

IMPLEMENTATION OF AN INTEGRATING ROBOT PLATFORM AS AN OPPORTUNITY TO ACHIEVE BETTER DIGITAL MATURITY OF POLISH ENTERPRISES

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Purpose: The aim of the article is to evaluate an innovative product - the implementation of a platform that integrates and at the same time increases the digital maturity of enterprises. Relationships with system integrators are important for maintaining and increasing manufacturers' competitive advantage.

Methodology. The research method includes a review of previous analyzes and assessments of digitization according to various studies, and a case study analysis - implementation of the DBR77 integration platform. Such a case study will allow for the introduction of digital solutions, which in turn will affect the level of digital maturity of both the supplier and the recipient. The example of a case study brings a lot to solving the problems of practice of companies interested in digitization, as well as an example for students.

The following research questions can be posed here:

RQ1. What is the role of digitalization in modern enterprises in the light of current research results in Poland?

RQ2. What are the methods used to evaluate digitalization and innovation for industry?

RQ3. Does implementing an integration platform help achieve better digital maturity?

Findings: The Digi and Desi digital maturity methods presented in the article can be used to assess the level of digitization of an enterprise, and the case study can be a model for companies to use the robotics platform.

Research limitations/implications: The research was limited by access to data due to its nature - it was sensitive data. Specific benefits could not be quantified because the company did not agree to this due to the sensitivity of the data. In addition, limitations arising from the requirements of the volume of the work do not allow for a broader analysis of platform systems.

Practical implications: The study conducted can be useful for a good example for students and a model that researchers can set for didactic purposes to deepen their knowledge, as well as for enterprises interested in the digitization of modern organizations.

Social implications: The integration platform is an excellent example of implementing innovative models and technologies for industrial companies as well as a model for operating in the cloud. It is an example both for enterprises operating in the cloud and for industrial startups - integrator companies.

Originality/value: This case study is also a good example for students and a model that researchers can set for didactic purposes to deepen their knowledge, as well as for enterprises interested in the digitization of modern organizations. It may also be the beginning of further

research in this area. So it is a contribution to the development of science. It may be worthwhile to include in further research a set of case studies covering all the major solutions that are being implemented in the factory of the future.

Keywords: marketing, society 5.0, digitalization, robotization, integration platform.

Category of the paper: Research article and case study.

1. Introduction

According to E. Worotyńska-Kos (2021) the new social model 5.0 (Society 5.0) is called super-intelligent and is data-driven (Data - Driven Society). The most important resource of the 21st century is data. Countries are supposed to provide tools that enable the smooth and secure flow of data between companies, citizens and public administration. A certain stage of social evolution is beginning before our eyes. Society 5.0 is expected to connect people, machines and systems into a single cyber-spatial platform that exceeds human capabilities.

A super-intelligent society is very adept at adapting to technological changes and is aware of their impact on society, so it tries to carry out activities aimed at promoting talent, diversity and empowerment (Huang, 2022). Nakanishi and Kitano (2018) distinguished 5 key characteristics of society 5.0. These are: the ability to solve problems and create value; Diversity. Society 5.0 values the diverse skills, ideas and needs of others, transforming them into business, Decentralization; Resilience; Sustainable development and harmony with nature.

2. Notions and concept of digitalization and the difference between automation and robotization

As stated by K. Śledziwska, R. Włoch (2020), in the Polish literature the term digitization is often used in the sense of transforming an analogue format into a digital one. The notion of digitization is used to denote the phenomena referred to as digitization: it is mentioned about the digitization of processes, the digitization of education, and the digitization of companies.

Another important concept is transformation. According to Bloomberg, "we digitize information, digitalize processes and roles falling within the scope of business operations, and we digitally transform the company and its strategy". The problem is that these concepts are close in meaning Bloomberg (2018). K. Śledziwska and R. Włoch further present the following definitions:

- digitization: converting an analog data format to a digital one;
- digitalization: the application of digital technologies to specific economic, social and political processes;

- datafication: obtaining data by creating digital representations of the real world as a result of digitization; integration (processing and joining of data sets) and data analysis with the use of algorithms; deriving economic, social or political value from the information thus obtained; technologies for collecting, integrating and analyzing data are referred to as datafication technology;
- digital transformation: in a narrow sense - a comprehensive change in the functioning of the organization taking place as a result of the implementation of digital technologies; in a broader sense - a structural change in the functioning model of the market, consumers, enterprises and other organizations (including the state), employees and the global economy, resulting from datafication.

