

SOCIAL PRACTICES WITHIN THE FRAMEWORK OF SUSTAINABLE DEVELOPMENT IN 4.0 ORGANIZATIONS

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Purpose: The purpose of the research described in this article was to identify the types of GRI (Global Reporting Initiative) indicators applied in the social area by companies declaring the implementation of the concept of Industry 4.0 with relation to companies listed on the WIG ESG index.

Design/methodology/approach: For the purpose of analysing the reports on the companies chosen for research, the content analysis method was applied.

Findings: All the companies analysed file reports in accordance with the GRI indicators, while their identification and level of detail are differentiated. The implementation of the Industry 4.0 concept by enterprises is based on strategies and leadership, as well as culture and organizational structure, digital integration, security, management, labour force, as well as products and services.

Research limitations/implications: only WIG ESG index companies, only Poland company, only public reports and website. Future research: the relation between Industry 5.0 and the GRI indicators.

Originality/value: Until now, there has been such detailed analysis conducted on companies listed on the WIG ESG index that indicates the element of reporting of social GRI on the part of companies declaring the implementation of the concept of Industry 4.0.

Keywords: ESG, GRI, Industry 4.0, Industry 5.0.

Category of the paper: Research paper.

1. Introduction

Industry 4.0 is the first industrial revolution that was predicted before it actually materialized in practice. It was created by the expectations of corporate entities and decision-makers on the basis of actual technological innovations (Vereycken et al., 2021). Research conducted by Da Silva et al. indicates that the concept of Industry 4.0 opens up wealth and novel activities that may be implemented in contemporary enterprises (Da Silva et al., 2019).

The unpredictability of the intricate socioeconomic system forces enterprises to embrace the great variability of the processes of management, which, in certain cases, causes the loss of social trust - the effect of a transition to the digital phase may undermine social trust, while simultaneously discouraging people from political stability. Hence, management should encompass the mission of integration in the interests of all entities in the economy and be based on temporariness, repetitiveness, while also constant evaluation and reflection combined with dialogue. This shall also serve as a gradient for the integration of economies (Kovacs, 2022). Elements of social trust should constitute an important point of interest for enterprises, while the broad range of activities aimed at its creation should be visible and transparent. The tools for this purpose currently constitute elements of nonfinancial reporting, which encompasses the principles of sustainable development, while also the realization of the concept of the principles of CSR.

The purpose of the research described in this paper was to identify the types of GRI indicators applied in a social area by companies declaring the implementation of the concept of Industry 4.0. With regard to the listing on the ESG index, it was acknowledged that the appropriate area of research would be companies listed on the Warsaw Stock Exchange, as both the normative acts in Poland and the regulations of the stock exchange itself require them to act in the area of sustainable development

2. Industry 4.0 and the social dimension of sustainable development

The transformation of the concept of Industry 4.0 into Industry 5.0 constitutes a combination of the advantages of the cyberphysical system of smart machines and common sense, which in turn may mean the focus on productivity and sustainable development (Nahavandi, 2019). The basis for the definition by the World Commission on Environment and Development of the UN, namely, the notion of sustainable development, which was defined as a long-term ecological strategy aimed at integrating economic and ecological goals with social goals in the context of fair opportunities in terms of the division of resources for the current and future generations, has become that of environmental problems (WCED, 1987). The concept was based on three fundamental dimensions as follows: social, economic, and environmental. The environmental dimension encompasses the preservation of natural resources, environmental quality, biological variety, as well as economic resources aimed at ensuring long-term economic growth based on technologies, properties or trust funds, etc., whereas the aim in the social dimension is to lead to the improvement of the standard of living (health) and the development of individual achievements, while also personal fulfilment, reduction of social inequality, while also the use of the cultural and historical specifics of various social groups (Chichilnisky, 1997; Elkington, 1999; Seuring, Müller, 2008; WCED, 1987; Vidrascu, 2015).

The social dimension of sustainable development is concentrated on ensuring equality and safety among its employees, stakeholders, and communities in which the enterprises operate (le Blanc, 2015; Sangwan, Bhatia, 2020).

The factors that stimulate the processes of sustainable development are activities aimed at the following (Hull, 2008):

- reduction of social inequality both on a global scale and in particular countries, while also the elimination of poverty, famine, illiteracy, social injustice, and exploitation,
- restricting demographic growth and stabilizing the population of the world on an ecologically justified level,
- implementation of all spheres of social life, as well as economic and political thinking, while also action based on the principles of equal rights, ecological responsibilities, and mutual benefits, as well as changes in the concept of aid for third-world countries,
- shaping and strengthening civil society,
- significant changes in educational systems and programs through the expansion and development of the ecological problems within the framework of the ecological problems.

