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LANDSCAPING OF THE WEB LABOUR MARKET IN BELARUS AND RANKING OF ONLINE JOB VACANCY SOURCES (WEBSITES)

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CONTENTS

1 INTRODUCTION

New opportunities for labour market analytics and decision making have emerged as a result of the increasing volume of information and the ability to aggregate Big Data. The digitalisation of the economy has led to an increase in the number of various information sources where vacancies are posted. These are not only online portals, but also websites of companies and recruitment agencies, professional networks (such as LinkedIn), online job search platforms (Upwork, Uber), educational platforms, social networks (Facebook, Twitter), websites of newspapers and announcements, university centres for promoting graduate employment, etc. Collectively, these sources expand the possibilities for labour market research and provide a means to measure what was previously unmeasured or unmeasurable: 'Measuring the previously unmeasurable' (Horton and Tambe, 2015).

As a result of the digitalisation of the economy, the number of internet users in Belarus is increasing, and this has led to an increase in the number of vacancies posted on online platforms and services. The analysis of job vacancies posted on various online platforms and sources provides plenty of additional information about the labour market, information that the analysis of statistical and administrative data fails to produce. Thus, it will be very important to:

- learn how to evaluate these new information sources and use the data they generate;
- combine these data with traditional resources (statistical, administrative data) in order to enrich information about the labour market and facilitate effective decision making;
- develop tools that people and organisations will use to find an employee or a job.

The research focuses on landscaping of the web labour market in Belarus and ranking of online job vacancy sources (websites). Analysis and ranking of online job vacancy (OJV) portals is the first step in the methodology of using Big Data for the labour market. This generates general understanding of the dynamics of the digital labour market in the country, the types of economic activities and qualification segments it covers, and the characteristics of the vacancies posted and curriculum vitae (CVs). Special attention should be paid to the forms for submitting the skills and qualifications required by employers, which contain templates for job descriptions, as well as the forms for submitting CVs (which also indicate skills and qualifications, personal and business skills, etc.). Analysis of these data provides a means of determining areas of potential growth and to give recommendations on using Big Data in the labour market. Artificial intelligence technologies make it possible to process large amounts of data. For example, the use of Big Data when recruiting personnel for a vacancy can be based on digital human resources (HR) profiling tools, which provide a means to objectively, economically and quickly determine the potential of an employee, to check the compliance of their professional and personal skills with the requirements of the vacancy, to review the validity of the information on their CV, and to produce a psychological portrait of an applicant based on a deep analysis and impartial assessment of their profile from social networks (Vankevich and Kalinouskaya, 2020). This creates an opportunity to process large amounts of currently scattered information about a potential candidate for a vacancy, to consider more precisely all the available information about the candidate (from social networks, instant messaging platforms, search engines, special databases). The use of such technologies will also allow HR professionals to make quick and objective recruitment decisions. Overall, this will reduce information asymmetry in the labour market and increase the transparency of decisions made for all participants (applicants, HR specialists, employers, business

owners) (Vankevich and Castel-Branco, 2017). Alongside the expanding opportunities for analytics, Big Data creates new challenges that need to be addressed, including access to data, the representativeness and quality of data, ways of structuring data, data processing and analysis, culture and ethics in publication and the use of personal data.

2 SUMMARY AND MAIN FINDINGS

1. The labour market in Belarus is developing the context of complex demographic trends that affect the parameters of the labour supply. Despite the growth, the resulting indicators on the economic efficiency of employment (labour productivity measured by gross domestic product (GDP) per person employed, real wages) have low values. Education remains a significant factor in terms of providing employment and reducing individual risks of unemployment, although the problem of an effective transition from school to work has not been sufficiently studied. Young people are becoming an increasingly vulnerable group in the labour market. The state employment service has lost sight of a proportion of the workforce, and issues of effective employment are still focused on the micro-level. The very high employment rate, the low unemployment rate and the high number of hours worked per year indicate that Belarus has exhausted its growth opportunities as a result of the increased labour supply. Therefore, another source of growth is needed, such as innovation, which implies learning new skills and competencies, i.e., qualitative changes in the labour supply. The distribution of employment according to work qualifications indicates that there is a shortage of skills and competencies in the country's labour market. Nearly a third of employees perform work that does not match their qualifications. However, only 9.9% of employed individuals are covered by the system of additional education for adults. To set the admission limits, the education system uses data from the Ministry of Labour and Social Protection on vacancies, people who have applied to state employment agency and among them those who received the status of unemployed. But these databases cannot be regarded as accurate and they do not record skills. They do not provide complete and reliable information about the state of the labour market and its demands for all stakeholders. When submitting information about vacancies, employers describe skills in their own words. To improve this situation, employers could use professional standards. However, the development of such standards in Belarus has only recently begun.

2. The trend towards the digitalisation of the economy in Belarus is confirmed by statistical data: both individuals and businesses use the internet and information and communication technologies (ICT) at an increasing rate in all areas of activity, both professional and personal. There has been an increase in the use of ICT by the population in the period 2013–2018: 97.2% of households in Belarus use mobile services, 73.5% use personal computers and 79.1% use internet services. The main use of the internet in Belarus is to search for information. Along with the expansion of the use of ICT and the internet, the problem of the provision of ICT specialists is becoming more acute.

3. The National Bank of Vacancies, the country's national online database, has been created on the portal of the National Employment Service. Information about a vacancy is submitted in accordance with the Law of the Republic of Belarus 'On Employment of Citizens' within five days of the date of its occurrence. Employers are asked to fill in a clearly designed template with the vacancy data following the current classifications. Vacancies are classified by type of economic activity in accordance with OKRB 005-2011 'Types of economic activity' in the context of regions, urban and rural areas, vacancies for workers and employees. When entering vacancies, the reference book OKRB 006-2009 'Trades of workers and positions of employees' is used. In 2020 there has been a gradual transition to the use of the OKRB 014-2017 'Occupations' reference book, which is harmonised with the International standard classification of occupations ISCO-08, and the gradual formation of a classification of vacancies in the context of nine professional qualification groups.

All citizens of Belarus and all organisation can use the services of the National Bank of Vacancies. As of 30 July 2020, 78 500 vacancies from 157 300 organisations have been registered on it.

4. Results from the Google and Yandex search engines show many links to online portals and job aggregators in Belarus. The basis of these portals' activity is the certificate of state registration of the mass media issued by the Ministry of Information. Among the non-government portals, the largest and most active are the initial portals Jobs.tut.by, Praca.by, and JobLab.by, and the search engines and vacancy aggregators Belmeta.com, GorodRabot.by, Trudbox.by and Mnogo-Raboty.by. Many portals operate as applications linked to other portals and platforms through tabs for job search (Kufar.by, Baraholka.onliner.by, etc.). There are also many links to the websites of direct employer organisations, where such employers post vacancies. Each portal and aggregator uses its own approach to job classification.

