

Dual Model of Education in the Republic of Serbia

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Abstract: A lot of work has been done on the development of education, digitalization, new technologies and educational methods in the Republic of Serbia in the last few years.

The Republic of Serbia is making significant efforts to adapt its education system to the needs of the economy. In this regard, great efforts are directed towards dual education, which will be presented in this paper. Based on the results of the research, directions of development trends will also be presented.

Key words: dual education, higher education institutions, cooperation between companies and higher education institutions

JEL: H0, I2

Introduction

Educational institutions have great importance and role in the society and economy of a country. The development of the market economy through modern tendencies shows that education and formation of human resources are the main priorities of the national strategy and policy for social, economic and technological progress. Promoting education has an investment character, which must be harmonized with the needs of the economy and society. The development of the economy and society is based on knowledge that is shaped by the educational system (Trifunović, et al., 2019).

In the last few years, the Republic of Serbia has been making significant efforts to adapt the education system to the needs of the economy and provide necessary skilled labor force. Accordingly, it has directed great efforts towards dual education. One of the main advantages of this type of education is the fact that upon completion of such studies, students are able to work in the chosen field, because their knowledge and experience is already adapted to the needs of the economy (Obradović, Dmitrović, 2022, p. 353).

The dual education system provides a more efficient response to the needs of the economy and the labor market, technological changes and the need for new competencies -

knowledge, skills, abilities and attitudes (The Ministry of Education, Science and Technological Development, 2022).

In the first part of the paper, within theoretical foundations, the introduction of dual education in the Republic of Serbia is explained. Clarification of the dual model in secondary and higher education is also included. The second part of the paper refers to the methodological framework of the conducted research. The third part of the paper refers to the graphic presentation of the results of the conducted research and the analysis of the obtained results on the importance of connecting the economy and higher education institutions. Finally, concluding remarks follow.

Theoretical premises

Dual education in the Republic of Serbia

The project of dual education in Serbia was launched 20 years ago by the German Agency for International Cooperation in the Field of Economic Development (GIZ). The project was supported by the Ministry of Education. The pilot project for the application of the dual model through education was within the profile of economics. Afterwards, the joint international team continued to carry out activities in this area. GIZ has focused its support on industrial occupations and profiles, such as mechanic, locksmith, welder or electrician. Serbia is working on making dual education only a supplement to the current model of vocational education, and that is why it differs from the model in other European countries (Grujić, 2021, pp. 140-147).

The Ministry of Education, Science and Technological Development has been committed to reforms in education with the goal of joining the European Union. Education reform is aimed at modernization of general, vocational and higher education, digitalization, entrepreneurship, and pedagogical education. The Ministry of Education, Science and Technological Development is orienting its capacities towards the national priority, the dual education sector and the digitalization sector in education and science (Grujić, 2021, pp.140-147).

Today, the system of dual education is at the level of secondary and higher education in Serbia. The goal of dual education is to improve human capital through faster integration

of secondary school and university students into the world of work. It is regulated by the Law on Dual Education and the Law on the Dual Model of Studies in Higher Education. In addition, the development of dual education is regulated by the Master Plan for the Implementation of the Law on Dual Education (The Ministry of Education, Science and Technological Development, 2022).

The development of the National Model of Dual Education in Serbia was supported by the German Development Cooperation (GIZ) within the project "DECIDE" and "The Reform of Secondary Vocational Education in Serbia", the Swiss Agency for Development and Cooperation (SDC) within the project "Support to Development and Establishment of the National Model of Dual Education" and the Austrian Chamber of Commerce and the Austrian Development Agency (ADA) (The Ministry of Education, Science and Technological Development, 2022).

Dual education in secondary schools

The Law on Dual Education was passed in 2017, and its implementation began in the school year 2019/2020. The law regulates the rights and obligations of stakeholders who participate in the dual model of teaching in secondary vocational education. The Ministry of Education was in charge of creating the Law on Dual Education, and it is envisaged that the entrusted tasks will be carried out by the Serbian Chamber of Commerce. Other partners were other relevant institutions - representatives of various ministries, educational institutions, employers, representatives of local self-government, the National Employment Service and other actors. According to the Law on Dual Education, it is a model of teaching in the system of secondary vocational education and upbringing in which the curriculum is taught in two places, i.e. at school and in a company (with an employer), which means that students acquire competencies, both in the school through theoretical classes and exercises, and in the company, in which learning through work is performed, all in accordance with the standard of qualification and the curriculum (Grujic, 2020).

