# MANAGING GENERATIONAL DIVERSITY UNDER INDUSTRY 4.0 IN THE CONTEXT OF THE IMPORTANCE OF ORGANIZATIONAL LEADERSHIP

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**Purpose:** The purpose of this article is to understand how representatives of different generations (Baby Boomers, Generation X, Generation Y, and Generation Z) view organizational leadership in the context of the challenges posed by Industry 4.0. The authors want to assess whether there are common leadership qualities valued by all generations, despite differences based on generational affiliation.

**Design/methodology/approach:** The study was conducted using a survey questionnaire aimed at people involved in decision-making processes in Polish companies. The analysis was based on descriptive statistics, which made it possible to assess the responses and compare the results among selected generational groups.

**Findings:** The results indicate different approaches to leadership depending on generational affiliation. All generations agreed that leadership is crucial, but differ in their priorities. Baby Boomers value leader adaptation, Generation X emphasizes values, Generation Y focuses on success, and Generation Z focuses on diverse leadership competencies.

**Research limitations/implications:** The survey is limited to Polish organizations, which may affect the generalizability of the results to other countries. The sample is small, especially for Generation Z, which may limit a fuller understanding of their perspectives.

**Originality/value:** The article provides unique findings on the differences and similarities in leadership perceptions among the four generations. It points to the need for a flexible management approach that takes into account specific generational needs in the era of Industry 4.0.

**Keywords:** Industry 4.0, Leadership, Organizational leadership, Management, diversity management of generation, generation Baby Boomers, generation Y, generation X, generation Z.

**Category of the paper:** Research paper.

## Introduction

In the era of Industry 4.0, organizations in all sectors of the economy are facing the challenges of modern technology and digitization, which necessitate a change in approach to key aspects of management, organizational culture formation, project management or leadership (Spałek, 2017, 2020; Kuzior, 2020; Miśkiewicz et al., 2020; Bijańska et al., 2020; Niewiadomski et al., 2023).

The Fourth Industrial Revolution has made it necessary for workers of different generations to adapt to changing working conditions and meet the tasks at hand (Kroenke, 2015; Skowronek, 2022). An important role in leading this change is played by leaders in organizations who combine the ability to adapt in a technologically developed environment with human resource management (Kazak, 2017; Dzwigoł et al., 2020; Ganiyu, 2022; Kucharska, 2023; Skubis, Bijańska, 2024).

The purpose of this article is to understand how representatives of different generations perceive organizational leadership in the context of the challenges posed by Industry 4.0. Analyzing how generational differences affect expectations of leaders and how these expectations can be met in the context of the dynamic changes taking place in organizations seems crucial in the context of the existence of common leadership qualities valued by all generations, despite differences based on generational affiliation. The article seeks an in-depth understanding of the role of leaders in today's organizations from the perspective of representatives of different generations.

## Literature review

The literature on organizational leadership in the era of Industry 4.0 increasingly emphasizes the need for organizational leaders to transform their management approach in the face of dynamic technological and digital change (Kwiotkowska, Gębczyńska, 2020; Moczydłowska, 2023). Industry 4.0, associated with the digitization of businesses, process automation, systems integration and big data, among other things, places a number of demands on organizational leaders in new competencies that include not only traditional people management skills, but also the ability to adapt in an increasingly complex technological environment (Kwiotkowska et al., 2021; Bitkowska, Szymborski, 2023). The ability to anticipate technological change and the ability to quickly adapt and integrate new technologies into a company's decision-making processes are becoming key challenges for innovative and flexible organizations in the era of Industry 4.0 (Skorban, Skierniewska, 2015; Bednarz, 2023).

