
TEAL Organizations in Times of Industry 4.0

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Abstract:

Purpose: The primary purpose is to present the state of development of Teal organizations in the age of Industry 4.0. The article assumes that (1) the so-called soft management factors have a significant influence on the development of Teal organizations, and (2) that companies operating under changing conditions must adapt to these conditions to operate successfully.

Design/Methodology/Approach: In the course of the research the following work was carried out: desk research, individual in-depth interview and a questionnaire. The study covered 900 respondents from various micro and small enterprises. The article is based on the third stage of empirical research conducted in 2020- 2021.

Findings: Research results show that organizations functioning in the age of Industry 4.0 should adapt to change and embrace it. Qualities such as partnership, flexibility, trust, creativity are indispensable in a Teal organization.

Practical Implications: Organizations seeking to implement teal qualities must realize that this is a process. Therefore, it is necessary to constantly monitor the functioning of these organizations in the turbulent reality of Industry 4.0.

Originality/Value: The research results (including pilot study, stage I, and stage II) show that organizations need to consider and adapt to changing conditions. An analysis of selected soft management factors shows how they can influence the development of an organization, which is particularly important for managers when it comes to management style or organizational structure.

Keywords: Development, teal organisations, polish enterprises, Industry 4.0

JEL: G32, J53, M12, M54.

Paper Type: Research article.

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1. Introduction

The rapidly changing external conditions that we can observe today, often referred to as Economy 4.0 (Olesiński and Rzepka, 2021), Economy 5.0 or the age of 4.0, require companies to search for new tools and make it necessary for them to adapt to such changes. In the science of management and quality, more and more different forms of self-management have emerged in recent years (Borowiecki *et al.*, 2021). We have also seen a growing number of concepts of how to replace the existing type of organization (which emerged in the industrial age and is described by F. Laloux (2015) as orange) with one that corresponds to the post-industrial age and is oriented towards 4.0. Laloux's new type of organization is described as turquoise (teal). The cornerstone of the new concept is the departure from the traditional and hierarchical model of management and the broad delegation of authority to employees, which contributes to better employee engagement and development (Ziębicki, 2017).

A Teal organization represents a new approach to management under changing conditions. This innovative type of organization represents a new paradigm for a self-managing organization whose main assumption is the empowerment of employees (Rzepka, 2020), who have a sense of the importance of their role in the organization and the feeling that they can influence decisions. In order to operate efficiently, a Teal organization needs a general framework that helps to define the course of its activities and contribute to the pursuit of continuous development of the organization.

2. Background

2.1 Concept of Teal Organizations

In the age of Economy 4.0, science faces the challenge of seeking revolutionary solutions that will enable organizations to meet the challenges of their turbulent environment. The post-industrial era (the age of services) leads to far-reaching radical changes in organizational structures, changing the rules of how they operate and finding solutions that encourage innovation, speed, and creativity. The concept of Teal organizations can serve as a reference point for determining the scope and direction of these changes.

Reviewing the literature and research on Teal organizations (Blikle, 2017; Hopej-Tomaszycka, and Hopej, 2018; Skrzypek, 2017; Rosiński, 2018; Olesiński, 2020; Rzepka, 2020; Kirov and Kirova, 2017), it was found that a Teal organization is a manifestation of a new approach to the management of organizations operating in conditions of changeability. Based on self-organization, teal management brings certain advantages to any company that decides to "reinvent" according to the concept of F. Laloux, author of "Reinventing Organizations". Teal organizations are founded on a flat organizational structure without hierarchy, and the traditional incentive system is replaced by internal employee motivation (Hopej, 2018; Kozina,

2017). Based on his research, Laloux (2015) distinguishes three types of structural solutions for Teal organizations: "Parallel Teams", "Web of Individual Contracting" and "Nested Teams". In the organizations studied by Laloux, their presidents and founders remain active participants and embody moral authority. They also serve as role models that relate to the three principles of self-management, wholeness in work, and evolutionary purpose (Laloux, 2015). In such organizations, managerial positions no longer exist, but those who held them continue to serve in the role of leaders (Rzepka, 2019b), mentors, or facilitators.

