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The Start-Up Competence Self-Assessment Tool[*]

Keywords: start-up; competences; self-assessment

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Abstract

Theoretical background: The role of start-ups is growing for many reasons, and their impact on the economy and society is becoming increasingly significant. Younger generations, such as Millennials and Generation Z, are more entrepreneurial and eager to start their own companies. Growing acceptance and promotion of entrepreneurship as an attractive career path. The widespread digitization of business processes and daily life is creating new opportunities for start-ups.

Purpose of the article: For these reasons, the authors have set themselves the goal to identify the start-up competencies and to develop a tool for self-assessment, which can find practical application. The authors decided to survey and determine the level of start-up's competencies, which enables the use of a self-assessment tool. In order to be able to realize this objective, it was necessary to answer the questions: which competences of a start-up will determine its development and how can they be self-assessed?

Research methods: Awareness of the challenges and the key competences necessary to meet them determines the development of start-ups. Based on the results obtained, the key competencies conditioning the maturity of a start-up were found to be: the ability to take risks, obtain funding for development and develop a competitive advantage. The survey questionnaire was completed by 500 people working in start-ups.

Main findings: Conducting a self-assessment helps to determine the level of development of the organization's competences necessary to increase its maturity, as it makes it possible to gain information that determines effective development actions. This guides the implementation of organizational solutions necessary to increase the effectiveness of strategy implementation. The research conducted is one of the first in Poland and may inspire further research. The limitation is the number of respondents who took part in the survey. Nonetheless, their conduct has made it possible to identify perceptions of competencies (assigning weights) that condition the functioning and development of start-ups.

Introduction

Today's economic reality is challenging many organizations. Following the implementation of automation and the spread of digitization, the development of smart manufacturing is being promoted, requiring access to resources, above all knowledge and financed resources (Masood & Sonntag, 2020). The limitations of the Industry 4.0 concept are already apparent, with insufficient attention paid to sustainability or the impact of the transformation on society (ec.europa.eu). This leads to an orientation towards the techno-social revolution principles of Industry 5.0 (Xu et al., 2021).

Managers of organizations need to see the opportunity in the integration of the robot and human work zone, keeping in mind the humanization of industry (Lis & Małysa, 2021). Organizations aiming for sustainable success, understood as the ability to grow in the long term, must be oriented to the environment in which they operate. Nowadays, significant importance is attached to the excellence of existing solutions, which makes it possible to generate not only financial, but also non-financial benefits, e.g. improved image. Experience, the ability to use knowledge effectively, and the ability to learn and draw conclusions are becoming important. Self-assessment, as an improvement tool, appears to be useful in this process. ISO 9000:2006 defines self-evaluation as a comprehensive and structured analysis of an organization's activities and performance, relating to a quality management system or an accepted model of excellence (ISO 9000:2006: 21). This concept, which originated from the practice of self-monitoring used in manufacturing, has been

extended to all areas of management in an organization. Self-assessment provides a better understanding of the causes of the current state of affairs and identifies real opportunities to improve processes, systems and products. Moreover, it encourages a systematic review of actions taken and an assessment of their effectiveness, which promotes the implementation of corrections and preventive actions, and thus affects the efficiency of the organization (Szkiel, 2015).