Three rulebooks were adopted: The Rulebook on the manner of deploying students for learning through work; the Rulebook on closer conditions, manner of work, activities and structure of the Team for career guidance and counseling in secondary school that implements educational profiles in dual education; the Rulebook on training programme,

closer conditions and other issues of importance to take the instructor exam. In addition, on the basis of the Law on Dual Education, the Chamber of Commerce of Serbia has passed the Rulebook on the organization, structure and manner of work of the Commission for determining the fulfillment of conditions for conducting learning through work with the employer (Grujić, 2021, pp.140-147). This Ordinance regulates the process of obtaining accreditation for companies wishing to engage in dual education, from the structure of this commission, through the manner of submitting applications by companies and the process of verifying their eligibility, including going out on the field, to the decision on the requirements, the procedure for determining fulfillment of conditions, etc (Grujic, 2020).

The Serbian Chamber of Commerce has conducted training for instructors, i.e. company employees. The government of the Republic of Serbia has established the Commission for the Development and Implementation of Dual Education for the implementation and improvement of dual education and a three-year evaluation of the achieved results (Grujić, 2021, pp.140-147).

Currently, about 30% of vocational schools in Serbia have at least one dual educational profile (Grujić, 2021, pp.140-147). The system of dual education includes over 10,000 students. The number of dual educational profiles, which are implemented in over 150 secondary vocational schools, has grown to 54. The National Online Database of Dual Profiles has been created, which contains 764 units. Teaching contents were recorded in equipped classrooms-workshops and training centers, as well as in some companies that educate a significant number of students with dual educational profiles. Topics for learning through work were recorded in real work environment with licensed instructors and coordinators. The provided materials enable students who finish primary school to be informed about the manner of realization of dual education, so that they can decide on a future profession. The online database of lectures will also be used in regular classes, so that students who are not able to learn in real work environment can use the simulation to network theoretical knowledge with practice (The Ministry of Education, Science and Technological Development, 2022).

In the school year 2020/2021, a total of 2,447 students enrolled in the first year of secondary school (Grujić, 2021, pp. 140-147).

Table 1. Dual education in secondary schools in Serbia

Dual educational profile	Number of students in dual programmes	Number of schools in the system of dual education	Number of companies in the system of dual education
54	10,000	150	900

Source: Own work based on official data from the Ministry of Education, Science and Technological Development (Dual Education –The Ministry of Education, Science and Technological Development) (mpn.gov.rs)

The dual model in higher education

Dual education in secondary schools was followed by the introduction of the dual model in higher education, and it began in 2019 with the Law on the Dual Model of Studies in Higher Education (Grujić, 2021, pp. 140-147). The dual model of studies has been applied in the Republic of Serbia for a short time and this Law regulates basic issues related to this model of education, such as defining the content and implementation of this model, rights and obligations of students, employers and higher education institutions, etc. (Obradović, Dmitrović, 2022, p. 353).

The goal of introducing the dual model in higher education is to provide students with the opportunity to significantly increase their competitiveness in the labor market and have greater chances to be employed by employers with work-based learning, but also by other employers in the same field. According to the dual model, a higher education institution can organize a study programme of academic or vocational studies, in which through active teaching at a higher education institution, as well as practical training and work with an employer, knowledge, skills, abilities and attitudes are acquired in accordance with the study programme and qualification standard (The Ministry of Education, Science and Technological Development, 2022).

In this way, it is possible for students to have the opportunity to learn through work during their studies. "Learning through work" is an integral part of the study programme according to the dual model of studies that carries a number of ECTS credits and is an organized process during which students under the supervision of a mentor working with an employer apply theoretical knowledge in real work environment. They have direct contact with business procedures and technologies used in the business world, they connect with professionals and prepare themselves for the world of work (NAT, Rulebook, 2020).

The ratio in the volume of hours of teaching performed at a higher education institution and learning through work with an employer is determined by the study programme, with teaching (lectures, exercises and other forms) represented with at least 450 hours per year on average at the level of the entire study programme, and learning through work with at least 450 hours per year on average at the level of the entire study programme (The Ministry of Education, Science and Technological Development, 2022).