The role of slowing down, or sometimes blocking, of sustainable development is played by the ways of thinking which propose particularistic and ethnocentric thinking in terms of socioeconomic issues, leading to local conflicts and the failure to perceive common goals, as well as mutual threats, while also those that advocate the slogan of the constant growth and the principle of the primacy of the economy (market) over social policy and values, thus reducing the role of the spontaneity of development and effectiveness of the market mechanisms in all spheres of social life (also in education, culture, entertainment, etc.) (Hull, 2008).

The main discussion associated with sustainable development and Industry 4.0 is the result of the generation of workplaces, as the serious changes that emerge as a consequence of the implementation of Industry 4.0 have a visible effect on the labour market (Korhonen et al., 2018; Romero et al., 2020). Due to technological progress, there is a chance/risk of replacing the labour force with technology. By 2030, approximately 8.5% of the world's workforce in the manufacturing sector alone will be replaced by Industry 4.0 technologies (Oxford Economics, 2019). This, in turn, leads to another problem which arises from the social dimension of sustainable development – the issue of lack of the appropriate education. Organizations must support the shaping of employees, as well as the local community in the direction of competencies that are essential for using the use of new technologies (Kirchherr et al., 2017), but also for the comprehensive evaluation of smart technologies. This is to facilitate cooperation between a human being and smart machines, while also constituting a stimulator for future innovations within the framework of the fourth industrial revolution (Zezulka et al., 2016). It is worth drawing attention to the important social factors that have an impact on the evaluation of smart technologies, namely, as follows (Ejsmont, 2018):

- psychological, namely, the human features that are essential in terms of the cooperation with smart technologies, e.g. the level of trust, resilience, openness to change,
- educational, such as those who have education, qualifications, courses,
- sociological, namely, the scope of cooperation with smart technologies and their nature.

These factors constitute the determinant of the level of social capital, which, in many cases, plays an important role in the effectiveness of innovations, also including smart technologies (Putnam, 2001).

3. Methodology

By applying the literary review for the identification and confirmation of the chosen research topic (Van Duren et al., 2015), attempts were made to define the ties between the concept of Industry 4.0 and the social aspect of sustainable development. In the literary review, full-text publications were availed of, which were included in the databases of ProQuest, Emerald and SCOPUS. This facilitated the indication of the area of science to which the research could contribute, while also the contextualization of research in terms of literature (Rowley, Slack, 2004; Khan et al., 2001; Higgins et al., 2019).

Subsequently, by taking advantage of the principles of planning the scientific research (Schwarz et al., 1999; Creswell, 2013) the following steps were formulated in the research process:

1. choice of research area – companies listed on the WIG ESG index on GPW were chosen for analysis, namely on the day of commencing research, in which there were 60 companies on the index,
2. identification of enterprises that declare the achievement of growth at the level of Industry 4.0 among entities listed on GPW in the ESG index – 16 companies,
3. familiarization of the way of nonfinancial reporting by the indicated enterprises in 2022 according to the following criteria:
 - report on activities + ESG report, or
 - report on the subject of nonfinancial information, or
 - report on sustainable development, or
 - integrated report, or
 - information on company website, or
 - lack of reporting.
4. choice of only those companies that published reports for 2021 for further analysis, namely, 8 companies,

5. identification of types of GRI indicators of a social aspect reported in the analysed companies,
6. familiarization of the elements of the social aspect in the reports on the analysed companies.

The preparation of reports on sustainable development on the basis of GRI standards helps organizations to measure the results, while also managing the changes, strive towards sustainable development, in which the reports contain indicators characteristic of both the positive and negative impact of organizations on the environment, society and the economy, while also indicating the specific and tangible activities of the organizations. The indicators and gauges agreed on at the international forum make it possible to gain access to information and compare data in the reports on sustainable development, thus ensuring stakeholders greater knowledge that is essential to take conscious decisions (GRI, 2016).

