities and rights, to work as other people do, and pay taxes as other people do. We invest in a disabled person. With understanding that it is the person's life, the government invests in a disabled person so that he pays taxes – that is the only aim (An employee of the All-Russian Society of the Deaf).*

However, state policy sometimes does not motivate them to do it, on top of the existing barriers and long-lasting prejudices.

*There are stereotypes, and even some people even think that deaf people can't drive. Our ideology is supposed to break bans, but everything was banned. And now that tendency is still alive, that is to say, we always have to overcome barriers" (An employee of the All-Russian society of the deaf).*

Now experts say, that employment stimulation policy is generally imitative and formal, and sometimes is a disincentive both for the disabled person and the employer. The positions offered are mostly low-paid, so disabled people do not want to work.

*There is a retiring pension with regional premium. We call it Luzhkov's premium. A person receives a pension of 15,000 rubles in Moscow. He finds a job with a salary of 17,000. His pension decreases from 15,000 to 3,000. Is he interested in work? You can*

*guess the answer. Does the state do its best to motivate a person to work, to pay taxes?  
(An employee of the All-Russian Society of the Deaf).*

In the 10-15 years, we should expect further changes in points of view on disabled employment. Hypothetically, it could also influence demand for ATD among citizens of active working age.

*If a person starts working among ordinary people, he will be using a hearing-aid all the time. That many people use assistive devices from time to time or never use them means the more inclusion there is in employment, the more assistive devices will be used all the time, will be in demand (An employee of the All-Russian Society of the Deaf).*

Disabled people and their families express a positive attitude to getting education. This also can stimulate demand for TRA. As for inclusive education, informants suggest it might not be a wholly good thing. They add that even disabled children and their parents can be psychologically unprepared to be getting education with nondisabled children.

*Nowadays, while they are trying to introduce this awful inclusion system and close special schools, it will lead to nothing good. Thank God, in Moscow there are still these schools left – as autonomous structural sub-divisions with their own administration. But in the rest of Russia they are just lumped together. Deaf children with blind children, and they are all sent to mainstream schools. What is the result? There is no result. That is why inclusion should be done sensibly. Meanwhile, special education as a base, as experience, as study, as a resource should be kept (An employee of the All-Russian Society of the Deaf).*

In the context of the supply of assistive technologies, it is important both to provide disabled people social inclusion and to evaluate the degree of accessibility for them – this is revealed in **infrastructural determinants**. In the sphere of social support for disabled persons, not only individual targeted necessary help is important, but also the creation of a comfortable environment. Many experts state the degree of accessibility of accommodation and the city environment as determinants of the need for assistive devices. There have been numerous improvements in the realization of the state program “Accessible environment”, providing a friendly environment to disabled people in cities and subtitling TV shows for the hearing impaired, presenting tickertapes in public places.

*Well, Moscow has visibly changed. Actually, the number of barriers has decreased. But the problem is.... Have you noticed more disabled people in the streets? No (Lawmaker assistant).*

Nevertheless, not all city infrastructure, schools, or work places have been fitted with wheelchair ramps and lifts. Most blocks of flats do not have facilities for disabled people.

*There is no place to keep wheelchairs in Khrushchev's buildings [common 5-storey apartment buildings, without lifts]. Some people leave them under the stairs at the entrance. But neighbors can get annoyed. Some people keep their wheelchair in the garage instead of a car. Everything should be solved together, and there is also the problem of giving affordable housing to disabled person (Lawmaker assistant).*

These and other issues should be taken into account while developing targeted social support and care for disabled people. The factor of closeness and accessibility to necessary services and the accessibility of ATD and their maintenance as well, is rather important. Some experts speak about potential improvement in this context.

*The Ministry of Labor is working on a program up to year 2030 called "Accessible environment". One of their priorities is developing a Bureau of Medical Social Expertise. The inaccessibility of the Bureau is also an infrastructural problem which must be solved. That is to say, physical specialists with medical-social expertise should be accessible. It's clear, that there are programs when specialists go out for visit, but they can't cover everybody. (A representative from company-manufacturer of ATD).*

There is also a proposal to strengthen social services with new subdivisions which will evaluate environment accessibility for disabled people and their need in equipping houses with various technical aids (a doorbell alarm device or a water/gas turning off alarm device and so on).

*Maybe, in the long run it will be necessary to start a guidance service within the Ministry of Labor. It will have its own center. It will be like they say now: let's evaluate the accessibility of the living environment for the hearing impaired (An employee of the All-Russian society of the deaf).*

Having considered the key determinants of the development of the Russian ATD market in the context of *buyers market power in respect to distribution TRA to final consumers*, we will touch upon the main drawbacks of this market organization. This analysis is of great importance because the specific criteria and the order of providing social assistance within budget, human resources and other restrictions, can cause a number of unfavorable tendencies.