Leaders in the era of Industry 4.0 should demonstrate technological skills as well as the ability to integrate and manage multi-generational teams. Nowadays, organizations have representatives of four generations: Baby Boomers, Generation X, Generation Y and the youngest Generation Z. Each generation has a unique set of certain repetitive characteristics, skills or expectations that characterize them and result from the times in which they were born and the conditions in which they grew up. In the same organization, people with different expectations of employment conditions, the way of working, management or the use of modern technologies may meet (Rogozińska et al., 2019; Cichorzewska et al., 2020,). The literature on organizational leadership clearly shows significant differences in how representatives of different generations view the role of the leader (Szafraniec, 2011; Chojnacka, 2018). Understanding these differences is key to effectively managing multigenerational teams and maximizing their engagement and effectiveness (Żarczyńska-Dobiesz, Chomątowska, 2016).

There are inconsistent age ranges in the literature for people belonging to selected generations. The reason for this is the differences between individuals in terms of the country or region from which they come, as well as the economic, political and social conditions of their place of origin (Cichorzewska et al., 2020). Baby Boomers are individuals born between 1946 and 1964, raised in an era of more hierarchical organizational structures. They often view leadership through the lens of traditional values such as authority, stability and loyalty to the organization (Hysa, 2016; Muster, 2022; Wątroba, 2022). Leaders in the eyes of Baby Boomers should be authorities who give clear guidelines and ensure safety and stability at work (Williamson, 2008; Lyons, Kuron, 2014). Generation X, comprising those born between 1965 and 1979, is characterized by pragmatism and independence (Czajkowska, 2013; Muster, 2022). For this group, leaders' competencies related to effective time management of tasks and work-life balance are crucial (Smolbik-Jęczmień, 2013; Baran, Kłos, 2014). Leaders valued by Generation X are those who can effectively solve problems and foster employee self-reliance (Wnuk, 2019; Baran, Mazur, 2022). Generation Y, or millenials, represent a very different approach to leadership. Born between 1980 and 1994, they grew up in an environment of intense technology and globalization (Górecka, 2021). Value transparency, collaboration and the opportunity for personal growth within the organization (Dziopak-Strach, 2016; Bartkowiak, Krugiełka, 2016). Leaders they perceive as effective are those who are open to innovation, promote team commitment and a flexible approach to work (Hysa, 2016; Smolbik-Jęczmień, Żarczyńska-Dobiesz, 2017). Millenials prefer more agile management models, where communication is open and the hierarchical structure is less formalized (Witmer, 2021). The youngest group of employees, Generation Z, born after 1995, expects leaders to be even more flexible and digitally proficient (Stachowicz-Stanusch, Aleksander, 2018; Zimny, 2020). Representatives of this generation have grown up in a fully technology-dominated reality, which translates into their high expectations of digital leadership skills and flexible forms of employment, such as remote or hybrid work (Roguska, 2018; Waszkiewicz, 2022). Leaders valued by Generation Z should be able to operate in agile organizational structures that promote innovation and rapid response to market changes (Rynkiewicz, 2014; Skowronek, 2022).

Managing generational diversity in the era of Industry 4.0 challenges organizational leaders to combine traditional values with the modern expectations of younger generations. Properly aligning leadership style with the needs of a multigenerational team can significantly increase employee engagement and productivity, while providing the organization with the innovation and flexibility needed to meet rapidly changing market conditions.

## Methods

The purpose of the research was to understand how representatives of different generations (Baby Boomers, Generation X, Generation Y and Generation Z) perceive organizational leadership in the context of the challenges of the fourth industrial revolution. Industry 4.0, which is characterized by dynamic technological change, digitization and process automation, challenges organizational leaders with management flexibility and the ability to manage multi-generational teams.

There is a wealth of research in the literature on generational differences in leadership expectations; however, there is a lack of comprehensive analyses that examine potential similarities in these expectations (Twenge, 2010). Accordingly, a key objective of this study was to assess whether there are common leadership qualities valued by all generations, despite differences based on generational affiliation.