In order to realize the dual model of studies, the study programme should be accredited in accordance with the accreditation standards established by the law governing higher education and the qualification standard determined in accordance with the law governing the national qualifications framework (The Law on the Dual Model of Studies in Higher Education, 2019).

In February 2020, the Rulebook on Amendments to the Rulebook on standards and procedure for accreditation of study programmes was adopted by the National Accreditation Body. The Rulebook explains the procedure and manner of conducting the accreditation process according to the dual model in higher education (Trifunović, Lalić, Radovanović, 2021, pp. 339-349). The National Accreditation Body in the Republic of Serbia performs accreditation, quality control of higher education institutions and their units, evaluation of study programmes and quality assurance in higher education (Law on Higher Education, 2021).

The dual study model can be accredited as an independent study programme or as one of the modules within the study programme. In addition to the elements prescribed by the law governing higher education and accreditation standards, it contains a description and scope of learning through work expressed in hours and ECTS credits (The Law on Dual Model of Studies in Higher Education, 2019).

Employers also participate in the development of study programmes or modules, in accordance with the law governing higher education (The Law on the Dual Model of Studies in Higher Education, 2019).

Before enrolling in a faculty, students can decide whether they want dual education or classic study programmes. Faculties define in their regulations that a student who opts for dual education can return to the classic way of studying and vice versa - that a student who has decided to study in the classic way can switch to dual education. Through this form

of education, although more demanding and difficult, young people acquire practical skills and abilities that will enable them easier entry into the world of work, as well as competencies for career management, lifelong learning and entrepreneurship. This form of education enables employers to participate in the education of future staff. In the long run this reduces costs of searching for qualified staff (Grujić, 2021, pp. 140-147).

Studies according to the dual model cannot be introduced in the field of social sciences and humanities (NAT, Regulations, 2020).

The dual model of studies in higher education, which began with the implementation of the first study programmes in October 2021, contributes to increasing the relevance of higher education, employability of graduates, modernization of the teaching process through cooperation with the economy and contact with modern technological achievements (The Ministry of Education, Science and Technological Development, 2022).

Table 2. The dual model in higher education in Serbia

Number of faculties that implement study programmes according to the dual model	Number of accredited study programs according to the dual model	Number of academies of professional studies that implement study programmes according to the dual model
3	26	5

Source: Own work based on official data from the Ministry of Education, Science and Technological Development (The Dual Model of Studies – The Ministry of Education, Science and Technological Development) (mpn.gov.rs)

Methodology

The research, a part of which used in this paper, was conducted on the territory of the Republic of Serbia in the period from October to December 2021. A questionnaire was used to collect data. A hundred companies of different sizes and activities were included. It was observed how much importance is given to cooperation and connection of companies and higher education institutions, how much the awareness of dual education is developed. It also included research on students' practical work and how much was invested in employees so as to receive additional education in the last few years. In addition, the cooperation between companies and higher education institutions in the past ten years was analyzed in order to see possible tendencies and directions of development in the future.

The conducted research was followed by data processing, which was presented through graphical representations. For the purposes of this paper, six graphic representations are presented.

Results

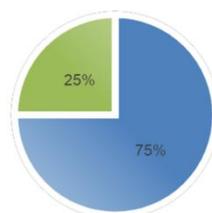
The first graphic shows the percentage of cooperation between companies and higher education institutions. There is high percentage of companies that stated that they have some kind of cooperation with higher education institutions, and that is a good indicator. The percentage of companies that gave positive answer was 75%, while 25% gave a negative answer. This type of cooperation brings great benefits for both companies and higher education institutions.

Cooperation between companies and higher education institutions leads not only to their development, but also to increased expertise of human resources, increased innovation and economic development (Trifunović, Lalić, Radovanović, 2021, pp. 339-349).

On the other hand, from the aspect of higher education institutions, this type of cooperation is also extremely important and can be achieved in various ways through the development of new academic programs, joint research projects, seminars, presentations at fairs, etc. (Polovina, et al., 2020).

Cooperation between companies and higher education institutions not only leads to their development, but also increases the level of expertise of the entire population, the diversity of knowledge among companies, and the diffusion of innovations in terms of quantity and speed. In addition, companies in interaction with higher education institutions are becoming more attractive to other companies, leading to new forms of cooperation, connections and partnerships (Ahrweiler, 2011, pp.218-235).