These definitions are also presented in foreign publications, among others, in Reis, J. (2018), Collins Dictionary, (2021); Hausberg, J.P. (2019); Digitization vs. digitalization: Differences, definitions and ... <https://www.truqcapp.com> › digitization. The concepts closely related to the aforementioned by K. Śledziwska and R. Włoch are **automation and robotization**. The paper presents selected problems because they are strictly related the analyzed case study – DBR 77. Automation is the use of machines for work that cannot be done in any other way. Automation is the next stage after mechanization, where direct human labor is necessary to produce the final product (Gupta, 2007, p. 1). Thanks to automation, the efficiency, speed and accuracy of production are increased. In addition, by implementing **automation** of production lines, a synergy of human and machine activities is achieved, which has a positive effect on the increase in efficiency. Repetitive, monotonous activities are carried out by industrial robots much faster. On the other hand, robotization is replacing human work with robots. In industry, it most often takes place at positions where repetitive, routine activities are performed, also in hazardous and burdensome conditions for humans. On the other hand, in the service environment, robots are IT applications used to automate business processes (the so-called *Robotic Process Automation*) (Grycuk, 2017, pp. 145-146).

Automation exists without robotization, while robotization without automation does not. Robots, after prior programming, perform a given activity autonomously. Robotization is therefore a narrower concept. On the other hand, depending on the specificity of the operation of a given enterprise, the production process can be automated so that there is no need to install a robot. The installation of individualized machines that perform their tasks automatically and autonomously, and do not fit into the definition of a robot, can also be successfully implemented in the spirit of Industry 4.0. Figure 1 shows that the aforementioned concepts are closely related to industry 4.0 and a smart factory, and this article focuses mainly on digitization, automation and robotization.

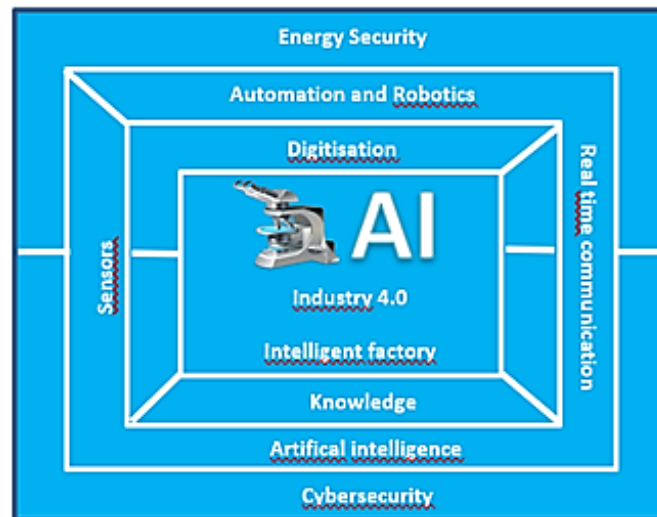


Figure 1. Features of Industry 4.0.

Source: based on Raport Szanse i wyzwania polskiego przemysłu 4.0 - agencja rozwoju przemysłu. https://arp.pl/documents/42/Raport_ARP_2018_Przemysl_4_0.pdf

A. Jabłoński writes more about the essence and concept of automation in the article entitled *Barriers and the scope of automation from the perspective of the content of work* (2021). It presents a historical perspective, but emphasizes that automation can be partial or full, when an automatic and flexible course of the production process is ensured without human intervention (Musso, 2013, p. 301). Therefore, the author believes that robotization means full automation, i.e. automated execution of specific tasks and processes (Jabłoński, 2021/3).