Effective use of the resources at hand makes it possible to meet: formal and legal requirements or expectations of customers and counterparties. This often requires transforming business models, improving organizational competencies, including management and employee competences, or shaping external and internal relations (Bondyra & Zagierski, 2019; Goździewska-Nowicka & Janicki, 2021). The result of the process of improving existing solutions should be an increase in the organization's ability to flexibly adapt to the situation in which it finds itself. However, not every organization can meet all challenges, e.g. being able to produce innovative products. The consumer expects originality and excellence in products, as well as freedom of choice and the ability to purchase them at various times and places (Krzepicka, 2016). An interesting solution for both contemporary organizations looking for growth opportunities and creative and innovative individuals may be to engage with start-ups that aim to bring risky innovations to the market, but nevertheless provide an opportunity to develop a competitive advantage. A start-up is a new, innovative form of organization, using external funding, which aims to build innovative products that give new value to the customer. It is characterized by extreme uncertainty and a desire to create a business model that enables scaling (Nigbor-Drożdż & Łukasiński, 2023). Start-ups often work on innovative technologies and solutions that can revolutionize various industries, such as fintech, medtech, artificial intelligence. Thanks to the internet and modern technologies, start-ups can easily enter foreign markets and scale their businesses globally. Easier international cooperation allows access to talent and resources from various parts of the world. The widespread digitization of business processes and daily life is creating new opportunities for start-ups. Start-ups, like other organizations, face numerous challenges in operating and growing in a dynamic market environment. An organization's competence is defined as the ability to create significant value – internal or market value – through the right combination of selected elements of the organizational system. These elements include both tangible and intangible resources, resource transformation processes, synergy effects, as well as the structure of the organization's core competencies, with particular emphasis on integration and coordination (Gamble et al., 2021). The formation of specific organizational competencies has a significant impact on the development of the organization. Therefore, it is important for start-ups to use tools to diagnose the current state and implement improvement measures. Only in this way is it possible for them to continuously improve and develop, which in the long run will allow them to transform into mature organizations.

The above reasons encouraged the authors of this chapter to conduct research on assessing the maturity level of start-ups in terms of the possibility of conducting its self-assessment. The objective of this chapter is to identify the level of start-up's competences, which will enable the development of a self-assessment tool. In order to realize this objective, the authors try to answer the research questions: which competences of a start-up will determine its development and how can they be self-assessed?

The realization of the objective and the answering of the research questions were made possible by studies of the literature, conducting a questionnaire survey completed by 500 people working in start-ups.

Literature review

One of the methods used by organizations in the processes of monitoring and assessing the quality of its functioning is self-evaluation. It makes it possible to identify the needs and directions for improvement of individual areas of the organization, and provides information to decision-makers (Poplawski, 2012). It is conducive to taking any corrective and preventive actions, as well as to improving products, technology, organization. Self-evaluation helps to identify the cause of the existing state and to outline real opportunities for quality improvement: the course of processes, the functioning of systems and the manufacture of products. In addition, it provides an opportunity to analyze the work. It obliges a systematic review and evaluation of activities, as well as taking possible corrective and preventive actions to improve the organization's performance (Szkiel, 2015). In practice, there are a number of models for improving the quality of organizational performance in which self-assessment is applicable (Haffer, 2011). In fact, it is worth noting: Deming Award Model, Malcolm Baldrige Quality Award Model, European Quality Award Model or Polish Quality Award Model. Significant importance is also attributed to the criteria of the ISO 9000 series standard, or the models proposed by schools of scientists, business consultants, such as Thomas Peters and Robert Waterman, John S. Oakland, Peter Senge, or Toyota (Lisiecka & Czyż-Gwiazda, 2014; Łukasiński, 2016).

Self-evaluation in this way can be used repeatedly and help the organization to achieve its goal. Various methods are used in conducting research. Many of the cognitive objectives in research are directly or indirectly related to causal research. Primarily, these are problems related to management effectiveness, the effectiveness of identifying the influence of several factors on performance, or other aspects related to the management of an organization. It is important to consider the results obtained in terms of causal relationships.

The problem of causality was already considered by Aristotle, who defined it as the explanation of phenomena. Causality is a general principle in the social sciences (and not only the social sciences), according to which every fact, event, phenomenon or situation has a cause. Popular in antiquity and the Middle Ages, the classical model

of scientific explanation referred to the categories of cause-and-effect relationships found in nature (Tabaczek, 2020). Self-assessment is conducive to establishing the level of maturity at which the organization currently stands, establishing a reference point for further development activities. In turn, the result of the above actions will be the development and improvement of various areas of the organization's functioning, increasing its efficiency and improving its performance. An increase in awareness of the organization fosters an increase in its maturity, i.e. the excellence of its individual elements.