The procedures for providing ATD are strictly regulated, but incomprehensible to final consumers. It was discovered that one of the main barriers is that disabled people are ill informed on current supply of ATD and the necessity to register the status of a disabled person. This information is not tailored by any agent working with the population, including medical workers. This lack of information results in refusals to register for the IPR, which is necessary to receive ATD, because “rehabilitation” is misunderstood. Some disabled people are afraid of losing their disability status or group if they agree to rehabilitation.

Here again we make reference to the secondary data of quantitative surveys, and note that the IPR is registered by 38% of disabled people, yet nearly 75% of disabled people who needed an ATD are fully provided with TRA<sup>14</sup>. Meanwhile, 65% of disabled people, having TRA first of all disabled of groups II and III, bought the devices on their own. Meanwhile, almost half of disabled people needing TRA do not have IPR treatment recommendations (including the fact that their program has not been developed yet).

In the context of the disability work system, interviewees discussed the competency level of employers from the Bureau of Medical and Social Expertise, responsible for registering disability status and composing IPR. They claim they are lacking in deep knowledge on technical peculiarities of different rehabilitation aids and miscomprehension of the opportunities and conditions of their use by persons with various health restrictions. Evaluations, included IPR, are not always done by specialists.

*IPR, as a rule, is formal and has nothing in common with real rehabilitation. How it is fulfilled in practice is never really checked. Only the TRA provision is registered, but it is not connected with the rehabilitation itself (An assistant deputy).*

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<sup>14</sup>A Sample Survey of the Quality and Accessibility of Services in the Areas of Education, Health and Social Services, Employment Promotion was carried out in 2015. The sample consisted of 115 856 individuals, including 6 847 persons with disabilities, including children with disabilities.



*A person is given a hearing-aid and informed that he doesn't need a translator. "Why?" – "Because you've got a device". That is not correct. I mean, when a disabled person is given something, something else is taken away. They say, "It is enough for you." It is absolutely the wrong approach" (An employee of the All-Russian society of the deaf).*

Quite often not only employers from the Bureau of Medical and Social Expertise, but medical workers as well are not well acquainted with the TRA available.

*As a rule, in the case of uncorrectable eyesight they tell the patients that nothing can be done, except rehabilitation. It is necessary to include basic study on the special correction of restricted eyesight and the rehabilitation of disabled persons in professional development and an up-grading program for ophthalmologists (An assistant deputy).*

These problems decrease the efficiency of the system and prevent disabled people from being independent and being included in society. That is why these problems demand urgent attention.

#### ***Buyers/consumers bargaining power analysis relating to ATD purchasing***

The Russian ATD market is highly regulated not only in the distribution of devices to final consumers, but also in the purchasing of ATD. Conditions for structural assistance between suppliers, buyers and consumers are confirmed by law, and the most influential are state agents who purchase and distribute ATD.

*Actually, there is no market now, because we mean market when, while purchasing, final consumer interests are taken into consideration. [...] Now there is no evaluation like that. We have a consumer, who is not involved in making purchasing decisions. Those who pay, make the decisions. [...] What is in the state contracts, that is done. Links with the market, with the final consumers have been lost. (An assistant deputy).*

However, the state does not support an innovation policy, and is inflexible in its decisions. Informants consider this a serious problem. For example, there is a list of devices that can be purchased by the state. Interviewees said that new and innovative ATD are very difficult to include in the existing TRA Register. In fact, administrative regulations deprive specialists

from the Bureau of Medical and Social Expertise of the chance to offer any substitutes to disabled persons. Budget restrictions and the absence of opportunity to enhance free medical aid for the disabled population delays the provision of rehabilitation aids<sup>15</sup>, the attempt to save money by purchasing devices by tender (which often results in bad quality) and the low salary of specialists from the Bureau of Medical and Social Expertise, badly affects service quality.

*The Social Insurance Fund holds [a competition] in regions, a tender is given. And mediators (the so-called suppliers of these devices) intrude there. [...] Companies with good products leave. Those who don't have good quality products win. (A representative of a public organization of disabled people).*

*Competition is good, struggle with corruption is very good, but not here. (A representative of a public organization of disabled people).*

We conclude that state agents purchasing and distributing ATD are the controllers who define which products will be available for consumers, and which technologies will be in demand and promoted, and consequently, will develop the market in general. In connection with that, state policy and state budget opportunities are the main political and economic determinates of the development of the ATD market in the next 10-15 years.