For the purpose of analysis of the reports, the content analysis method was applied. Content analysis may be briefly defined as the systematic, objective, and quantitative analysis of message characteristics. It includes both human-coded and computer-aided text analysis (Krippendorff, 2004; Wu et al., 2020). The content analysis assumes that the study of the content is meaningful. This assumption requires the content be accepted as a ‘common meeting ground’. That is, the content analyst assumes that the ‘meanings’ he ascribes to the content by assigning it to certain categories correspond to the ‘meanings’ intended by the communicator and/or understood by the audience (Berelson, 1970). This study conducts content analysis as a systematic means of evaluation to identify the core factors; thus, it may be applied to the analysis of practically any type of communicative materials and would constitute a subjective analytical method of content by means of the process of systematic classification of encryption and the identification of topics or patterns (Hsieh, Shannon, 2005). Content analysis is a reliable and valid academic methodology for social sciences that analyzes reports on the basis of their important aspects, authenticity, or meaning (Joubish, Khurram, 2011). Research follows the procedures applied by (Denyer, Tranfield, 2006; Tranfield et al., 2003) and consisted of the following steps:

Step 1. Data sources were identified. The research process is based on public data, such as annual statements, sustainability reports, corporate social responsibility reports, corporate websites, trade unions’ opinions, and targeted interviews with company representatives.

Step 2. Categories were developed. The correct categories were prepared and tested in order to identify the elements which may be ambiguous or still require further clarification in order to subsequently specify the categories by defining the specifications relating to what is necessary to take into consideration, or what should not be taken into consideration when there is uncertainty, in order to ensure the credibility of the encryption.

Step 3. The encrypted data was acquired by taking a decision which should be encrypted in one category or multiple categories on the basis of a preliminary review of the data and testing of the encryption. The method of the paradigm funnel (Berthon et al., 2003) was used on the

most general to the most detailed data for analysis in order to achieve the intended results. This concept facilitated the grouping into thematic groups on the basis of the adopted criteria of the research findings. This diagnosis facilitated the comprehension of the information available in the pool of data acquired from the preferred reporting items, as well as the adopted guidelines of meta-analysis.

Step 4. The acquired results were analysed. The validation of the accuracy of the information was conducted over several stages (Hyde, 2000) in order to be able to interpret the acquired results and also compare them with the information acquired during the course of the literary review. The research process was conducted by the mutual impact of the induction and deduction processes. Gleichzeitig, objectivity was maintained during the course of data analysis, while also the cognitive distance was maintained, as well as the social and emotional distance with respect to the analysed sources (Duberley, 2015).

4. Results

As a consequence of the research conducted, during which the research area was chosen (Step 1), enterprises declaring the achievement of development at the level of Industry 4.0 were identified (Step 2), the way of non-financial reporting became known to the aforementioned enterprises in 2022 (Step 3), 8 companies were selected to go through to the next phase of the research process which had fulfilled all the hitherto assumed criteria. Subsequently, the identification of the types of GRI indicators of a social aspect reported in the analysed companies was carried out (Step 4).

The results have been presented in the diagrams (see: Figure 1, Figure 2, Figure 3).

Table 1.

Identification of the research area

Company name	Industry 4.0 Concept Declaration	Activity report/ report on non-financial information	Sustainable report development/ESG report	Information on the website
Allegro	v		v	
CD Projekt	v		v	
Grupa Azoty	v	v		
ING Bank Śląski	v			v
KGHM Polska Miedź	v			v
LPP	v		v	
PKN Orlen	v	v		
Tauron	v	v		

Source: Self-analysis.