Figure 1. Cooperation between companies and higher education institutions

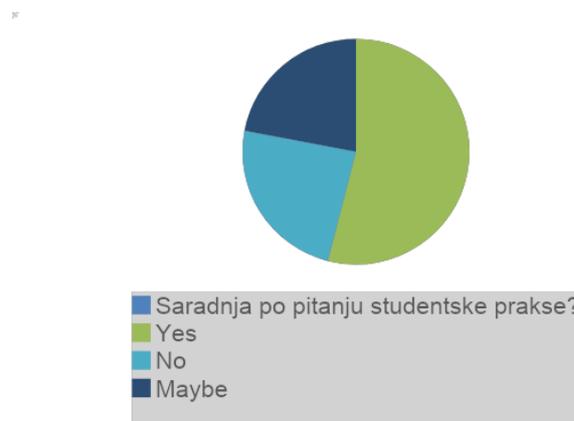


Source: Authors' illustration based on own research

One of the types of cooperation and connection of companies and higher education institutions is sending students for internships at companies. It is also one of the obligatory elements of the dual education system, as well as short study programmes. Graph 2 shows the percentage of companies that cooperate with higher education institutions by accepting students for internships. The percentage of companies that answered in the affirmative was 54%, 24% answered in the negative, while 22% answered that they might work on achieving this type of cooperation.

This type of cooperation is one of the ways in which students learn and understand more easily through practical experience. On the other hand, new scientific and technical knowledge is implemented in companies. The goal of cooperation through this programme is to teach students to apply theory in practice. In that way, students will gain self-confidence and motivation, become proactive, creative and learn how to work in a team (Oosterbeek, 2010, pp. 442–454.).

Figure 2. Cooperation on student internships

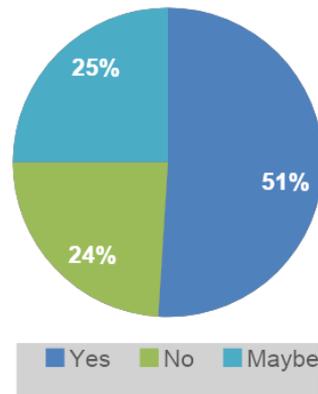


Source: Authors' illustration based on own research

Graph 3 shows a company's investment in additional education of employees. This investment can be in employees to take part in undergraduate, master's or doctoral study programmes, or in short study programmes. In addition, it can be through different further educational programmes such as different courses or trainings. This certainly contributes to employees' implementation of new scientific knowledge in their companies. In this regard, 51% of companies answered yes, 25% maybe and 24% no. This is a good indicator because investing in employees, by financing their additional training, leads to an increase in the knowledge fund, new scientific knowledge and practical application of newly

acquired knowledge. Companies that invest in human resources in this way influence the skills, attitudes and behavior of individuals to do their job (Trifunovic & Tankosic, 2013).