5. The portals with the highest rating (Trudbox.by, Gsz.gov.by, Jobs.tut.by, JobLab.by, Praca.by) are the initial online job portals. These have the highest number of vacancies and employment assistance services (resume writing assistance, CV database, articles, training courses, improving the position of CVs and vacancies in search engines, etc.), together with analysis of the current labour market situation and detailed classifications by all indicators. Specialised portals are usually small and are used by a narrow segment of specialists. Not all online portals provide information about CVs. However, this indicator could be used for the assessment of the portal's popularity among job seekers.

6. To assess the labour demand presented on online job portals as a share of total demand, we used as indicators the number of vacancies on the portal as a share of employed individuals in the economy and the number of companies that posted their vacancies on the portal as a share of the total number of companies in Belarus. Online job portals cover 0.2–2.5% of the labour demand (assessed by the number of employees), while companies are actively posting their vacancies on websites. The analysis shows that there are differences among portals in terms of coverage of economic activities:

- Gsz.gov.by and Belmeta.com: agriculture and forestry, processing industry, construction, health care and education;
- Praca.by: processing industry, construction, trade, transportation, temporary lodging and catering services;
- Jobs.tut.by: trade, information and communication, temporary lodging and catering services;
- JobLab.by: processing industry, trade and construction.

Thus, the portals are focused on slightly different segments of the labour market (by type of economic activity). The situation is the same for vacancies in terms of occupation, but in this case portals provide insufficient data for comparison.

7. To assess online portals in terms of their share of the labour supply in the labour market, the following indicators were used: the number of CVs posted on the portal, their share of the workforce, the structure of CVs (by type of economic activity, profession, education level) and their share of the corresponding category of the workforce. However, not all online portals provide information about CVs. The coverage of labour supply by online portals varies, while the coverage of non-state portals is much wider in terms of the number of users: 7.34–44.03% of the workforce, against 0.03% using a state-owned portal.

There are quantitative and qualitative differences between private and state-owned portals of open vacancies in Belarus in the presentation of data on vacancies and CVs. Differences in the presentation of vacancies relate to the volume of vacancies, classifications and methods of vacancy structuring, templates for job descriptions and the methods of submitting vacancies. These differences explain why portals present the situation in the labour market differently (or characterise different segments of the labour market). The analysis shows that there are difficulties in creating a single job portal for labour market analytics with the use of Big Data: each portal has its own picture of the labour market, which cannot be summarised, as some data are duplicated, there are different criteria for

structuring information in job descriptions and CVs, there is no standardisation in either the use of classifications or the methodological approaches to the description of the labour market (understanding labour demand and supply, division into types of economic activity, categories of vacancies and CVs), and the necessary skills are not sufficiently described. Confidentiality of information and the absence of some information also make analysis difficult.

Comparing the demand for vacancies from the National Bank of Vacancies and non-state portals, it is notable that organisations prefer non-state portals when searching for an employee (because they may receive help from them in selecting a suitable candidate, may find an employee more quickly, and may find a better-quality employee). Likewise, workers are also more actively looking for new jobs on non-state portals, or are bypassing them by making direct contact with employers, using recommendations, etc.

8. More detailed information on the assessment of online portals can be obtained using primary information about vacancies obtained from sites by scraping, or from the portal of the state employment service through the application programming interface (API). Comparison of the most in-demand vacancies between three portals shows that the ratings of the National Bank of Vacancies and the aggregator Belmeta.com coincide by 40%, while health care and trades dominate in the rating. Specialists prevail in the rating on the Jobs.tut.by portal (mainly in the field of trade). Thus, this portal shows another segment of the labour market. Setting up filters in the application when processing an array of downloaded vacancies (geo-filters, job classification according to ISCO-08, job requirements, education, experience, work schedule, type of employment, etc.) showed that, for example, on the Belmeta.com aggregator, 21% of vacancies require higher education, 19% specialised secondary education, 19% vocational training and 20% general secondary education, while 11% of vacancies do not require any education. By type of employment, 83% of vacancies offer permanent work, while in terms of work schedule, 29% of vacancies involve a full-time job and 42% one shift.

Grouping of competencies using artificial intelligence according to the European Skills, Competences, Qualifications and Occupations (ESCO) classification will help to analyse more precisely the coordination of labour demand and supply, as well as to classify vacancies according to the dynamics of the required competencies. Moreover, such data are useful to educational institutions for adjusting curricula and developing in-demand skills.

The Jobs.tut.by portal is the largest in terms of the number of CVs presented on it, with more than 2.2 million CVs registered, 44.03% of the workforce in Belarus (i.e. it covers the largest share of labour supply). Thus, it is of great interest for studying the structure and dynamics of CVs. A scraper application on the Jobs.tut.by portal was used to download 423 000 CVs for the period 2015–2019. Analysis of these CVs shows that there is a seasonality in CV submission, and most applicants are in the age range 25–40 years. The description of the existing skills and competencies in CVs, as in the case of vacancies, is quite arbitrary, and the grouping of the top 50 competencies into 15 groups also presents the profile of applicants in a slightly different way.

Comparison of the most in-demand competencies (grouped by the top 50 competencies from vacancies) with the most represented competencies among applicants (grouped by the top 50 competencies from CVs) resulted in the conclusion that most employers demand the competencies of ‘direct sales’, ‘PC user (various applications)’, ‘negotiating, business communication’, ‘teamwork’ and personal business skills. Meanwhile, most applicants indicate the following skills in their CVs: ‘PC user (various applications)’, ‘teamwork’, ‘negotiating, business communication’, direct sales’, and personal business skills. The analysis shows that according to the rating, the competencies demanded by employers and those present on the labour market coincide in general, while there is a significant

excess of labour supply over labour demand. Development of an application and the training of artificial intelligence in the classification of competencies described in vacancies and in CVs, and their comparison in the context of professions, regions and types of economic activity, will increase the validity of measures in the development of employment policy and education policy, as well as decisions made by individuals.

9. In theory, the total level of labour demand in a country is measured by the total number of jobs in the country (both filled, i.e., the number of employees, and vacant, i.e., the number of vacancies). Assessment of how online portals cover labour demand can be carried out in the following areas: characteristics of the portal volume as indicators of the portal's coverage of labour demand, characteristics of vacancies and their dynamics, characteristics of the portal's coverage of labour supply, labour market conditions (number of CVs per vacancy), wages, clustering of vacancies and competencies, search for matches (mismatches), and search for dependencies (statistical methods of analysis).

The economics literature suggests the following actions to address the problem of the representativeness of data on vacancies obtained from online job portals: combine different data sources; use statistical tools to analyse the data obtained; and focus on characteristics of vacancies (the need for skills and competencies that are described in the vacancy) rather than on their number in order to understand employers' preferences not by the number of vacancies, but by the skills they contain. In this case, it is advisable to adhere to a single (or similar) vacancy description format based on generally accepted classifications.

10. Compared with traditional employment channels (such as employment services, recruitment agencies, mass media, friends and acquaintances), online job portals can provide a broader information base and more efficient ways to find a job or employee, and can give a better and more complete understanding of the labour market situation and trends in its development. This can strengthen state policy in the field of employment and training, provide more effective tools for the work of the state employment service, provide better signals for the education system and additional education for adults, and facilitate the integration of socially vulnerable people into the full life of society.

