

University of Economics, Prague

# **Bachelor's Thesis**

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Faculty of Business Administration  
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Title of the Bachelor's Thesis:

# **Preparation of labor market for the Industry 4.0 focusing on the Russian labor market**

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## **Declaration of Authenticity**

I hereby declare that the Bachelor's Thesis presented herein is my own work, or fully and specifically acknowledged wherever adapted from other sources. This work has not been published or submitted elsewhere for the requirement of a degree programme.

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**Title of the Bachelor's Thesis:**

Preparation of labor market for the 4.0 era focusing on the Russian labor market

**Abstract:**

The thesis investigates the concept of labor market 4.0 and its specifics on the present stage. The findings of the research combine both a theoretical overview of the concept and its inherent characteristic and a case-study analysis of labor market 4.0 as implemented in Gazprom, Russia's monopolist corporation on the energy market. It is shown that basic elements of labor market 4.0 such as automated data collection and processing, big data analytics, the Internet of Things, cloud technologies, and so on play an important role in the optimization of human resource management in the business practices of companies. Practical recommendations have been developed for Gazprom to improve further the integration of labor market 4.0 into the corporation's business.

**Key words:**

HR Management, Unemployment, Automation, Gazprom, Labor Market 4.0, Industry 4.0.

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# Introduction

In the conditions of globalization, the international labor market is developing rapidly. As people get opportunities to move more freely across the borders, the labor market keeps intensifying and the struggle between companies for the best employees and between individuals for the best employers becomes more and more intensive. At the same time, an important role is played by the development of up-to-date technologies. The integration of digital and online innovations into the activities of the labor market contributes to a more effective growth of the market, improved processes of recruitment, quicker fulfilling of vacancies, and an overall higher level of competition on the labor market. In the long run, this all contributes positively to the overall development of the global economy.

The concept Industry 4.0 relates to the fourth industrial revolution and embraces revolutionary changes which are currently occurring as a sign of rapid progress, primarily in developed states. Industry 4.0 is based on interconnection through the Internet of Things, information transparency, technical assistance, and decentralized decisions. The elements of Industry 4.0 embrace mobile devices, smart sensors, cloud storages, 3D printing, augmented reality devices, distributed data processing, effective fraud detection, and so on. The continued progress of Industry 4.0 is expected to bring major benefits to humanity in terms of the ultimate performance and the effectiveness of economic growth.

Labor market 4.0 can be understood as a part of the wider Industry 4.0 concept. Given the current dynamic development of the labor market and the methods applied on it, it becomes particularly important to investigate the specifics of the existence and activity of the labor market in the 4.0 era.

The **aim** of this thesis is to analyze the current application of the industry 4.0 concept on the labor market and to analyze the specifics of the process on the example of a Russian multinational corporation, namely Gazprom.

The **goals** of the thesis are to understand the key elements and specifics of the labor market; to investigate the types and forms of the labor market and their inherent parameters; to overview the concept of industry 4.0 and its key components; to consider specifically the concept of labor market 4.0; to analyze the recent dynamics of the Russian labor market; to

investigate in detail the case study of the chosen Russian multinational corporation, Gazprom, in order to reveal the extent to which the company deploys the labor market 4.0 elements in the course of its activities; to discuss the findings and to make appropriate conclusions according to the aim of the thesis.

The **research questions** of the thesis are the following:

- RQ1: What are the main specifics of the labor market 4.0 concept and how is it implemented in practice?
- RQ2: What role does labor market 4.0 play in the activities of Russian multinational corporation Gazprom?

The **methods** to be used for writing the thesis include secondary and primary research. Literature review will be applied in the theoretical part of the thesis for investigating the available bibliographic sources dealing with the topic and for forming the required theoretical basis for further investigation. The sources used will include reliable print and electronic publication. The analysis in the practical part will be based on a key informant interview held with the company's manager. An interviewer is considered to be an expert in the field of labor market. It will aim at revealing the current stage of implementation of labor market 4.0 and its specifics in the chosen corporation. The interview will contain open questions which the manager will be asked to answer for the purpose of revealing appropriate information pertaining to the thesis topic. The findings will be analyzed in line with the topic of the thesis and the stated aim and goals.

Thesis also includes statistical data analysis of the Russian labor market. It focuses on understanding of labor market, unemployment rate in Russia and labor sector by sort of occupation.

The practical results of this thesis are expected to provide a better understanding of the actual implementation of labor market 4.0 in the practice of multinational corporations and to show to which extent this concept can yield benefits in terms of how such corporations behave on the labor market.



# 1 Theoretical Part

## 1.1 Labor Market: Key Definitions

Before proceeding to a more detailed investigation of the labor market, it is worth focusing more specifically on the definition of the labor market and the analysis of its constituent elements.

According to the International Monetary Fund (1996, p. 2), a labor market can be defined as “*a mechanism for matching the supply and demand of the factor of production labor, through the terms of the contract between buyer and seller.*” There are many different types of labor performed on the market, including in terms of the existence of a contract between the buyer and the seller, the level of skills of the hired employee, their gender, and so on. All these different forms of labor and the interaction between the employer and the employee are tightly interlinked. As a whole, they can be understood as the labor market.

Davulis and Petrylaitė (2012, p. 86) note that the labor market can be treated not plainly as a market, but also as a set of policies, instruments, services, and institutions which are destined to ensure the proper turnover of labor force in a given economy and to guarantee the most effective use of resources available to it, and primarily of the human potential. From this perspective, the labor market can be deemed a highly complex entity with a great number of ties between the participants in the market.

Vranken (2005, p. 342) suggests that the labor market is a rather abstract market, as it cannot be localized and the relationships between its parties revolve around intangible products. The researcher points out that the labor market can be treated as a social structure and a social institution given the nature of the labor market and the goals which it follows. Also, Vranken states that the labor market cannot be understood as a single market. On the contrary, it is a unified set of smaller submarkets, which are closely interconnected and the functioning of which always affects each other. Despite the fact that the labor market is abstract, it still functions similarly to traditional product markets, as employers are buyers who seek hiring employees, while employees sell their knowledge and practical skills for which they get money in exchange. The functioning of the labor market is directly associated with the operation of product markets, and negative dynamics occurring on either of them affects the other market as well.

Purdy (1988, p. 6) adds that *“The study of the labour market can be defined as covering all aspects of the behaviour of workers and employers, the environment in which it occurs, and the institutions through which it is filtered, which have some significant bearing on the exchange of wages for labour-power and the process of market equilibration.”* In this context, it can be understood that for studying the specifics of the labor market’s operation, it is worth taking into account a great number of factors affecting its parameters, including those related to the external environment and those shaping the internal characteristics of the market. Without paying sufficient attention to both the external and the internal factors, it is impossible to comprehend effectively the nature of the market and the driving forces which contribute to its growth. Furthermore, it is impossible to forecast effectively future trends on the market and the possible new vectors of its subsequent development.

Analyzing the structure of the labor market, it is worth paying particular attention to the participants in the labor market. These actors include the following:

1. Individuals (employees). Blossfield (2008, p. 290) states that the individuals are those persons who seek a job on the labor market. As noted above, they act as sellers who offer their skills and knowledge in exchange for a salary. For the individuals, the main motivation to participate in the labor market is to fulfill effectively their needs in ensuring proper standards of life. Individuals require salaries in order to pay for their needs and for guaranteeing sufficient social standards for their families. At the same time, employees seek self-fulfillment and the practical implementation of their aptitudes. The competition between employees on the labor market occurs based on several key parameters, namely based on their skills appropriate for a particular industry and sector and based on their readiness to accept particular work conditions, including the level of wages. After being hired, the employees continue developing their careers, enhancing their skills and knowledge, and so on. Subsequent turnover of labor force contributes to a greater intensification of activities on the labor market.
2. Companies (employers). According to Blossfield (2008, p. 290), employers on the labor market are buyers of human resources. The main goal of employers is to find the best employees who would perform their job duties and thus contribute to the company’s overall progress and financial success. Companies on the labor market include both entities operating on particular national or regional markets and large

multinational corporations focusing on cross-border activities. Companies struggle for hiring the best employees, for which purpose they can use both financial and non-financial motivation. On subsequent stages, companies seek developing their staff and ensuring its growth prospects, guaranteeing effective and safe work conditions, promoting the best employees, and so on.