3. Need for digitalization – overview of conducted studies and reports

Digitization and the introduction of new technologies are not a goal in themselves, they are tools to change business models into those that allow you to remain competitive in the market. In the case of manufacturing companies, digitization enables the emergence of "intelligent" production management systems based on online communication between the elements of the production process and advanced data analysis (Marchewka, 2018). The main area of the authors' research interests has also become the automation of business processes and the impact of automation and robotization - on the development of the company. The study by researchers Almeida, F., Santos, J.D., Monteneiro, J.A. (2020) is very interesting because their team study analyzed the impact of digital transformation on processes in three areas. This team-based exploratory study analyzed the impact of digital transformation on processes in three business areas: employee and social relations, marketing, and sales and technology. The authors state that the effects of digitization are felt in all these areas. These considerations, as underlined, require empirical research in different business sectors and in specific countries. In the next team article, Rachinger, M., Rauter, R., Muller, C.H., Vorraber, W., Schirgi (2018), the authors

present empirical insights collected in interviews with 12 representatives of two media and automotive industries in Austria and Hungary. This preliminary study clearly shows that the company's value creation itself, as well as its position in the network, determine the innovation of business models (BMI) through digitization. On the other hand, organizational skills and employee competencies were identified as future challenges that both industries will face.

On the other hand, a very interesting team article presents the concepts of one-time research as well as their implementation and results Brodny, J., Tutak, M. (2021) according to 16 indicators that characterize the most important areas of the digitization and robotization process. The main objectives were to determine the ranking of EU countries in terms of the level of digitization and robotization, taking into account the size of enterprises, and to determine groups of these countries that are similar in this respect, well presented in clusters. The authors confirm that in terms of assessing the level of digitization and robotization, the best and weakest groups of countries largely coincide with the results of The Digital Economy and Society Index (DESI). These are important, but one-time studies, they are not carried out cyclically, as the main reports presented below, which discuss both the DIGI and DESI methods and indicators determining the level of digitization.

An overview of the selected studies and reports, due to a number of research units carried out on this level of transformation, automation and robotization of industrial organizations is presented below.

The results of the 2018 survey conducted by ARP (2018) are interesting and are presented below. The Opportunities and Challenges Report of Polish Industry 4.0 presents the integration of the robotics and industrial automation market with the ICT market. Next, the report deals with the development and importance of robotics in the world. Unfortunately, the level of robotization in the Polish industry is much lower than the global level. This is particularly evident in the so-called robotization density index (a number of robots per 10,000 employees). For Poland, in 2016, the International Federation of Robotics IFR defined this indicator at the level of 32 robots per 10,000 industrial workers.

Another study was developed by IDG & ABB: On the way to Economy 4.0. A time of change for business. The study was conducted in 2019 by "Computerworld" in cooperation with IBM Polska, TIDK sp. z o.o. and ABB sp. z o.o. (www.computerworld.pl/news/W-drodze-ku-Gospodarce-4-0-Wyniki-badania-Computerworlda,412715.html, 2019).

A total of 108 respondents whose enterprises operate on the Polish market participated in the survey (48% of entities came from the SME sector, the remaining 52% were large companies and corporations). The research project aimed to collect data on the level of adaptation of digital technologies in enterprises on the threshold of the fourth industrial revolution. Several research questions were posed: How are the activities carried out under Economy 4.0 anchored at the level of the company's strategy? What are the plans for the digitization of manufacturing processes of companies operating on the Polish market? What factors and potential benefits are driving companies to take a bigger step towards digital

transformation? As the study shows, the term Industry 4.0 was familiar (recognizable) to more than half of the surveyed companies. Nearly 70% of companies aware of the existence of the Industry 4.0 concept have planned or have already started implementing its elements into their strategies. The survey showed that enterprises have precise business plans and awareness of which areas of their activities require refreshing and optimization. Nevertheless, the report showed a serious problem regarding the awareness of Polish entrepreneurs and their willingness to change. Over a quarter of the respondents (27%) do not plan to undertake any activities in this area. Such conclusions are repeated, in a similar form, in many reports on Economy/ Industry 4.0 in Poland.