The study was carried out using a survey questionnaire, developed by the authors of the article, which was addressed to people involved in decision-making processes in Polish trade, manufacturing and service organizations. The questionnaires were sent to 4673 purposively selected entities, which enabled the deliberate selection of respondents who met the criteria of interest to the researchers. Seventy-three correctly completed questionnaires were received, which met the established sampling criteria, which were as follows:
- A minimum length of service of three months;
- Membership of the organization in the commercial, manufacturing or service sector;
- The age of respondents (over 18 years old).

The questions in the questionnaire made it possible to assess the phenomena studied and the relationships between them. The analysis of the results of the research concerns selected parts of the questionnaire:
- Metrics (5 questions, 5 variables);
- Specific questions (17 questions, 17 variables).

In analyzing the results, the authors focused on descriptive statistics, with particular attention to interpreting percentages of response frequencies and comparing results among selected groups of respondents.

The objectives of this research are:

O1. Identify similarities in perceptions of the importance of organizational leadership among respondents representing generations: Baby Boomers, X, Y, Z.

O2. Identify differences in perceptions of the importance of organizational leadership among respondents representing generations: Baby Boomers, X, Y, Z.

The following research questions were posed in relation to the research objectives:

R1. What are the similarities in perceptions of the importance of organizational leadership among respondents representing generations: Baby Boomers, X, Y, Z?

R2. What are the differences in perceptions of the importance of organizational leadership among respondents representing generations: Baby Boomers, X, Y, Z?

Descriptive statistics were used to analyze the results, which made it possible to assess the frequency of responses and their percentage distribution among the different generational groups. The variables analyzed included the leadership abilities of leaders, their impact on innovation and employee engagement. The analysis used made it possible to compare the results between the responses of each generational group (BB, X, Y, Z) and identify differences and similarities in their perceptions of leadership.

The survey has some limitations that should be taken into account when interpreting the results. The sample is limited to Polish companies in specific economic sectors, which may affect the possibility of generalizing the results to other countries and industries. In addition, the number of respondents (73) is relatively small, which limits the possibility of fully generalizing the results to the entire population. However, the data obtained provide valuable conclusions and clues for further research.

## Results

The survey included an analysis of the responses of 73 respondents from the four generational groups described by Rogozinska et al. (Rogozińska-Pawełczyk et al., 2019):

- Baby Boomers – people between the ages of 60 and 78;
- Generation X – people aged 45-59;
- Generation Y – people aged 30-44;
- Generation Z – people aged 29.

Tabele 1. presents the characteristics of respondents by generational group (Baby Boomers, Generation X, Generation Y, Generation Z) and various variables such as gender, education, form of employment, length of service and form of work performed. This analysis allows for a better understanding of the structure of the survey sample.

**Table 1.**
*Results of respondents' answers - section: metrics*

| Variable | Types of variable | Results for selected groups of respondents | | | | |
|---|---|---|---|---|---|---|
| | | The entire study group (n = 73) | Baby Boomers (n = 16) | Generation X (n = 17) | Generation Y (n = 35) | Generation Z (n = 5) |
| 1. Gender | Female | 27 | 6 | 7 | 13 | 1 |
| | Male | 46 | 10 | 10 | 22 | 4 |
| 2. Education | Higher | 56 | 12 | 14 | 28 | 2 |
| | Secondary | 14 | 3 | 3 | 6 | 2 |
| | Other* | 3 | 1 | 0 | 1 | 1 |
| 3. Form of employment | Employment contract | 60 | 13 | 16 | 27 | 4 |
| | Contract of mandate | 13 | 3 | 1 | 8 | 1 |
| 4. Job seniority | 3 months 1 year | 6 | 2 | 1 | 3 | 0 |
| | From 1 to 3 years | 31 | 1 | 4 | 22 | 4 |
| | From 4 to 10 years | 8 | 0 | 3 | 4 | 1 |
| | From 7 to 10 years | 8 | 1 | 3 | 4 | 0 |
| | Over 10 years | 20 | 12 | 6 | 2 | 0 |
| 5. Form of work performed | Stationary work at the company's headquarters | 42 | 10 | 10 | 19 | 3 |
| | Hybrid work | 27 | 6 | 7 | 12 | 2 |
| | Remote working | 4 | 0 | 0 | 4 | 0 |

Source: Own elaboration.