As stated by the International Monetary Fund (1996, p. 2), the conditions of work agreed upon between the buyer and the seller can vary. Thus, the levels of wages are preconditioned not only by the skills which a worker has, but also by the country in which such labor relationships are implemented, the level of inherent hazard, the intensity of competition between the employers and the employees, and a number of other essentially important characteristics.

3. Governments. The main function of the government on the labor market is to develop an appropriate regulatory framework within which all labor market participants would enjoy the best opportunities to fulfill their particular goals. The International Monetary Fund (1996, p. 2) suggests the importance of effective regulations which should be adopted for the labor market by the authorities. Such regulations can govern the minimum amounts of wages which can be paid to particular categories of employees or in particular sectors, set the guarantees for effective payments and fines for the employers who violate such rules, monitor the adherences to the work safety standards and measures on the part of the employers, to provide equal opportunities for the resolution of possible disputes, and so on. For the public policymakers, regulating the conditions of cooperation on the labor market is important, as the performance of the labor market affects the general performance of the national economy as a whole and preconditions the actual limits of its expansion.

Peck (1996, p. 40) notes that debate as regards the actual scope of the government's involvement in the processes of regulation of the labor market have always been strong among economists. Generally, it is believed that excessive government intervention in the activity of a country's labor market yields negative consequences, as this affects competition and makes the activities of companies on the labor market more dependent on the will of the authorities, which in its turn raises the risks of corruption and the associated phenomena.

Nevertheless, Peck states that a completely self-regulated market is a kind of utopia and is actually unachievable in real-life economic conditions. Similarly to the World Bank, the researcher points out the importance of the state's role as a regulatory, controlling and monitoring body. The actual role of the government consists primarily in the development and implementation of a common legal framework within which both companies who seek employees and individuals who seek companies would be protected and would get an opportunity to fulfill their existing needs effectively. At the same time, the author suggests that the role of the state should be limited beyond this and that any direct interventions of the state in the market should be minimized.

Now, having understood the nature of the labor market and the specifics of the relationships between different labor market participants, it is worth noting the key functions of the labor market and their particularities.

The main functions of the labor market are the following:

1. Redistribution of labor resources. Jack et al. (2010, pp. 2-3) state that by providing a platform for labor demand to meet labor supply, the labor market contributes to the most effective redistribution of labor resources within the national economy. As a result, individuals' own forces can be applied more effectively, and a balance can be reached between the available workforce and the need of companies in labor. In its turn, this contributes to a more effective situation in the national economy, thus providing the national economy with improved growth prospects.
2. Organization of the relationships between the employer and the employee. The labor market contributes to the establishment of effective relationships between the companies and the individuals. This contributes further to the growth of the labor market, as companies and individuals can use their resources more effectively, thus achieving enhanced performance.
3. Guarantees of competition. Thanks to the functioning of the labor market, companies compete over labor resources. For this purpose, they have to offer better job conditions for their employees, which in its turn required overall better financial performance and the availability of greater funds and more innovative technologies.

Thus, the labor market contributes to intensified competition between companies, which is one of the essential growth factors in the modern economy.

4. Natural regulation of wages. According to Jack et al. (2010, pp. 2-3), the balancing of demand and supply on the labor market shapes the actual levels of wages existing on the market. As a result, the market balances itself and guarantees the opportunities for companies to find labor resources and for employees to find a job.
5. Balancing of employment. The need of employers on the labor market prompt individuals to get the required skills and knowledge to become employed. If an individual cannot find a job in their particular field, they can start developing themselves in another sector in order to find a job and ensure proper living standards. In these cases, the labor market ensures the balancing of labor supply and demand. At the same time, the state has to respond to the existence of unemployed persons by developing effective public policies targeting the labor market specifically.
6. Monitoring and control. Through the existence of a well-organized and developed labor market, it becomes possible for the government to guarantee the fulfillment of employees' rights and to prevent any violations of such rights.

Thus, as can be seen from the information provided in this chapter, the labor market is a complex phenomenon which embraces a great number of participants and is affected by a great number of differently-vectorized factors. Bearing these facts in mind, it is now possible to analyze in more detail the different types of the labor market.

## **1.2 Types and Forms of Labor Market**

Today, there are different classifications of the labor market in literature, as different researchers classify the labor market based on individual key parameters they take into account. Below, the main classifications of the labor market currently available in literature are investigated.

1. By geography (territorial coverage) (Levinson and Christensen 2003, p. 826):

- 1.1. Local labor market. A local labor market is the smallest geographical entity in the structuring of the labor market. It is the labor market of a city or a region within a state. Its resources are limited compared to national markets, and the main scope of its functioning is to ensure the normal operation of the economic sector of the locality in which it exists.
  - 1.2. National labor market. A national labor market is a market extending over the territory of an individual state. This type of labor market is characterized by the fact that it is governed completely by the laws of one state. However, national labor markets are not isolated entities, and the participants in such markets can include both companies and individuals from abroad. National labor markets represent the primary source of labor force for the companies operating within a given state and they interact most closely with the economy of such a state in general.
  - 1.3. Regional labor market. In contrast to the national labor market, a regional labor market is a market extending over the territories of several individual states or a supranational formation. For example, the market of the European Union is a regional labor market. This market is governed by the mutual agreements between the states participating in it, namely in terms of how individuals are allowed to cross the borders for seek employment in another state, which rules apply to companies seeking employees, and so on.
  - 1.4. Global labor market. The global labor market includes all national labor markets of individual states and operates on the global scale. The global labor market is a complex entity which is not directly regulated by the law of particular states. However, within international organizations and through international agreements, states do shape the general guidelines and rules for their activities on the global labor market.
2. By demography (Freeman and Wise 2004, pp. 3-4):
    - 2.1. Male and female labor markets. These segments of the labor market are identified based on the existing gender differences. This structuring of the labor market allows seeing what particular industries or other economic sectors are characterized by the domination of either men or women as employees and tracking the reasons which

cause particular shifts in the dynamics of employment of different genders in different circumstances.

- 2.2. Youth, elderly labor markets, etc. These segments are identified based on the age criterion. The fragmentation of the labor market by age allows tracking which particular age categories have better job opportunities and what particular reasons might be the causes of such disproportions.

3. By type of professional activities (Gokhberg, Shmatko and Auriol 2016, p. 121):

This criterion allows identifying a great number of different types of the labor market, including the market of doctors, engineers, translators, carpenters, and so on. Each particular profession available on the market has its own level of complexity, different supply and demand of labor force, different wages, and so on. Companies most often seek employees with particular skills and knowledge to fill particular vacancies. Thus, they do not operate on either the national or the global labor market as a whole, but focus on those particular segments which are prospective for them in terms of the practical opportunity to find the required number of professionals in the dedicated field of activities. This contributes to the formation of effective professional standards and to the establishment of balanced levels of wages. In the long run, both companies and individuals obtain an opportunity to fulfill their specific needs on the labor market more effectively.

4. By the existence of regulation (Freeman and Wise 2004, p. 496):

- 4.1. Regulated labor market. The regulated labor market is characterized by the fact that the relationships between the employers and the employees on it are regulated by the state. The state provides a marketplace for the companies and the individuals and bears the responsibility for the regulation of the market. As a result, all participants can resort to court protection in case of any breaches by the counterpart.

- 4.2. Unregulated labor market. In contrast to the previous market type, unregulated market is characterized by the fact that its participants act beyond the segments supported legislatively by the state. On the unregulated market, the participants evade taxation. As a result, they cannot resort to the protection mechanisms available to the regulated market participants. While the activities of the unregulated labor market can be deemed detrimental to the national economy, it can at the same times

be stated that the existence of the grey market is required in some conditions, namely for developing states, as the existence of this market segment allows supporting higher economic standards of the population.

5. By the degree of state regulation (Ertuna 2016, p. 88):

- 5.1. Free market. The free market assumes that there is no control at all on the part of the state and the market exists completely based on the free market mechanisms. As stated earlier in this thesis, this model is utopian and does not exist in practice, as there is always state impact to some extent.
- 5.2. Liberal market. Liberal labor markets are characterized by minimum state intervention. This type of markets resides on the existence of effective market mechanisms, and the state acts only for the protection of the interests of all participants.
- 5.3. Controlled market. This market is characterized by the greatest degree of state intervention. This type of the labor market is most often inherent of states with an authoritarian model of government. Such markets are the least attractive for foreign investors and entail a high level of risks.