2.2 Teal Qualities

In recent years, technological change has forced a paradigm shift in business and operating models toward innovation. The key feature of Teal organizations is a new approach to management (Rzepka, 2020). However, despite the well-described case studies, effective methodologies, and frameworks, many companies and their technology leaders still have not developed effective innovation capacity.

In view of the increasing changes in the environment (Modrak, Soltysova, and Poklemba, 2019), a company must respond to innovation and develop the characteristics (agility, self-management) that enable the company to survive in such an environment (Rauch, Linder, and Dallasega, 2020). In particular, companies must develop the ability to quickly identify market opportunities (Sambamurthy, Bharadwaj, and Grover, 2003). It could be argued that if a company wants to introduce innovations, these innovations must be part of a chain that creates an innovation ecosystem (Laamanen *et al.*, 2018) which consists of a number of interconnected links. Today, in the age of Economy 4.0, the amount of technology and talented personnel is so large and the potential so great that innovations (Bouncken and Kraus, 2019) rarely occur in the vacuum of a single company (Bouncken and Fredrich, 2016). If we take a strategic approach, ecosystems consisting of internal and external business partners can help reduce risk and increase the pace of innovation.

Managers today have a wide range of partners at their disposal, and there are countless opportunities for collaboration that can take a wide variety of forms. When comparing different variants of collaboration, it is advisable to examine one's partners in terms of the kind of innovation they could offer. However, soft management factors (agility, flexibility and, above all, knowledge) must also be taken into account in the age of Industry 4.0, as they are conducive to innovation. These factors are crucial for the development of Teal organizations (Olesiński and Rzepka, 2017).

Soft factors are the cornerstone of teal qualities. Olesiński (2020) rightly observed an increasing role of intangible factors such as data, information, power, intellectual capital (interpreted as organizational, social, human and relational capital), trust, partnership, flexibility, cultural conditions and other factors. Just like

inter-organizational relations (Rzepka, 2018) between independent entities, such qualities as flexibility or agility are currently considered as one of the development trends (Long *et al.*, 2020) in modern mechanisms used in the establishment of enterprises.

2.3 Industry 4.0

Industry 4.0 is an approach that changes the way businesses operate (Roblek and Meško, 2016). The main goal of Industry 4.0 is to achieve accuracy and precision, as well as a higher degree of automation (Thames and Schaefer, 2016). The concept of the Fourth Industrial Revolution stands for a simultaneous compilation of three independent elements - real-world production machines, virtual world, information technology (Zhong, Xu, Klotz, and Newman, 2017).

Industry 4.0 is the driving force for innovation and technological advancements in the near future. Despite its advantages, Industry 4.0 is primarily a technical and economic vision that shows how technological progress (Olesiński and Rzepka, 2020) can influence industrial value chains and how it will change their economic position.

Compared to previous industrial revolutions, the current one is developing at a much faster pace. This is due to the fact that each new technology (Turulja, 2019) gives rise to a newer and more efficient one, and the 4.0 revolution that is currently underway is generally considered to be a concept closely associated with the development of the Internet of Things, digitization, advancing robotization (Gracel and Rodak, 2002), and the automation of production processes (Miśkiewicz, 2019). Companies that have understood that innovations are the key to success in the era of Industry 4.0 (Huges, 2018), can well observe the developments taking place (Sharp, 2019). The Fourth Industrial Revolution which connects the physical world with the digital world, offers great opportunities for companies (King, 2018). The introduction of new products and new production methods must be faster than ever. This is possible thanks to innovations that are the driver of the current revolution (Szczepańska-Woszczyna, 2021).

The main goal of implementing Industry 4.0 (Zezulka, 2016) in a company is to achieve higher productivity and flexibility. However, this goal is to be achieved not only by improving production processes or by gradually introducing innovations related to production processes, but by a fundamental technological and organizational change and updating the company's business model (Roblek, Meško, and Krapež, 2016). Industry 4.0 is likely to change the way we design and create services/products and the way organizations are run (Rzepka, 2019a). Industry 4.0 integrates the digital and physical worlds (Stverkova and Pohludka, 2018). The digitization of workflows (Kohli, 2018), production, delivery networks and products enables organizations to combine knowledge gained from people, machines, analysis, and insights to make better and more holistic decisions (Masood and Egger,

2019). There is little doubt that the extent to which the Industry 4.0 concept will be adopted in the processes and operations of businesses will increase. This, in turn, will enable entirely new achievements as well as transformation of business models (Mittal, Khan, Romero, and Wuest, 2018).

