

FORECASTING FUTURE SKILLS AND THE INTERNAL POTENTIAL OF ENTREPRENEURS IN THE PERSPECTIVE OF MINING TRANSFORMATION IN POLAND AND THE GLOBAL LABOR MARKET MEGATREND

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*We can gain knowledge from others,
but we must learn wisdom ourselves
Adam Mickiewicz*

Objective: in the cognitive space of the article, it focuses on one of the key challenges for the domestic mining industry, which is the need for skillful and innovative promotion of modern attitudes and convincing that moving away from the way of thinking prevailing in the industrial era is purposeful and inevitable, because only and exclusively turning to the future - through care for one's own development - can guarantee success¹.

Methodology: the theses presented in the article were verified using the following methods: literature review, critical analysis of literature, analysis of documents and comparisons and examples of good practices.

Result: the possible success of maintaining balance on the labor market in the area of internal potentials of entrepreneurs - in transformed areas - in the perspective of the megatrend global labor market will most likely be determined by an approach based on important determinants such as full and understandable information for the recipient based on the most complete knowledge of transformation processes and creativity in their implementation.

Originality: it seems that breaking mental barriers towards innovations in order to strengthen their acceptance may play a decisive role in creating the development of transformed labor markets. The pursuit of innovation leads directly to economic growth at the level of both the state and the commune, while at the individual level promoting social inclusion and strengthening people's sense of life to the full.

Keywords: transformation, job market, skills.

Category of the paper: research paper.

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1. Introduction

Currently, one of the key challenges, among others for the domestic mining industry, is the need for skillful and innovative promotion of modern attitudes and convincing that moving away from the way of thinking that prevailed in the industrial era is purposeful and inevitable, because only and exclusively turning to the future - through care for one's own development - can be a guarantee of success. The main determinant shaping the position outlined above is the change in the paradigm of development of the current model of the world economy as a result of its dynamic transition from the era of the industrial revolution to an economy based on knowledge, determined in its development by a new process called Revolution 4.0. In this perspective, it should be recognized that human resources - in particular qualified staff - are the most valuable resource of modern economies determining the successful course of transformation of mining areas and further.

The indicated process will have a huge impact on the quantitative and qualitative dimension of the labor market, which is also determined by changes in the structure of consumer demand or, for example, the decline or development of economies. This is related to, among others, with the emergence of increasingly severe effects of transformation processes in the globalized economy. This article is devoted to the problem outlined in this way, in which, in the context of issues related to the global labor market, the social challenges related to the transformation of mining are in the foreground.

2. Discussion

Transformation in Poland is an important social and economic issue. This issue is particularly related to the process of implementing the European Green Deal plan (<https://ec.europa.eu/info/strategy...>, 2024). In the perspective of the plan, the green economy, which is defined as an economy that improves people's well-being and increases social justice - while reducing environmental risk and the consumption of natural resources (Environmental Indicator Report..., 2012), is of particular importance. In another approach, the green economy is a low-emission economy, economical in the use of raw materials and socially inclusive (Measuring Progress..., 2012). The importance and significance of actions developing the green economy are emphasized by the policy of the European Union, which has some of the strictest environmental protection standards in the world. The EU and national governments have set clear objectives to shape European environmental policy towards 2050. These objectives are (A greener, more sustainable Europe..., 2022):

- protecting, preserving and enhancing the EU's natural capital,
- transforming the EU economy into a resource-efficient, green and competitive low-carbon economy,
- protecting Europeans from environmental pressures and threats to health and well-being.

EU environmental policy has always been characterized by a structured set of legal acts regulating it, the most important of which over the years have been:

- Articles 11 and 191-193 of the Treaty on the Functioning of the European Union (TFEU); in the Single European Act of 1987, a new title was introduced, "Environment", which was the first legal basis for a common EU policy in the field of the environment (OJ 2004.90.864/2 – Treaty on the Functioning..., 2004),
- under the Maastricht Treaty (1993), the environment was recognized as an official area of EU policy. The Amsterdam Treaty (1999) introduced the obligation to integrate environmental protection into all sectoral EU policies (European Union consolidated..., 2002),
- in the Treaty of Lisbon (2009), "Combating climate change", as well as sustainable development, became specific objectives (Treaty of Lisbon amending..., 2009).