6. By time of existence (Levinson and Christensen 2003, p. 826):

- 6.1. Permanent market. A permanent labor market is not constrained by any time limits and exists regardless of a particular season or another time interval. For example, the markets of programmers, plumbers, dentists, and so on exist without any time limits, as the services of such professionals are required on a permanent basis for the population.
- 6.2. Seasonal market. This type of labor market exists only during particular seasons, as the services of particular professionals are required only during particular time periods and are not required during other. For example, this is true speaking of winter or summer resorts, and so on.
- 6.3. Temporary market. This type of labor market exists only for a particular limited amount of time. For instance, it exists when the need for labor force exists only for a particular project, and so on.



As can be stated based on the information outlined above, the labor market is a complex entity which embraces a number of different types of submarkets.

Now, having investigated, the specifics of the labor market and its different segments, it is worth analyzing in more detail the concept of industry 4.0 and the place which the labor market holds in it.

### **1.3 Industry 4.0: Overview of the Concept**

According to the definition provided by Gao, Souri and Keates (2017, p. 340), Industry 4.0 is *“the development of manufacturing technologies to allow higher levels of interconnectivity, leading to greater communication between machines and decentralised/local processing of data.”* The authors suggest that the term Industry 4.0 appeared for the first time in 2011, when it designated the strategy of the German government for the implementation of high technologies in industry and manufacturing. The term meant the new approaches to the computerization of manufacturing and the implementation of more sophisticated innovation based on self-configuration, self-diagnosis and intelligent support.

Ustundag and Cevikcan (2017, p. 5) note that the concept of Industry 4.0 resides on 8 main components which underlie technological advances, namely *“adaptive robotics, data analytics and artificial intelligence (big data analytics), simulation, embedded systems, communication and networking such as Industrial Internet, cloud systems, additive manufacturing and virtualization technologies.”* The researchers suggest that the implementation of these components in today’s industrial production contributes to its growing automation, improved reliability, smaller dependence on human errors, and more sophisticated management mechanisms. It allows integrating all business processes and achieving their seamless simultaneous operation, which is indispensable for the most effective performance of all appropriate business procedures and the maximized effectiveness of corporate commercial activities.

Monostori et al. (2019, p. 79) note that the backbone element of the Industry 4.0 concept is advanced manufacturing, which is based on the fourth industrial revolution. Digitalization

within Industry 4.0 occurs through the use of the Industrial Internet of Things (IIoT). The practical implementation of Industry 4.0 so far has been done by 37 national governments, mostly in developed countries around the globe. The topic is also of great importance to theoretical research, as it represented potential opportunities for the continuous improvement of industry in years to come.

Citing Wang et al., Ustundag and Cevikcan (2017, p. 6) state that for effectively adapting systems to Industry 4.0, three key features should be taken into account, namely horizontal integration via value chains, vertical integration and networking of manufacturing or service systems, and end-to-end engineering of the overall value chain. Vertical integration assumes the need to unify all business processes in a way for them to operate in the most efficient manner given their high rates of mutual interconnection. Through the use of smart machines and real-time digital management, it becomes possible to maximize the quality of a firm's vertical integration, which is a direct prerequisite for the optimization of its general production and other commercial processes. The more effective processing of data through Industry 4.0 allows controlling all processes more effectively and join them together. As for horizontal integration, it assumes the creation of stronger ties between companies operating in the same sector, namely between manufacturers on the one hand and suppliers, agents, etc. on the other hand. Using advanced digital technologies, it is possible to process more quickly the existing information flow, to optimize the processes of data exchange through real-time data sharing, to guarantee the most effective product lifecycle management, to ensure proper and accurate planning, and so on, which all contribute to the more effective relationships between different economic actors. Finally, as for end-to-end engineering, it stands for the integration of supportive technologies with due consideration for customer requirements, product design, manufacturing, and so on. Such supportive technologies include adaptive robotics, embedded systems (cyber physical infrastructure), additive manufacturing, cloud technologies, visualization technologies (virtual and augmented reality), simulation, data analytics and artificial intelligence, etc.

Considering the Industrial Internet of Things (IIoT) as one of the main pillars of Industry 4.0, Monostori et al. (2019, p. 80) state that this is “*a novel paradigm that is rapidly gaining ground in the scenario of modern wireless telecommunications.*” The main idea of the IIoT is the creation of opportunities for different appliances to interact within a mutual framework to operate jointly in the most efficient and uniform manner. The three constituent

components of the IIoT are context, omnipresence, and optimization. Context stands for the opportunity of advanced object integration in the environment; omnipresence means the presence in all physical environments; and optimization means that machines today are not just a network of human-operated appliances.

Ustundag and Cevikcan (2017, p. 7) note that adaptive robotics is based on the recent advancements in the field of innovative production. Namely, today's robots have not only greater capacities in terms of the actions they perform, but also greater autonomy, which means that they can operate often without human intervention. This raises significantly the opportunity of using such robots in complex manufacturing processes, minimizing the expenditures associated with labor force and guaranteeing maximum precision of all procedures. The flexibility of such robots also allows making them learn new operation and perform their activities in different physical environments.

Considering cyber physical infrastructure, Ustundag and Cevikcan (2017, p. 8) claim that *“Embedded systems, named as Cyber-Physical Systems (CPS), can be explained as supportive technology for the organization and coordination of networking systems between its physical infrastructure and computational capabilities.”* In these terms, physical and digital tools should be integrated with other devices for the sake of achieving a due level of decentralization and the opportunity to perform decentralized actions. Thus, it can be stated that cyber-physical systems perform two main sets of functional tasks: on the one hand, they provide real-time data processing from the physical infrastructure and information feedback from the digital infrastructure; on the other hand, they ensure intelligent data processing to support the physical infrastructure.

As for big data analytics (BDA), Monostori et al. (2019, p. 81) suggest that *“Big data typically stems from various channels, including sensors, devices, video/audio, networks, log files, transactional applications, the web, and social media feeds.”* The collection of such data and its comprehensive real-time analysis become of core effective for enterprises to ensure proper business management and the due interaction with their customers, for supporting real-time decision making and guaranteeing minimum time expenditures in all ongoing business processes.

Considering cloud computing, Monostori et al. (2019, p. 81) note that it *“refers to delivering computational services through visualized and scalable resources over the Internet;”*

Effective cloud services have the following essential characteristics: “*on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service.*” Cloud manufacturing stands for a model of industrial manufacturing which relies on the use of cloud computational technologies, cloud storage services, and so on. The use of cloud technologies allows deepening the virtualization of the integrated manufacturing procedures and thus making them more effective.

As for visualization technologies, Ustundag and Cevikcan (2017, p. 10) suggest that in Industry 4.0 they include virtual reality and augmented reality technologies. The main purpose of such visualization technologies is to ensure the integration of the real-world physical environments with virtual environments, thus enriching people’s perception of reality. They actually represent graphical user interfaces which allow people seeing more than is actually present in the physical environment. Ustundag and Cevikcan (2017, p. 10) note that such visualization technologies generally have 4 key requirements, namely scene capturing, scene identification, scene processing, and scene visualization. Such technologies can be used effectively not only in the tertiary sector, but also directly in manufacturing, namely in the design of smart factories.

Investigating simulation, Ustundag and Cevikcan (2017, p. 11) state that this includes discrete event and 3D motion simulation, which can be used effectively in different cases for raising the quality of product and process planning. The researchers claim that “*In the perspective of Industry 4.0, simulation can be evaluated as a supportive tool to follow the reflections gathered from various parameter changes and enables the visualization in decision-making.*”

Thus, based on this overview, it can be stated that Industry 4.0 is a recent concept, and today it shapes the development of industry based on innovative technologies and effective automation. Bearing these facts in mind, it is now worth proceeding to an overview of labor market 4.0.

