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STARTUP AND THE ECONOMY 4.0

Abstract: *The aim of the article is to present an empirical analysis of the role of startups in the economy 4.0. The research was conducted in February-April 2020 in Poland. It has become important to identify how Poles perceive the role of startups in the 4.0 economy. The achievement of the goal was made possible by literature studies and a survey, the conduct of which made it possible to use a questionnaire made available on the Internet on social networks. The paper also presents a case study of a Krakow startup in which innovative solutions were applied on the online meal ordering market for employees. A case study of a startup operating in Poland makes it easier to understand the key function of a startup in the 4.0 economy thanks to its competences. Particular attention was paid to defining the concept of a startup, defining its features and financing sources. The information obtained shows that Poles' awareness of the importance of startups is at a good level, they understand the essence of this type of organization very well and see it as a great opportunity. They perceive startup as an innovative solution (business idea) that is needed in some industries that offer innovative products. The vast majority of the respondents associate startups with the IT industry and technologies, which is the right direction of thinking. The study shows that the quality of products for Poles is not only a determinant of the development of startups, but of all organizations. Managing the stream in the 4.0 economy requires respecting the assumptions of, inter alia, the concepts of knowledge management, corporate social responsibility, sustainable development or comprehensive quality management (TQM).*

Keywords: *startup, economy 4.0, innovations, digitization, technologies*

1. Introduction

The growing political instability of the world, the need to adapt to changes caused by the pandemic (Covid-19), results in the economic crisis occurring in many countries. Atmospheric (climate) changes, demographic changes, and the emerging opportunities to use new informational technologies are also important, which

means that in order to survive, organizations must at least adapt to them. The necessity to operate an organization in a dynamically changing and complex environment obliges the managers to seek sources of competitive advantage (Zalewski, 2016).

It seems rational to see opportunities to improve the quality of the organization's functioning and its development in new forms of its organization. It is possible

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thanks to the competences of the employees (among others mobility, flexibility in solving problems or working in a team), which determine the effective use of the strengths of the organization and the limitation, and if possible, eliminating the weaknesses. It is important for organizations to be able to properly use the opportunities and avoid threats. Therefore, it should be recognized that the quality of the organization's functioning in the 21st century depends to a large extent on the competences that determine the meeting of the emerging challenges, which include:

- globalization, which is related to the ability to identify sources of competitive advantage of an organization on the international market and to use the opportunities that result from it,
- effectiveness of monitoring the environment, diagnosing the market situation, developing competences conditioning the anticipation of changes, skillful survival of crises,
- competitiveness, the ability to manage resources necessary to gain an advantage over others,
- satisfying the expectations of stakeholders in a way that determines the achievement of lasting success, understood as the ability to develop in the long term,
- the ability to adapt to the principles of an economy based on knowledge (information), which results in the improvement of the quality of relationships with partners, the creation of business networks.

In a dynamically changing and complex environment, the resource that most often determines the possibility of developing a competitive advantage is knowledge, i.e. expenditure with great potential, determining the quality of functioning and development of the organization. Knowledge is reflected in the level of economic development. The changing environment and the fourth

economic revolution currently taking place forces organizations to constantly adapt their competences to new conditions.

The currently developing economy 4.0 brings with it a revolution in traditional sectors and a change in the model of the economy through the use of digital solutions. A startup that creates innovative products in areas considered to be the pillars of the current revolution, i.e. Big Data, the Internet of Things (IoT) and analytical solutions, seems to be an ideal type of organization in the 4.0 economy. Startups are organizations that are relatively new organizational solutions in the Polish economy. However, their importance for economic development is undeniable, if only because of their participation in preparing Poland to accept the principles of economy 4.0 (Tomczuk, 2018).

The aim of the article is to provide an empirical analysis of the role of startups in economy 4.0. It may seem that this form of organization can be considered crucial for the quick implementation of the economy into the new reality. Particular attention was paid to defining the concept, distinguishing the features of a startup, identifying financing methods and functioning of the startup in practice. The implementation of the chosen goal was possible thanks to a literature review, a questionnaire survey and presentation of a case study. The article presents the perception of startups by the surveyed group of Poles. An attempt was made to create a definition of a startup based on the conducted research

The article is supplemented by describing an example of a Polish startup that created an application for ordering meals initially by office workers, and currently for everyone interested. The solution proposed by the startup shows how finding a new innovative solution can affect the quality of human life. In fact, the description of the startup's functioning allows for a better understanding of its importance in the 4.0 economy.