To expand the use of these online portals in labour market analytics, the following recommendations are highlighted:

- in all countries, legislate for the mandatory submission of vacancies to the state portal of vacancies;
- analyse vacancies on the state job portal, with the obligatory visualisation of its results for all interested users;
- bring together job descriptions and CVs, including a structured description of skills (according to the ESCO classification);
- organise targeted projects aimed at researching specific aspects of the market;
- ensure the representativeness and reliability of the data at country level and in relation to a specific area of research by means of data segment or a sub-sample that can be considered (more) representative;
- develop methodological recommendations for training artificial intelligence in the implementation of technologies for analysing the labour market and the selection of vacancies.

3 REVIEW OF LABOUR MARKET DYNAMICS IN BELARUS: MAIN LABOUR MARKET INDICATORS, SUPPLY AND DEMAND TRENDS (OCCUPATIONS, SKILLS)

3.1 Demographic and macroeconomic parameters of labour market development

Table 1 shows the basic demographic characteristics of Belarus. On 1 January 2020 the country's population was 9 408 400 (preliminary data include the results of the National Census 2019), which shows that the population had decreased by 1.01% compared to that of 2016. In the population structure, the male population accounted for 46.23% of the total (in 2019), and the urban population for 77.63%. The number of labour resources (working-age population, as well as people below and above working age, employed in the economy) amounted to 5 730 100 people in 2018, with labour resources as a share of the total population being 60.47%. The labour market in Belarus has been developing against a background of complex and unfavourable demographic trends, including a decrease in the population and in the number of labour resources, an aging population, urbanisation, and the prevalence of the female over the male population. All this has an impact on the supply of labour to the labour market.

Table 1. Demographic segmentation of the labour market, 2016–2019

Parameter	2016	2017	2018	2019
Population, thousands	9 498.3	9 504.7	9 491.8	9 408.4*
Labour force, thousands	5 797.6	5 745.6	5 730.1	5 728.9
Male population, thousands	4 420.8	4 426.5	4 421.5	4 349.5
Female population, thousands	5 077.5	5 078.2	5 070.3	5 058.9
Working-age population, % of total population	57.9	57.1	57.2	
Population below working age, % of total population	17.3	17.6	17.7	
Population above working age, % of total population	24.8	25.3	25.1	

Note: *Population as of 1 January 2020, referring to the preliminary results of the National Census 2019.

Source: Belstat (2018), pp. 20, 25, 26; Belstat (2020a), pp. 6, 11, 14, 15; Belstat (2020c), pp.20, 25, 34, 53, 54.

In the context of macroeconomic indicators (Table 2), the labour market in Belarus is characterised by a unidirectional growth in qualitative indicators (growth in labour productivity and wages, with the exception of 2016) and quantitative indicators (employment growth, reduction of unemployment). However, despite this growth, the resulting indicators for the economic efficiency of employment

(labour productivity measured in terms of GDP per person employed, real wages) have low values. There is a legitimate conclusion about the priority of social efficiency of employment in the labour market regulation policy in Belarus.

Table 2. Dynamics of the labour market in the context of macroeconomic development, 2016–2019

Parameter	2016	2017	2018	2019
GDP, % compared with previous year	97.5	102.5	103.0	101.2
GDP per person employed, BYN	21 551.4	24 289.8	28 197.9	30 473.1
GDP per person employed, growth rate, % compared with previous year	99.5	103.7	103.5	101.4
Nominal wages, EUR (calculated using the exchange rate of the Belarus National Bank as at the end of the year)	353.4	349.3	392.7	463.7
Real wages of employees, % compared with the previous year	96.2	107.5	112.6	106.5
Proportion of employees with professional training to total employees in organisation, %	9.6	9.4	9.5	9.9
Consumer Price Index, %	111.8	106.0	104.9	105.6

Source: Belstat (2019c), pp.19-26; Belstat (2019e); Belstat (2020a), pp.8-10; National Bank of the Republic of Belarus website (www.nbrb.by).

At the international level, Belarus is part of the group of countries with a very high level of human development (Table 3), while at the same time, the Gross national income (GNI) per capita indicator is lower than that in Eastern Europe countries, as well as in Russia and Kazakhstan.

Table 3. Human Development Index (HDI) and its components, 2018

HDI rank 2018	Human development groups	HDI	Life expectancy at birth, years	Expected years of schooling, years	Mean years of schooling	Gross national income (GNI) per capita (2011 PPP$)*	HDI rank 2017
	Very high human development	0.892	79.5	16.4	12.0	40.112	
1	Norway	0.954	82.3	18.1	12.6	68.059	1
49	Russian Federation	0.824	72.4	15.5	12.0	25.036	49
50	Belarus	0.817	74.6	15.4	12.3	17.039	50
50	Kazakhstan	0.817	73.2	15.4	11.8	22.168	51

* Gross national income (GNI) per capita: Aggregate income of an economy generated by its production and its ownership of factors of production, less the incomes paid for the use of factors of production owned by the rest of the world, converted to international dollars using PPP rates, divided by midyear population (2011 PPP$)

Source: UNDP (2019), pp.300,303.

3.2 Economic activity, employment and unemployment

According to the household employment survey (Belstat, 2020b), the economically active population aged 15–74 years reached 5 122 447 in 2019 (5 141 611 in 2018). Of these, 4 909 111 people were employed (4 896 704 in 2018), while 213 337 (244 907 in 2018) were unemployed but were actively looking for a job and were ready to start work (in accordance with the methodology of the International Labour Organization (ILO), they are classified as unemployed). The level of economic activity of the population (the ratio of the economically active population to the population aged 15–74 years) reached 70.7% in 2019 (70.9% in 2018). It was higher (75.5%) among the male population than the female population (66.3%), and higher among the urban population (70.9%) than the rural population (69.6%) (Belstat, 2020c, p.34).

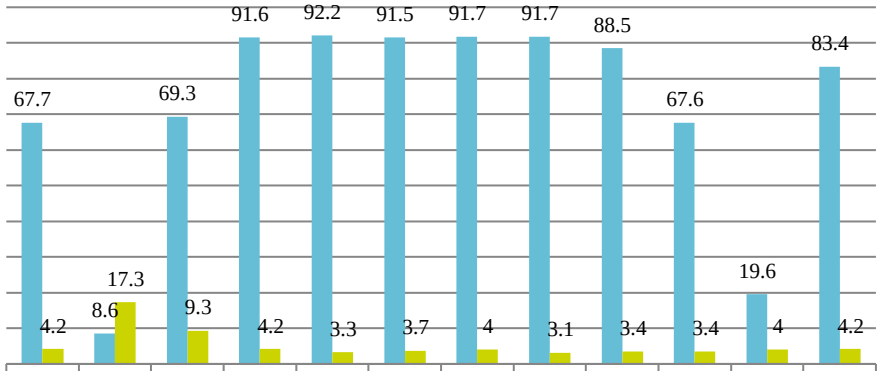
Table 4. Economic activity, employment and unemployment (according to the survey of households on employment issues), 2018–2019

	2018	2019
Economically active population (workforce), thousands	5 141.6	5 122.5
Number of employed, thousands	4 896.7	4 909.1
Number of unemployed, thousands	244.9	213.3
Level of employment, %	67.5	67.7
Level of unemployment, %	4.8	4.2
Number of unemployed registered with agencies of labour, employment and social protection (data provided by the Ministry of Labour and Social Protection for end of year)	12.5	8.8
Economically inactive population (not considered as workforce), thousand people	2 108.2	2 126.1

Source: Belstat (2019e); Belstat (2020b), p. 9; Belstat (2020c), pp.34, 47, 210.