A milestone in the transformation of EU countries towards a green economy – which assumes the need to decarbonize energy – is the Horizon Europe program (Horizon Europe – new program..., 2024). Horizon Europe promotes excellence and provides valuable support to the best researchers and innovators, thus driving the systemic transformation needed to ensure a green, healthy and resilient Europe. It stimulates scientific excellence through the European Research Council (ERC) to enable excellent researchers to push the frontiers of science and knowledge to help address the economic and societal challenges Europe faces. Horizon Europe also supports collaborative research on the societal challenges Europe faces and strengthens technological and industrial capacity through thematic policy groups addressing the full range of global challenges. For example, the clusters "Climate, Energy and Mobility" and "Digital, Industry and Space" will scale up climate-related research and innovation, and provide European companies with access to the technologies and data they need. Horizon Europe will also introduce new initiatives such as the European Innovation Council (EIC) and EU missions. The European Innovation Council, which operates, has received a budget of over €10 billion to support emerging and breakthrough innovations in start-ups, small and medium-sized enterprises and mid-cap companies. This activity will complement the work of the European Institute of Innovation and Technology (EIT). Furthermore, by establishing contacts with regional and national innovators, European innovation ecosystems will be strengthened. In turn, EU missions focus on issues that affect our daily lives – from fighting cancer to adapting to climate change, living in greener cities, protecting water and oceans, or ensuring healthy soils for healthy food, human health, nature and climate.

In turn, the aforementioned European Green Deal plan is the path to the first climate-neutral continent. The European Green Deal is:

- a plan to build a sustainable economy,
- resource efficiency and a clean economy,
- covering all sectors of the economy,
- the need for additional investments and a fair transition mechanism,
- citizens' voice and international cooperation,
- transition to a clean, circular economy,
- stopping climate change,
- combating the loss of biodiversity and reducing the level of pollutants emitted.

Climate change and environmental degradation pose a threat to Europe and the rest of the world. To meet these challenges, the European Green Deal action plan was created. It is to help transform the EU into a modern, resource-efficient and competitive economy that will:

- achieve zero net greenhouse gas emissions by 2050,
- decouple economic growth from resource consumption,
- shape social order so that no person or region is left out of the transformation process.

The European Green Deal is financed with funds representing one third of the €1.8 trillion earmarked for investments under the Next Generation EU recovery plan and from funds from the seven-year EU budget.

In addition to the above-mentioned literature sources relating to the transformation, the article refers to national documents outlining medium- and long-term goals and tasks in the field of energy transformation and the Just Transition Plan. The first of the documents discussed in the expert opinion is the National Recovery and Resilience Plan (National Recovery Plan..., 2021), in which the key objective in the part devoted to green energy and reducing energy intensity is clean air. This objective should be achieved, among others, by: thanks to (<https://www.funduszeuropejskie.gov...>, 2024):

- faster replacement of old coal furnaces with more ecological ones,
- purchase of photovoltaic panels and solar collectors,
- wind farms in the Baltic Sea,
- smart power grids,
- hydrogen technology,
- green cities.

In turn, in the Strategy for Responsible Development we read that the assumed transformation of the economy towards a low-emission economy will require a complete revaluation and new market models allowing for such features as power, availability, location of the producer, location of the recipient, demand characteristics, etc. However, due to the nature of energy services, changes must be evolutionary and it is necessary to reconcile a sufficiently strong base of conventional, large-scale production forces in professional energy

with distributed sources functioning as a supplement for medium-sized agglomerations and clusters, energy cooperatives, etc. with a significant level of autonomy (Strategy for Responsible Development..., 2017).