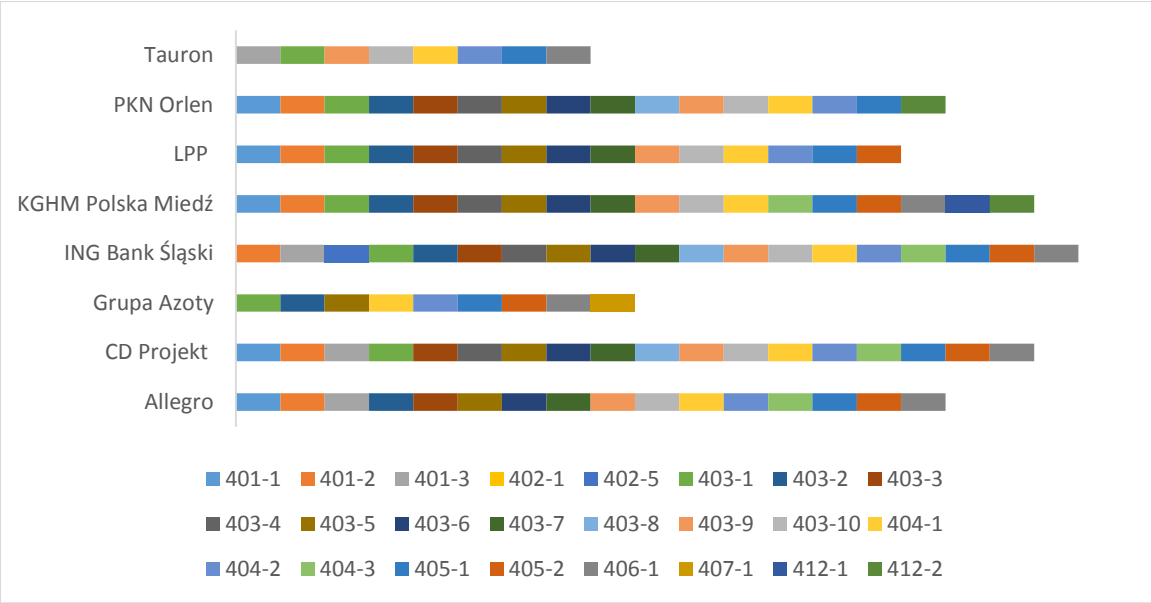


Figure 1. GRI indicators reported by companies in the employee area.

Source: own study based on research reports.

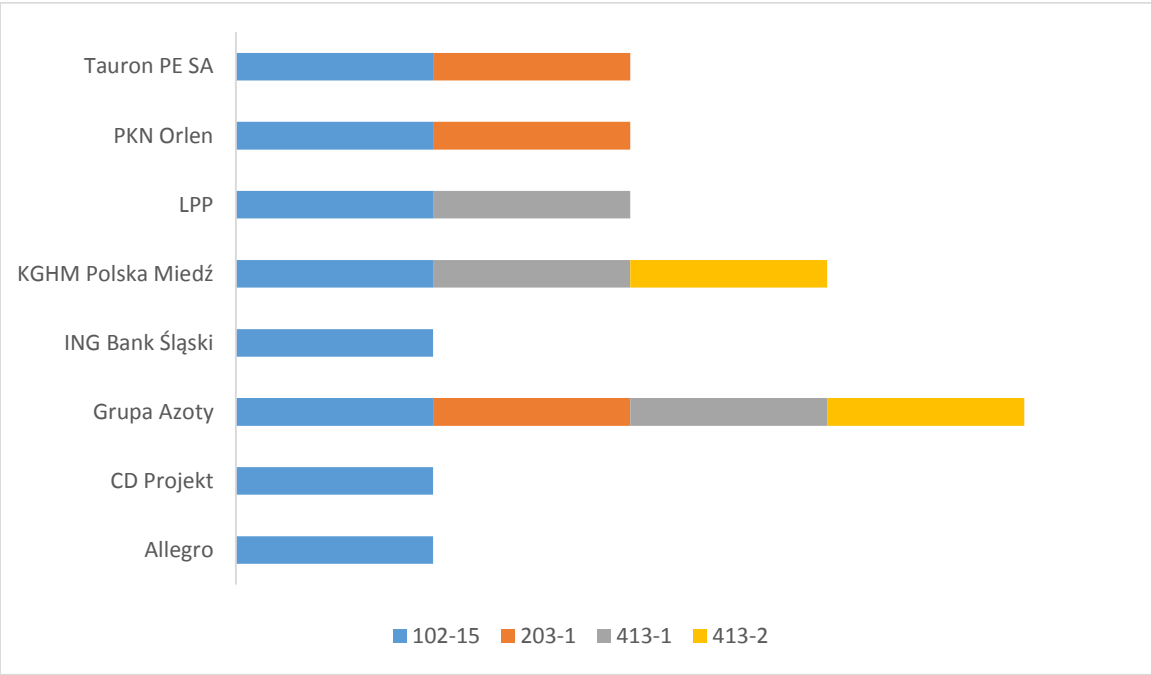


Figure 2. GRI indicators reported by companies in the area of the local community.

Source: own study based on research reports.