The level of employment (the ratio of employed people to the population aged 15–74 years) grew in the period 2016–2019 and reached 67.7% in 2019 (66.7% in 2016). It was over 67.9% (67.4% in 2016) among the urban population and 67.1% (64% in 2016) among the rural population (Belstat, 2020c, p.34).

Figure 1. Differentiation of employment and unemployment by age, 2019 (%)



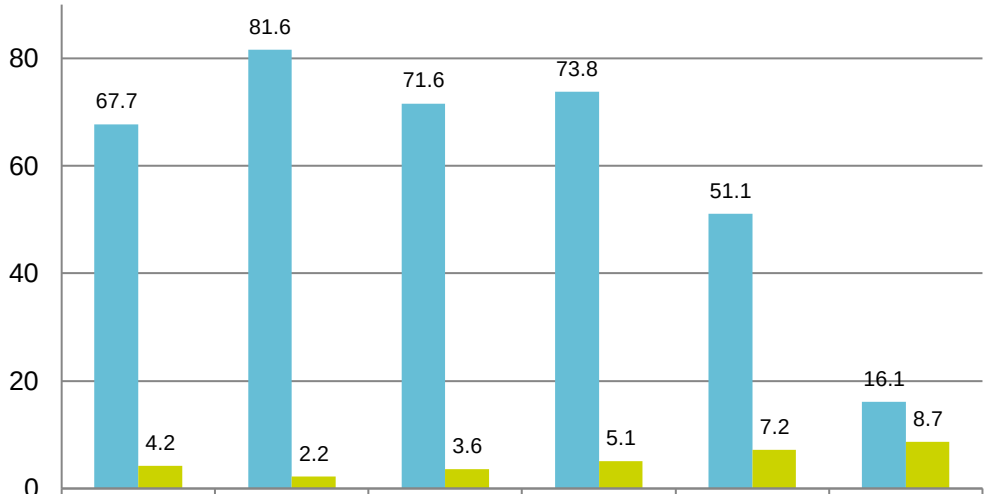
	total	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-74	working-age
employment, %	67.7	8.6	69.3	91.6	92.2	91.5	91.7	91.7	88.5	67.6	19.6	83.4
unemployment, %	4.2	17.3	9.3	4.2	3.3	3.7	4	3.1	3.4	3.4	4	4.2

Source: Belstat (2020b), pp. 29, 86.

With a total employment rate of 67.7%, the employment rate among the working-age population (16–58 years for women, 16–63 years for men) was 83.4%. The highest level of employment was in the age range 25–49 years (over 90%), and the employment among young people aged 20–24 years was also quite high (69.3%).

Unemployment was 4.2% overall, with the highest rates among young people: 17.3% for those aged 15–19 years and 9.3% for those aged 20–24.

Figure 2. Employment and unemployment by education, 2019 (%)



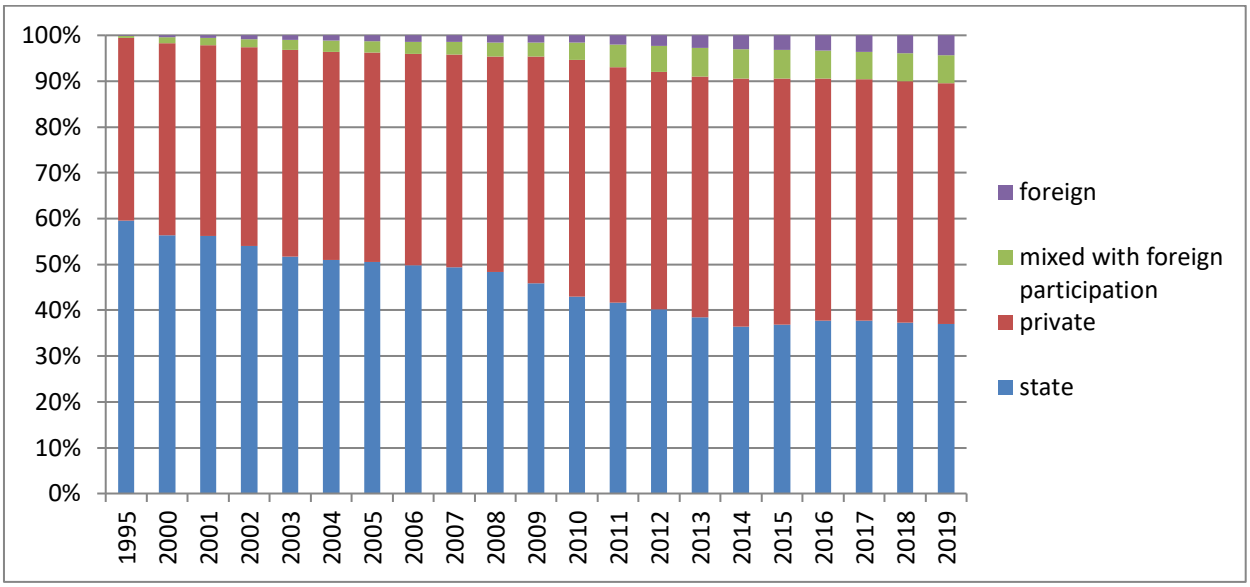
	total	higher education	specialised secondary education	vocational training	general secondary education	general basic education
employment, %	67.7	81.6	71.6	73.8	51.1	16.1
unemployment, %	4.2	2.2	3.6	5.1	7.2	8.7

Source: Belstat (2020b), pp. 32, 87.

In 2019 the total employed population comprised 33.1% who had higher education, 23.1% with specialised secondary education, 28.5% with vocational training, 13.9% with general secondary and 1.4% with general basic education (including general primary education) (Belstat, 2020b, p. 16). The employment rate was higher among the female than the male population. Among the employed female population, 39.2% of women had higher education and 27.2% had specialised secondary education, while among men the figures were 27% and 19%, respectively.

The distribution of employment by type of ownership changed in the period 1995–2019. In 2019 state-owned enterprises employed 39.4% of the employed population (57.2% in 1995) (Figure 3).

Figure 3. Distribution of the employed population by forms of ownership (% of the total)



Source: Belstat (2019f)

https://www.belstat.gov.by/ofitsialnaya-statistika/solialnaya-sfera/trud/godovye-dannye/

The distribution of employment according to the main type of economic activity changed slightly in the period 2010–2019, but the major proportions of the distribution remained unchanged: in 2019 8.7% of the population was employed in agriculture, forestry and fisheries, 23.7% in industry, 6.4% in construction, 14.5% in wholesale and retail trade, and 10.4% in education (Table 5).