Another important document in the space of transformation processes is the Energy Policy of Poland. In this document, one of the primary goals is to ensure that for social, economic and environmental reasons, the implemented restructuring of coal regions will ensure that a just energy transformation will lead to economic strengthening, leaving no one behind and will serve future generations. Financial instruments under the EU mechanism for a just transformation, mobilizing support funds in the amount of PLN 60 billion, are to support this process. Detailed solutions in this area will be included primarily in the national and territorial plans for a just transformation (Energy Policy of Poland..., 2021). At the regional level, the key document of a strategic nature in the space of transformation processes is the Development Strategy of the Silesian Voivodeship "Śląskie 2030". This document clearly states that from the perspective of the Silesian Voivodeship, the implementation of the Silesia Program will be important, the aim of which is to change the economic profile of the region, gradually replacing traditional sectors of the economy, such as mining and metallurgy, with new ventures in more productive, innovative and technologically advanced sectors. It was assumed that after 2020, the Silesia Program will be fully implemented, correlated with government restructuring programs, expansion and modernization of transport infrastructure, implementation of a new, territorially sensitive, integrated urban, industrial, innovation and human resources policy. It is planned to introduce additional instruments related to the adaptation of national operational programs to the objectives of the Silesia Program, primarily in the area of investment promotion and innovation (Voivodeship Development Strategy..., 2020). New directions and challenges are outlined in the Regional Innovation Strategy of the Silesian Voivodeship 2030. The strategy clearly indicates that in the coming years, entities from the Silesian Voivodeship will be beneficiaries of a special European Union instrument supporting green transformation, which is the Just Transition Fund. This support will enable: production investments in SMEs, leading to economic diversification and economic restructuring; investments in the creation of new enterprises; investments in research and innovation activities and supporting the transfer of advanced technologies; investments in the implementation of technologies and infrastructures providing affordable clean energy, in the reduction of greenhouse gas emissions, energy efficiency and energy from renewable sources; investments in digitization and digital connectivity; investments in the regeneration, decontamination and renaturalization of areas and projects changing their purpose; investments in strengthening the circular economy; improving and changing employee qualifications. However, the allocation of funds will be carried out within the framework of a separate Territorial Just Transition Plan, which will be created for seven subregions of the voivodeship: Katowice, Bytom, Sosnowiec, Gliwice, Tychy, Rybnik and Bielsko (Regional Innovation Strategy..., 2021).

The key operational programmes in the transformation process space are the Regional Just Transformation Plan of the Silesian Voivodeship 2030 (Territorial Just Transformation Plan, 2021) and the Just Transformation Fund (Just Transformation Fund, 2020).

In the Regional Plan, expert attention was focused primarily on the transformation process. In this perspective, it is stated that the transformation of the voivodeship will require a change in the production structure and the development of the energy sector in the region. One of the implemented actions will be the phasing out of obsolete power units (built in the 1970s and 1980s) and replacing them with modern infrastructure, friendly to the environment and the inhabitants of the region. (...) Renewable energy sources will play a key role in the energy system of the region. The Territorial Just Transformation Plan provides support for this type of investment as an important element of the diversification of generation sources in the regional energy mix. The implementation of the indicated activities will contribute to achieving the national target of 21-23% share of renewable energy sources in gross final energy consumption.

The second of the cited documents, the Fund for Just Transition in the Silesian Voivodeship, will serve to achieve the main goal, i.e. mitigating the social, economic and environmental effects of the transition to a climate-neutral economy. In conjunction with other sources of financing, in particular the funds of the Cohesion Policy 2021-2027, funds from the remaining pillars of the Just Transition Mechanism and other public and private funds dedicated to complementary activities and projects, this Fund will give new impetus to the region's economy and open up better development prospects for its inhabitants, especially those most affected by the negative consequences of the inevitable transformation process.

Documents, plans, strategies and theses, corresponding to the goal of achieving a green economy in the EU, determine at the same time – especially at the level of local communities – the need to recognize the social reception of the just transformation process, which may be of great importance for the state and development prospects of the transformed areas and are a fundamental recommendation for the creation of programs aimed at strengthening the country's energy policy based on clean technologies. Remembering the effects that have occurred over the many years of transformation of hard coal mining in Poland, one should not ignore the fact that further transformation of this important sector of the national economy may cause states of its social acceptance or rejection. This is of particular importance for the sector and its environment, which are systematically subjected to pressure resulting from its adaptation to changing political, economic and social conditions. In this perspective, thematic areas that are clearly part of transformation processes – especially the transformation of hard coal mining – are key challenges for EU policies shaped by the European Green Deal plan, which is gaining particular importance in both the cognitive and utilitarian areas. The above-mentioned processes and phenomena trigger transformations within economic organizations and other institutions. They are directly or indirectly related to the spheres of employment and human resources management. As noted in numerous works, six key global challenges, which are: digital future, global market, health care, raw materials and natural resources, urbanization and