Of interest to managers is the application of self-assessment in a start-up, seen as an organization seeking a viable and scalable business model under conditions of uncertainty with a substantial risk of failure to operate and grow (Blank & Dorf, 2013). A start-up is an innovative and forward-looking form of organization that is an ideal business idea especially for certain industries and products. It is seen as an effective and necessary business solution (Nigbor-Drożdż & Łukasiński, 2022). Start-ups are distinguished primarily by innovation, bringing new or significantly improved products, services or business models to market. They operate in an environment of high risk and uncertainty, due to the lack of an established financial history and heavy reliance on external funding sources. A key role in the success of a start-up is played by the founding team, which should be characterized by creativity and willingness to take risks. In addition, start-ups are characterized by their potential for rapid growth and scalability, which allows them to dynamically expand into new markets and compete with established companies (Kulej, 2018; Skala, 2020).

The start-up development process is based on continuous improvement of the product and business model, often using modern management methods such as lean start-up, design thinking or agile. Start-ups create new markets or innovate in less mature markets, which requires flexibility and rapid response to change. In this context, product and project management plays a key role, and Product Owner or Product Manager roles are essential to coordinate the work of the team and maximize the value delivered to customers. Collaboration of start-ups with science and research institutions further strengthens their innovation potential and accelerates their development (Skala, 2020; Sobczak & Dudycz, 2016). In the development process, tools supporting it, e.g. self-assessment, become extremely important. It makes it possible to determine the current level of sophistication of individual solutions, processes or behaviors and then indicates in which direction to go further.

Self-assessment in start-ups can contribute to reducing the risks they face, identifying the possibility of critical errors, which helps to avoid them through early recognition. In addition, the self-assessment tool can positively influence the knowledge level of start-up employees and founders. Increasing the level of knowledge is essential for start-ups aiming to develop and maintain a high innovation potential (ijqr.net). It is particularly important for them to be aware of the challenges (Table 1) they have to face in order to be able to make decisions, create and implement strategies, conditioning the development of the start-up to become a mature organization in the future.

Table 1. Challenges for start-ups

Specification	Description
Concept start-up	The challenge of defining a start-up is to find a scalable and replicable business model (Lopusiewicz, 2013). In order to obtain support for growth from external funds, it is necessary to demonstrate how and when investors will get a return on the money invested. A plan for scaling the business model must be presented (ICHI.PRO, n.d.), which is often difficult as the start-up has a very high risk of failure (Ries, 2011)
Operation of a start-up	It is especially important to acquire knowledge about the market and the needs of customers. Even though a start-up creates its market by creating the needs of its customers, the founder of the start-up must have information about similar organizations that are already operating. It is important for him or her to pursue a competitive advantage (Tomaszewski, 2018). In fact, it may not be easy to commercialize a product in an extremely uncertain environment (Ries, 2011). It is necessary to engage with corporations and find a group of loyal customers. The product needs to be characterized effectively, including defining its purpose and the need it is intended to satisfy (Bierzyńska-Sudoł, 2019.). It is important to achieve synergies between the organization's competences, including those of its employees and modern technologies (Chursin & Strenalyuk, 2018)
Development start-up	The effectiveness of preventing critical errors that prevent users from accessing the product, thus discouraging them, is crucial (Startup LIFE, n.d.). Efforts should be made to increase product recognition and build a customer base, enabled by effective marketing activities. Implementing new activities and product development requires raising funding (Wrocławski Park Technologiczny, n.d.). Start-ups have to adapt to a convoluted legal system. Excessive bureaucracy and formalities weigh heavily on founders (Krysztofiak-Szopa & Wisłowska, 2019)

Source: Authors' own study based on the indicated literature.