## **1.4 Labor Market 4.0 and its Specifics**

Analyzing the actual impact of Industry 4.0 on the labor market, Mehta and Awasthi (2019, p. 25) note that the occurring technological changes have their deep and long-standing implications for the labor market. First of all, the authors highlight that the subsequent

spreading of automated data processing, adaptive robotics, effective autonomous operations of smart factories, and so on would inevitably lead to the growing levels of unemployment on the global scale: the number of available jobs would be shrinking and the availability of vacancies would become gradually smaller. Mehta and Awasthi (2019, p. 25) note that “*with the exponential growth of technologies on the horizon, the higher value jobs will be created that would require altogether different skill sets and results in likely job losses in developed and developing countries.*” On the other hand, the integration of innovative technologies in production also prompt people to learn new professions in order to be able to meet the current requirements of the market. As a result, the mobility of labor force tends to keep steadily growing, which can be deemed an overall positive effect for the global economy from the standpoint of the long-term perspective.

This opinion is also supported by Kergroach (2017, pp. 6-7) who notes that the occurring changes in industry in terms of the growing use of innovative technologies might represent a threat to the availability of vacancies on the labor market on the one hand, but at the same time can bring benefits. Thus, according to the researcher, labor market 4.0 will be creating new jobs instead of the ones eliminated. Such new jobs will be based on intelligent labor rather than on manpower. They will include data analysts, researchers, automation engineers, and other professions which are indispensable in the new market conditions. In its turn, this will provide another impetus for the continued spreading of Industry 4.0 and thus will contribute to the improvement of the global economy as a whole.

Another important characteristic of labor market 4.0, according to Eberhard et al. (2017, p. 50), is its further internationalization and globalization. New technologies will continue erasing the borders between states, and the teams of professional workers will tend to become international, cooperating from different countries at once. Local companies will obtain access to greater labor force markets. Also, Eberhard et al. (2017, p. 50) suggest that “*by using modern ICT and by developing the speed of the internet, manufacturing companies will be able to create real-time communication and connectivity with worldwide subsidiaries. All the mentioned facts result in totally new workforce requirements.*”

In addition to this, it should be understood that the companies will get new tools to improve their activities run on the labor market. Thus, thanks to the spreading of innovative technologies, businesses will be able to collect and process data from the labor market more effectively and, as a result, they will be able to make more weighed decisions as regards the

recruitment of employees and their subsequent career management. In turn, this should contribute to more effective development of employees' skills and to the saturation of the market with enhanced knowledge and improved human potential.

Thus, it can be stated that labor market 4.0 as a part of the Industry 4.0 concept plays an important role in the transformation of the current labor market relationships and affects the activities of both companies and individuals on the labor market.

Given the findings of the theoretical part of the research, it is now worth proceeding to the practical part of the thesis.

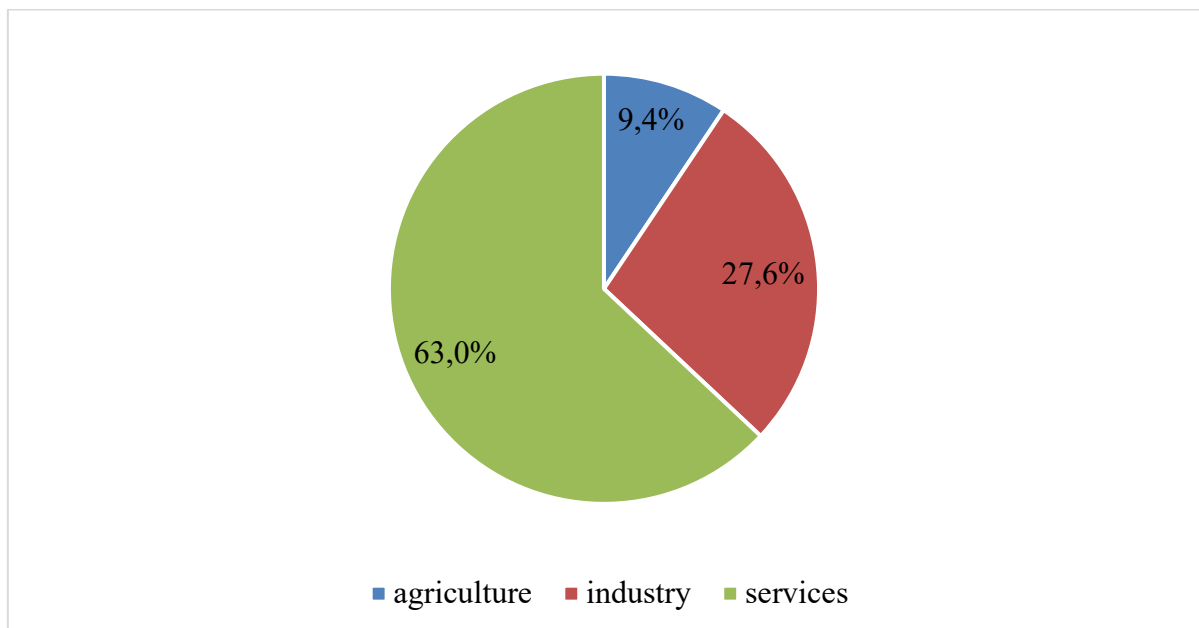
## 2 Practical Part

### 2.1 Labor Market in Russia: Statistics

Before carrying out the analysis of the chosen company for revealing how it integrates labor market 4.0 into its business practices, it is worth first providing a general overview of the Russian labor market.

According to the CIA World Factbook (2019), Russia has a total of 76.53 million persons of labor force, which is the world's sixth indicator behind China, India, the United States, Indonesia, and Brazil. As can be seen from the chart below, most of these persons are employed in the tertiary sector: 63 %, while industry and agriculture account for significantly lower shares in the labor market: 27.6 % and 9.4 % respectively. This situation testifies that Russia is shifting toward a post-industrial model of economic growth, which is more inherent of developed states.

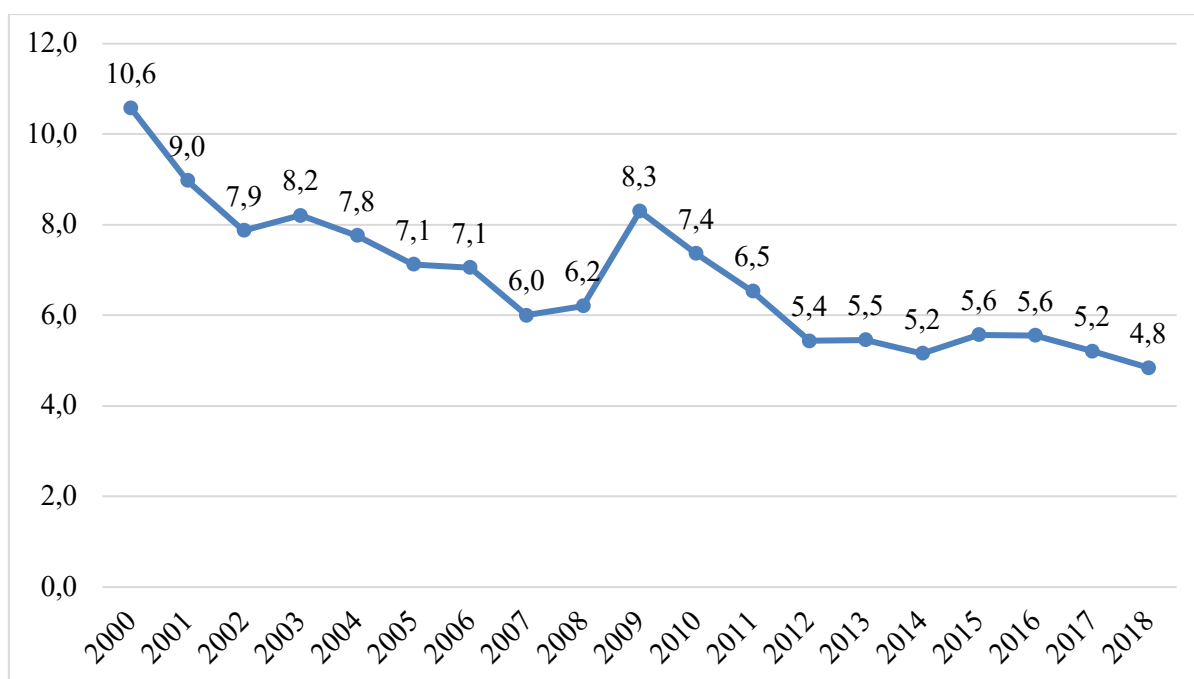
**Figure 1 Russia's labor force by occupation, as of 2017**