growth of entrepreneurship, result in the process of adaptation of enterprises in the areas of principles of operation, information methods and organizational models in order to build sensitive solutions based on innovations that shape modern (smart) enterprises of the future (Rosário, Dias, 2023). Given the directions of change outlined above, the biggest challenge for intelligent and innovative organizations is the need to predict the future, improve in the face of the changing environment, build solutions that respond to changes that may occur in the future and increase their competitiveness (Leea, Trimib, 2018, pp. 1-8).

In the area described above, special importance is attributed to the management of human resources. This is even more so if management generally means the ability to work through other people. In practical terms, this ability is difficult and complex. Effective management of people requires, apart from substantive knowledge, orientation in the scope of their needs and the system of values they possess. Only on the basis of such knowledge can one take up challenges related to developing a system of motivation, assessment, promotions, etc. Based on the definition of human resources management, it can be stated that it is the ability to determine the principles and methods that condition the pursuit of organizational goals through the employees employed in it, i.e. qualified staff that are specified and respond to the given needs (Sajkiewicz, 2004, p. 33). In the perspective of the indicated definition, the goal of strategic human resources management is to strive for a state in which everything (i.e. tradition, work style and organizational structures, as well as quality, commitment and motivation of employees) brings the enterprise closer to the desired success (Dudzińska-Głaz, 2012, pp. 83-83). In this context, strategic thinking is an essential, and perhaps even the most important component of human resources management in the transformation process. It outlines the framework within which specific solutions to problems arising in the employee team are developed and adopted (Arokiasamy, Fujikawa, Piaralal, 2024).

Moving on from the level of considerations, the subject of which is the individual, it should be noted that the changes taking place in the modern world pose new challenges for the education system and enterprises, which in turn are reflected inside them, leading to changes in processes and structures. Both education systems and enterprises that intend to survive and develop must skillfully forecast the reality surrounding them and permanently adapt to the changes taking place, among others, through appropriate strategies and permanent shaping of processes occurring inside them. In addition to this challenge, new problems in the field of human resources management are currently emerging, which are a consequence of changes in the global economy, of which domestic enterprises are participants. One of such challenges is the constant need to adapt education to the processes taking place on the labor market, which often does not correspond to the directions of economic development and the needs of the enterprise. Hence, it is so important to skillfully recognize the staffing needs expected in the economy (Matei, Abrudan, Abrudan, 2024). As Juchnowicz notes, the economy and its changing structure shape both the quantitative and qualitative staffing needs, qualifications and competencies of labor resources. A 21st century employee must be a comprehensively educated

expert. In modern economies, where knowledge is the key capital, there is a characteristic regularity. Namely, obtaining a job is determined by 70% of the professional knowledge resources and 30% by soft skills, also known as social skills. However, a job can be lost 70% due to a lack of soft skills and 30% due to a lack of professional knowledge (Juchnowicz, 2007, pp. 40-46). At the labor market level, the indicated transformations are determined primarily by the quantitatively and qualitatively changing flows of labor supply and demand for labor. In particular, changes are revealed as a result of the aging process of labor resources and the changing market, which in a given situation is dominated by high unemployment or a high employment rate (Betcherman, Olivas, 2024). The situation of change on the labor market as a result of convergence or divergence of the flows of labor supply and demand for labor in the context of qualified personnel causes an increase in demand for them or their surplus. In a given situation, appropriate solutions should be sought, in accordance with the available possibilities, to consolidate or improve the situation on the labor market. As indicated by the authors of the work entitled *Foresight of the staff of the modern economy* (hereinafter FKNG), currently numerous analytical works inform about the deficit of qualified personnel (Gryzik, 2009, p. 44). This state may significantly threaten economic development on a global scale. In view of this change, the situation on labor markets is subject to constant change. As a result of the changes taking place, regularities characteristic of labor markets can be distinguished. The population of people with unlimited access to gaining education, especially higher education, is clearly increasing. The service sector is dynamically growing. Along with this process, staffing needs are developing, which will increase in the long-term perspective (World Employment and Social..., 2024). These processes in countries with the highest level of economic development are inevitably accompanied by the progressive process of ageing of societies and the phenomenon of a decrease in the population of people entering the labor market for the first time. At the same time, there is a clear decline in births, which in the economies already mentioned do not guarantee a simple population replacement, and the average life expectancy is significantly increasing, which is the result of a significant improvement in the area of health care and living conditions. As a result of these changes, it is increasingly difficult for working people to secure the area of economic deprivation for non-working people (World employment social outlook..., 2018). The effect of the described demographic and social changes is a systematic decrease in labor resources in OECD countries, where it is forecasted that in the years 2025-2030, they will decrease by 12 million per year (Commission Staff Working Document..., 2023).