We should add very important results of the report conducted by *Business Insider Polska, Digitize or save?* Kerall's Research agency commissioned by Symfonia - a Polish producer of software for business. The study was conducted on the example of Polish small and medium-sized enterprises, where most of them have been operating on the market for over 21 years. After the survey in August 2021, the report entitled *Investments in technologies in the age of a pandemic. New challenges for SMEs: digitize or save?* was prepared. (businessinsider.com.pl/finanse/cyfryzowac-czy-oszczedzac-wyniki-raportu/81ctrpb, 2021) According to the surveyed companies, a visible benefit from digitization is that a company that invests in digitization gains cost savings, which was indicated by 42.2% of the respondents. Its efficiency and effectiveness also increase (43.5). However, according to entrepreneurs, new technologies also mean greater competitiveness (27.05) and access to a wider market (22.2%). For almost one in ten companies, investments in new technologies do not give any advantage, and according to them only digitization (9%) is an additional cost. The study shows that 75% of small and medium-sized enterprises in Poland conduct digitization of business. Such a decision was made by every fourth of them in order to reduce costs, which is in line with the earlier indication that the main advantage of digitized businesses is cost savings in the future. A very interesting question for companies was: what is digitization today? A necessity, a strategy or an opportunity? The prevailing opinions were that this technological change was a compulsory necessity and they stated that - *we do it because we have to* (32.7%). More than 30% consider digitization as an opportunity to enter the market more widely, and 31.2% say that digitization is their development strategy and will give them greater competitiveness and improved revenues. Mainly in small enterprises - in every tenth they say that you do not need to digitize to develop. On the other hand, 15% believe, especially medium-sized companies, that if it had not been for the pandemic, they would not have invested in digitization. In addition, 28.7% of enterprises believe that the current investment in digitization is a condition for staying in business, and 44.2% see digitization as an opportunity for development.

The current study by DBR77: *Forecast of Directions for the Development of Robotization in Poland*, (Wiśniewski, 2022).

It is also worth quoting the results of the report conducted by the DBR77 company, a very up-to-date study, the purpose of which was to make robotization available to all production companies, which significantly influenced the development of enterprises, as well as the level of people's quality of life (Wiśniewski, 2022 – the author's study of the analyzed company).

According to the aforementioned report, DBR77 Poland is in 18th place in the world in terms of the number of installed and operating industrial robots. In 2015-2020, there was an increase in the numbers of robots by 16%, however, the level of robotization density in Poland should still be considered low, i.e. 52 robots per 10,000 employees in the manufacturing industry. The robotization density in the automotive industry in 2020 was 206 robots per 10,000 employees.

The above publications and reports show that companies must constantly invest in the development of digitization and robotization, which will help them not to fall behind the competition. Company digitization is not only necessary, but absolutely imperative. Current generations, living in the environment of technology from an early age, will expect more and more digitization and digitalization.

4. Methods of assessing implementations according to the Siemens method'(DIGI, DESI Index and ADMA Method')

The level of digitization of the Polish industry in 2020 was analyzed by Siemens in the premiere report "**Digi Index 2020. The Level of Digitization of Production in Poland**". It was measured using the proprietary Digital Enterprise Index (Digi Index) (siecotwartychinnowacji.pl/baza-wiedzy/przemysl-4-0-poziom-digitalizacji-polskich-firm-w-2020r). It was created on the basis of an algorithm developed by Siemens and a survey of the Polish market. Digi Index is calculated for the entire industry and for individual industries: food, chemical and pharmaceutical, automotive and machine industry. The index includes six areas of digitalization - strategic planning, organization and administration, system integration, production and operational operation, data management and the application of digital processes. The rating scale ranges from 1 to 4 points. A result below 2 points means an alarmingly low level of digitization, while industry 4.0 leaders score above 3.5 points. The first survey was carried out in March 2020. The CATI technique, i.e. telephone interview, was used. The survey was conducted throughout Poland only among active entities, excluding companies in a state of suspension or liquidation bankruptcy. 100 manufacturing companies employing 50-249 employees were selected (random-layered sample). The Digi Index for Poland for 2021 was 1.8 points on a 4-point scale. These results show a large lag of the Polish industry compared to the development of EU countries and confirm a need for an immediate action. According to the assumptions of the research method, an indicator in the range of 2.1-2.5 proves that the

foundations for digitization are created in the company. In all analyzed industries, the area of data management achieved the highest values (from 2.6 to 3.1 points). The lowest scores in each sector were achieved by areas such as systems integration as well as organization and administration. Every third respondent declares the degree of digitization in the company at the level of 20-39%. Only 6% of companies assess this indicator at a level exceeding 80%. For many years, the automotive industry has been relatively best in the research, where the total digitization level is 56.7%.

