



Educational service robotics in the Russian Federation

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Introduction

- Russia has the potential to become a significant player in the educational service robotics market. Unfortunately, this potential remains unrealized. The capacity of the domestic Russian market is still insignificant, and for the sustainable development of domestic developers and manufacturers of robotic systems, it is necessary to focus efforts on foreign markets.
- However, in our opinion, it is this approach that makes it possible to determine the direction that will ensure a more energetic start and sustainable development of robotics in Russia



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- The world market of robots for education and entertainment is actively developing. The volume of this market may increase from \$ 0.5 billion in 2018 to \$ 2 billion in 2021 and reach 5 million pieces.
- Educational robotics is a cycle of events in secondary school or educational institutions of additional education, in which programming and design, when combined, allow the formation of technical creativity skills, motivate schoolchildren to study the exact sciences and provide their early vocational guidance.



Educational service robotics in the Russian Federation

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- Today on the Russian market there are designers from almost all well-known world manufacturers of Lego, FischerTechnik, RoboRobo, WeX IQ, Bioloid STEM, ITS ROBOT and others. Russian developers and manufacturers of constructors for assembling robots, as well as robots for teaching robotics, teaching aids, teaching methods for teaching robotics.



SWOT analysis of the Russian robotics industry

Strengths	Weaknesses
<ol style="list-style-type: none"><li data-bbox="537 376 1223 458">1. Ability to solve complex and unique technical problems;<li data-bbox="537 458 1223 554">2. Domestic inventions have an advantage;<li data-bbox="537 554 1223 635">3. Ease of adaptation of the population to new technologies;<li data-bbox="537 635 1223 679">4. Positive attitude towards robots;	<ol style="list-style-type: none"><li data-bbox="1253 376 1939 458">1. Deficit of capacities of the domestic advanced production;<li data-bbox="1253 458 1939 554">2. Product scaling is a barrier to product cost reduction;<li data-bbox="1253 554 1939 598">3. Low culture of industrial design;<li data-bbox="1253 598 1939 694">4. Difficult to create attractive for the consumer product;<li data-bbox="1253 694 1939 818">5. Weak penetration of the best world practices of robotization into the national economy;<li data-bbox="1253 818 1939 1033">6. Decision makers do not have the necessary knowledge to make informed decisions about technological modernization and robotization;



SWOT analysis of the Russian robotics industry

Opportunities	Threats
<ol style="list-style-type: none"><li data-bbox="537 361 1225 486">1. Companies that lose the race vacate a niche for new applicants;<li data-bbox="537 486 1225 575">2. Opportunities for radical improvement labor productivity;<li data-bbox="537 575 1225 701">3. Ability to produce and implement lower cost robotic solutions;<li data-bbox="537 701 1225 789">4. Expanding the fields of application of robotics;<li data-bbox="537 789 1225 1058">5. Significant potential for development, implementation and export of robotic solutions for mining industry, agriculture, nuclear energy, aircraft and shipbuilding;<li data-bbox="537 1058 1225 1146">6. Huge territory and small population;<li data-bbox="537 1146 1225 1229">7. Capacious niche for retail robotics and services;	<ol style="list-style-type: none"><li data-bbox="1251 361 1936 396">1. Accelerating brain drain;<li data-bbox="1251 396 1936 432">2. Emigration of qualified specialists;<li data-bbox="1251 432 1936 575">3. Rapid development of disruptive technologies / acceleration technology race;<li data-bbox="1251 575 1936 658">4. Acceleration of the life cycle of a startup, product;



Conclusions

- Educational programs are rapidly becoming obsolete due to the accelerating technology life cycle, on the one hand.
- On the other hand, the current generation of teachers is not interested in the transition to new training programs, as this will lead to the rewriting of already created programs.
- For example, in Russia there is nothing like strategic plans for science, technology, engineering and mathematics education (STEM Education, USA). In particular, only two national universities have training programs in the field of collaborative robotics: Skoltech and Innopolis.