Table 5. Distribution of the employed population by type of economic activity in accordance with the National Classification of the Republic of Belarus 'Types of economic activity' OKRB 005-2011

	2010	2015	2016	2017	2018	2019
Employed in the economy – total	100	100	100	100	100	100

Agriculture, forestry and fisheries	10.4	9.6	9.6	9.6	9.3	8.7
Manufacturing	25.4	23.7	23.3	23.5	23.7	23.7
Mining	0.2	0.3	0.2	0.2	0.2	0.3
Processing industry	22.0	20.2	19.8	19.9	20.2	20.2
Electric power supply, supply of natural gas and steam, hot water supply and supply of conditioned air	2.3	2.3	2.2	2.3	2.2	2.2
Water supply; collection, processing and disposal of waste, activities to eliminate pollution	0.9	0.9	1.1	1.1	1.1	1.0
Construction industry	8.8	7.8	7.0	6.4	6.4	6.4
Wholesale and retail trade; repair of motor vehicles and motorcycles	13.3	14.5	14.4	14.2	14.2	14.5
Transport activities, warehousing operations, postal and courier activities	6.7	6.7	6.7	6.9	6.9	6.8
Temporary lodging and catering services	2.0	2.1	2.2	2.2	2.2	2.3
Information and communications	1.7	2.1	2.2	2.4	2.6	2.9
Financial and insurance business	1.5	1.7	1.6	1.6	1.6	1.5
Real estate transactions	1.6	1.8	2.0	1.8	1.7	1.6
Professional, scientific and technical activities	2.7	3.0	3.1	3.2	3.2	3.3
Administrative and ancillary services	2.0	2.3	2.1	2.3	2.3	2.4
Public administration	4.3	4.1	4.3	4.2	4.2	4.2
Education	10.0	10.0	10.3	10.4	10.4	10.4
Health care and social services	6.5	7.0	7.3	7.4	7.5	7.6
Arts, sport, entertainment and recreation	1.8	2.0	2.1	2.1	1.9	2.0
Other service provision	1.3	1.5	1.7	1.7	1.7	1.7

Source: Belstat (2019f)

With regard to employment status, in 2019, 95.7% of the employed population worked at their primary place of employment and 4.3% were self-employed, of which only 0.9% hired workers (Belstat, 2020b,

p. 43). A temporary employment agreement (contract) was the dominant form of labour relations at the primary place of employment, accounting for 89.5% of such employment in 2019, with 8.4% on the basis of an regular contract, 1.2% on the basis of an independent contractor agreement, and 0.6% on the basis of verbal agreement without proper paperwork (Belstat, 2020b, p. 47). In 2019, 98.1% of employees had one job, 1.9% had a primary and an additional job (1.6% in 2016), with women having a primary and additional job twice as often as men (2.6% of women, 1.3% of men) (Belstat, 2020b, p. 70). Among the employed population in 2019, 72 033 people were looking for another or additional job (86 900 people in 2018) (Belstat, 2020b, p. 69). The main reason for looking for another job is dissatisfaction with the level of remuneration (about 65–69% of those looking for a new job), the second is having a different professional background (11.4% of employed people looking for a new job in 2019), the third reason is dissatisfaction with working conditions, work schedule, location, etc. (Belstat, 2020b, p. 71).

In the context of professional qualification groups, the structure of employment in 2019 was as follows (Belstat, 2020c, p. 42; Belstat, 2018, p.46):

- managers – 8.7% (9.3% in 2017);
- professional specialists – 21.4% (18.2%);
- specialists – 10.5% (11.7%);
- employees providing office, administrative and ancillary services, consumer services, preparation, processing and recording of information – 3.4% (4.3%);
- employees in the services sector, trade and other related activities – 15.0% (14.7%);
- skilled employees in the agricultural, forestry and fisheries sectors – 3.0% (3.0%);
- skilled workers in industry, construction, workers of similar occupations – 16.1% (15.6%);
- operators, machine operators, machinists and other workers involved in the control, operating and maintenance of installations and machines, product assemblers – 13.1% (14.1%);
- unskilled workers – 7.8% (8.0%).

The alignment of qualifications with the work performed (at the primary place of employment) is highest for professional specialists and lowest for workers engaged in the provision of office, administrative and ancillary services and for unskilled workers. Nearly a third of employees perform work that does not comply with their qualifications. In 2019, 30% of employees with higher education had a job below their qualifications or in another specialty (29.1% in 2018), among those with secondary specialised education the figure was 45.5% (43.7 % in 2018), and among those with vocational education it was 42.4% (40.7% in 2018). A significant proportion of employees – 17.4% – have a qualification that corresponds to their work but does not relate to it; for some vocational qualification groups the figure is as high as 27.5%. This is explained by the emergence of new professions and an increase in the volume of further training (retraining).

Table 6. Distribution of the employed population by occupation at their primary place of employment and by alignment of their qualifications to their work, 2018 and 2019 (%)

	Total		Employees' work							
			Corresponds to qualification		Is below qualification		Is higher than qualification		Corresponds to qualification but does not relate to it	
	2019	2019	2018	2019	2018	2019	2018	2019	2018	2019
Total	100	100	63.3	62.1	17.2	17.0	3.7	3.6	15.9	17.4
Managers	8.7	100	61.6	62.7	4.1	4.4	15.1	13.0	19.3	19.9
Professional specialists	21.4	100	**84.6**	**83.6**	2.5	2.4	2.3	2.2	**10.6**	**11.8**
Specialists	10.5	100	68.5	65.4	11.0	11.1	4.0	3.4	16.5	20.1
Employees providing office, administrative and ancillary services, consumer services, preparation, processing and recording of information	3.4	100	**40.8**	**39.3**	27.7	27.4	4.1	5.7	**27.4**	**27.5**
Employees in the service sector, trade and other related activities	15.0	100	45.3	44.7	32.3	31.5	3.5	3.8	18.9	20.0
Skilled agricultural and fisheries workers	3.0	100	47.4	49.4	30.9	32.6	2.0	1.5	**19.8**	**16.6**
Skilled workers in industry, construction, workers of similar occupations	16.1	100	**65.2**	**63.1**	15.1	14.4	2.0	2.8	**17.7**	**19.6**
Operators, machine operators, machinists and other workers involved in the control, operation and maintenance of installations and machines, product assemblers	13.1	100	**65.5**	**63.0**	16.9	17.1	1.8	2.0	15.8	17.9
Unskilled workers	7.8	100	**39.0**	**37.9**	47.7	47.2	1.9	1.3	11.4	13.6

Source: Belstat (2020b), pp.36, 62; Belstat (2020c), pp.39.42.