2. Startup in the economy 4.0

The beginning of the 21st century brought with it the fourth economic revolution called industry 4.0 or economy 4.0. It is related to the invention of the Internet and its possibilities. For the first time an economic revolution is foreseen a-piori, and not as previously observed after the fact. This allows entrepreneurs and research institutions to somehow shape the future, increase efficiency, and also create completely new business models, products or services.

So far, no unambiguous definition of this term has appeared in the literature, and only attempts have been made to define it. Germany Trade and Invest (GTAI) defines Industry 4.0 as: “a paradigm shift made possible by technological advances that reverse the logic of the conventional manufacturing process. This means that an industrial production machine simply no longer “processes” the product, but that the product communicates with the machine to tell it exactly what to do ”(Sniderman et al., 2016). A very similar definition of this concept is proposed by H. Kagermann et al. (2013), who wrote that Industry 4.0 is: “a network of autonomous production resources, able to control themselves in response to various situations, self-configuring, knowledge-based, equipped with sensors and spatially distributed, as well as covering appropriate planning and management systems ”. In turn, M. Hermann et al. (2016) claim that Industry 4.0 is “a collective term for the technology and concept of the value chain organization”. H. Lasi et al. (2014): write that “Industry 4.0 describes the increasing digitization and automation of the production environment, as well as the creation of digital value chains to enable communication between products, environment and business partners ”.

Economy 4.0 is primarily determined by innovative technologies, as well as new methods of organization or management and

ways of working. Economy 4.0 puts forward a technological zone with soft competences in the form of intelligent machines, autonomous robots, augmented reality, which are to support the design of new products as well as production and management processes. The new economy also means data analysis, cloud computing, the Internet of Things, and cyber security. The economic revolution is also changing the function of a man who is transforming from a manual worker into a specialist for handling intelligent technology (Łapuńska, 2017).

The transition to economy 4.0 depends on the use of opportunities and elimination of emerging barriers (Schwab, 2018). The main barriers include: high costs of introduction, low awareness of the topic and openness to new ones, and the demand for engineers (Szum, 2019).

The following should be considered important in the economy 4.0 (Roblek et al., 2016):

- smart factories,
- internet of things and self-organization,
- open innovation, organizational learning and presumptions,
- cyber physical systems,
- new production, distribution and procurement systems,
- sustainable development and resource efficiency.

The development of digital technologies is a new challenge for organizations (Rippa & Secundo, 2019; Thomas, Passaro, & Quinto, 2020; Ilić et al., 2019; Weber & Chatzopoulos, 2019).

The digital revolution is not only changing traditional business models, but redefining entire industries. Digitization brings profound changes in all spheres of life. It enables us to deliver products that meet customer requirements and exactly when they are needed. This direction of changes is triggered by consumers who more willingly

than before give up having a large amount of exclusive resources in favor of sharing. Another element is the Internet of Things, understood as devices with sensors that enable their communication (more efficiently than human participation). Big Data and analysts that power artificial intelligence examine our behavior and consumer, communication or nutritional and health habits, and then identify our needs, suggesting solutions. All this delivers the product to consumers in a timely manner (<https://www.pb.pl/w-gospodarce-4-0-jest-miejsce-dla-wszystkich-898687>).

In order to achieve the sustainability of the effects of managing the organization in accordance with the principles of economy 4.0, it is necessary to constantly analyze and draw conclusions based on the provided data. Competences that determine the efficiency and effectiveness in sharing knowledge and information within the organization are important. Another important aspect is to combine sales, distribution and production into one system that will be effective, able to improve, eliminate inefficiencies, and thus reduce the cost of the process. It is also important to implement a flexible approach in various aspects, e.g. meeting customer needs. The ubiquitous digitization in everyday life is an opportunity for companies introducing new products to the market, as it is becoming easier and easier to respond to customer needs thanks to the tools we have for this purpose.

The improvement and development of the organization's competences has an impact on the quality of its functioning, understood as the ability to at least adapt to the existing conditions. The quality of the organization's functioning is reflected in the ability of employees and the organization to effectively and efficiently transform inputs (input resources) into outputs (expected products, optimal management of the waste generated) as part of the transformation

processes. Such action becomes possible when the structure is created in the organization (Kolman, 2009): spatial, personnel, functional, experiential, economic, ecological (Table 1).