Another significant – currently very new – challenge for labor markets in transformation processes is digital disruption. As the authors of the work note: *Competencies of the future in times of disruption*, we are witnessing rapid changes in the previously linearly organized world. Thanks to digital technologies, our lives and work are changing so radically that we can even talk about sudden civilizational changes. In the perspective of 2030, we will have to free ourselves from the current cognitive dualism - seeing two separate worlds called real and virtual

- and accept the integrity of the 21st century world as a space in which reality gains a new, digital dimension. This is a sine qua non condition for the country's development, posing a huge challenge to the education system. The last decade, as never before in the history of the Internet, has shown that civilization competences have a dominant impact on the comfort of life and professional position. Today, having them is a guarantee of good remuneration and a strong position (Głąb, 2019, p. 8). In this light, transformation processes can lead to growing and perpetuating social divisions – the syndrome of “inherited poverty” – economic, civilizational and cultural territorial divisions (Bowen, Kymlicka, Muhammed, Duyvendak, 2018). As Piątkowski notes, transformation processes, on the one hand, stabilize areas of economic growth, low unemployment and increasingly better infrastructure, while on the other hand they create regions with poor economic prospects (low development dynamics and no prospects for overcoming civilizational regression). In the latter, people are accompanied by a sense of pessimism, hopelessness, apathy and discouragement. Increasingly numerous and increasingly alarming social diagnoses and expert opinions gradually began to reveal the image of permanent exclusion and isolation that grew among numerous categories of people dependent on the care of others or the support of an inefficient social welfare system. It was pointed out that this group has ceased to be a "social margin", as its numbers are gradually growing, and poverty and passivity are increasingly becoming petrified and inherited. These phenomena are particularly drastic and painful when they concern children and young people, both those from big cities and those from rural and small-town environments (Piątkowski, 2011, pp. 76-84). The phenomenon of employment diversity also includes many features defining the characteristics of qualified personnel and their position on the labor market. Diversity in employment and the benefits resulting from it have two key references (Saxen. 2014, pp. 76-85). The first emphasises the need to keep people of pre-retirement age on the labor market as long as possible. Considering Poland's development prospects, in particular the improvement of the professional and social situation of people aged 50 and over, changes in the labor market are important - and in the area of professional activation - which can be illustrated by the employment rate in the population between 20 and 64 years of age, which in 2022 approached 75.7% in Poland (Employment rate in EU countries..., 2024). In the same period, the employment rate for the 28 European Union countries was 73.5% (In Sweden, the employment rate..., 2024). In view of the above data, it is worth noting - taking into account the transformation processes - that retirement is the main cause of professional inactivity of Poles aged 45-69 (Employed, unemployed and professionally inactive..., 2024). Decisions regarding retirement are conditioned by various systemic and institutional factors, but individual reasons related to the socio-economic, health and family situation prevail. Some of the barriers to extending the period of professional activity can be removed through appropriately implemented social policy. This includes providing institutional care for minor children and seniors, as such caregiving responsibilities, especially towards grandchildren and

parents, burden many people from the 45+ generation, increasing the tendency to professional deactivation.