Figure. 3. Investments in employees to be further educated



Source: Authors' illustration based on own research

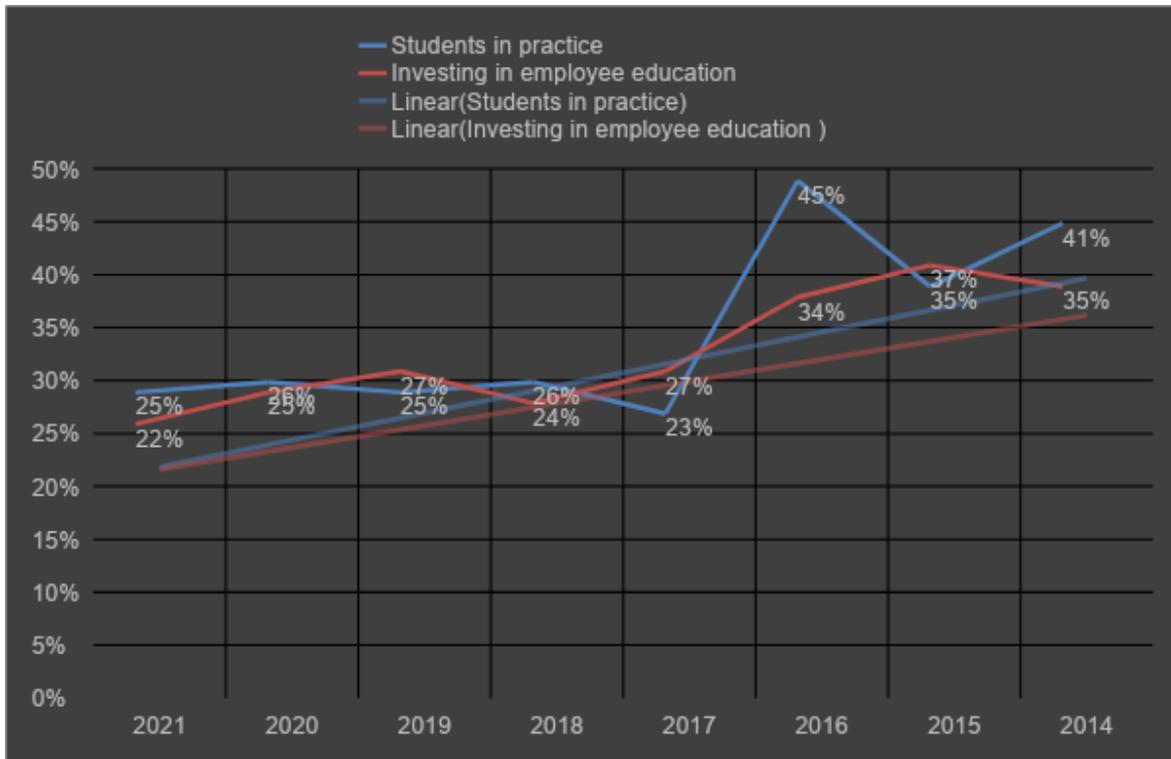
Various environmental factors and working conditions impose the need for the constant introduction of new development programmes based on innovation and new technologies. There is also a positive trend from year to year of linear increase in the introduction of new technologies. Innovations and new technologies are going in a new direction that leads to better life and work experience (Trifunović et al., 2020). New technologies, innovations, digitalization of education have contributed to the fact that employees can acquire the necessary knowledge in a simpler way. Thanks to new technologies, employees are not obliged to be present in classes, but have the opportunity to follow everything on a platform, as well as have access to various types of *online teaching*.

Graphic 4 shows the cooperation between companies and higher education institutions in terms of student internships and investments in employees to receive additional education in the last eight years, from 2014 to 2022.

When we look at students doing practical work at companies, we see that their number is increasing from year to year and that a significant increase followed the launch of dual education. The percentage of the ascending line would have been even higher if it were not for the emergency situation and various restrictions due to COVID-19.

When we look at the investment of companies in additional education of employees in the last eight years, we see that it is increasing from year to year.

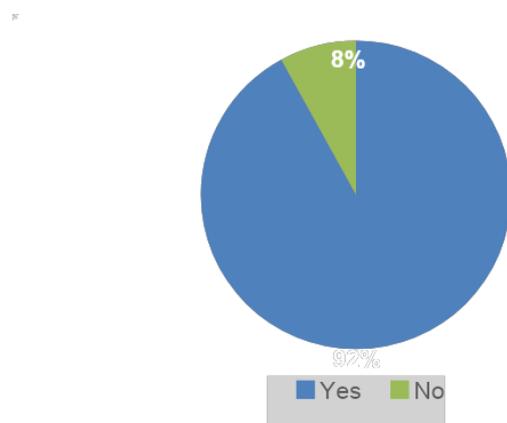
Figure 4. Cooperation between companies and higher education institutions in terms of student internships and investments in employees to receive additional education in the period 2014-2022



Source: Authors' illustration based on own research

Graph 5 shows whether companies in the Republic of Serbia have developed awareness of dual education and whether they support the dual model. The number of companies that answered yes was 92%, while 8% answered no. This is a good indicator.