So far, no study has been prepared in Poland that would indicate in detail what role startups will play in the fourth industrial revolution. However, we can find mentions of various authors who see important aspects of the operation of these organizations in the economy 4.0. Białoń & Werner (2018) note that 76% of startups in Poland operate in the research and development model, and moreover, most of them operate in areas closely related to the 4.0 economy, such as Big Data, the Internet of Things. They also see their advantage over traditional organizations in the context of the infrastructure needed to operate, which in the case of startups is much less extensive and expensive (than in the case of traditional organizations), and their strength is people (their competences), i.e. what the economy 4.0 is mainly based on. Trębicki (2019) believes that startups introduce new business models and solutions, which is possible thanks to technology in the 4.0 economy. Such a procedure helps to reduce ineffectiveness in many industries. He believes that startups influence the growth of their innovativeness and their development, i.e. they play a key role in economic development.

Large industrial organizations wanting to gain a competitive advantage in the face of constant economic changes related, among others, with the transition to economy 4.0 can gain it thanks to flexible and effective adaptation to subsequent changes. It often happens, however, in order to obtain innovative knowledge, the resources owned by the organizations are not enough. Here there is a great opportunity for startups with relatively young forms of organization, providing innovative solutions, products or services.

Table 1. Structures determining the optimal quality of organization functioning (Own study based on: Kolman, 2009)

Type of structure	Characteristics
Spatial structure	The creation of ergonomic workstations should be considered crucial in the organization. It is necessary to provide equipment, build infrastructure that determines the optimal implementation of processes, or provide the required number of warehouses.
HR structure	Improving staff competences, ensuring working conditions that are satisfactory for the employee, stimulating the level of his involvement in the tasks performed. This is favored by the shaping of the atmosphere at work that determines the establishment of interpersonal relationships based on mutual trust.
Functional structure	One should strive to shorten the length of the production cycle and ensure occupational health and safety. It is important to ensure the optimal quality of materials or created equipment.
Sensational structure	Ensuring a high level of humanization of work, occupational hygiene, aesthetic appearance of rooms and their optimal equipment conditioning the ergonomics of the workplace.
Economical structure	Achieving planned financial results in the conducted activity, striving to optimize the costs of running identified processes.
Ecological structure	Waste management is aimed at reducing their generation and increasing the capacity to use, creating organizational solutions that ensure the sustainable and sustainable development of the organization. It is important to ensure a high level of improvement in environmental protection activities.

Organizations establish cooperation with startups that help them implement innovative solutions. They are often unable to introduce them on their own due to their traditional methods of operation, which no longer prove effective in the new economic reality. Often, entering into cooperation with a startup turns out to be much better and cheaper for an organization that strives for excellence than acquiring experts to achieve specific goals. It often happens that recruiting experts is too time-consuming and costly.

In addition, startups have innovative knowledge that is invaluable and often impossible to acquire or create by the organization. It can, therefore, be concluded that startups are an opportunity for the growth of maturity of organizational solutions and condition faster adaptation to the principles of economy 4.0. It can be said that startups represent an innovative economy, thanks to which they can lead to the development of traditionally functioning organizations, whose development was still largely based on the struggle for market positions obtained thanks to price

competition. The initial cooperation of a startup with an organization operating according to classical rules obliges it to comply with the principles important from the point of view of economy 4.0. Start-up organizations have enormous potential to increase the level of innovation and competitiveness not only of the organizations themselves, but also of the national economy (Skawińska & Zalewski, 2020). Sami Lozano and Petros (2018) found that startups offer intelligent solutions that are more inventive than ever.

So sooner or later organizations will be forced to learn to act like startups, which is very difficult. Each side must learn to cooperate with each other.

Startups that achieve spectacular success can be called revolutionary. It is these young organizations that will implement radical innovations (Christensen, 2010). Examples include startups such as Facebook, Amazon or Google. These are the flagship examples that changed the way of looking at the organization in the 21st century. These examples mobilize young people to create

their own businesses. The idea of a startup paves the way for new entrepreneurs who are looking for new solutions to contemporary economic and social problems. Startups, which in their essence are focused on the continuous development of innovations and their implementation, constitute the foundation for creating a knowledge-based economy, in which there is no other development option than ensuring sustainable and sustainable development. Fast-growing organizations most often rely on new technologies and innovations based on a large amount of information and data (Burnat-Mikosz, 2016). By operating in the area of new technologies, as well as the digital economy, and characterized by diversity, startups contribute to the implementation of the fourth technological revolution.