Based on the above regularities, it should be stated that human resources - including qualified staff - characterized by a certain level of knowledge, qualitatively unique skills and highly developed qualifications constitute the basic resource of labor supply and every organization (Mizrak, 2023). Good, qualified staff in the economic reality surrounding them can minimize structural stratification on the labor market, eliminate the mismatch between professional qualifications and employment needs, limit the growth of unemployment and ultimately determine the success of the enterprise's mission. As it is noted in research on the labor market, especially in the field of organization and management, in the recent past, competitive advantages on the market were demonstrated by enterprises with relatively simple capital resources, which were most often technologies, raw materials, means of work, etc. Currently - as indicated by research on management - the dominant ones on the market are enterprises with modern, intelligent and change-sensitive staff, which efficiently and effectively use their potential to achieve the assumed economic goals and implement the mission of the enterprise. Dominant in these activities is - as already noted earlier - the ability to work appropriately through people and manage personnel (David, 2011, 2009, 2007).

The spaces introduced in the transformation process are important for identifying knowledge that becomes a unique achievement developing in the cognitive and practical canon of implementation and development of the organization and the possibility of managing it in a possible changing socio-economic system. This position is confirmed, among others, in the monumental study on "Management, organizations and organizing - a review of theoretical perspectives". The cited work notes the importance of interpenetration of theory with practice and practices with theory - as a determinant of the development of the management science discipline. In this part, attention is drawn to the influence that concerns the classical perspective, which concerns the already established and unquestionable position in the achievements of management science, and concepts that are relatively new and that include the subject of scientific considerations. As a consequence, they spread with inevitable devices that are provided from theoretical and empirical research results - which open up a new space for the management science discipline - as part of achieving transformational goals (Latusek, 2016, p. 13). In this light, it can be assumed that empirical works, examining transformational changes in the applied goals of organizational research and the cognitive spaces encompassing them, not only spread to the encountered problems, but also bring new, external elements resulting from the facts that progress in knowledge and scientific activity is possible if we consciously and deliberately closed the research procedure (Apanowicz, 2020, pp. 19-20). Drawing conclusions from the conclusions on the content, it seems that the contribution to transformational allegations based on research based on changes in the environments transformed within the framework of economic and humanistic sciences, applying itself in the form of compensating practical knowledge. The validity provided by your Sudol achievements,

who notes, science is increasingly expanded, management practice, as it is increasingly expanded, more advanced solutions should be applied in conditions expanded from the reach of technology and increasingly advanced prediction of the future in terms of the development of technology, and social life (Horizons of Contemporary Management, 2016, pp. 38-39). Against this background, it was noted that the current action is possible for employees, which can be available for the world economic growth and development. The labor market is turbulent and constantly changing. The processes and actions occurring in the labor market can be identified its characteristic determinants. As the authors of the work entitled Using the labor market note, every day people, companies and institutions in the labor market make choices. What education should be the property of my child? Is there a skilled force available in the system, which can come from our company, available in a new business? Can a better educated workforce be used to attract foreign investment? Is there a need to revise some educational programs? Is the application required to attract students to study in the extension? Are people making decisions based on the information provided earlier; or inevitably a description in a situation of imperfect information. In this category, people, institutions and companies have not been preparing for these challenges for many years. You can never be sure what will happen will appear in the future, it is important to use the information that is available in the future (Rihova, 2016). Expand the forecasts and notifications are the aforementioned growing population and its aging. As signaled by the authors of the Leadership 2030 report, especially as a result of the effects of demographic changes that come from the traditional industrial model (Building a New Leader, 2014). These countries may be primarily the result of an attack with social systems and growing migrations. A serious challenge for these countries will be the "brain drain". It is worth supporting here that the controller was sent by the Royal Society in London (British Royal Society). It took place in the first half of the 1960s and described the emigration of a young controller living in the British Isles (Podemski 2010; Aráuz, Wittchen, 2010, p. 91; Kaczmarczyk. Tyrowicz, 2008, p. 4).