In the age of Industry 4.0, an organization should be agile (Borowiecki *et al.*, 2020) and flexible, putting its knowledge into practice by introducing necessary innovations (Turulja and Bajgoric, 2019). As Hughes *et al.* (2018) reveal, almost 75% of companies state that innovation is one of the top three management priorities, while 35% of companies place it first. Although an innovation strategy is necessary, it may not be enough (Bouncken *et al.*, 2019). In a world of shortening product life cycles and business models (Kraus *et al.*, 2019), value creation requires speed and decisive action. However, this is not surprising because a successful innovation strategy combined with the right innovation system can make a significant difference. However, it should be noted that innovation is difficult (Rzepka, 2019) and only about 30% of companies believe they are good at it. It is therefore a growing challenge for organizations in the age of Industry 4.0.

3. Methodology

Over the past 20 years, my research team has conducted a series of studies on several thousand organizations in Poland, Canada, United Kingdom, and Georgia. The implication of this research has been to find a common ground between the research findings and changes in the turbulent social and economic environment, while exploring and validating the relevance of the findings to organizations.

The research used in this article is part of another research project called "Teal Organisations in Economy 4.0". The project includes research in Poland and in selected countries of the world (USA, Georgia, Slovakia, Brazil, England, Romania, Czech Republic, Ukraine, Spain). The research was conducted in stages and includes a pilot study (N=300), core research (N=300 PL and 330 in other countries) and repeated research (N=300). The research follows the principles and standards developed by OECD - DAL (Development Assistance Committee - Networking on development evaluation).

Taking into account the formal requirements and the goal of conducting the research reliably, I assumed that all the research would be conducted using many research methods and techniques. This led to a triangulation of methods and techniques both in the area of data collection, analysis and the formulation of conclusions. In the course of the research the following work was carried out: desk research (1), individual in-depth interview (2) and a questionnaire (3). The chosen method of statistical analysis was the use of the χ^2 test - Pearson's Chi-square test for independence. The statistical analysis of the data obtained from the surveys was performed using the computer package SPSS STATISTICS 21.

The aim of the analysis was to record and specify those characteristic features of the surveyed companies that differentiate the level of subsequent indicators. For this purpose, a one-factor variance analysis was used as a method to verify the hypotheses. The null hypothesis with equal average values for the general population was verified by the F-test (Fisher-Snedecor).

The application of this test was possible because the calculated indices could be considered as continuous variables with distributions close to normality (at the materiality level $\alpha = 0.05$) based on the results of the calculations performed with the Kolmogorov-Smirnov test. A Alpha Cronbach test was carried out to verify the reliability of the questions concerning the surveyed companies. The above tests made it possible to determine the variables for which there are statistically significant correlations.

4. Results and Discussion

The study was piloted in May and June 2020, with the first stage taking place between August and September 2020, and the second stage between December 2020 and January 2021. Each stage included a sample of 300 respondents from a variety of micro, small, and medium-sized enterprises, with varying geographic scope of operation and size (Table 1).

Table 1. Scope of respondents

Predominant mode of company's operation (%)				Geographical scope of activity (in %)			Number of employees (in %)				
	A*	B	C		A	B	C		A	B	C
Trade	19.7	10.3	16.6	Loc al	19.3	22.1	9.4	0-9	13.7	9.1	3.3
Manuf acturing	17.6	13.9	28.0	Regi onal	8.2	12.4	27.3	10-49	24.0	18.8	55.1
Servic e	62.7	75.8	55.4	Nati onal	30.0	23.0	22.0	50-249	15.5	28.2	16.6
				Inter nati onal	42.5	42.4	41.3	250-999	18.5	20.9	16.6
								1000 - and over	28.3	23.0	8.4

Note: *A-Pilot, B-I stage, II-stage

Source: Own research.