The success of many startups is due to the ability to deliver a product that meets the needs of users. The development of innovative products entails the desire to improve the existing solutions that serve people on a daily basis. It can be argued that startups are a key element of the innovative economy of the future.

3. Startup as an innovative form of organization

It seems that the term startup was originally perceived and used in the wrong sense. Many people identified it with the initial activities of the organization. It was only in the 1970s that the concept of startup began to evolve towards a dynamic, ambitious and, above all, technological enterprise (Skala, 2018). At the beginning of the 21st century, many definitions of the term startup appeared in the literature. The most popular, but at the same time very general definition of a startup is that of Steven Blank, an entrepreneur from Silicon Valley, one of the creators of the lean startup concept. Blank claims that "a startup is a temporary organization that is looking for a repeatable

and scalable business model" (Blank, 2013). According to this author, a startup is not a small version of a large company. The basis of its functioning is the goal which should enable development and gaining new markets or their creation. Therefore, one should strive to find the best business model and create a financing structure that, as the business grows, is possible thanks to external investors.

The second best known definition was created by Eric Ries, who stated that a startup creates a new product in conditions of uncertainty and extremely high risk. A product created by a startup is associated with uncertainty as to its acceptance by the client (Ries, 2011).

According to Gupta et al. (2020) startups are temporary organizations offering innovative products and looking for repeatable and scalable business models. They prefer to use the accumulated knowledge to implement various market experiments.

Passaro et al. (2020) claim that startups are temporary organizations because, by exploiting innovation-driven market opportunities, they can propose a repeatable and scalable business model and grow rapidly in terms of sales, production value, and / or employee numbers. On the other hand, they are destined for acquisition failure by other companies, either in whole or as a business idea. "

Clayton Christensen sees startups as an organization that creates breakthrough innovations that change market patterns in the long run (Tomczuk, 2018). Agnieszka Skala, an expert from the Startup Poland Foundation, proposed a 'spiral definition of a startup'. According to this definition, a startup is "any organization with very limited resources and uncertain demand for its products (or no demand at all)".

It is difficult to clearly identify a startup among other types of organizations. An attempt to summarize this aspect was made by Krystian Bigos (2018), who, based on a Deloitte report, considered the most

important factors such as: the will to strive for the growth of the project and the degree of risk of the project.

According to the classification presented by Agnieszka Skala (2018), startups can be understood as:

- startup companies;

- new undertakings commercializing scientific achievements;
- entities that create and use digital technologies in their main activities.

Startups are characterized by (Malec, 2019): independence, innovativeness, ability to respond to customer needs, business scalability, uncertainty (Table 2).

Table 2. Key features of a startup (Malec, 2019)

Feature	Characteristics
Independence	The founders of a startup are natural persons who bear the risk, but at the same time have a significant impact on all areas of its operation: strategies, finances, operating and investment activities.
Innovativeness	It may refer to both the product (new features, new functionalities) and the process (e.g. a new way of producing a product).
Response to customers' needs	The startup first defines the user's problem, which is then solved by its activity, thus creating the target market for itself.
Business scale	This is one of the most important features of a startup, i.e. increasing its income without increasing operating costs.
Uncertainty	The operation of a startup is characterized by high risk, both internal (acquiring appropriate employees, financial liquidity, management errors) and external (incorrect identification of customers and their needs and inappropriate solutions).

Moreover, the startup is characterized by (Łopusiewicz, 2013):

- relatively low costs of starting a business (startups usually do not require specialized machines or tools at the beginning),
- higher risk of undertakings than standard (there is no certainty that the offered product is accepted on the market),

- high return on investment, much higher than in the case of standard projects (if you find your target group on the market).

Szymon Wierciński (2015), analyzing the ways of strategic thinking among startups, proposed the classification of individual types of entrepreneurs establishing startups. He distinguished among them: testers, replicators, visionaries, partners (Table 3).

Table 3. Types of entrepreneurs establishing startups (Wierciński, 2015)

Description	Characteristics
Testers	People without experience, engaging in many initiatives at the same time, thus reducing the risk of possible start-ups. These people are very flexible, open to a new business idea.
Replicators	Entrepreneurs who base their actions on copying or duplicating already existing patterns, estimating the level of risk in individual markets and applying the traditional approach to management.
Visioners	Experienced startups with experience and failures behind them, who, despite their flexibility, largely plan their next steps.
Partners	People with a lot of ideas, seizing opportunities and getting involved in other activities. The search for new business partners and partners is becoming increasingly important, but the organizations they set up most often fail.