The Digi Index for Polish industry was 1.9 points in 2020. According to the scale adopted by Siemens, this is an alarming result. It indicates an urgent need to introduce changes in the area of digitization of enterprises in Poland (Digi Index 2020). Polish producers did best in the areas of production and operational activities (2.6 points) and data management (2.9 points). The worst result was observed in the case of systems integration (1.1 points) and strategic planning (1.4 points). This means that Polish companies most often focus on the standardization of production and operational activities as well as the digitalization of production data. Businesses do not have a digitalization implementation strategy and systems are not sufficiently integrated. In the Siemens study, as much as 43 percent of the surveyed companies indicated the lack of financial support as the main barrier to digitalization. Developing plans and strategies is a problem for 20 percent of companies. It turns out that 14 percent of entities do not know how to use the collected data. The digital transformation of the company increases its competitiveness and is a significant advantage on the international market. It is also worth learning how Polish producers compare in terms of digitization to the European background.

Another indicator determining the country's potential in terms of the development of industry 4.0 is DESI (Digital Economy and Society). It is an index developed by the European Commission that summarizes approx. 37 indicators on a scale from 0 to 100, grouped into five areas: connectivity, human capital, internet services, integration of digital technology and digital public services. Thanks to it, the level of digitization of the European Union countries is monitored.

According to DESI, in 2020 Poland was in the 23rd place with a score of 44.92 points, which is below the European average of 52.57 points. For comparison, in 2019 the DESI index for Poland amounted to 40.71 points with the EU average at 49.4 points. Despite the observed increase in this indicator, Poland is still far from the European leaders. Each manufacturing company can self-assess its digital maturity. This self-analysis tool was commissioned by the Future Industry Platform, taking into account the key industry 4.0 aspects of enterprise development. After answering a series of questions, entrepreneurs receive information about the stage of digitization of their companies. **The Future Industry Foundation in Poland has introduced the ADMA digital maturity scan also in relation to the Polish market.** Entrepreneurs are networked through the platform of the Future Industry Foundation. The Foundation introduces good entrepreneurship practices, knowledge sharing, and cooperates with 13 clusters. It also introduced ADMA's digital maturity in relation to the Polish market

and is characterized and recommended by the Poznań Science and Technology Park (ppnt.poznan.pl/oferta/doradztwo-w-procesie-transformacji-cyfrowej/2021). The ADMA (Advanced Manufacturing) method includes:

- analysis of the digital maturity of an enterprise based on the ADMA Scan method;
- analysis of possible sources of financing for the transformation process (regional and national programs and funds coming directly from the European Commission);
- formulation of change scenarios/ roadmap towards Industry 4.0;
- preparing the team to carry out digital transformation in an enterprise.

ADMA Scan is a tool developed at the request of EASME - a unit of the European Commission dealing with supporting small and medium-sized enterprises. The European Commission has initiated the creation of the European Advanced Manufacturing Support Center (2018-2021) to help SMEs assess digital maturity. The method was created on the basis of many years of experience of experts from many European countries. Within three years of its inception, it was carried out for several hundred companies all over Europe. This tool allows for methodological diagnosis of the company's functioning in many aspects, such as production technology, the level of automation and robotization of processes, digitization of products and processes - production and non-production (sales, warehouse, distribution, marketing, HR, etc.), data integration in the company, cybersecurity, digital strategy, leadership, organizational culture, employee competency management.

5. Research method - case study analysis of the DBR77 Robot Platform

A wide spectrum of research reports was presented relating to many types of evaluation of the degree of digitalization, automation and robotization, which became the basis for the case study of the DBR77 Robot Platform company. This method of case study description is exploratory here and is the first step in the study of the nature of system integrators. The case study method can be used to reconstruct the course of a phenomenon in order to present the factors that shape it - we are then talking about a narrow view. This article takes this narrow view.

Identifying and learning about such factors and tools enabling the implementation of robotics platform technologies according to the empirical study carried out by the CEO of DBR77, P. Wiśniewski, gives an example of the use of integrating platforms and very quick effects in the company's development. Relationships with system integrators are the key to the competitive advantage of manufacturers and will also be a guide for companies operating both in a given country and globally.

Mission and vision of the DBR77 company. The Platform's **vision** is to become the first global market for industrial robots and the choice of anyone who thinks about robotization or automation of production and logistics. The DBR77 platform is the Amazon of the robot world and changes the robotization market (Report by P. Wiśniewski, DBR77, 2022, dbr77.com/report, 2022). **Mission** means we make the processing and digitization of production plants accessible to everyone. In addition, another element of the mission is to build a community of people interested in automation, robotization and digitization.