When it comes to the profile of the respondents, the percentage of respondents was highest in the following group: - Male respondents in managerial positions (57.9%); employed in service companies (62.7 and 75.8%) with international operations (42.5%) and between 50 and 249 employees (28.3%). The different stages of the survey also show how different the sectors were. However, respondents representing the IT, education, gastronomy, trade or banking sectors participated in all 3 stages (Table 2).

Table 2. Summary of industries and age of respondents in subsequent research stages

Industry (%)						Age of respondents (%)			
A*		B		C			A	B	C
Banking	9.4	Hotels	16.5	Aviation	5.3	25 or younger	57.9	11.5	26.5
Transportation	8.6	Municipal	14.5	Fuels	4.0	26-35	27.5	26.1	22.4
Automotive	5.2	IT	13.2	Automotive	3.8	36-45	9.9	37.9	36.3
Finance	5.2	Banking	9.4	IT	11.4	46-55	4.3	19.1	11.2
IT	3.0	Education	6.8	Education	3.8	56-65	0.0	5.5	3.4
Logistics	2.6	Construction	5.8	R+D	4.0	65 or over	0.4	0.0	0.2
Gastronomy	2.6	Gastronomy	5.8	Gastronomy	5.2				
Construction	2.6	Other	28.1	Construction	5.3				
Trade	2.6			Trade	3.4				
Insurance	2.1			Banking	10.0				
Other	56.2			Other	43.8				

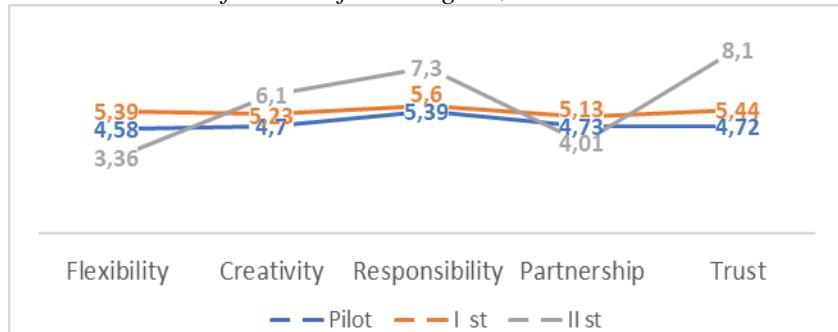
Note: *A-Pilot, B-I stage, II-stage

Source: Own research.

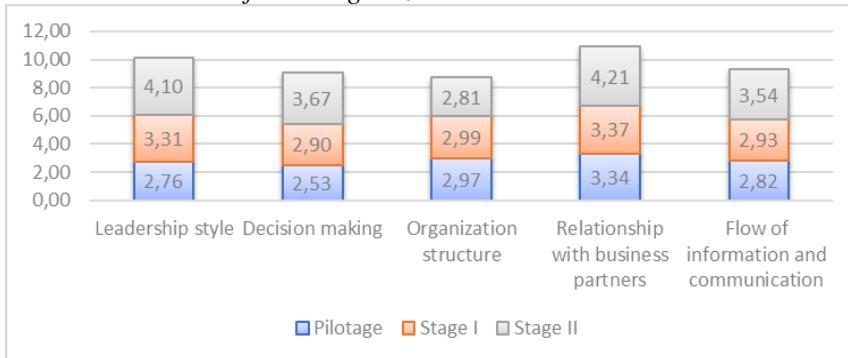
Only some of the components were analysed for the purposes of this article; the focus was only on research areas related to the factors that lead to the formation of Teal organizations.

The first area for attention was the approach to associations in relation to the distinctive characteristics of Teal organizations - flexibility, accountability, partnership, trust, and creativity. As shown in the chart, the pilot study and the first stage of the research show similar results for the above attributes. The second stage of the research shows a significant discrepancy, especially for creativity, partnership, and trust (Figure 1). Such results are rather puzzling. However, this discrepancy may stem from the fact that the research was conducted over a period that included December 2020 and January 2021, when the companies were experiencing the impact of the pandemic on their development.