In fact, it is important for start-ups to be able to deal effectively with the challenges that arise. In order to be able to do this, they need to possess the competences that are necessary to at least adapt to the situation. Therefore, they must develop the competences they possess (Łukasiński et al., 2021; Penc, 2008):

- in terms of innovation, creating innovative solutions to generate competitive advantage (Chrupała-Pniak & Sulimowska-Formowicz, 2010);
- marketing, ensuring the ability to effectively identify changes in the market and incorporate them into the offering (Kozielski, 2015);
- technical and technological expertise necessary for the effective application of the technology and the identification of opportunities for improvement, enabling the offer to be adapted to the needs and requirements of customers;
- knowledge (information) management, i.e. the ability to acquire, process and use knowledge (information) to generate innovative solutions, rational decision-making (Skibińska, 2021);
- financial, enabling investments (Swiecka, 2018);
- organizational structure, increasing the flexibility of structures to the implemented strategy reflecting market requirements;
- socio-cultural to meet the requirements of employees (internal customers) as well as other stakeholder groups (relationship improvement);
- ecological, necessary to produce solutions that ensure compliance with environmental principles.

The organization's competences are the ability it possesses to combine knowledge, which determines the effective realization of strategic intentions (Bratnicki, 2000). Organizational competence is also defined within the framework of the so-called resource school. Then, organizational competence may be defined as the company's possession of the ability to combine knowledge and resources in order to realize strategic intentions (Obłój, 2007). Rokita (2005) points out that competences, as opposed to skills, have a broader context. This is because they are the result of many different skills and indicate what an organization does best. For an economic entity, it is most important to have key competences, i.e., competences that allow the realization of strategic intentions while building a competitive advantage.

The research team under the direction of Podstawka found, an important barrier to carrying out innovative activities is the financial barrier related to the lack of capital, difficult access to it and the high cost of handling it, as well as the high cost of innovative activities. In addition, an important factor in the development of innovation is the market situation (uncertain demand for new ideas and too much competition in the market and internal processes) (Podstawka et al., 2024). The main feature of the various definitions is that the organization's competencies are seen as the ability to apply the knowledge it possesses, make optimal use of human capital, shape attitudes and adhere to principles, which, with the effective selection of objectives and efficient application of resources, will allow it to achieve sustainable success (Waśkowski, 2018). The competencies of an organization mainly consist of the competencies of the owner and employees. Important are: knowledge and collective memory, competences adopted from outside in the form of licenses, patents, competences in the sphere of products and technologies, and social competences arising as a result of cooperation with the external and internal environment (Oleksyn, 2010; Rokita, 2005).

Many examples of organizational competences can be found in the literature, but their measurement or self-evaluation is a constant challenge for managers. While the measurement and self-assessment of employee competences has been described in detail in many studies, for example, a study by the Ministry of Labor and Social Policy (2012), the very problem of measuring and self-assessing organizational competences is still a major challenge. The ability of an organization to identify and measure its key competences is becoming extremely important; this determines the creation of an environmentally oriented strategy. This results in the ability to outperform the competition (Siwak, 2015). The development of key competences also increases the efficiency of start-up management.

The continuous improvement of start-ups' competences increases the chance that they will be able to cope with the challenges that arise. Only those that are able to cope with them do not collapse. It is crucial for their founders and employees to realize that an increase in competence maturity determines the survival and growth of a start-up, and that self-assessment is a tool that supports this.

Research methods

As mentioned, in this chapter the authors attempt to identify the competences of a start-up, which determine its maturity. The aim was to build a tool that would allow the self-assessment of the maturity of its competences. The survey method and questionnaire used are described in Table 2, which shows the steps taken to achieve the objective, i.e. to build a self-assessment tool.