People setting up startups are mainly characterized by (Matuszczyk, 2019):

- young age (although in Poland there are more and more startups established by forty-year-old experienced managers),
- gender (usually the person founding the startup is a man),
- higher education (interestingly, successful managers who graduated in the field of social sciences are

successful, contrary to appearances).

Startups would not have a chance for development if it were not for funding, which at various stages of the organization's operation is obtained from various sources, including: bootstrapping, crowdfunding, Venture Capital funds, Business Angels funds, accelerators and others (Table 4).

Table 4. Sources of funding for startups

Description	Characteristics
Bootstrapping	The most common way to finance startups at the beginning of its operation. No influence of funds from external investors. Funds for starting a business come from private funds of the founders and their families (Malec, 2013).
Crowdfunding	It consists of supporting a specific undertaking, even with small amounts, through services that make it possible to make such a message available to the public (Luboš, 2019).
Venture Capital	Funds usually brought by investors to small or medium-sized companies at an early stage of development. The main reason for investing in this case is the very high potential for significant returns on investment after a few years (Tamowicz, 2004)
Business Angels	Natural persons, often former entrepreneurs or managers who have capital, experience, as well as business contacts and look for ventures at an early stage of development that will take the risk related to the investment and in return receive shares in the organization (Grzegórska, 2010).
Accelerators	Programs aimed at supporting business. In exchange for small shares in the organization, they offer mentor support, a place to work and help in finding capital (Kogut, 2017).
Other funding sources	In practice, we can distinguish: strategic investors, industry investors, seed funds or bank loans.

4. Perception of a startup by the surveyed group of Poles

Startups remain an undiscovered form of organization. Just as there is no unambiguous definition of this concept, there is no unambiguous perception of this project by consumers. The results of the research aimed at presenting how startups are perceived by the group of Poles covered by the study will be presented below. The research was conducted in February-April 2020 in Poland.

In order to conduct the research, a questionnaire was used, which was made available online on social networks.

The research was conducted on a group of 300 Poles answering the survey questions. 65.3% of women and 34.7% of men took part in the study. The study group was dominated by people with higher education (67%), the remaining 34% were people with secondary or less education. A significant proportion are working people (31%) or working students (34%). Students who do not work account for 31% and the unemployed account for 4%.

In the first question, respondents were asked when they first encountered the concept of a startup. The subjects were asked to choose the appropriate time period. The results are shown in Figure 1.

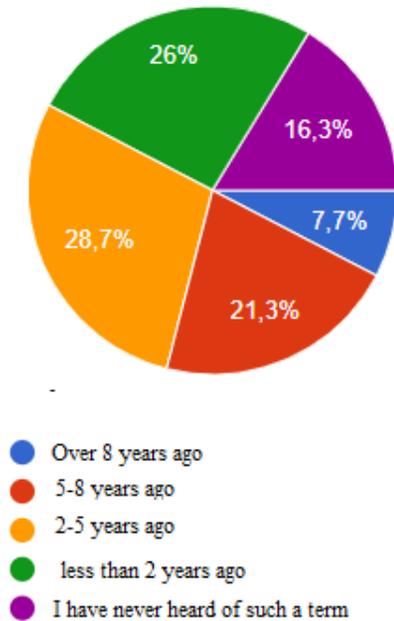


Figure 1. First meeting with the concept of startup (Source: Own study based on the survey conducted)

In the next question, Poles were asked how they understand the concept of a startup. The respondents could choose three answers from the proposed definitions. One of the definitions is intentionally incorrectly provided. The results are presented in table 5.

Most people in this question indicated one of the shorter definitions of "startup is an innovative form of organization" and "startup is an organization that uses external financing and methods aimed at finding the optimal way to create value for customers based on innovation, which can then be replicated on a global scale ". It is worth noting that the deliberately placed statement that "startup is any new form of organization" was indicated the least times by the respondents. This may prove that Poles' awareness of the essence of startups is at a good level and is not mistakenly identified with something new. Poles do not mistakenly identify startups as any new organization, which indicates a higher level of public awareness of startups.