If we compare 5 additional areas (Figure 2) - organizational structure, leadership style, decision-making, relationships with business partners, and communication and information flow, the results of the second stage show deviations. When we analyze the leadership style, one can clearly see the deviation between the pilot research and the second stage (2.76 vs 4.10 respectively). Similar differences can be seen in the area of relationships with partners, where we see an increase from an average of 3.35% to 4.21% between the first two stages (pilot study and the 1st stage) and the 2nd stage.

Figure 1. Characteristic features of Teal organizations

Source: Own research

Figure 2. Selected areas of Teal organizations

Source: Own research.

The Figure presented above illustrates the averaged results of a sample of 300 questionnaires submitted in the pilot study conducted in Poland, mainly among managers, and the averaged results of a sample of 330 respondents from six countries at different levels of development, and the results obtained in stage II of the study also conducted in Polish companies. From a purely statistical point of view, there are three groups: highly developed countries (USA, UK), developed countries (Poland and Hungary), and developing countries (Georgia and India). The results of the respondents from Georgia and India seem too optimistic. Moreover, the results of the second stage include Polish companies from the regions (voivodeships) located in the west and east of the country. By comparing the figures in the average results, it is possible to conclude similar levels in the pilot sample and in the second stage of the research, with an indication of the sample from the II stage of the research.

From the research described above, it can be concluded that the transformation of a company to a Teal organization can occur in a variety of ways. However, such transformation is not always possible. Much depends on the levels at which an organization currently operates and the breadth of awareness of its employees. Following the research, one can try to answer the question to what extent employees

are ready for such a transformation in Teal. For this purpose, it is useful to draw conclusions about specific groups of employees and compare them. Based on the results, concrete measures can be proposed to implement the desired transformation. Although a complete transformation of the organization cannot be guaranteed, such a step will, however, provide insight into the strategic situation of the company and also facilitate the implementation of corresponding development-related measures.

The research presented above will be continued in the near future to verify the data. In particular, the number of questionnaires used in future research will be increased to cover a wider group of countries - it is planned to conduct the research also in Austria, Germany, Yemen, and United Arab Emirates.

It is advisable to carry out a detailed analysis of the data collected, including the comparison of the responses received with the age and work experience of the respondents, the size of the company and the type of its activity.

5. Conclusions

Today, in the face of a pandemic, characteristics such as high market flexibility and expansion, efficient exchange of resources, quick response to external opportunities, and mutual support in difficult situations are the main advantages of the innovative organization. Research shows that those organizations that are agile, flexible, and able to respond quickly have a chance to thrive in the competitive environment of the 4.0 era.

It can be concluded that "teal management" is still an uncommon model of running a business. However, its importance may increase with the development of humanistic (people-oriented) management and in connection with possibilities and support offered by various systems, such as the ability to analyze the company's state based on defined indicators, efficient order management, or process automation.

To become a facilitative (teal) leader, managers should be able to change their current leadership style to support their team rather than doing the work in their place. The facilitative leadership style requires a manager to be a coach rather than a boss. Such a manager will allow the team to make their own decisions in various aspects while offering support in other decisions or in resolving conflicts in hopeless situations. Such a person will allow employees a high degree of autonomy and ensure that they realize that they can always count on his support and help when it is needed.

Research shows that those companies that succeed in adopting the teal model or its elements reap numerous benefits. The fact is that most of the Teal companies currently operating enjoy financial and emotional success (in the form of increased employee engagement). Such organizations tend to develop at a faster rate. The research described above also shows that teams operating under the Teal model are

more effective, have higher levels of employee satisfaction and engagement, and have lower rates of employee turnover. Teal organizations truly grow at a faster pace than the competition. Organizations operating in the age of Industry 4.0 that want to compete and implement the Teal organizational model should focus on the following aspects:

- Implement innovation by forcing the organization to understand the application of various technologies and their potential impact on the business;
- Select such forms of activities in the organization that can give the organization greater leeway in building Industry 4.0 on a larger scale and can also help individuals overcome the fear of failure (which can ultimately lead to more innovation);
- Improve selected areas in the organization by identifying priority areas that can be flexibly leveraged and led to success.

A modern company that wants to survive in the new reality of Industry 4.0 must face numerous challenges that the market brings. It should therefore develop enduring strengths that define its uniqueness. Such a modern company must acquire characteristics that are the answer to the emerging impulses from the market environment.

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