**Source: CIA World Factbook 2019.**

As the chart below illustrates, the current level of total unemployment in the Russian Federation can be deemed average or moderate. The current rate of total unemployment in the state is 4.8 %. This is the lowest figure in the last 20 years. The recent dynamics of unemployment are positive, as its values have been gradually shrinking, which is a positive signal for the Russian labor market. Thus, in 2015, the level of unemployment was 5.6 %, which means that it decreased by 0.8 percentage points in the last 3 years. Compared to 2000, the total unemployment rate dropped more than twice. A characteristic trait evidence by the charts is that the overall positive long-term dynamics of unemployment in Russia were affected significantly twice: the first time in 2009, which was caused by the effects of the global financial and economic crisis, and the second time in 2015, which was caused by the effects of Russia's military intervention in Ukraine and the Western financial sanctions which ensued. However, in both cases, the positive dynamics were achieved again shortly, which allowed continuing the development of the Russian labor market.

**Figure 2 Unemployment in Russia (total labor force) in 2000-2018, in %**



**Source: World Bank Databank 2019.**

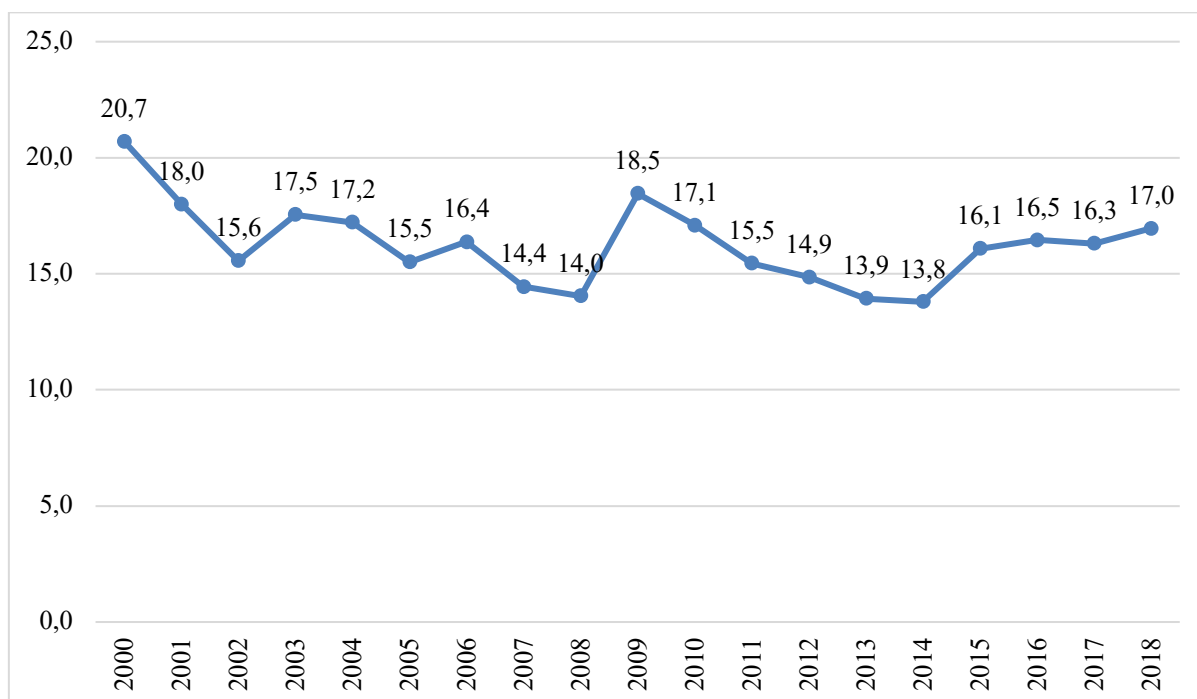
The Ministry of Labor and Social Security of Russia (2019) notes that the situation with unemployment is not equal in different Russian regions. Thus, the highest levels of registered



unemployment have been registered in Ingushetia (9.08 %), Chechnya (8.03 %), and Tyva (3.93 %). The situation is drastically better in large Russian cities such as Moscow (1.5 % of registered unemployment) and Saint-Petersburg (1.4 %). Also, the coefficient of unemployed persons per 100 vacancies is several times higher compared to the average value in Russian regions such as Ingushetia (17,699 unemployed persons per 100 vacancies), Chechnya (2,588), and Dagestan (2,362), which provokes an outflow of labor force from the regions to the capital. The high differences in the labor market saturation in different Russian regions is one of the major negative tendencies which affects the country's national economy.

The situation with youth unemployment in the Russian Federation has no such positive tendencies as the one with total unemployment. As can be seen from the chart below, the current level of youth unemployment in Russia is 17%: the highest level in the last 8 years. Compared to the year 2014, youth unemployment grew by as much as 3.2 p. p. and correlated in time with the sanctions implemented against the Russian Federation and the negative oil market dynamics. Thereafter, there have been growth of the figure of youth unemployment. This tendency preconditions a higher outflow of young specialists from the Russian Federation, which affects not only the labor market and the country's national economy, but also leads to further ageing of the population and other negative social tendencies.

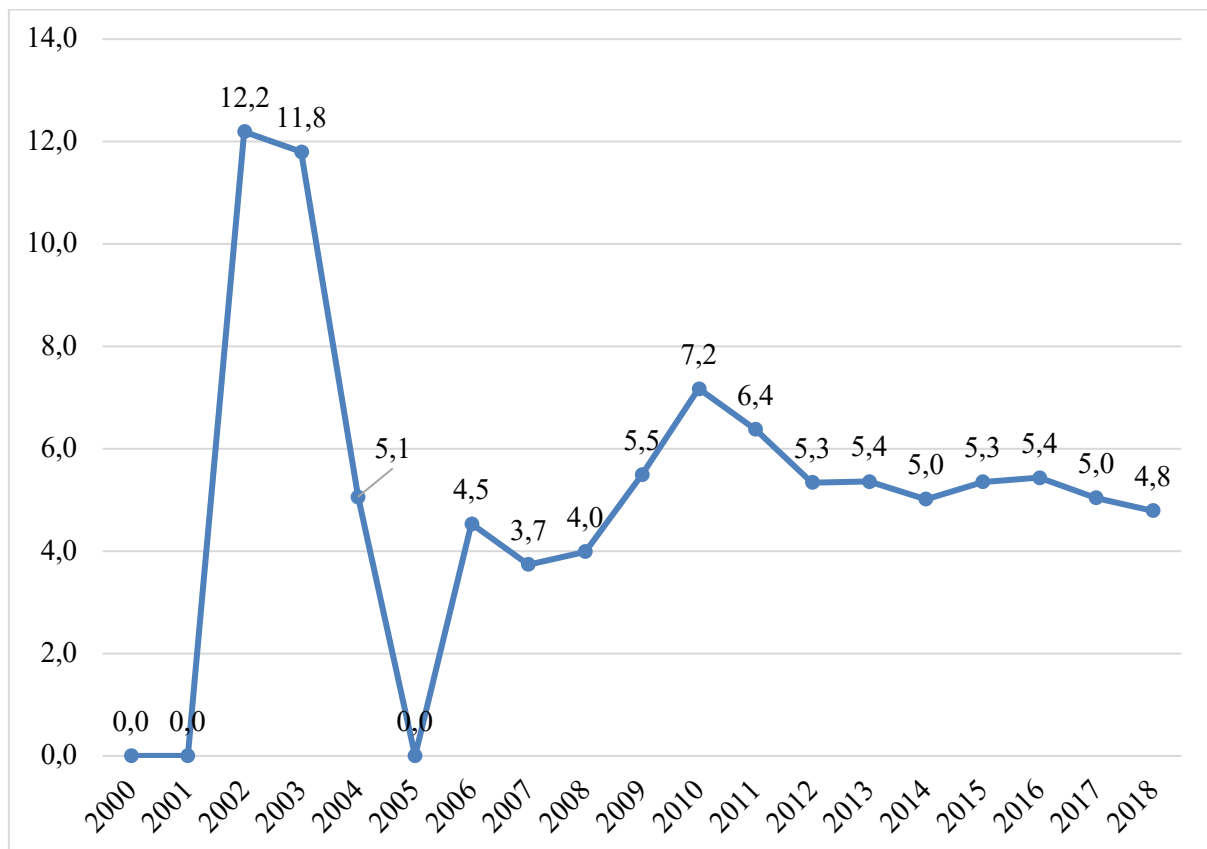
**Figure 3 Unemployment in Russia (youth, aged 15-24) in 2000-2018, in %**



**Source: World Bank Databank 2019.**

Another important tendency is that the level of unemployment among people with advanced education in the Russian Federation is generally comparable with the country's total unemployment. Although the situation is better in absolute terms compared to the early 2000's, it still allows assuming the existence of considerable problems on the Russian labor market. This raises the outflow of high-quality labor force from the country and emphasizes the existence of structural problems in the Russian economy.