DBR77 Robotics Ltd is a technology company whose main spectrum is activity on the B2B e-commerce services market. It is one of the companies of the DB77 Group, beside DB77 Tax & Legal and DB77 Consulting. The result of the company's work is the world's first DBR77.com Robot Platform. The platform is an innovative solution on a global scale - there is no virtual space anywhere else that allows manufacturing companies to design a workplace using 3D tools and select a robot according to their needs. The platform is a combination of two business models - marketplace and SaaS formulas.

The DBR77 Robot Platform is one of the B2B platforms based on an innovative business model. There has been a well-established order on the market for the supply of production robots. A small number of equipment suppliers have mastered the global robot supply market. The robots and selected peripheral devices are delivered to local markets through a network of distributors. The robots are sold to integration companies that finally install them together with the rest of the station's equipment in production plants.

The DBR77.com Robot Platform is an innovative solution on a global scale - there is nowhere else a virtual space that allows manufacturing companies to design a workplace using 3D tools and select a robot according to their needs. It provides wide and universal access to information on robotization. The platform connects production companies that require robotization and automation (Investors) with entities that provide and integrate robotic systems (Integrators). The workstations designed and implemented thanks to the platform can also work in the Robot as a Service (RaaS) model, where instead of selling the application, the robot's work is sold on the customer's line. The platform's vision is to become the first global market for subscription-based, cloud-based industrial robots dedicated to production processes. The digital marketplace allows to personalize products.

Within several months, the DBR77 team managed to establish cooperation with global suppliers and manufacturers of robots, i.e. Fanuc, KUKA, Yaskawa, ABB, UR, Mitsubishi Electric, TFM Robotics. In addition, "The platform gives the opportunity to share the created technological solutions and make them available to all users. Thanks to the availability of these solutions, platform users can design their own solution, based on the analysis of already existing ideas. Thus, cooperation, and not competition, is a distinguishing feature and the key to the platform's success "- added P. Wiśniewski (ISBnews).

The DBR77 Robot Platform is a new business model, the purpose of which is to enable the perfect adjustment of robotic solutions available on the market to precisely described specific customer needs. In order for such a perfect match to be possible, it is necessary to standardize the data relevant to investment decisions. The work process on the DBR77.com Robot Platform is organized in such a way that the final adjustment of the solutions is optimal. An integrator on the DBR77 Platform is anyone who, independently or in cooperation with other entities, is ready to propose the concept of a Technological Solution submitted by the Investor. The role of the Integrator can be both the development of the concept and the acceptance of the position delivery order. Thanks to the work on the DBR77 Robot Platform, the integrating company can focus on the execution of orders related to the construction, implementation and commissioning of robotic stations. All activities related to customer acquisition, analysis of the effectiveness of the robotization concept, submission of the offer and carrying out the required formalities are undertaken by the Robot Platform. The integrator only has to integrate the position.

The platform limits the costs associated with obtaining an order to zero. The information contained in the inquiry, also presented in the 3D studio, is sufficient to prepare the concept of the position and financial analysis of the offer. An integrator receiving an inquiry in the form of the described Technological Challenge may immediately start working on the concept of a technological solution. Thanks to the technology used in Studio 3D, people involved in the development of the concept of the station can easily analyze and build production stations. Thanks to the 3D Integrator studio, it does not submit offers that do not make any sense for investors. When designing the Technological Solution, the application automatically calculates the operational and economic effect of the prepared concept of the position. The entire relationship between the Investor and Integrator on the platform is carried out in accordance with the best business practices. The clarity and simplicity of the process ensures the security and transparency of transactions. The Investor and Integrator are safely guided through the entirety of transactions and implementations, in accordance with the best practices in project management.