Table 5. Understanding the concept of startup by the respondents (Source: Own study based on the survey conducted)

Responses	Structure%
A startup is an organization that uses external financing and methods aimed at finding the optimal way to create value for customers based on innovation, which can then be reproduced on a global scale (Malec, 2019).	60%
A startup is a new, innovative form of organization (Skala, 2018).	58,70%
A startup is a temporary organization that is looking for a profitable and scalable business model (Blank, 2013).	47,70%
A startup is an institution created to produce new products in conditions of extreme uncertainty (Ries, 2011).	44,70%
A startup is a temporary organization in the early stage of the life cycle (https://mfiles.pl/pl/index.php/Start-up).	36,70%
A startup is any organization that has very limited resources and an uncertain demand for the products offered (Skala, 2017).	25,30%
A startup is any new organization.	17,70%

The next question required the respondents to express their opinion on the startup as an organization. The respondents could select

three responses from various statements, both negative and positive. The results are presented in table 6.

Table 6. Startup assessment by the respondents (Source: Own study based on the survey conducted)

Responses	Structures %
A startup is a new organizational form that will become more and more popular in the future.	62%
A startup is a great idea for organization.	57%
A startup is an organizational form that works only in certain industries.	51,70%
A startup is a very effective organizational form that is needed on the market.	43,70%
A startup will only work for truly innovative products.	43,70%
A startup is an organizational form that will disappear from the market over time.	21,30%
A startup is not a good business idea.	19%
A startup is an organizational form that will not last long on the market.	10,70%

In the opinion of the respondents, a startup is a form of future organization, a great idea for a venture but also works in a specific industry. The respondents believe that the startup will not disappear from the market in the future.

In the next question, the respondents were asked whether they would decide to run a startup organization while creating their own organization and what would be the motive for doing so. The respondents could choose one answer. The answers are presented in table 7.

Table 7. Motives for creating startups (Source: Own study based on the survey conducted)

Responses	Structure %
Thanks to a startup, you can get a big market advantage, better prepare and adjust the product for the client.	24,70%
A startup is a very interesting form of organization that meets the needs of the market.	20,30%
Running a startup is beneficial because it has great development potential.	19,30%
A startup is a form of organization that will not work in the industry in which I would like to work.	15,30%
Currently, most people decide to run an organization such as a startup.	6,70%
When starting a startup, you wait too long for real profits.	5,30%
A startup is too risky an organizational form.	5%
Only proven and old organization models are most effective in business.	3,30%

The most common motive for creating startups among Poles turned out to be the perceived competitive advantage of this form of organization and better adaptation of the product to customers, and the fact that it responds to the current market needs. Obviously, the statement that older models are more effective in business than startups

was not confirmed by the respondents. Then, the respondents were asked about the industries in which the startup, in their opinion, has a chance of success. Everyone could select three industries from the presented ones. The results are presented in table 8.

Table 8. Industries in which startups have the greatest chance of success according to the respondents

Responses	Structure %
IT branch	75,3%
entertainment branch	45,3%
telecommunication branch	40,7%
industrial branch	29,3%
fashion branch	26,3%
banking branch	20,3%
food branch	18,0%
medical branch	17,3%
hoteling branch	15,7%
building branch	7,7%

By far the largest number of people indicated the IT industry as the best for the development of a startup (75.5%), which may prove that startups are well associated with technologies. The smallest number of people indicated the construction industry (7.7%) as the one in which a successful startup may appear.

The respondents were also asked if they knew organizations starting up as a startup. Only 25.3% answered the question in the affirmative, and as many as 74.7% answered negatively. The respondents who answered yes, were asked to name these companies. The answers included companies such as: Uber, Codewise, Airbnb, Revolut, Tinder, Spotify, Snap, Lyft, Brand24, e-traveler, Reliability Solutions, Cardiomatics and Consenance, Facebook, DropBox, Spotify, InPost, SmartPlace. The results of this question may indicate that, although the concept of a startup is understood, it is often forgotten who started their business in the form of a startup. People who mentioned examples of scabs indicated several companies, which indicates that world leaders are associated with their beginnings and are an inspiration for the young generation of entrepreneurs.

In the last question, the respondents were asked how important the quality of the product offered by the startup is for the development of a startup. The respondents could indicate only one answer. The results are shown in Figure 2.