**Figure 4 Unemployment in Russia (with advanced education) in 2000-2018 (no data for 2000, 2001, and 2005), in %**



**Source: World Bank Databank 2019.**

Thus, as can be seen from the information outlined above, the current situation with unemployment in Russia is not good in absolute terms, although the level of total unemployment has been decreasing in recent years. Particularly negative tendencies are represented by the high levels of unemployment among the youth and among people with advanced education.

## **2.2 Overview of the Chosen Company**

The company chosen for the practical part of this thesis is Russian multinational corporation Gazprom.

According to Gazprom (2019), the corporation is “a global energy company focused on geological exploration, production, transportation, storage, processing and sales of gas, gas condensate and oil, sales of gas as a vehicle fuel, as well as generation and marketing of heat and electric power.” Today, Gazprom holds the world’s largest natural gas reserves and operates a number of major oil deposits in the Russian Federation and abroad. The corporation’s strategic goal is to ensure its global leadership on the energy market, outperforming competitors from developed Western states.

The current strategy of Gazprom’s market expansion is active growth and increased industrial output. Thus, according to Gazprom (2019), the corporation aims at producing up to 660 million cubic meters of natural gas by 2020. At the same time, “*The oil business development strategy stipulates that annual production will reach 100 million tons of oil equivalent and refining capacities will grow to 70 million tons by 2020.*” For the purpose of developing effectively its oil market segment, the corporation operates a number of subsidiaries, among which the most important role is played by Gazprom Neft. The corporation’s exploration and mining activities extend beyond the territory of Russia and over other states around the globe.

Gazprom is owned by the Russian government (50.23 % of the shares) and acts on the conditions of monopoly on the Russian domestic market. The total number of the company’s employees exceeds 460,000. The supreme body responsible for the management of Gazprom is the General Shareholders Meeting held on an annual basis. As noted by Gazprom (2019), “*The Board of Directors exercises general governance over the Company’s activities, with the exception of decision-making on issues falling within the scope of authority of the General Shareholders Meeting. The Members of the Board of Directors are elected by the General Shareholders Meeting for the period until the next annual General Shareholders Meeting.*”

In addition to the economic parameters of Gazprom’s business activities, it is worth noting that the company also plays the role of a powerful political tool in the hands of the Russian government. According to the Policy Department for External Relations of the European Union (2018), the Russian Federation is using its state-owned corporation for putting tensions on Western states. As Russia is a major supplier of energy resources to the European Union, the use of Gazprom’s powers to manipulate the Western partners can serve to fulfill particular Russian goals. This is clearly seen on the recent situation with the ongoing military

conflict between Russian and Ukraine and the aggressive stance taken by Gazprom. Moreover, Russia is using the power of its monopolist for purchasing assets abroad and thus for spreading its control on the international arena. Despite the efforts of the European Union to diversify energy supplies and to increase the share of renewable energy sources in its power balance, the current role of Russia is still major for the European market.

Therefore, it can be concluded that Gazprom is not just an economic monopolist on the Russian energy market but also a major political and geopolitical tool of the Russian government in international relations. Therefore, it becomes particularly important to investigate in detail the different sides of Gazprom's business. Within the framework of this thesis, the focus is put on revealing the specifics of Gazprom's policies on the labor market, namely in terms of the implementation of labor market 4.0.

Taking into consideration these facts, it is now worth proceeding to the analysis of the interview with the company's manager.

## **2.3 Key-Informant Interview with the Manager**

It was decided to hold a key-informant interview with the Manager of Gazprom company. A key informant interview is held with experts in a particular field. In this case this field is labor market and employment in Gazprom. The main goal of this interview was to identify a potential problem and to identify the mainstreams in this field. This interview is to be knowledgeable for the terms of this thesis, but its results cannot be implemented for public purposes. It covers only situation in a particular company, in Gazprom.

The interview was held with an HR manager of Gazprom operating in the company's head office. The interview was arranged through personal acquaintances and was carried out by means of a video conference on the web. The questions for the interview had been prepared by the thesis author beforehand (Appendix 1). They included open-end questions, which was aimed at providing the manager with the best opportunities to develop his ideas. The structure of the interview was designed in a way to uncover the main aspects related to Gazprom's activities from the perspective of Industry 4.0 and labor market 4.0 as its elements. The manager's name remains anonymous according to the agreement on non-disclosure. The interview lasted for approximately one hour, and its findings are presented below.

Answering the first question, the manager noted that Gazprom can indeed be deemed an innovative company. According to him, this is definitely true on the domestic market of the Russian Federation. On the international arena, the situation is more complex, as Western companies are more competitive in terms of technological advancements. Nevertheless, Gazprom invests in its own research and development (R&D) activities, and the corporation sees the growing intensity of research as one of its strategic goals for the near future. On the market of Russia, Gazprom is a complete monopolist, which might act negatively for the company's interest in improving the effectiveness of its business.

When asked on Gazprom's recent achievements in terms of the deployment of innovative technologies in its production, the manager noted that the company focuses on the field of its target business interests when designing R&D activities. Today, there are 75 innovative solutions implemented by Gazprom on the market of natural gas. Among other technologies, the most important ones include equipment for less harmful and more secure exploration, development of electromagnetic sensing of gas and oil deposits, application of lithological and petrophysical models on deposits of key exploration targets, and so on. Gazprom's trade in energy resources and the steady support from the state allow the corporation investing significant amounts of funds in its research engineering, which makes it possible for the international business to develop a number of important innovative solutions in its business sector.

As for the implementation of Industry 4.0 in the business practices of Gazprom, the manager noted that *this is not formally stipulated in any of the company's internal regulations*. However, Gazprom indeed considers this framework as strategically important for the long-term success of its business model and therefore aims at integrating all of its elements in the company's commercial practices. Thus, the interviewee states that the company actively uses the Internet of Things for arranging the internal communications processes, deploys up-to-date technologies for wireless connection across of all its facilities and for decentralized decisions. Industry 4.0 also plays an important role in the company's security solutions and the detection of fraud.

Manager states: *"I believe that the main achievements of Industry 4.0 in Gazprom's business today have been the growing automation of processes and digitalization of all interactions within the corporate structure."* Being involved in the field of Gazprom's HR management for more than 7 years, the manager is aware of how the situation has changed with the gradual

implementation of Industry 4.0: all internal communications have improved significantly, the time spent on negotiations and controls has decreased, and the quality of such controls has risen on the contrary. Also, thanks to the technological advancements of Industry 4.0, Gazprom has been able to considerably improve its asset management and has been able to avoid excessive risks of loss of data, and so on. Therefore, the manager is confident that Industry 4.0 is a positive phenomenon for Gazprom, and it has allowed the company increasing its market potential.