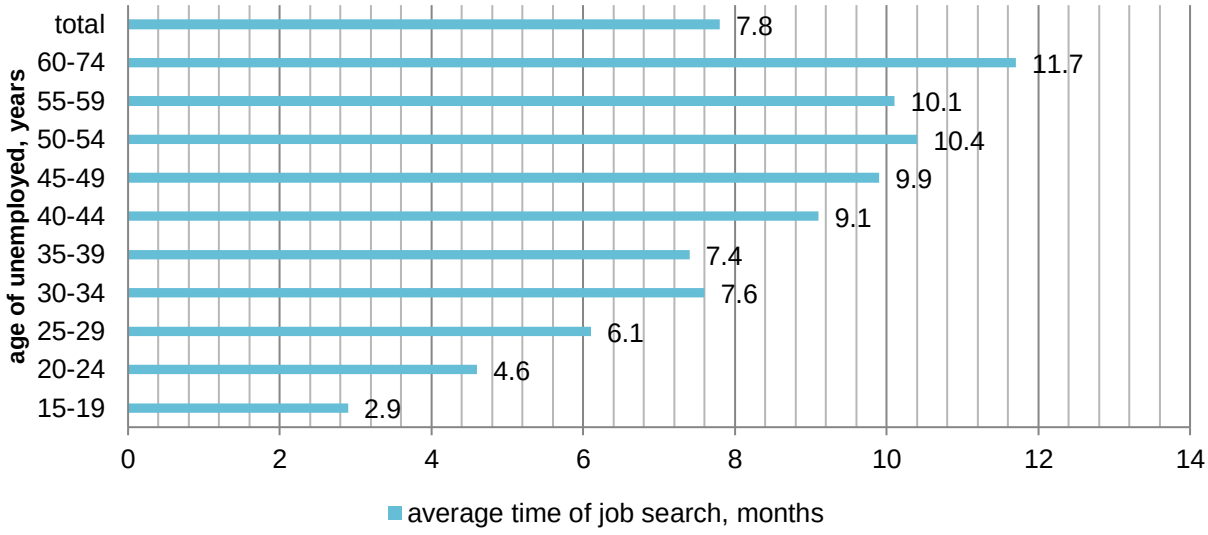
According to the survey, in 2019 the number of people working abroad (without changing their permanent place of residence) averaged 98 400 per year (2.0% of the total number of those employed). Around 74.7% of external labour migrants worked in Russia (82.7% in 2018). Half of those leaving for work abroad were citizens aged 25–39 years (52.2% in 2019, 50.9% in 2018). In terms of educational level, labour migrants had vocational education (45.5% in 2019), general secondary and basic secondary education (19% in 2019), secondary specialised education (17.9% in 2018, 20.8% in 2016), or higher education (14.6% in 2019). In 2019, 49.7% of people working abroad were employed

in construction, 34.0% in the transport industry and 8.1% in the manufacturing industry (Belstat, 2020b).

The number of unemployed people, according to the survey in 2019, was 213 300 (4.2%), 62% of whom were men and 38% were women. The share of men is decreasing: in 2016, men accounted for 64.3% of the total number of the unemployed. The unemployment rate (the ratio of unemployed people to the economically active population) decreased from 5.8% in 2016 to 4.2% in 2019 according to the survey data for the period 2016–2019. At the end of 2019, 8 800 people were registered as unemployed by the agencies of labour, employment and social protection (35 300 people in 2016). The registered unemployment rate was 0.2% at the end of December 2019. The unemployment rate was higher among the urban than the rural population (4.3% and 3.7%, respectively, in 2019), and was consistently higher among men than among women (5.1% and 3.1%, respectively, in 2019). The unemployment rate was the highest among those aged 15–19 (17.3%) and 20–24 (9.3%) (Figure 1). The average age of unemployed people was 37.9 years in 2019 (37.7 years in 2016, 36.6 years in 2015). Some 74 000 young people aged 16–30 were unemployed, or 35.02% of the total unemployed population (35.5% in 2016). The youth unemployment rate was significantly above the total rate.

The lowest unemployment rate is observed among the population with higher education and secondary specialised education (Figure 2). In 2019 the average time taken to find a job was 7.8 months, although there was significant differentiation between age groups (Figure 4). On average, the older the unemployed person, the longer their period of job search.

Figure 4. Average time of job search by age, 2019



Source: Belstat (2020b), p. 96.

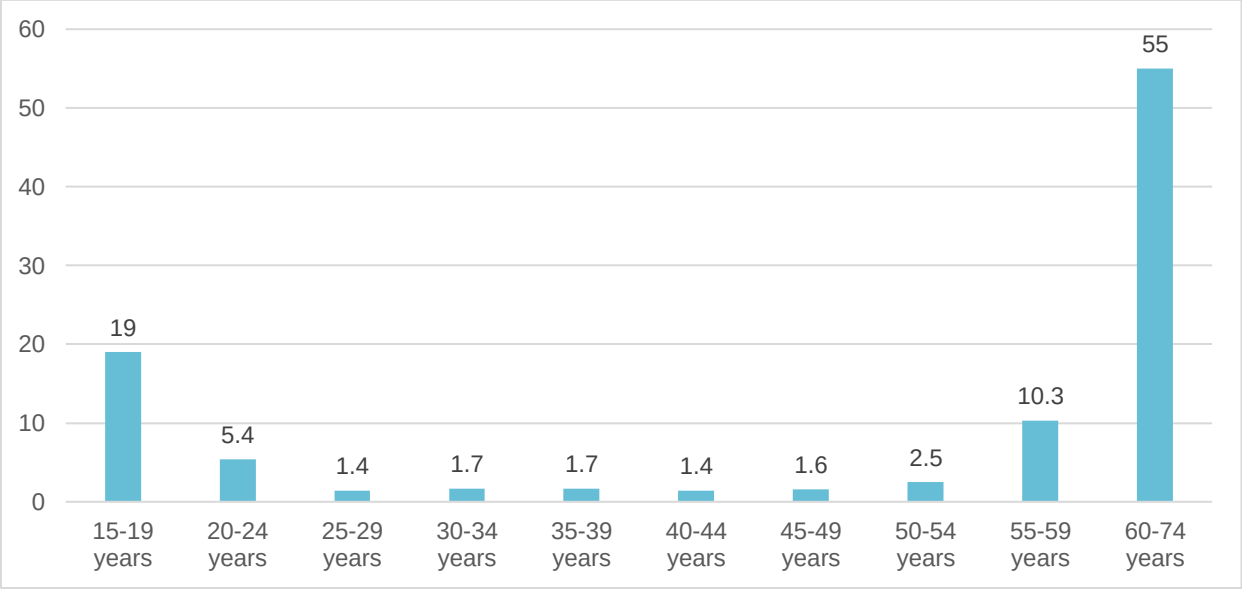
There was a decrease in the share of unemployed people looking for a job through employment services, at only 17.3% in 2019 compared with 22.8% in 2016; most unemployed people search for a job on their own. Newspapers and the internet are the preferred methods of searching for a job; these were used by 63.2% of unemployed people in 2019 (64.6% in 2016), with assistance from friends and relatives in second place (57.4%). More than half of unemployed people (51.7% in 2019) said they were ready to take up vocational training to increase their chances of finding a job. Around 77.1% of

unemployed people were looking for a full-time job, 9.8% were looking for any type of job, while 1.8% wanted to start their own business (Belstat, 2020b, pp. 102, 104).