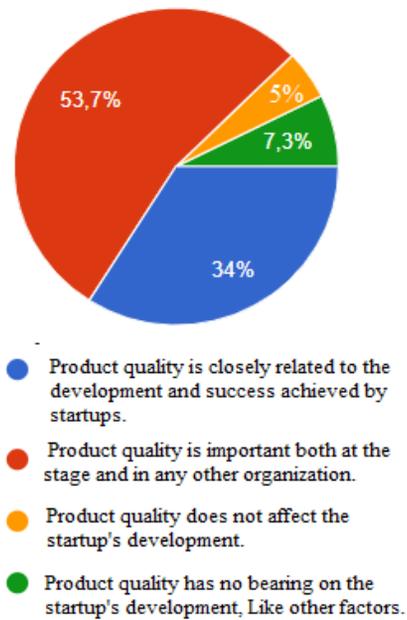


Figure 2. The perception of the importance of product quality by the respondents (Source: Own study based on the survey conducted)

The respondents clearly indicated that product quality is as important in a startup as in any other organization (53.7%). The smallest number of respondents indicated that the quality of the product did not affect the startup's development (5%). It can therefore be concluded that product quality is one of the key factors with which Poles would like to identify all organizations, not only startups.

Based on the information obtained, an attempt was made to identify the startup as seen through the eyes of a Pole. The study shows that in Poland startup is perceived as "an innovative and future-oriented form of organization, which is an ideal business idea, especially in the case of certain industries and products. It is perceived as an effective and necessary business solution.

When analyzing the obtained results, it can be concluded that the surveyed group of Poles:

- they know the concept of a startup and associate it with innovative products, especially in the IT industry,
- sees startups as a chance to develop a great competitive advantage and operational efficiency, mainly in selected industries
- such as: IT, entertainment and telecommunications industry and the products they offer.

The most famous startups among Poles are: Uber, Facebook, Spotify, i.e. organizations offering products used mainly by the young generation of Poles.

The study shows that the quality of products for Poles is not only a determinant of the development of startups, but of all organizations.

5. Functioning of a startup in practice and the economy 4.0 - Case study

Innovation and modern solutions are characteristic of the economy 4.0. An example of a Polish startup that offers an innovative solution on the online meal ordering market is a startup that created an application for ordering lunches by office and production workers.

A startup is an innovative solution because it combines and meets the needs of employers, employees and restaurants in one place. Companies offering a benefit to their

employees in the form of a meal subsidy may subsidize meals of their employees ordered through the application in any amount. Employees can place an order individually from a restaurant of their choice, for a selected time, without delivery costs and the minimum value (using the grant from the employer). Restaurants receive collective orders for several or a dozen orders to specific places, at a specific time and in advance. Thus, they can plan their production for a given day and plan the routes of their drivers. The startup's vision is to facilitate and promote eating a healthy, wholesome meal at work. Thus, influencing the efficiency and quality of work of employees. On the other hand, employers have the opportunity to introduce a benefit in their companies, which in a real and everyday way improves the quality of life.

The described startup has achieved a decisive competitive advantage thanks to customer grouping (logistics), an application that allows for quick preparation of meals (social aspect) and the Customer Service Office solution (social aspect). The startup manages to achieve the required result thanks to the synergy effect of human competences and modern technologies (Chursin & Strenalyuk, 2018). The stronger potential of a startup is: leadership, employees, technological development ability and exit.

The style of leadership affects a startup's success. Research shows that success depends on the type of leadership (Zaech & Baldegger, 2017).

It is advisable for a startup to have transformational (charismatic) leadership. Leadership is a word for this organization in achieving goals and improving efficiency (Nielsen et al., 2016; Rizki et al., 2019). Transformational leadership is characterized by attention to employee development. It becomes possible to discover and improve the competences of employees, which results in effective problem solving. Moreover, transformational leadership means

communicating a positive vision of the future, support and recognition for people, motivating individual development, independent, creative thinking conditioning the development of an organization, Gaviria-Rivera & Lopez-Zata, 2019).

The advantage of a startup is also the amount of knowledge, not only technological, but also practical and knowledge derived mainly from the leader. Often the startup development process is driven by human resources or skills (Tsolakidis, Mylonas & Petridou, 2020).

The Krakow startup is managed by an experienced manager who has been working intensively for two years on the development of the application and obtaining funds for this purpose. It also focuses on building a team that already today consists of young and ambitious employees who focus on the development of both their own and the organization.

Thanks to such actions of the leader, the organization develops in a sustainable and sustainable manner: on the economic, social and environmental levels. Employees are one of the key elements of the organization thanks to which a startup develops and gains a competitive advantage. The selection of the first twelve employees for the startup turned out to be crucial for its development. Employees' competences can determine the future of a startup, its success or failure. The most important thing is for the team of employees to share the same values and standards. This is a precondition for creating an organizational culture oriented towards quality, trust, respect and mutual cooperation.

(<https://www.arp.gda.pl/plik,3355,zarzadzanie-wstartupie-zasady-organizacji-i-budowy-zespolu>).