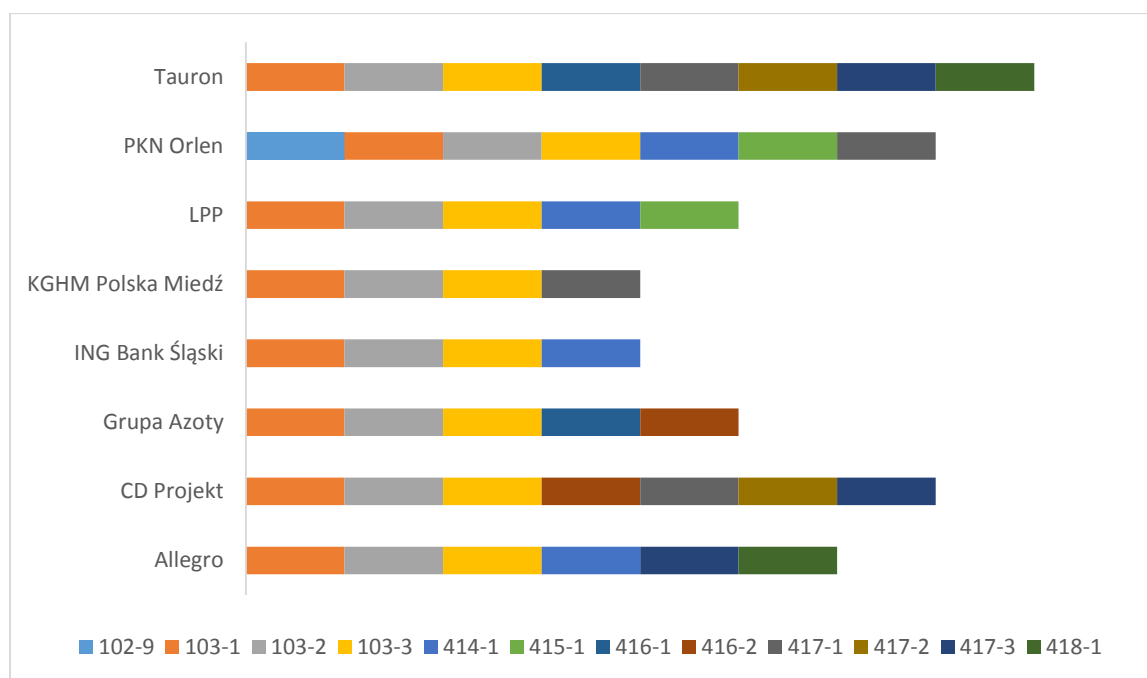


Figure 3. GRI indicators reported by companies in the area of other stakeholders - mainly suppliers and customers.

Source: own study based on research reports.

In conclusion, the research conducted illustrated the following issues:

- All the companies analysed submit reports according to the GRI indicators, in which their identification and level of detail is varied – companies have discretion in terms of presenting data.
- The largest group of indicators described by the companies constitutes the area of employment – it would seem to be relatively easy to present with regard to the numerical data available on the digitized personnel systems; on the other hand, this area constitutes an important level for every employer in terms of building employer branding.
- Communication with stakeholders is conducted with the aid of electronic tools, which is in accordance with the concept of Industry 4.0.
- Only one of the companies analysed, namely, Grupa Allegro.eu SA, provides detailed reports on activities aimed at shaping technological competences.
- The social dimension among the analysed companies is also described in the majority of cases in the context of ecological activities – activities on behalf of the natural environment, taking care of the environment in which the particular group of stakeholders functions.
- Training of employees is partially executed with the aid of electronic tools – e-learning, which is according to the concept of Industry 4.0.
- Activities on behalf of employees are most widely described by three of the analysed companies, whereas reports on the external stakeholders, namely the local communities, while also clients and suppliers are provided by Grupa Azoty SA, KGHM Polska Miedź

SA, PKN ORLEN SA and Tauron SA, thus enterprises whose area of business activities involves emissions in the manufacturing process.

5. Summary

Business activities in a social or environmental area may also translate into the economic performance of the company, hence, it would seem to be significant for enterprises implementing the concept of Industry 4.0 to pay attention to the elements of nonfinancial reporting.

The relation between Industry 4.0 and the GRI indicators remains to a large extent stable depending on the enterprise, its sector, and magnitude, while it also seems to rather depend on the specific technologies used. Apart from the extraordinarily stable relationship with building the level of engagement of the employees, various technologies would seem to be associated differently with various practices in terms of building relations with the other groups of stakeholders. Our conclusions indicate the necessity to maintain caution in creating ties based on the use of imperative concepts, and also the significance of Industry 4.0 in terms of the future of the analysed enterprises.

Although advanced research methodology facilitated the analysis of social practices within the framework of sustainable development among Polish companies listed on the stock exchange in the WIG ESG index, there are certain limitations to which attention should be drawn to. First and foremost, despite the wealth and multiperspectives of the data collected and analysed, the findings are limited to the declarations of the enterprises stipulated in the reports published by them. Hence, future research should aim at verification by means of interviews and observations in the firms in order to check the accuracy of their declarations. Such empirical evidence derived from implementing the technologies of Industry 4.0 in social processes and relations with stakeholders will facilitate a discussion about the differences between the planned impact, the declared impact and the actual one. Future research could also execute vertical integration, or fragmentation with a prevalent approach that is rather oriented towards the cooperation between an enterprise and its environs.

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