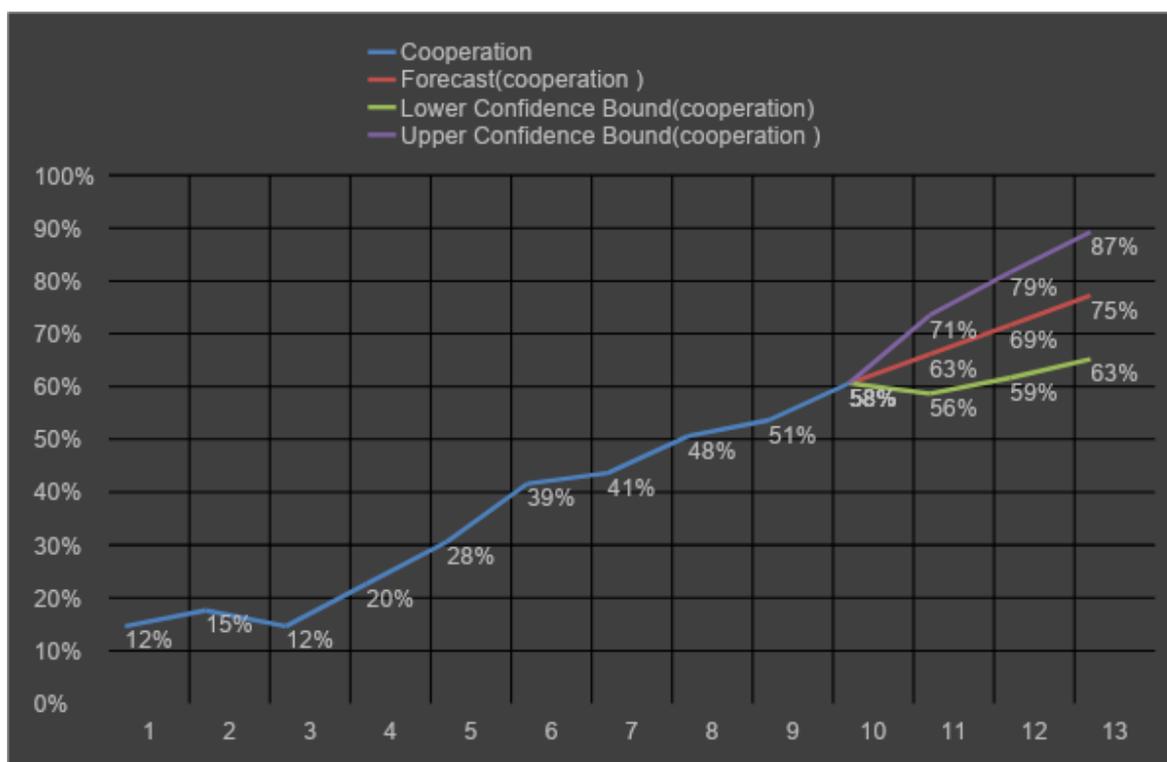
Figure 5. Do companies support dual education?



Source Authors' illustration based on own research

Graph 6 shows the cooperation between companies and higher education institutions in the previous ten years, from 2012 to 2022. From year to year, the cooperation between companies and higher education institutions is growing. The graph also shows a projection of the increase in the cooperation in the next couple of years.

Figure 6. Cooperation of companies and higher education institutions from 2012-2022



Source: Authors' illustration based on own research

Summary, recommendations

Cooperation between companies and higher education institutions can be achieved in several ways. Each of these methods has numerous advantages for both organizations and economic development (Trifunovic, Tankosic, 2013, pp. 227-231). The Republic of Serbia is making great efforts to connect the economy and higher education institutions.

The Republic of Serbia, in response to the needs of society for skilled workforce that will be immediately ready to jump into the process of production of goods and services (Stojanović, et al., 2021, pp. 29-40), by addressing youth unemployment and modernization of educational system, turned to dual education and its implementation in the school year 2019-2020. Dual education is a model of teaching and learning in the system of secondary

vocational education and upbringing. In dual education, students acquire competencies through theoretical classes at school, practical classes at school and learning through work with employers (Renold, Caves, Oswald-Egg, 2021, p. 3). The introduction of the dual model was followed by its introduction in higher education in the academic year 2020/21.

This paper presents the importance of the dual education model and the efforts of the Republic of Serbia to implement it.

The conclusions based on the research presented in this paper are: a high percentage of companies establish a certain type of cooperation with higher education institutions; the number of internships in companies is increasing from year to year, same goes for the investment of companies in employees to receive additional education; there is a high percentage of companies that support dual education; in the last ten years, in the period from 2012 to 2022, cooperation between companies and higher education institutions has been increasing, with a tendency for further development.

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