Table 2. Research methodology

Specification	Description
Literature study	Literature studies have made it possible to identify the challenges faced by start-ups and, subsequently, the competencies required to meet these challenges. On this basis, the criteria for a start-up's self-assessment of its competences were distinguished
Construction of the questionnaire and conducting the survey	In an effort to identify the perceived importance of the criteria that will be used for the self-assessment, a survey questionnaire was created. The survey questionnaire was completed by 500 people employed at start-ups across Poland, representing a variety of industries. Respondents included founders and managers of start-ups, as well as employees hired in executive positions. Respondents were asked to indicate what they considered to be the 7 key competences of a start-up, conditioning its functioning and development
Construction of the self-assessment tool	The results obtained from the survey were used to determine the weights of the individual criteria. Based on the % share of respondents' answers, the weighting for the individual self-assessment criteria was indicated. Subsequently, based on the literature and available descriptions of the maturity levels of organizations, an attempt was made to characterize the maturity levels of start-up competences. These levels are characterised in Table 4
Conducting the self-assessment	The knowledge gained allowed the construction of a tool that could be put into practice by the start-up manager

Source: Authors' own study.

A number of methodologies for determining the maturity level of organizational solutions can be identified in the literature (Cobb, 2003; Haffer, 2011; Hormon, 2003; Kalinowski, 2012; Łukasiński, 2016; Paulk et al., 1995). In practice, a 5-degree maturity scale is adopted hence, for the purposes of this work, it also seems reasonable to distinguish just this many levels of maturity of start-ups in the development of specific competencies (Table 3).

Table 3. Start-up maturity levels

Level	Description
Level 1 – initial phase (value 1)	The organization is functioning, but there is a lack of focus on improving existing arrangements for the development of the studied competence
Level 2 – improvement orientation phase (value 2)	The organization begins to diagnose the determinants that influence the development of the studied competence. However, it is not able to take systemic measures that can influence its development. It only makes limited use of the opportunities that arise
Level 3 – system approach phase (value 3)	The organization is beginning to take systematic action to improve its competences to meet emerging challenges

Level	Description
Level 4 – active maturity formation phase (value 4)	The organization knows how to ensure the effectiveness of its operations and can shape the solutions necessary to ensure the self-development of competences. Thus, it is a learning, knowledge-based organization
Level 5 – maturity phase, orientation towards excellence (value 5)	Competency development makes the organization best in class. It innovates and grows

Source: Authors' own study.

The measures taken are conditioned by the development of a self-assessment tool, which was applied to one of Krakow's start-ups.

Results

The survey questionnaire was completed by 500 people employed at start-ups across Poland, representing a variety of industries. Respondents included founders and managers of start-ups, as well as employees employed in executive positions. Respondents each indicated 7 key competencies of a start-up, conditioning its operation and development. The results of the surveys helped determine the weights of the various start-ups' self-assessment criteria. Then the developed criteria were applied to determine the level of development of an example start-up, which is an Internet canteen operating in Kraków.

This canteen allows office and production workers to order meals using internet. The product is innovative and has solved the users' problem of ordering meals at work on a daily basis and the issues of subsidizing them by employers.

The final result of the self-assessment of competences to determine their level of maturity (Table 4) is the sum of the products of the manager's assessment value and the weighting assigned to the criterion assessed.

Table 4. Self-assessment questionnaire results

Criteria for self-assessment	Weight	Level	Evaluation
Ability to take risks	0.095	4	0.38
Ability to raise finance for development	0.094	4	0.376
Ability to develop a competitive advantage	0.084	3	0.252
Scalability and repeatability of the business model	0.079	3	0.237
Effectiveness level of marketing activities	0.078	4	0.312
Ability to recruit competent staff and improve their competencies	0.076	3	0.228
Ability to be customer-oriented	0.075	4	0.3
Ability to prevent critical errors (e.g., lack of user access to the product)	0.064	4	0.256
Ability to achieve synergy of organizational competencies, people and modern technology	0.064	3	0.192
Ability to deal with legal, accounting and tax issues	0.056	4	0.224
Capacity building of the organization	0.055	3	0.165

Criteria for self-assessment	Weight	Level	Evaluation
Ability to commercialize an innovative product	0.053	4	0.212
Ability to cooperate with, e.g., corporations, universities	0.053	3	0.159
The ability to develop thinking horizons	0.048	4	0.192
Product characterization capability	0.021	4	0.084
Total	1	–	3.569

Source: Authors' own study.