When asked on the cooperation between different departments and business units for guaranteeing the best results of Industry 4.0, the manager noted: *“Synergy is indispensable for maximizing the outcomes of any process of reforms or optimization. Therefore, the quality of the performance of the aforesaid operations by all actors and stakeholders involved in the communication process is a key prerequisite for optimizing the quality of public management in terms of Industry 4.0 in Gazprom.”* The manager stated that the main actor responsible for the integration of Industry 4.0 on the strategic scale is the parent corporation of Gazprom and its top managers. The head office develops strategies to be thereafter adapted on site for the purpose of increasing the overall quality of management and for favoring the penetration of innovations into the corporate sector. There are regular reviews which occur between the parent corporation and the other entities of Gazprom: they are held once in a quarter and are destined to ensure the exchange of opinions on the quality of the implementation of particular innovations on particular sites and for verifying the actual robustness and quality of such innovations. Subsidiaries can rarely diverge from the general guidelines set by the parent corporation, yet they can participate in the negotiations process to ensure the best strategy in the long run. Yearly reviews are held as well for controlling the results achieved and modifying the plans for the next periods.

As for HR management, the interviewee stated that its directions are classical in the business processes of Gazprom and range from recruitment to career management. The company focuses on minimizing the turnover of its labor force, for which purpose Gazprom pays particular attention to the quality of candidates on the early stages of recruitment. The company seeks hiring the best specialists and thereafter providing them with comfortable financial remuneration and non-financial conditions of work. According to the manager's words, Gazprom offers salaries higher than average in Russia, and therefore the company has no problems in finding and selecting the best staff. Moreover, Gazprom is a state-owned

monopolist in the energy sector, which means that the corporation can offer long-term stability rare on the Russian market. This makes working at the company very beneficial and attractive for high-quality job seekers. For reducing staff turnover, the company implements wise-thought career planning and provides its employees with the opportunities of not only supporting and raising their professional level but also of holding higher positions in the corporate hierarchy. Gazprom organizes corporate learning and training in order to constantly improve the knowledge and skills of its employees and to make them share the key values adopted by the corporation.

The main challenge in Gazprom's HR management activities is the fact that the company has to deal with very large amounts of data, which takes both significant time and resources. Also, the manager noted that another considerable difficulty is represented by the cross-border nature of Gazprom's business activities and the need to implement effective HR management in different countries at once. The communication processes between the HR departments of the head office and local branches can be quite difficult and bring additional risks to the implementation of high-quality HRM.

Answering the question on how precisely the corporation is using the advancements of labor market 4.0 in its business practices in the field of HR management, the manager pointed out that the company is using a set of automated technologies already on the early stages of recruitment and later on in the course of subsequent HR management. Thus, for the purpose of screening its candidates, Gazprom maintains an automated database where all profiles are uploaded. Prior to organizing an interview, candidates are offered distant tests via e-mail. On this stage, their location is checked, as well as their professional background and other characteristics written in the CV. Machine learning algorithms allow revealing where information from the Internet has been used and where other kinds of fraud have been committed by candidates for obtaining their position at Gazprom.

In the course of their subsequent career at Gazprom, the quality of individual performance is measured and entered into the database. The database generates automated reports and allows both tracking the performance of each employee and comparing it against the same employee's achievements in previous periods and against other employees. As a result, the HR managers of Gazprom can provide financial and non-financial incentive only to the very best employees who contribute most to the corporation's commercial success.



When employees are sacked or leave the company, automated technologies allow identifying instantly from which segments of the labor market additional specialists are required. Also, these technologies create a psychographic portrait of the candidates, which eases significantly the task of the HR managers and allows them completing the HR management processes on the most effective level.

The company also uses actively the Internet of Things. Gazprom and its regional branches actively maintain their profiles in online social networks. Beyond LinkedIn dedicated specifically to job search and recruitment, the corporation also carries out its marketing in VK, OK, Facebook, and a number of other platforms. Thus, the company not only monitors the supply of labor force on the target market but also ensures bilateral communication and the exchange of ideas with its potential employees, which allows making the most effective recruitment decisions in the long run.

Another important aspect of how labor market 4.0 is engaged in the company's HR management activities is how Gazprom is using data visualization for training its employees. The company deploys high-quality visual technologies for simulating work environments under load for its employees. This allows high-quality stress testing and the preparation of the staff for solving complex and urgent tasks in harsh conditions.

Finally, the manager noted that all of the company's recent developments in the field of HR management are adapted specifically to portable devices. This makes it possible for the managers and the employees to constantly keep in touch with the staff and to resolve the ongoing issues more effectively. Mobile apps are also used for data tracking and personal time management. This contributes not only to more effective performance of individual employees, but also to the opportunity to collect more comprehensive data to be used subsequently in corporate planning and management processes.

The manager highlighted that a great number of these technologies for the improvement of the corporation's interaction with labor market and the patented developments of Gazprom. The corporation invests in R&D activities on this direction, which allow it raising further the quality of its HR management processes at smaller expenses. However, the corporation also uses the technological achievements offered by third-party vendors and is an active actor on the market of technological solutions.

It should be understood however that the market is constantly evolving and therefore technologies are improving every day. The company implements rigorous monitoring in order to stay updated and to overcome competitors on the international arena. This is the main driver of the implementation of innovative labor market 4.0 concepts in Gazprom's business. Furthermore, the manager affirmed that the environment in which the company operates requires changes toward innovations as well. Namely, for effective cooperation with partners such as recruitment agencies, and so on, Gazprom actively uses cloud computing and storage and advanced human-machine interfaces, big data analytics. This contributes to the performance of all parties involved and also favors their cooperation. Moreover, this allows further enhancing the quality of monitoring and control on all stages of business interaction.

At the same time, the manager is aware of the threats which this race for innovations imposes. Thus, Gazprom has faced situations in which the implementation of potentially beneficial but insufficiently tested technologies led to financial losses and required time to recover. Therefore, the company relies on market monitoring as a way to minimize risks and guarantee the best business results in the long run.

As for the performance of audits, the manager noted that they are carried out both internally (i.e. with the own forces of Gazprom) and externally (i.e. with the involvement of professional third-party auditors). In both cases, for maximizing the effectiveness of audit results and for guaranteeing their systemic nature, all data revealed through audits are updated in real time in a unified system accessible to the responsible persons of auditors and the managers of Gazprom. Information is exchanged promptly between all parties involved, which ensures the quickest implementation of decision-making and timely improvements in case of any deficiencies revealed through the checks. All data are archived from previous periods and are stored on cloud servers. Thus, historical data can be accessed quickly for reassessment, which allows modifying plans in real time and thus improving corporate performance significantly in the long term.

Answering the question on the involvement of third parties, the manager noted that Gazprom indeed cooperates with a great number of external specialists, even though the company has its own large staff. For instance, Gazprom has contracts with recruitment agencies, labor market analysts, and so on. In all such cases, the use of technological advancements is

considered to be a key precondition for optimizing the bilateral relationships with the counterparties and for achieving higher economies of scale.

According to the interviewee, the effectiveness of communication between the managerial staff and the employees plays an essential role in all the aforementioned processes. It ensures the due exchange of information and allows increasing significantly the speed of decision-making. Communication occurs both on a regular and on an ongoing basis. Therefore, the manager noted that the use of mobile technologies and the shift toward online communication are inevitable steps to improve the quality of interaction and cooperation between all parties involved in the business processes at Gazprom. Also, effective ongoing communication allows tying effectively remote branches of Gazprom and promoting the operation of all business units as a single mechanism.

Finally, answering the question on his forecasts as for the role of labor market 4.0 in the industry in the future, the manager affirmed that there are no alternatives to this concept today and the previous concepts will be gradually eliminated as outdated. Of course, these tendencies will have different intensity in developed and developing countries, but he believes the general shift toward Industry 4.0 to be inevitable not only for the energy sector but also for other industries. As for Gazprom, the corporation's current strategy for labor market 4.0 assumes the continued implementation of new innovations, and the manager believes that the role of such technologies in the corporation's business will only tend to keep growing.

Taking into consideration the findings on the operation of Gazprom in the field of the labor market from the perspective of the deployment of labor market 4.0, it is now worth proceeding to the discussion section for analyzing the practical effects of the results revealed.

## **1.4 Discussion**

In the theoretical part of the thesis, it has been revealed that Industry 4.0 as a subset of the fourth industrial revolution is currently one of the main trends in the commercial activities of multinational corporations all over the world. This concept finds its practical implementation in a number of different fields and sectors, including in the activity of the labor market. The main interest of commercial actors in labor market 4.0 can be explained by the fact that it is set to guarantee smart recruitment, effective data management and

storage through the use of online and digital technologies, increased security, and quicker decision-making in the field of human resource management. In the long run, these benefits can be reduced to improved corporate financial performance as the ultimate indicator of the overall business effectiveness.