Employee competencies play a key role in both a startup and economy 4.0. Therefore, both hard competences and soft competences should be shaped. The surveyed startup has already passed the stage of selecting the first twelve people for the organization. It

currently employs around 20 people who work on new application solutions and product development every day. Further additional solutions for clients, employers and restaurateurs are successively introduced.

Technological development in the Krakow startup is extremely important in order to provide better and better products for users and adapt it to their needs. It would not be possible without the subsidy from the Venture Capital fund, which has been financing the development of the startup and its product for a year. Thanks to the support received, the application develops at a very dynamic pace, introducing newer and newer system improvements. These activities contribute to increasing comfort and quality for employees, employers and restaurants. In addition to the development of the web application, the mobile application for customers and restaurants is also being developed.

A startup operates in accordance with the principles of sustainable development, which means that for managers and employees it becomes important to meet the needs of not only the present generation, but also the future ones (Pindór, 2005). In the Krakow startup, the actions taken on a daily basis prove compliance with the principles of sustainable development. Firstly, grouping orders and deliveries at a specific time allow the restaurant to combine deliveries into one collective course. Thus, the driver covers much less km during the working day, which in a way improves the air quality in the city. Secondly, the website promotes biodegradable packaging, each customer can make an informed choice. Thirdly, the startup provides companies with an original poster, through which it teaches employees to properly segregate packaging after eating lunch at work. Fourth, the dishes are ordered without plastic cutlery. The above competences perfectly fit into the dimension of economy 4.0.

Above all, the startup also reacted swiftly to the Covid-19 crisis. It extended its service with deliveries to the homes of employees working remotely. Thus, employees do not have to waste time cooking while working or spend additional money on delivery costs, the employer, even in this difficult period, when most benefits have been withheld, can still provide it to employees. On the other hand, orders continue to flow to restaurants, which are often one of their main income during a pandemic. Deliveries are contactless, and customers receive information that an order is waiting at the door via the application. In 2020, a blog was also created, where the startup regularly publishes information on nutrition at work, the benefit itself in the form of co-financing, as well as information on safe deliveries during a pandemic. Thus, the startup additionally educates its clients and raises their awareness about proper nutrition.

It can certainly be said that the described startup is an innovative venture that fits into the economy 4.0. The product he offers is both an innovative solution and a tool for its implementation. Its advantage is the ability to connect different stakeholders to meet their needs.

6. Summary

The world is currently in its fourth economic revolution, with ubiquitous digitization at its center. Successive organizations, wanting to gain a competitive advantage, try to adapt to the changes imposed by the developing environment. Startups perceived as organizations providing innovative products come to their aid. They play a huge role in advancing the economic revolution. Startups are an innovative form of organization looking for a business model that can scale. Currently, there are several thousand startups on the Polish market that provide many solutions, largely also those considered key in the 4.0 economy.

The article presents the economy 4.0, its characteristic features and the most important issues related to it. This part was an introduction to the topic of the participation of scabs in the ongoing revolution. A startup was given as an example of an innovative form of organization. This was to help understand the essence of a startup in the 4.0 economy. The conducted research shows how startups are perceived by Poles. It turns out that this concept, although relatively new, is already quite well known and understood by them. A startup is perceived positively and is seen as an opportunity for success, especially in the IT industry.

Based on the research, it should be concluded that Poles' awareness of the importance of startups is at a good level. Poles to a large extent met the concept of a startup a few years ago. Most of them understand very well the essence of this type of organization and see it as a great chance for success in the future. Based on the conducted research, it should be stated that a startup is an innovative solution that is needed in selected industries and in the case of selected products. It is perceived as a great business idea. The vast majority of respondents associate startups with the IT industry and technologies, which is the right direction of thinking.

The description of the Krakow startup perfectly illustrates how startups improve the quality of human life and respond to their needs. Despite the fact that the economic revolution is still ongoing, it can already be said today that startups will play an important role in it and will support the economy in adjusting to the principles of economy 4.0.

The literature review presented in the article, as well as the case study, proves that startups will play a significant role in the economy 4.0. The principles of their functioning oblige them to respect the principles of generally recognized concepts such as knowledge management, corporate social

responsibility, sustainable development of the organization, or comprehensive quality management (TQM). The article collects and presents the key tasks that startups fulfill in the 4.0 economy and shows how they affect its development. The presented case study

shows what it might look like in reality.

This research is one of the first conducted in Poland and should be an inspiration for the next ones.

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