The survey included 73 respondents, who were divided into four generational groups. Generation Y was the most represented, with 35 people belonging to it, accounting for almost half of all respondents. Generation X had 17 people, making up 23% of the sample. Baby Boomers accounted for 16 people, equivalent to 22% of the sample. The smallest group was Generation Z, represented by 5 people, which accounted for 7% of all survey participants. This distribution indicates a diverse representation of generations, which makes it possible to accurately analyze differences and similarities in the perception of leadership in the context of Industry 4.0 by representatives of different age groups.

In terms of gender, men were the dominant group, making up 63% of the total sample. Among Baby Boomers and Generation X, the gender ratio was more even, while Generation Y and Generation Z were significantly outnumbered by men (respectively, 22 men and 13 women in Generation Y and 4 men and 1 woman in Generation Z).

In terms of education, the majority of respondents had higher education (77% of the total group), regardless of the generation represented. Secondary education had 14% of the respondents, while other forms of education, such as vocational, were represented by 3 people. An analysis of the forms of employment showed that the overwhelming majority of respondents (82%) work under a contract of employment, regardless of the generation represented. In terms of seniority, the largest number of respondents (31 people) had work experience of 1 to 3 years, of which 22 were from Generation Y. Job seniority of more than 10 years was most common among Baby Boomers (12 people). Baby Boomers have the most seniority because they have

been active in the labor market the longest, while Generation Z is just entering the labor market and starting their careers.

The last variable analyzed was the form of work performed. On-site work was the preferred form of employment for 58% of respondents, especially among Baby Boomers (10 people) and Generation Y (19 people). Hybrid work was chosen by 37% of respondents, while remote work was the rarest (4 people, all from Generation Y).

A detailed analysis of the collected data allows a more comprehensive picture of the structure of the group of respondents, which provides an important context for formulating further conclusions and conducting research discussions Analysis of the data by generation allows a deeper understanding of the phenomenon under study, taking into account potential differences in the perception of leadership in Industry 4.0 among people in different age categories.

Tabele 2 shows the average ratings of respondents from different generations on important leadership issues in organizations operating under Industry 4.0 conditions. The results make it possible to compare the perspectives of representatives of Baby Boomers, Generation X, Generation Y and Generation Z on the role and importance of leaders in organizations, as well as on the impact of leadership on various aspects of organizational performance. Tabele 2 shows how each generation assesses the importance of leadership, which provides a better understanding of generational differences in the perception of leaders and their role in modern companies.

**Table 2.**
*Average scores of leadership importance for selected groups of respondents*

| Symbol of variable | Variable | Average scores for selected groups of respondents | | | | |
|---|---|---|---|---|---|---|
| | | The entire study group (n = 73) | Baby Boomers (n = 16) | Generation X (n = 17) | Generation Y (n = 35) | Generation Z (n = 5) |
| 1. | A leader is essential in organization | 4,41 | 4,63 | 4,41 | 4,26 | 4,80 |
| 2. | Leadership has an impact on engagement employees | 4,30 | 4,25 | 4,35 | 4,26 | 4,60 |
| 3. | Organizational leaders should have the ability to quickly adapt to the changing conditions of conditions of Industry 4.0 | 4,30 | 4,38 | 4,47 | 4,17 | 4,40 |
| 4. | Leadership has an impact on productivity employees | 4,29 | 4,38 | 4,29 | 4,17 | 4,80 |
| 5. | Leadership is critical to an organization's success | 4,18 | 4,06 | 4,18 | 4,29 | 3,80 |
| 6. | An organizational leader should have the ability to make decisions based on the values of the of the organization | 4,14 | 4,13 | 4,35 | 4,03 | 4,20 |
| 7. | Leadership has an impact on organizational culture | 4,11 | 4,25 | 4,18 | 4,06 | 3,80 |
| 8. | Leadership has an impact on employee turnover | 4,07 | 4,13 | 4,06 | 4,06 | 4,00 |
| 9. | Leadership has an impact on innovation of the organization | 4,07 | 4,19 | 4,35 | 3,94 | 3,60 |
| 10. | A leader's soft skills are vital | 4,07 | 4,19 | 4,00 | 3,94 | 4,80 |