3.3 Economically inactive population

The economically inactive population in 2019 was 2 126 200, of whom 709 900 (33.4%) were of working age. The economically inactive population has remained practically unchanged since 2016 (when it was 2 127 000, or 29.2% of the population aged 15–74), but the share of the inactive population of working age decreased (from 36.0% to 33.4%). The main reasons for the economic inactivity of the population were retirement (61.6%) and enrolment in education (22.2%) (Belstat, 2020b, p. 110).

Figure 5. Economically inactive population by age, 2019 (%)



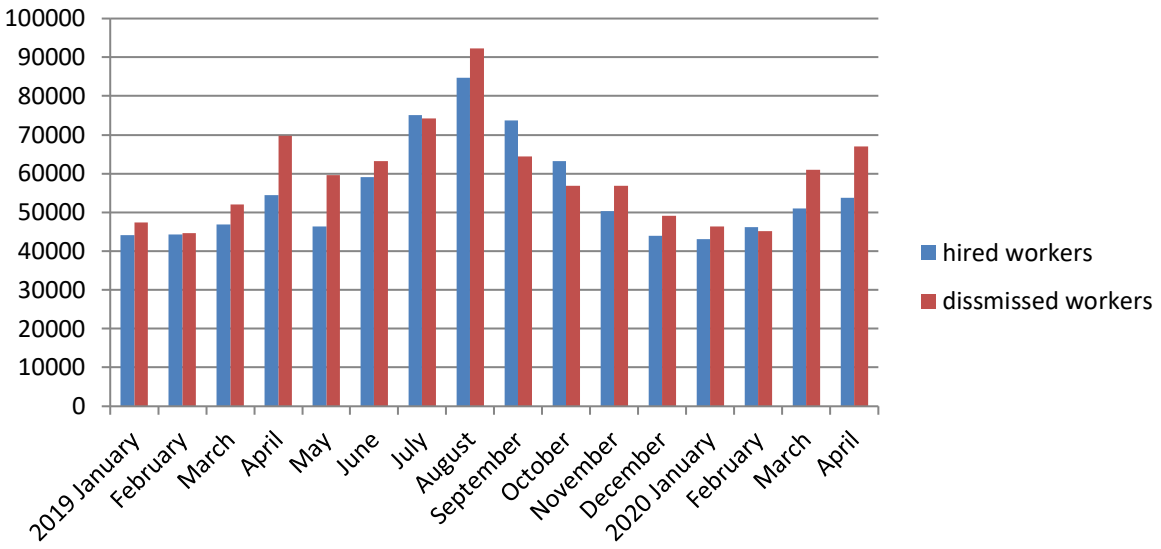
Source: Belstat (2020b), p. 112.

The proportion of young people aged 15–24 who were not in education, employment or training (NEET) is 6.9%. Informal employment accounted for 8.0% of the population aged 15–74 in 2019 (Belstat, 2019c).

3.4 Turnover of employees in organisations

A characteristic of the Belarusian labour market is the high turnover of workers among organisations. The total turnover of the labour force (the number of employees hired and dismissed during the year) has remained above 50% since 2005, and in 2019 it was 57.77%; the number of dismissed employees consistently exceeds the number of hired workers. In the period January 2019–April 2020, this trend has continued (Figure 6).

Figure 6. Number of hired and dismissed workers, January 2019–April 2020 (people)



Source: Belstat (2020d).

The COVID 19 pandemic has had an impact on the dynamics of the primary labour market indicators in Belarus. During the period January–April 2020 the volume of GDP decreased (98.7% compared to the same period in 2019). The decline in GDP occurred in industry, transportation, and wholesale and retail trade, while GDP increased in construction, agriculture, and information and communications services (National Bank of the Republic of Belarus, 2020). During January–May 2020 the number of people employed decreased by 0.2%. The employment rate in Q1 2020 (according to a sample survey of households) was 66.6% and the unemployment rate was 4.1%. Young people and those in the middle age groups with higher and secondary specialised education or without education were the most vulnerable categories (Table 8).

Table 7. Employment and unemployment rates in by age group and educational level, Q1 2020 (according to a sample survey of households) (%)

Parameter	Employment rate		Unemployment rate	
	2019	Q1 2020	2019	Q1 2020
Total	67.7	66.6	4.2	4.1
Age group (years)				
15–19	8.6	6.8	17.3	21.2
20–24	69.3	67.2	9.3	9.9
25–29	91.6	89.0	4.2	5.0
30–34	92.2	90.4	3.3	4.2
35–39	91.5	90.9	3.7	3.8

40–44	91.7	91.8	4.0	3.1
45–49	91.7	90.8	3.1	2.6
50–54	88.5	88.6	3.4	3.5
55–59	67.9	69.9	3.4	2.4
60–74	19.6	19.2	4.0	3.4
Education level				
Higher education	81.6	80.7	2.2	2.6
Specialised secondary education	71.6	70.5	3.6	3.8
Vocational education	73.8	73.7	5.1	4.7
General secondary education	51.1	49.5	7.2	6.3
General basic (including primary) education	16.1	15.1	8.7	11.5

Source: Belstat (2020e).

At the same time, the amount of forced part-time employment increased to 109 078 people, or 3.7% of payroll employees, in January–May 2020 (compared with 44 300 people, or 1.5%, in January–May 2019), according to the operational data of the Ministry of Labour and Social Protection. This refers to workers who were transferred to part-time work or placed on partially paid or unpaid administrative leave. However, the number of people who applied to the agencies for labour, employment and social protection did not increase. In the period January–June 2020, 79 600 people applied for assistance in finding a job (82.9% of the figure for January–June 2019), of whom 38 200 people were registered as unemployed (75.8% compared with 2019). Taking into account those registered by 1 January 2020, 92 370 people were seeking employment, 47 050 of whom were unemployed. The average unemployment benefit is BYN 33 (about EUR 13).

3.5 Conclusions

1. The labour market in Belarus is developing in the context of an unfavourable demographic situation, with the population decreasing and the proportion of people over working age increasing, thus increasing the burden on the working-age population.

2. The labour market is characterised by a fairly high level of employment and a low level of unemployment, which correlates to increasing, though still low, labour productivity and wages. This configuration of the labour market is evidence of the social effectiveness of the employment policy (aimed at preserving labour collectives and preventing the growth of unemployment), and its low economic efficiency (labour productivity and wages), which reduces the competitiveness of the economy and increases the risk of labour migration abroad.

3. Around 39.4% of the employed population work in state-owned organisations, 56.0% in privatised companies and 4.6% in foreign businesses. Hired workers represent the main form of employment. Some 89.5% of employees work under fixed-term labour agreements (contracts).

4. The main adaptive response of the labour market to unfavourable shocks is quantitative adjustment: a) by means of part-time forced employment (either transition to part-time work initiated by the employer or placement on partially paid or unpaid administrative leave), which prevents unemployment growth, though it results in decreased income and a growth in informal employment; b) by means of a high turnover of employees (the cumulative ratio of hiring and dismissing is above 50%), which indicates the constant turnover of employees searching for better jobs, while not leading to radical structural changes in the economy.