The obtained score of 3.569 means that the organization is between maturity levels 3 and 4, i.e., it is already taking systematic measures to improve its competences and, to a certain extent, is able to effectively implement activities and develop them. In order to move to maturity level 4 and above, the start-up must systematically improve and develop the competences it possesses, especially those that have a key impact on the maturity level of the organization (they have been assigned the highest weighting). Thus, the ability to gain a competitive advantage, the scalability and repeatability of the business and the ability to hire competent employees and improve their competencies should be worked on above all.

It is advisable to develop competencies related to innovation, marketing, organizational, socio-cultural or technical-technological skills. Their development will certainly allow a higher level of maturity of organizational solutions. In addition, it is also worth focusing on shaping the ability to take risks and acquire financing, even though they are currently already at maturity level 4. The dynamic volatility and complexity of the environment may contribute to a changing situation and current solutions may be ineffective. Taking action to develop individual competencies should contribute to a continuous increase in the maturity level of the organization.

It is worth remembering that the development of individual competences will not always influence the excellence of the achievement of the set objectives. In fact, there may be other, undefined factors that will influence the level of achievement, and these have not been included among the self-assessment criteria for several reasons, or they will only emerge during the implementation of improvement actions.

Discussion

It is worth considering whether and to what extent the competences of a start-up differ from those of a traditional organization, as well as what set of competences a start-up should have. Furthermore, it is important to find out which competences determine the business maturity of a start-up. In the research to date, only the first attempts to define the competences that start-ups possess in their distinct phases of operation can be observed. Noronha et al. (2022) conducted a thorough review of scientific articles on start-ups and their competences, and on this basis, they managed to identify eight start-up competences that authors write about in various publications.

It can be assumed that a start-up has: competences related to the market; competences related to building and configuring a product, competences related to innovation; digital competences, technical competences, work-related competences, management competences; competences related to international expansion. Schuh et al. (2022) identified start-up competencies in the following areas:

- in the area of development – financial competence;
- in the area of business model development – value creation competence, entrepreneurial competence, revenue generation competence;
- in the area of market development – marketing and sales competence, managerial competence.

In contrast, Tambunan et al. (2019) point to the innovative and digital competences that are found in start-ups.

The above competences differ from those highlighted in the proposed self-assessment tool, which is because the starting point for their identification was the challenges faced by start-ups. This is in order to create a practical applicable to the self-assessment process.

The results of the innovation research show that the sector and scale of operations influence the perception of innovation barriers. For companies operating in the service sector, innovation process constraints related to financial, market and internal processes are lower than in the group of industrial and construction companies. A negative relationship was found between the scale of operations and innovation barriers related to internal processes (Podstawka et al., 2024).

The research conducted so far is only theoretical in approx. 70% of cases (Noronha et al., 2022). It may therefore follow that the issue of start-ups and their competencies is new in management studies, which implies an embryonic phase of theoretical constructs and a research gap for practical diagnostic tools. The need for self-assessment in start-ups is recognized by Pugacewicz et al. (2015), who developed a concept for assessing the maturity of start-up business models, taking into account the assumptions of Osterwalder Business Model Canvas (2010). A self-assessment of start-ups based on the assessment of individual elements of the business model can be a continuation of their research.

The competences of start-ups also include the competences of employees. Research on employee competencies influencing start-up failures was conducted by Szathmari et al. (2020), who identified nine employee competencies. These were: knowledge (technical, professional, managerial), analytical thinking, flexibility and self-control, accuracy, interpersonal understanding, teamwork and collaboration, organizational commitment, relationship building, customer service orientation and information retrieval. They found that deficiencies in the area of the last two tended to lead to the failure of start-ups.

Although the competences of start-ups can be approached from both the organizational and employee competence side, as the first studies in this area indicate. Only the development of employee competencies should be considered insufficient, as the

others also play a significant role in the formation of start-ups. The identification, measurement and self-assessment of individual competences is still proving to be quite a challenge for organizations.