Cont. table 2.

| 11. | Leadership has an impact on an organization's financial performance | 3,96 | 3,94 | 4,00 | 3,94 | 4,00 |
|-----|---------------------------------------------------------------------|------|------|------|------|------|
| 12. | The hard competencies of a leader are important | 3,88 | 4,00 | 3,88 | 3,74 | 4,40 |
| 13. | Leadership has an impact on customer satisfaction | 3,79 | 3,81 | 3,82 | 3,80 | 3,60 |
| 14. | Organizations need a A pro-quality model to provide effective leadership in an environment of Industry 4.0 | 3,79 | 3,75 | 4,00 | 3,71 | 3,80 |
| 15. | Organizational leadership today is much more important than ever before | 3,77 | 4,00 | 3,71 | 3,71 | 3,60 |
| 16. | Industry 4.0 has introduced new requirements for leadership skills | 3,77 | 3,81 | 3,82 | 3,80 | 3,20 |
| 17. | Industry 4.0 has changed traditional organizational leadership models | 3,56 | 3,50 | 3,88 | 3,46 | 3,40 |

Source: Own elaboration.

Figure 1 presents in the form of a radar chart the average assessment of the importance of leadership among the studied generations.
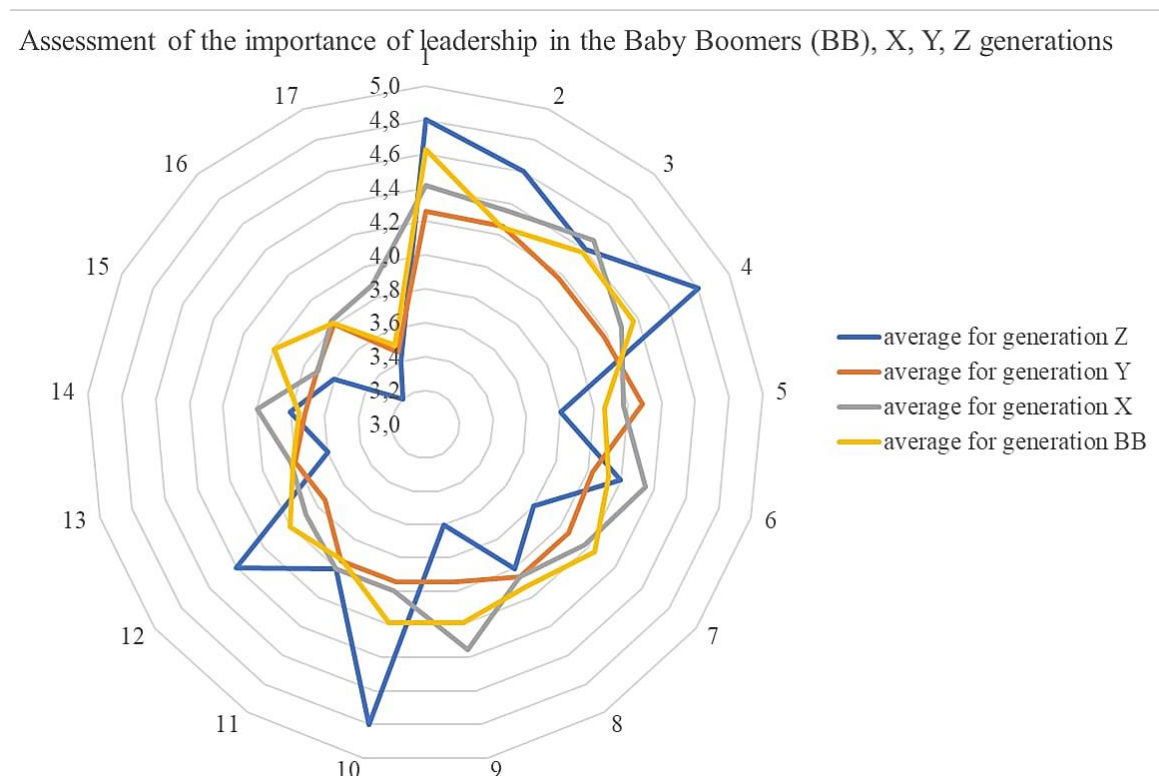