The following steps are presented in Fig. 2: the process begins with the registration of the Investor (production plant) that provides a small amount of data describing the way work is organized in the plant. In the next step, the so-called "Technological challenge" is placed on the platform, which describes in the proprietary 3D editor what type of workstation should be robotized. The technological challenge is then made available on the platform to be solved. The data contained therein are sufficient to prepare the concept of a technological solution. On the other hand, the platforms are registered by Integrators (suppliers of complete robotic positions) that have access to reported technological challenges. In the environment of proposing technological solutions, a list of the best ideas for a given Challenge is co-created. Then, these solutions are subject to the bidding process. The platform supports the investment decision-making process by analyzing the operational and financial effectiveness of competing

offers in real time. The DBR77 Robot Platform allows you to significantly accelerate the robotization of production plants by reducing market ineffectiveness.

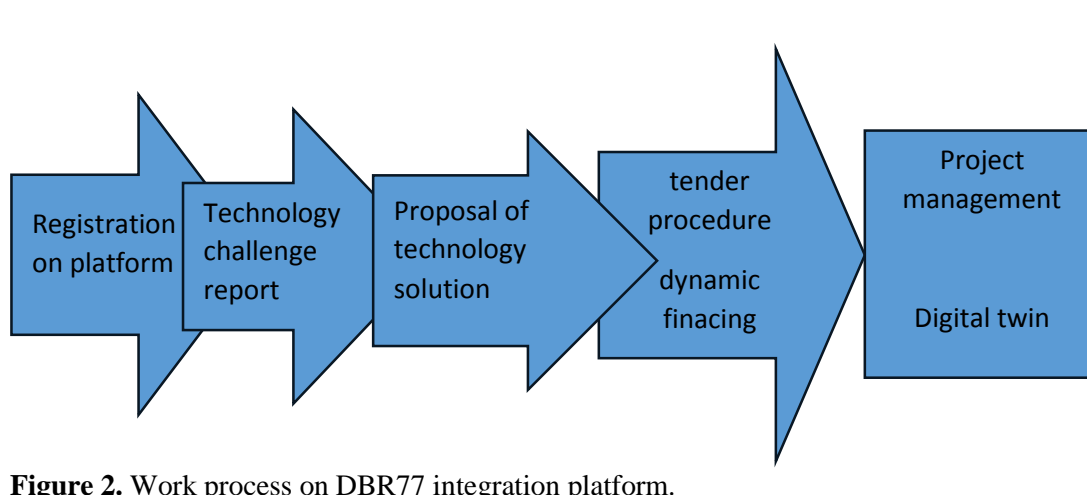


Figure 2. Work process on DBR77 integration platform.

source: Based on materials from DBR77.

The model described carries a unique value offer for both investors and installers. Investors finally have the opportunity to compare both technical and financial conditions, different technological solutions based on different robots. Thanks to the possibility of co-creating solutions on the platform, the design cycle is significantly shortened. At the same time, the available history of already completed projects and their analyzes describing them makes the submitted proposals much more effective from the very beginning than those available in the traditional way. As a result, the process of installing robots becomes cheaper and more efficient, leading to greater availability of robots. Thanks to the platform, integrators can more precisely respond to market demand. By reducing the time and costs spent on sales, companies integrating positions can focus on building positions and developing their own technical competences. Platform companies thrive and grow thanks to the scale effects of collaborative networks. The economies of scale make the platform more valuable as the platform's users create and exchange more value with each other.

The DBR77 Robot Platform reduces entry barriers for both sides of the market. Small and medium-sized production plants no longer need huge financial resources and specialized competences to develop and implement (the platform also provides Robot as a service - RaaS) robots on production lines. Integration companies no longer need to engage sales forces to reach the customer with the best offer. The robot platform has also implemented mechanisms supporting the development of its participants and the scale of the cooperation network. Firstly, trust in integration companies is built through a clear form of evaluation of the technological solutions they submit and the positions they perform. The second phase of project implementation, after selecting the offer, is also carried out on the platform, which means that the project is carried out in accordance with the best practices in project management. Following the process enforced by the project management tools on the platform guarantees successful installation. The third tool to support the development of the platform's reach is the

implementation, in cooperation with other market participants, of further modules for resolving competences for market participants.