Over time, the term brain drain was adapted in other European countries, including Poland. An example of the phenomenon described is, among others, the migration of Poles from 1981-1988. It is estimated that around 700,000 people emigrated from Poland during those years, of whom nearly 15% had education higher than secondary. It is worth noting that the indicated percentage of migrants constituted a serious loss considering the fact that during that period people with higher education constituted only 7% of the entire Polish population. It is estimated that as a result of the described migration of highly qualified and specialist staff, national labour resources decreased by a factor corresponding to one quarter of the total number of graduates of national universities (Kaczmarczyk, 2006, p. 11). As a result of the changes outlined above, industrial countries may experience numerous shortages, which may result in numerous problems and social conflicts. This may be particularly evident in the phase of the return of migrants, who may undoubtedly accelerate local development at the expense of increasing competition on the labour market as a result of the increasing supply of highly developed

professional qualifications. The authors of the Leadership 2030 report call this phenomenon directly the "talent war" (<https://www.leadersinstitute...>, 2024).

Along with the indicated trends, it is necessary to note the growing problem related to migration. This is particularly noticeable in countries with moderately developed economies, which are struggling with the outflow of qualified personnel to highly developed markets. When assessing the indicated phenomenon, it is emphasized that in the migration processes of human resources characterized by highly developed and innovative qualifications, not only the brain drains counts, but also their degradation (brain waste). The global regression on labor markets that occurred in the years 2001-2004 significantly limited the professional development of young people. The indicated phenomenon particularly strongly depreciated the position on the labor market of young people with lower and less developed qualifications. These people most often decided to migrate as a result of lower self-esteem in the context of their own development opportunities on the domestic labor market, lack of abilities enabling planning of personal development and critical knowledge on the subject of migration conditions and the resulting effects. When deciding to leave the country, they did so many times as a result of pressure from the environment (critical attitude towards the position on the labour market burdened with the risk of unemployment) and the lack of other solutions. As a result of decisions made, which were not determined by justified premises, there was a depreciation of the qualifications and skills held as a result of taking up work unrelated to the education and qualifications held. This was also indirectly related to the phenomenon of social alienation in the place of origin and difficulties related to socio-professional adaptation in the place of destination of migration. In conclusion, economic migration of young people resulted in very unfavorable further behaviors, which were associated with the lack of continuation of education, stagnation in the development of personal life and lowering self-esteem as a result of assigning the status of a second- or third-rate employee (Kaczmarczyk, Tyrowicz, 2008, p. 4).

In light of the considerations undertaken above and the indicated regularities, it is clear that the situation in the structure of human resources, including qualified personnel in the labour market and enterprise dimension, is currently determined by numerous challenges. Failure to address them may significantly determine a bad relationship between labour demand and labour supply. In this situation, it seems justified to accept the following thesis: since it is impossible to stop changes in the market, one must learn to benefit from it (Chesbrough, 2002). The view expressed above regarding changes in the market implies several significant changes, among which the following deserve special attention:

- the growing importance of local participation in making global decisions in more culturally diverse conditions of cooperation,
- the need to implement projects based on international mobility and adaptability as well as cultural sensitivity,

- the need to increase social awareness related to responsibility for the natural environment,
- the disappearance of state policy in the implementation of social functions and their takeover by an increasingly organized local society.

An indispensable element of the ongoing changes that determine the situation on labor markets, including in enterprises, is the previously indicated high positive balance of external migration (Kałuża-Kopias, 2014) and the reversal of the age pyramid and the related demographic depression and ageing of society (Marszowski, 2017, pp. 229-244). These processes will force the need to develop innovative solutions that can integrate and develop international policies towards the phenomenon of migration of older people, especially in relation to women. In response to the indicated changes, it seems that the primary actions should be focused on building innovative solutions that respond to the need for intergenerational integration programs related to maintaining the professional activity of older people for as long as possible. At the same time, reducing the growing intergenerational information gap. The potential success in this area will most likely be determined by the ability to prepare innovative solutions that ensure a balance between professional work and life - based on the flexibility and multifunctionality of work - while guaranteeing freedom and autonomy to the individual. It is worth noting in the context of the threats indicated that in highly developed economies, the changes taking place have been focused on selected economic and social areas. They are currently taking shape on the level of the convergence process between nano-, biological and information technologies and cognitive sciences (hereinafter referred to as NBIC technologies) (Cognitive Sciences and Philosophy of Law, 2014, pp. 175-186). NBIC technologies are developing extremely dynamically, creating progress in the sphere of health care, energy, environmental protection and production, leading to the transformation of other areas, even non-technical ones – from outside their area of impact. It seems that in this light, the future of local communities will be determined by two trends. In the first of them, the local community will be on the margin of the changes taking place as a result of its exclusion from the process of co-participation in the convergence mentioned above. In a successful scenario, it will join the process indicated above based on its development potential – and will benefit from it on equal terms with other participants.