The final consumer is given less market power, than state buyers, and influence the development of the market less than the state.

### **3.2 Analysis of the bargaining power of suppliers**

Another important group of players on the current market are domestic and foreign manufacturers and distributors of ATD. These are federal state prosthetic and orthopedic enterprises of the Russian Ministry of Labor (71 enterprises) and small and medium-sized businesses (about 200 enterprises)<sup>16</sup>.

The total volume of domestic production of rehabilitation products in Russia in 2015 was 11.8 billion rubles<sup>17</sup>. However, 60% of the market was accounted for by imported goods. The

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<sup>15</sup> Which is confirmed by the result of the control measures of the accounting chamber, see: <http://audit.gov.ru/upload/iblock/439/43947816235d34700912b77028f9769b.pdf>

<sup>16</sup> The project of Strategy of development of industrial production rehabilitation orientation to 2025. URL: [http://minpromtorg.gov.ru/common/upload/files/docs/Project\\_REAPROM\\_until\\_2025.pdf](http://minpromtorg.gov.ru/common/upload/files/docs/Project_REAPROM_until_2025.pdf) (date accessed: 14.06.2017)

<sup>17</sup> Ibid

total imports of rehabilitation-oriented goods in Russia in 2015 including the segment of architectural and planning adaptations (ramps, etc.) was estimated at 17.7 billion rubles<sup>18</sup>.

The most influential player in the ATD market is currently the government. It is the largest purchaser of products who, using the determination of the budget of the state support of the market – economic determinants – establishes the conditions for the activity of producers and suppliers of ATD. However, as noted by the surveyed experts, the financing of purchases from the state budget is stable, but for various reasons, there are periods when it increases or decreases. This factor complicates the process of planning production and procurement in this field. When producers face irregular payments over the year, it negatively affects the recipients of assistive technologies (for example, delays occur in the transmission of the TRA to the end user).

*The bulk of our funding falls on the fourth quarter, sometimes in the third quarter but the first half of the year, in general, remains without adequate funding for various, mostly for organizational reasons. The Ministry of Finance may delay the transfer or state customers are too slow to prepare to the competitive procedures (An employee of an ATD manufacturer).*

Not many experts believe that in the near future there will be significant procedural or legislative changes that will ensure the inflow of investments into the ATD industry and will allow manufacturers and suppliers to feel the change in his role and exercise their market power in a different way.

*To improve investment conditions, some specific improvements to public procurement processes or the creation of other methods of communication with the end user must definitely be made so that there would be sustainable demand, reliable demand for a long period, which would be interesting for the investor (An assistant deputy).*

Changes in ATD production **technologies** are potentially a source of significant market changes. A comfortable solution can increase the demand for the devices and in the future reduce the cost of production and increase supply. New technological solutions can contribute not only to improving the quality of life of persons with disabilities, but also to make education, employment and leisure activities more accessible for disabled people. However, to assess the

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<sup>18</sup> Ibid

impact of this determinant automatically, according to experts, is not possible. Technological solutions are dependent on the **political vector**; in the absence of a request for an extension of the supply and an individual approach by the regulator, investments in technological changes (both in the development of new and the adoption of existing solutions) remain economically unattractive. The cost reduction in the current circumstances may result in deterioration in the quality and functionality of the product, since the prices of assistive devices in Russia are lower than in foreign countries.

*You can't strive for cheapness, because it kills innovation. If we take any device (a TV, a telephone), you will notice that the cost of generally good devices does not change over time, but they are getting better and better (A member of the all-Russian society of the deaf).*

In the next 10-15 years, according to experts, one should not expect that the production of rehabilitation devices will become cheaper. In particular, this is due to new challenges that will require new technological solutions. Nowadays there is demand for development of the ATD for children, which is significantly inferior to the senior segment in Russia.

*Now we see that there will be an emphasis on children. For adults, there are, more or less, a medical database, there is, more or less, an understanding of the history of providing the adult population with current means of rehabilitation, absorbent underwear, and diapers. The proportion of children is very small. And children probably will need some new innovative products (A representative of an ATD manufacturer).*

Thus, ATD manufacturers and suppliers have much less influence in comparison with the state authorities. It is expected that in the future the role of political determinants (whether it is the policy of import substitution, support of domestic producers, normative regulation of ATD production and sales or the development of the sector of high-tech assistive technologies) will not weaken. Nevertheless, political decisions will be certainly associated with economic ones – obviously, the innovation vector will require a substantial increase in public funding.