**Figure 1.** Assessing the importance of leadership in the Baby Boomers, X, Y, Z generations.

Source: Own elaboration.

For the entire group of respondents, the following variables are the most important in assessing leadership 4.0:

- A leader is essential in an organization (4.41);
- Leadership has an impact on employee engagement (4.30);
- Organizational leaders should have the ability to adapt quickly to the changing conditions of Industry 4.0 (4.30).

For representatives of the Baby Boomers generation, the results are as follows:

- A leader is essential in an organization (4.63);
- Organizational leaders should have the ability to adapt quickly to the changing conditions of Industry 4.0. (4,38);
- Leadership has an impact on employee productivity (4.38).

For representatives of Generation X, the following are of greatest importance:

- Organizational leaders should have the ability to adapt quickly to the changing conditions of Industry 4.0 (4.47);
- A leader is essential in an organization (4.41);
- Leadership has an impact on employee engagement (4.35);
- An organizational leader should have the ability to make decisions based on the organization's values (4.35);
- Leadership has an impact on organizational innovation (4.35).

Among Generation Y, no key statements appeared above an average of 4.30. The highest rated statements were:

- Leadership is crucial to the success of an organization (4.29);
- A leader is essential to the organization (4.26);
- Leadership has an impact on employee engagement (4.26).

For representatives of Generation X, the following are of greatest importance:

- A leader is essential in an organization (4.80);
- Leadership has an impact on employee productivity (4.80);
- Soft skills of a leader are important (4.80);
- Leadership has an impact on employee engagement (4.60);
- Organizational leaders should have the ability to quickly adapt to the changing conditions of Industry 4.0 (4.40);
- The hard competencies of a leader are important (4.40).

The results of the survey indicate differing attitudes toward leadership according to generational affiliation. Although all groups agreed on the key role of leadership in the organization, differences in evaluations of specific aspects indicate different generational priorities. Such diversity in expectations of leaders presents both a challenge and an opportunity for organizations to thrive in a rapidly changing business environment.

## Conclusion

Studying the differences in leadership perceptions among representatives of different generations in the context of management science and the social aspects of Leadership 4.0 is key to understanding how changing expectations of each generation affect organizational effectiveness. In the era of Industry 4.0, characterized by rapid advances in technology, digitization and globalization, leaders must adapt their approaches to the diverse needs and preferences of multi-generational teams. By understanding how different age groups define and evaluate leadership, it is possible to more effectively manage teams where representatives of different generations, from Baby Boomers to Generation Z, work together.

These differences stem from the different cultural, economic and technological experiences that have shaped each generation. Studying these differences allows leadership styles to be tailored to the specific needs of teams, which can help increase employee engagement, motivation and effectiveness.

Moreover, analyzing intergenerational differences in leadership perceptions helps identify potential conflicts and communication challenges in organizations. In this way, it is possible to develop strategies that foster integration and cooperation between generations, which is key to building sustainable, dynamic and innovative work environments.