In view of the above-outlined patterns and challenges, the transformation of mining, especially in the context of global trends related to decarbonization, automation and sustainable development, has a huge impact on human resources in this sector. Changing technologies, regulations and socio-economic expectations force not only the adaptation of enterprises, but also far-reaching transformations in competences, work organization and employment structures. First of all, automation and the introduction of modern technologies, such as robotics, artificial intelligence or the Internet of Things (IoT), reduce the demand for traditional, physical work in mines. Tasks previously performed by people are increasingly being taken over by machines, which leads to a reduction in jobs in the mining sector. Therefore, the need

to retrain employees is becoming a key challenge for human resources. Skills related to the use of advanced technologies and data management are becoming increasingly desirable, which requires intensive training programs and investments in the development of human capital. Secondly, the transformation of mining forces a change in the approach to human resources management. Mining companies need to develop flexible employment strategies that allow them to adapt to new technological challenges and the changing structure of the industry. Instead of long-term employment based on manual work, there is a need to create more dynamic work models that value innovation, analytical skills and an interdisciplinary approach to problems. HR managers must therefore take into account new competences and promote continuous professional development of employees. Finally, the transformation of mining also brings with it social transformations. In regions dependent on traditional forms of extraction, the reduction in the number of jobs can lead to social tensions, requiring intervention in the form of programs supporting local communities. Therefore, the development of strategies that support restructuring processes by creating new jobs becomes a key aspect, especially in sectors related to renewable energy and other sustainable branches of the economy. The transformation of mining significantly affects human resources, requiring new competences, adaptation to advanced technologies and flexible employment models. At the same time, it poses challenges related to retraining employees and support for mining regions, which is necessary for sustainable social development. In view of the above findings, it seems that breaking down mental barriers towards innovations in order to strengthen their acceptance may play a decisive role in creating the development of transformed labour markets. Striving to develop innovations leads directly to economic growth in both the state and the commune, supporting social inclusion in the individual dimension, strengthening people's sense of life to the full (Wronka-Pośpiech, 2015, p. 133).

3. Summary

Analysis of the overall analysis in the spatial space of the transformation noticeable, characteristic of the occurrence, which can limit or determine their successful course. spreading to the risk that occurs in the last decades of the labor market. In view of this, the solution that will follow with the development, can be detected on the regularities, the detection and launch of which can ensure their successful solution. Continuing the supply, it should be taken into account that they are particularly exposed to the effects of transformation changes in countries and regions whose economies are on the traditional industrial model. the threat that may occur above all is the threat to the efficiency of social systems and growing migrations. In this light, transformation processes can lead to growing and perpetuating social divisions - the syndrome of "inherited poverty and deprivation" - economic, civilizational and cultural territorial

divisions. On the one hand, transformation processes can stabilize economic growth, lead it and increasingly threaten infrastructure, on the other hand, create regions with poor economic prognosis (low development dynamics and no prospects for breaking the civilizational regression). In these last speeches there is usually a sense of pessimism, hopelessness, apathy and disruption. In order to apply the effects above, the effects resulting from the full definition of the community that is transformed, justified that the departure from the way of thinking in the industrial era is purposeful and inevitable, caused only and exclusively with access to the future - through the application of one's own development - can constitute a success. In the system dominated by the Industrial Revolution 4.0 and shaped meaning, attention should be paid to the inevitability of technological developments that will shape a new dimension of life and work. Transformational processes in extensions available worldwide, combined with cognitive functional functions, two independent worlds and virtual, in favor of the original reality perceived in one digital sensor. The above elements concern one of the goals, that is, to perform a reconnaissance of the social reception of the transformation, which may be significant for the state and development perspective of the transformed areas and be a fundamental recommendation for the creation of restrictions that may affect these elements in the labor market space.

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