The case study of Gazprom carried out in the practical part of the thesis illustrates that labor market 4.0 is a concept important not only for multinational corporations of developed Western states but also for companies from developing countries and countries with weak economic institutions such as the Russian Federation. It has been shown that the current business models and market policies of Gazprom are rooted in the deployment of Industry 4.0 and labor market 4.0 specifically across all directions of the corporation's business activities and involving all units and individual business actors.

A positive finding revealed through the interview with Gazprom's manager is the fact that the company seeks adopting a holistic model in the implementation of labor market 4.0 in its business activities. This allows solving multiple tasks at a single time and gradually moving the corporation toward greater operation effectiveness. Thus, as the findings of the interview suggest, the implementation of innovative labor market 4.0 at Gazprom extends from the very beginning of the recruitment process and throughout the subsequent career planning, management and growth. Also, a major advantage, at least as declared by the company, is the fact that such technologies are integrated into the communication and interaction with other market actors such as suppliers and third-party advisors. This contributes to the creation of a single technological field thanks to which Gazprom can both achieve greater economies of scale and improve all of its activities related to human resource management.

It is worth noting in particular the corporation's approach to data management. As stated by the interviewee, the company adopts sophisticated and up-to-date methods of information collection, storage, analysis, and control. Thanks to the use of cloud computing and storage, Gazprom is able to process large data arrays and to avoid excessive risks of data leakages. The intensive use of automation technologies makes it possible to analyze vast data arrays in real time, which in its turn contributes to quicker and more effective decision-making. The company maintains historical databases of all its employees, which allows effectively tracking both individual and collective performance and which thus allows improving the nature of financial and non-financial incentive delivered to the best-performing actors.

The fact that innovative technologies are applied from the initial stage of recruitment is possible, as Gazprom gets an opportunity to select the best candidates on the market and at the same time to deliver their best screening. The use of the advancements of labor market 4.0 allows minimizing the probability of fraud. At the same time, similarly to large Western multinational corporations, Gazprom is using online social networks to maintain the communication with both its current and prospective employees. In the long run, this creates a situation in which the company can perform its human resource management activities dynamically, quickly reacting to all minor changes in the environment and maximizing the quality of its response.

However, the manager did not note the specifics of the company's activities in online social networks. The additional analysis carried out for the company's LinkedIn accounts (parent corporation and child entities) reveals that Gazprom fails to achieve the best synergic effect required for maximizing the effectiveness of labor market 4.0. Thus, the different accounts maintained by the company's different branches on LinkedIn are rather disrupted and do not maintain any visible interaction. This is negative for the company's brand, particularly in the light of the tendencies toward the steadily growing role of mobile devices and social networks. For improving the situation, Gazprom can be recommended to pay greater attention to the consolidation of its activities in online social networks. Also, in the light of labor market 4.0, the company can be advised to focus on the development of mobile solutions for its prospective candidates such as branded apps for employment. This could bring further intensification of the ties between Gazprom and the people offering their services on the labor market, thus raising the corporation's chances to maximize the quality of its recruitment and the general HR management procedures.

One more recommendation for the company in terms of its activities in online social networks can be to react more promptly to the questions and commentaries submitted by its clients and prospective employees. Today, this is one of the major flaws based on the information which can be accessed publicly from Gazprom's online social network accounts.

Another important aspect worth highlighting is the attention that the company pays to monitoring, control, and security. Indeed, given the fact that Gazprom operates vast data arrays within labor market 4.0, including sensitive personal data of employees, the establishment of effective monitoring and protection can be deemed indispensable for avoiding excessive business risks. A positive fact is that even in the interaction with third-

party auditors, Gazprom pursues its general strategy and establishes a unified framework of technological cooperation and data exchange. This testifies that the corporation indeed seeks achieving the best synergic effects in its activities within labor market 4.0, which is crucial for maximizing the economies of scale and generating the best financial results.

The communication between the company's business departments and individual managers and employees can be deemed another essential element within the framework of the transition to labor market 4.0. The findings of the interview allow concluding that today the company is aware of the importance of such communication and pays sufficient attention to the maximization of its quality. The types of communication used (both regular and ongoing) allow confirming further that such communication fits the general framework of the company's business. However, it can be recommended again here to focus more on the development of mobile solutions and on the subsequent improvement of communication through mobile technologies. This should enhance not only the interaction between individual stakeholders within Gazprom but also the company's general continuous transition to Industry 4.0 and labor market 4.0 specifically.

If Gazprom continues operating effectively in the field of labor market 4.0 and implements the recommendations outlined above, the company will enjoy higher chances of withstanding the fierce competition on the international scale.

## Conclusion

In the current conditions of globalization and technological progress, innovations are playing an ever-growing role in ensuring effective operation of the corporate sector and thus is guaranteeing high living standards for the population. Industry 4.0 is an up-to-date concept which assumes that on the present stage of development industry is driven by information technology, automation, robotization, the Internet of Things, and social media communication. By deploying the concept in their corporate practice, companies can perform more effectively.

The research questions of the thesis were the following:

- RQ1: What are the main specifics of the labor market 4.0 concept and how is it implemented in practice?
- RQ2: What role does labor market 4.0 play in the activities of Russian multinational corporation Gazprom?

RQ1 can be answered as follows. Labor market 4.0 is a part of the wider Industry 4.0 concept. It assumes the implementation of smart recruitment and HR management on the basis of the Internet of Things and the advancements in online and digital technologies. Characteristic traits of labor market 4.0 include the wide use of automation technologies for data collection, processing, and analysis, use of cloud computing and storage for optimizing data management and security, big data analytics, active involvement in online social media, multilevel interaction between managers and employees, real-time data processing and visualization, and so on. On the present stage, the deployment of labor market 4.0 within the structure of corporate business practices in the field of HRM can be deemed an important step for guaranteeing high-quality recruitment and subsequent career planning and growth of employees. In its turn, this is a key prerequisite for the optimization of the overall corporate financial performance.

As for RQ2, the findings of the interview held with the HR manager of Gazprom, a Russian multinational corporation operating on the energy market, allow confirming that labor market 4.0 plays an important role in the organization's current business activities. Thus, the

corporation integrates innovative technologies throughout all stages of its HR management, from recruitment to career planning and subsequent development.

Gazprom creates a unified system of automated data collection, management, analysis, storage, and protection in the field of HRM, which allows testing and selecting candidates for job positions with maximum degrees of precision and reliability. Thus, the company runs automated screening on a distant basis and registers all candidates for subsequently estimating automatically their appropriateness for particular positions. The performance of every individual employee is measured through the use of human-machine interfaces. Thanks to the application of cloud computing and storage technologies, the company maintains vast data arrays which can be accessed in real time. This guarantees increased speed of decision-making. Gazprom's other focal points in terms of labor market 4.0 include the promotion of mobile technologies in communication between managers and employees, automated exchanged of data with third-party business partners, and so on. This all contributed to the entity's effective HRM activities based on innovations.

For improving the quality of these activities further, Gazprom can be recommended to improve its social media communication and to rely more on mobile technologies in internal business communications.



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## **Appendix 1 Questions of the Interview**

1. Can your company be deemed innovative?
2. What particular innovations have been implemented lately?
3. Does Gazprom focus on deploying the Industry 4.0 concept in its activities?
4. How has Industry 4.0 changed the company's operation?
5. How do individual departments have to cooperate for maximizing the quality of 4.0?
6. What are the main directions of Gazprom's HR management activities?
7. What are the main challenges of such HR management activities?
8. How do you use the advancements of Industry 4.0 in the field of HR?
9. Does the company have R&D activities specifically for the field of HR?
10. What are the main drivers of change in your company's HR management?
11. What threats do exist today?
12. How audit is performed in your department in the light of technological advancements?
13. Do you cooperate with third parties for improving the innovativeness of your activities on the labor market?
14. Which role does communication play in the processes?
15. In your opinion, what role will be played by labor market 4.0 in your industry in general and in Gazprom in particular in the near future?