### **3.3 Analysis of the threat of substitute products**

The issue of the economic efficiency of the replacement of traditional services for social services due to the wide distribution of ATD, which is widely considered abroad, has not yet

received any significant discussion among Russian experts. In the future, the ratio of the expenses for wages and payments to individuals providing care for a disabled person, on the one hand, and the cost of ATD, on the other hand, will determine the trajectory of the development of this market on a par with other determinants. And here again we have to mention substantial budget limits and lack of effective demand – **economic determinants** – as restrictions for expanding the range of rehabilitation equipment in the Russian market.

For consumers of ATD a significant disadvantage of the current system, according to the interviews, is the lack of individualized choice of assistive devices. Informants note that the wrong rehabilitation device can exacerbate health problems.

An individualized selection of ATD becomes possible for persons with disabilities who self-purchase assistive devices. There is also the option of reimbursement from the state. However, according to experts, this compensation is much lower than the retail cost of the device because its size is based on the purchase prices determined as the result of competition, where frequent dumping and the consequent distribution of products of poor quality frequently occur. The share of those who are able to purchase the technical means of rehabilitation, according to experts, is extremely low. Under the conditions of the centralized public procurement of standardized devices, persons with disabilities often receive devices that they do not use. Thus, instead of the targeted assistance there is a formal approach leading to inefficient expenditure of funds.

*It means, [a technical means of rehabilitation] can lie on the shelf, can be used for hammering nails, maybe, for doing something else. Needed or not, as we are used to hearing, "I will take it". If I am a part of the individual rehabilitation program, I'll take a "speaking" book and put it aside or give it to my grandson – let him listen to an audiobook or some music (A staff member of the Reakomp institute, the All-Russian society of the blind).*

When the standardization of products is high, for example, if national standards are approved or international ATD standards are fully recognized, it is easier to switch between suppliers, and this change within one group of highly standardized devices does not involve additional costs. In such circumstances, suppliers have to differentiate their products and offer additional benefits compared with the universal standard in their group of ATD.

Some experts believe that the marked deficiency in the system of selecting technical means of rehabilitation can be resolved by a transition to a new mechanism of issuing personal certificates for assistive devices to disabled persons (**a political decision**). With this certificate a recipient could go to any supplier whose products are more suitable for them. However, according to some experts, a number of companies that can offer the possibility of an individual choice of technical means of rehabilitation, may increase the cost of their products because the cost of switching to devices from other vendors will go up for the purchaser.

Thus, the incorporation of individual needs and characteristics of those persons with disabilities who are in need of ATD must be specified in compliance with the relevant standard for purchased products. Then it will be possible to make individualized choices of technical means of rehabilitation without a loss of interchangeability and compatibility of devices produced by different companies. This will encourage the adaption of universal standards, and the prospect of the substitutes will have a real impact on the market situation.

### **3.4 Analysis of the threat of new entrants**

As it is already noted, the market for assistive devices features imported and domestic products. Experts attribute the hypothetical possibility of the emergence of new players with the change of import conditions (if procedures are simplified, there will be more companies willing to import foreign goods) or with the adjustment of the policy in relation to domestic production. This is again a question associated with the state policy of economic decisions, i.e., **the political and economic determinants**.

Some experts believe that it is in the interest of the state to set high duties on the import of assistive devices to give impetus to the development of the domestic TRA, others insist that there should be a reduction of customs duties, as imported components are used in the development of the Russian assistive devices.

*This year we've been able to agree on zero VAT import tax and customs duties.[...] Because technical means of rehabilitation for stoma patients were imported with VAT and customs duty until recently. Sometimes the tax reached 45 % (An employee of a company that sells ATD).*

Without high-quality imported components, manufacturers of assistive technologies in Russia cannot work. Therefore, experts note that the reduction in taxes on production and import duties will have a positive impact on the ATD proposal in the next 10-15 years.

Informants admit that Russian producers at this stage are unable to compete with imported products in quality, but innovations in ATD production technologies and the production technologies of their components can potentially be a source of the market transformation.

*In order to produce quality products on the level of foreign counterparts, a lot of investment is needed – millions of dollars. The government is unlikely to find the money for this. If they invest, then the question is when it is going pay off. Where should the manufacturer get the money to purchase materials, which are again mostly manufactured overseas? The components that make up a particular model of this or that technical means of rehabilitation for medical patients, are not made in Russia (An employee of a ATD company).*

In connection with the issue of product standardization, detailed requirements, the harmonization of national and global standards and the regulation of international trade is becoming more important. In particular, for essential differences in requirements for ATD, users can lose access to products of certain manufacturers, and producers lose access to necessary and inexpensive materials and components. Thus, this issue is linked with the diversification of the market.