Verifying what influences a start-up's performance and to what extent, will provide the knowledge necessary to improve the competences that determine a start-up's maturity. A tool that can be used by a start-up for diagnosis is the self-assessment, seen as a "prelude" to establishing the organization's level of maturity, its advancement in the use of modern techniques or the results obtained. In fact, it constitutes the "first step," conditioning corrective and preventive actions, as well as the improvement of products, technologies, organization, etc. (Kwintowski, 2015).

Organizational self-assessment as an evaluation tool has significant limitations, which are primarily due to the subjectivity and lack of objectivity in the self-assessment process. Organizations often find it difficult to reliably and critically assess their own activities, leading to distorted and overly positive results. In addition, effective self-assessment requires developed competencies in self-observation and critical analysis of processes and results, which are often lacking in organizational practice and available training is insufficient. An important limiting factor is also the low level of trust and sense of security in the organization, which makes employees and teams reluctant to disclose real problems and weaknesses, thus, limiting the sincerity and reliability of self-assessment.

The process of self-evaluation is also hampered by psychological and socio-cultural barriers, such as the natural tendency to avoid admitting mistakes and selective perception of reality. In practice, self-assessment is often treated as a formality or obligation that does not bring real development benefits, which lowers the motivation to conduct it reliably and use the results. In addition, constraints arising from organizational culture, including lack of adequate preparation and understanding of the meaning of self-assessment, lead to superficial assessments and low involvement of participants in the process. Therefore, organizational self-assessment, despite its potential, needs to take into account the above limitations in order to be a valuable tool for organizational development and improvement (Mirek, 2017).

Conclusions

Supporting the development of start-ups is beneficial not only for the economy, but also for society as a whole. Creating a favorable environment for start-ups leads to increased innovation, job creation, diversification of the economy and improved quality of life. Promoting start-ups supports the development of entrepreneurship, which is key to dynamic economic growth. Start-ups bring competition to markets, leading to better quality products and services and favorable prices for consumers. They often operate in new and emerging sectors, which helps diversify the economy

and reduce its dependence on traditional industries. They help the economy better adapt to global technological and market changes.

Start-ups are organizations that need to constantly improve and look for innovative solutions in order to achieve a competitive advantage and develop a viable and scalable business model. When working on an innovative product or business model, it is important to have a process to assess the level the organization is at. Self-assessment, which enables the identification and evaluation of the level of sophistication of the various elements of the organization, is a tool to help start-ups grow.

Based on the research conducted, it can be noted that:

- self-evaluation makes it possible to identify needs and directions for improvement in specific areas of the organization, thus, providing the information necessary for decision-makers;
- the reason for an organization's lack of sustainable success, i.e., its ability to develop in the long term, is the insufficient development of the competences required to meet the challenges that arise;
- self-assessment is a tool for identifying the maturity level of an organization's competences, the results obtained, which determines the effectiveness of corrective and preventive actions taken, as well as the improvement of products, technologies and the organization;
- the most principal factors in the maturity of a start-up are, the ability to take risks, obtain financing for growth and develop a competitive advantage;
- awareness of the challenges and key competences determining the development of start-ups allows the direction of improvement of existing solutions to be identified;
- self-evaluation increases the awareness of employees and founders of a start-up of the importance of the factors and phenomena that affect the quality of its performance, in fact it can contribute to reducing the risk of a start-up's failure, as it enables them to be identified in suitable time.

By reviewing the literature, identifying the challenges faced by start-ups and the competencies that enable them to meet these challenges, an attempt was made to answer the research questions posed at the beginning of the thesis, which determined the realization of the chosen objective. In the literature, we do not find a tool to diagnose the maturity of a start-up, including its competences, which constituted a research gap. This publication is one of the first to present an exemplary tool for self-assessment of start-up maturity and may inspire researchers and managers for further research in this area. A limitation of the presented research was its limited geographic scope, covering only the territory of Poland.

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