Each generation - Baby Boomers, Generation X, Generation Y and Generation Z - has unique characteristics that shape their perceptions of authority, communication styles and expectations of leaders. Studying these differences allows us to identify the challenges of managing diverse teams and to better understand how generational diversity affects workplace relationships, decision-making and innovation.

This type of research supports both the organization's adaptation to new working conditions and the development of leaders who are able to create an environment that fosters innovation and engagement in teams of different generational composition.

The results of the survey on assessing leadership 4.0 in the context of generational differences indicate a diversity in priorities and expectations of leaders. For all respondents, three variables emerged as key: the role of the leader in the organization, the impact of leadership on employee engagement, and the ability of leaders to adapt to the rapidly changing conditions of Industry 4.0. These results reflect the widespread need for flexible and strategic leadership in the face of advancing technological change.

In particular, representatives of all generations agreed that a leader is essential in an organization, with Generation Z placing the highest importance on this (rating of 4.8) and Generation Y the lowest (rating of 4.26). Regarding leaders' ability to adapt, most generations considered it a key trait, although Generation Y rated it lowest.

In the Baby Boomers group, leadership was seen as a key organizational element, especially in terms of leaders' adaptability and their impact on employee productivity. In contrast, of less importance to this group was the impact of leadership on employee engagement.

Representatives of Generation X particularly valued the ability of leaders to adapt, indicating their awareness of the changing conditions in Industry 4.0. In addition, they attributed great importance to decision-making based on organizational values and the impact of leadership on innovation. This shows that their approach to leadership combines flexibility with an emphasis on values.

For Generation Y, although none of the surveyed statements averaged higher than 4.30, the highest ratings were given to the importance of leadership for organizational success and its impact on employee engagement. Generation Y pays attention to the practical aspects of leadership and its direct effects on the functioning of teams.

For Generation Z, on the other hand, assessments of the necessity of a leader and the impact of leadership on employee productivity and engagement were key. This group also showed particular interest in both soft and hard competencies of leaders, indicating their differing expectations in leadership skills.

## Summary

This study examined the differences in leadership perceptions of representatives of four generations: Baby Boomers, Generation X, Generation Y and Generation Z in the context of the requirements of Industry 4.0. The study identified key leadership characteristics relevant to each age group and identified the differing priorities of each generation. The results showed that while all generations recognize leadership as a key organizational element and appreciate its impact on employee engagement, they differ in their expectations of leaders.

Baby Boomers expect a leader to be adaptable and to influence employee productivity, Generation X values value-based decision-making and innovation in a leader, Generation Y focuses on success, and Generation Z pays attention to diverse leadership competencies (soft and hard). Despite significant differences due to cultural and technological experiences, there are also similarities in leadership expectations. Regardless of generational affiliation, respondents expect effective communication, leaders' involvement in the development of teams, trust-building, and authenticity and transparency in leaders' actions, which is becoming extremely important in an era of digital transformation.

This work points to the need for a flexible management approach that takes into account the diverse needs of generations. Leaders able to adapt their leadership style to the dynamically changing conditions of Industry 4.0 and the diverse expectations of employees can make a significant contribution to organizational effectiveness. These findings are an important

contribution to the development of leadership theory in modern organizations and provide a basis for further research on generational diversity management.

Despite the important findings, this study has some limitations that are worth taking into account when interpreting the results. The research sample was limited to Polish organizations which may affect the generalizability of the results to other countries. The number of respondents, especially from the youngest age group (Generation Z), was relatively low, which may have limited a more complete understanding of their perspectives. In addition, the survey was based on a self-assessment questionnaire, which may involve some subjective bias in respondents' answers. Despite these limitations, the results provide valuable insights into diversity in leadership perceptions and provide a solid basis for further research on managing multigenerational teams in the context of Industry 4.0.

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