6. Conclusions and practical implications

It can be concluded that the elements of a smart factory, automation and robotization is the basis of the business model and is the basis for determining that robots produce robots. Digitization in modern enterprises is very important, hence **the answer to the first research question** is positive that the role of such automation or robotization is necessary for industry 4.0 because enterprises in Poland are only beginning to notice the benefits of Industry 4.0. Understanding them will allow for the development of automation and robotization to achieve a higher level of digital maturity. The discussed research and studies of reports on the level of digitization - made it possible to evaluate the activities undertaken by Polish enterprises. The reports also indicate the recommended actions that should be started to spread robotization in Poland. A. Sobczak (2018) wrote about it earlier that there is not enough research in the publication: Robotization of business processes- current status and development directions (Sobczak, 2018), but valuable is also a publication of theoretical nature supported by the opinions of practitioners, edited by B. Gregor and D. Kaczorowska-Spychalska (2020). Digital technologies in business. Enterprises 4.0 and artificial intelligence (978-8-3012-1407-4), First Edition, PWN Scientific Publishers, Warsaw [URL]. Moreover, this is confirmed by a review of this publication prepared by Prof. Dr. Jan W. Wiktor and published in Organization Review 11/2021.

Answering the second question, it was the review of the conducted publications and reports that allowed to present the methods of assessing technology implementations according to the Simen's method, along with the DIGI and DESI indicators achieved by Polish industry companies in the following years. They are not satisfactory because Poland has a low level of achieved results (the digital gap is visible in almost all indicators), but this system allows each company to be able to carry out such an assessment of its digital maturity level. Therefore, it is worth keeping a close eye on the digitization of the economy. This is confirmed by the DESI (Digital Economy and Society Index) commissioned by the European Commission, which shows that in almost all areas of digital transformation, Poland differs from other Member States of the European Union. A supporting method is also the previously described ADMA method- Advanced MANufacturing.

The third research question confirms that it is innovative integration platforms as business model changes that help achieve better digital maturity. It is a great example for the implementation of innovative cloud models and technologies for industrial companies as well as a model for operating in the cloud. It is an example both for enterprises operating in the cloud

and for industrial startups - integrator companies. Moreover, it is worth emphasizing that technological change is not a compulsory necessity, but an opportunity to increase efficiency and effectiveness. However, according to entrepreneurs, new technologies also mean greater competition and access to a wider market.

In turn, the benefits that platform implementation brings can be put as: the digital marketplace allows to personalize products. Thanks to the availability of these solutions, platform users can design their own solution, based on the analysis of already existing ideas. Thus, cooperation, and not competition, is a distinguishing feature and the key to the platform's success. The platform limits the costs associated with obtaining an order to zero.

Thanks to the technology used in Studio 3D, people involved in the development of the concept of the station can easily analyze and build production stations. Thanks to the 3D Integrator studio, it does not submit offers that do not make any sense for investors. Thanks to the possibility of co-creating solutions on the platform, the design cycle is significantly shortened. As a result, the process of installing robots becomes cheaper and more efficient, leading to greater availability of robots.

The DBR77 Robot Platform reduces entry barriers for both sides of the market. Small and medium-sized production plants no longer need huge financial resources and specialized competences to develop and implement robots on production lines.

It should be emphasized once again that an important aspect of the research conducted is its contribution to the development of science. It may concern preparing the enterprise for hyperautomation - one of the key technological trends of 2022. Preparing a company for hyperautomation should begin with gathering information about all processes, as well as gaps, delays and the so-called bottlenecks. The work may be facilitated by the preparation of digital twins to facilitate the visualization of activities. Next, one needs to determine which data is necessary in orderly processes, define the automation platform and techniques, and check where it is worth enabling AI algorithms (Grendys Industrial Guide, 2022; <https://przemyslprzyszlosci.gov.pl/author/aleksandra-grendys/page/20/>). Science has not yet fully realized that there is a lack of knowledge and has not dealt with the fast-paced education process in this regard. This also translates into such a low level of digitization of the Polish economy. But the theoretical publication supported by the opinions of practitioners, edited by B. Gregor and D. Kaczorowska-Spychalska, *Digital Technologies in Business*, is also valuable. *Enterprises 4.0 and artificial intelligence (978-8-3012-1407-4)*, first edition, Polish Scientific Publishers PWN, Warsaw 2020 [URL]. It is also confirmed by the review of that publication by J. Wiktor (2021). The limitations of the volume of work requirements do not allow for a broader analysis of platform systems.

The author is aware of the fact that due to editorial limitations have not been exhausted all the issues that are related to the processes of digitization or digitization of Polish companies.

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