The high specification of requirements for purchased products can protect end consumers from the proliferation of substandard ATD from companies which receive benefits only at a price under the current procurement procedure. In addition, the introduction of universal standards for ATD will make this market more attractive for new businesses and companies receiving an objective picture of possible barriers and prospects for selling their products on the Russian market. As state agencies are the only buyers in regional markets, the emergence of new players on the supply side may also result from regular events at which representatives of the companies could present their products, to convince the decision makers to procure their devices to increase the effectiveness of rehabilitation measures.

### **3.5 Analysis of the nature of industry rivalry**

According to the interviewed experts, ATD suppliers currently compete not on quality but on price, which largely determines the outcome of public procurement procedures. At the same time high-quality products, produced by domestic manufactures and leading foreign companies cannot withstand such competition, losing out to cheaper devices.

Market procedures are not always considered fair and transparent, and may be perceived as collusion with unqualified suppliers.

This situation, according to experts, seriously hampers the development of the Russian assistive technologies market and must undergo drastic changes in the near future. The possibility of individual choice of ATD and ensuing service (preventive maintenance, training, etc.) can become a competitive advantage for suppliers.

It is now appropriate to recall public organizations which act as intermediaries between the state, consumers and suppliers of ATD. Defending the rights of persons with disabilities, the largest NGOs in their public activities emphasize the problem of the provision of quality rehabilitation equipment required to comply with the UN Convention among other things.

## **4. Discussion and Conclusions**

The ATD market, like any other market, has specific features which are due to, among other things, the disposition of the agents. The determinants of the development of market, in our view, should be described in the context of the analysis of the interaction of these agents. Therefore, we use Porter's five forces model and introduce the main determinants of the Russian market of assistive technologies in the context of actions of buyers (those who make decisions to choose these or those ATD and pay for them), suppliers and consumers.

In the light of the initial limit of available information on subject matter, the unique data collected in this study enabled us to identify key factors and trends in the development of the ATD market in Russia, and to determine problematic areas that need to be further explored. The application of the five forces approach to the analysis of socio-economic development trends of this specific market represents another contribution of this study.



Focusing attention on the major determinants of the development of the Russian ATD market – **demographic, economic, political, social, technological and infrastructural** – and analyzing the existing trends in the context of the positions of key players, allowed us to get an idea about the prospects of the market and to sketch a map of possible changes.

Increasing demand for medical-social support of persons with disabilities due to the ongoing increase in the size of senior population and the proportion of those having multiple chronic diseases and/or disabilities, and an increase in the number of disabled children due to reductions in child mortality are global demographic trends and they create conditions for the growth of demand for ATD.

The change in solvency of the population, the rules of state budget financing, taxation and the payment of fees also have an impact on the situation, but depending on the direction of public policy, they can contribute to the realization of different scenarios of development of ATD market. Since the government took the course on partial co-financing of ATD by the population (this is the most likely scenario), the role of income of the population (the economic determinant) in the context of the development of the market of assistive technologies is expected to grow.

Another change in demand for ATD can be caused by the attitudes of the population regarding the inclusion of persons with disabilities in everyday occupations, the labor market and education. At the expert level the number of those wishing to receive education and to work among people with special health issues is expected to increase, however, it should be recognized that in this matter the influence of state policy is also very large.

In general, today we can say that in Russia the request of the state and society (including individuals with disabilities) to integrate the disabled people into society is leading to the formation of requirements of a barrier-free environment. The development of collective ATD, adapting the physical space (ramps, etc.) will increase demand for individual ATD.

Analysis of the actions of different groups of agents in the market of ATD highlights the role of public organizations involved in the purchase and distribution of rehabilitation equipment. Today, in Russia, they act not only as virtually the only source of funding for procurement, but they also determine which products and, consequently, which level of rehabilitation technologies will be available to end-users.

Along with that, experts note that the criterion for effective rehabilitation is not just providing disabled persons with assistive devices, but the degree of elimination of the restrictions in the implementation of rehabilitation activities. However, the current system of rehabilitation is not fully organized around the existing obstacles in different activities of life of individuals. A focus on the development of individual programs, individual choice and training practices for persons with severe disabilities, carried out by the specialized non-state rehabilitation centers under contracts with the social security services is the preferred version of the evolution of the support system for disabled people, or the alternative scenario of universal unification would result in significant changes in the ATD market.

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