5. The structure of the employed population by types of economic activity, forms of ownership and professional qualification groups changed slightly during the period 2016–2019. The main types of economic activity are manufacturing industry (23.7% of those employed), agriculture and forestry (8.7%), wholesale and retail trade (14.5%), education (10.0%) and health care (7.6%).

6. Occupational and qualification imbalances persist in the labour market. For a third of employees there is a discrepancy between the work performed and the qualifications held.

7. The registered unemployment rate fell to 0.2%; the average unemployment benefit for the period of January–June 2020 amounted to BYN 33 (equivalent to EUR 13).

8. A significant proportion of the population were economically inactive (22.6% of the population in 2019), NEETs (6.9%) or in informal employment (8.0%).

4 GENERAL AND EMPLOYMENT-RELATED USE OF THE INTERNET IN BELARUS

4.1 Development of the digital economy

Belarus is officially pursuing a course towards the digitalisation of the economy, the main legal provisions of which are established in a number of regulatory documents, including the Decree of the President of the Republic of Belarus No. 8 of December 21, 2017 'On the development of the digital economy', the Strategy for the development of informatisation in the Republic of Belarus for 2016–2022, approved at the meeting of the Presidium of the Council of Ministers dated 03 November 2015 No. 26, and the Strategy 'Science and Technology': 2018–2040, approved by the Resolution of the Presidium of the National Academy of Sciences of Belarus on 26 February 2018 No. 17. Based on international experience, Belstat has developed a system of national statistical indicators showing the development of the digital economy. The system includes five blocks of indicators: information and communication infrastructure, use of ICT by people and organisations, informatisation infrastructure, digital transformation, and the national ICT industry (45 indicators in total)[1]. The contribution of the digital sector to the Belarusian economy can be assessed by the increasing share of the ICT and IT industry in the country's GDP. In 2011 this amounted to 2.8% of Belarus's GDP and in 2016 to 5.2% (calculated according to the data of the Statistical Yearbook of the Republic of Belarus (Belstat, 2019, pp. 9, 344)).

In general, the trend is positive. For the period 2011–2018, the use of the internet by both individuals and organisations expanded significantly.

The development of the digital economy in the country is evident from changes in Belarus's position in international rankings. According to the ICT Development Index (IDI), the country was 32nd in 2017 (with an index value of 7.55), a relatively high position; for comparison, the Russian Federation was in 45th place with an IDI value of 7.07 (Belstat, 2019a, pp. 95–96). In terms of its E-Government Development Index (EGDI) rating, Belarus rose from 61st to 38th place in the period 2012–2018. Belarus also improved its position on the E-Participation Index (EPI), rising to 76th place in 2016 (from 98th in 2008). The country's position has remained stable over the past two years according to the Global Connectivity Index (GCI) (47th place in 2017–2019) (GCI Ranking Table website). At the same time, in the period 2014–2018 there was a negative trend in the Global Innovation Index (GII) (58th position in 2014, 53rd in 2015, 88th in 2017). In 2020 the country moved up from 86th to 64nd place (Global Innovation Index, 2020, p.xxxii).

[1] The list of national statistical indicators for the development of the digital economy in Belarus is posted on the official website of Belstat (www.belstat.gov.by) on the tab Methodology/Methods for the formation and calculation of statistical indicators/Statistics of information and communication technologies. Some of these are shown in Table 8.

Table 8. Selected national statistical indicators of the development of the digital economy, 2011–2018

Indicator	2011	2012	2013	2014	2015	2016*	2017*	2018
Population aged 6–72 who use the internet as a share of the total population aged 6–72 (%)	43.3**	50.9**	58.4	63.6	67.3	71.1	74.4	79.1
Population aged 6–72 who use the internet on a daily basis as a share of the total population aged 6–72 (%)	26.4**	35.1**	37.7	41.3	45.2	48.5	54.3	2.6
Number of ICT organisations	3 569	3 958	4 227	4 477	4 536	3 962	4 492	4 996
ICT sector personnel as a share of total personnel in organisations (%)	2.2	2.2	2.2	2.3	2.4	2.2	2.4	2.7
Organisations using indoor broadband internet access as a share of the total number of organisations surveyed (%)			84.6	86.6	88.6	89.4	96.7	96.7

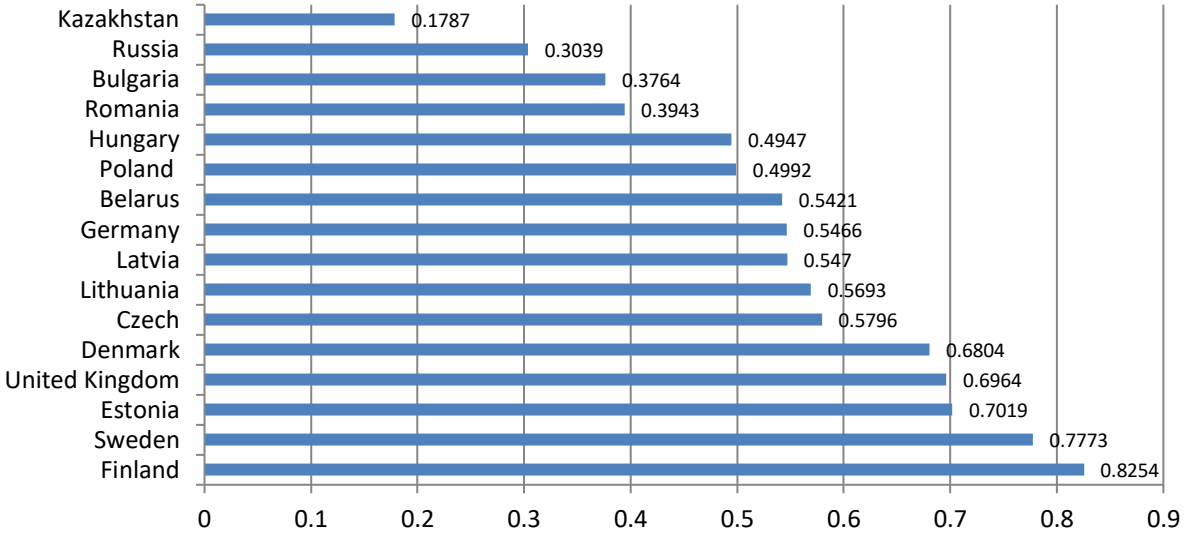
* For the period 2016–2017, statistical indicators for the ICT sector, the content and media sector and the IT industry are calculated by the types of economic activity that are part of the collective groupings 'Information and communication technologies sector', 'Content and media sector' and 'Information technology industry' by type of economic activity in accordance with the National Classification of the Republic of Belarus OKRB 005-2011 'Types of economic activity'.

** population aged 16-72

Source: Belstat (2019d).

Given that the country does not take part in every international rating reflecting the degree of digitalisation of the economy, Belarusian specialists proposed a method for calculating the index of the development of the digital economy. This index includes 22 indicators in 5 areas: quality of the ICT infrastructure and internet access, intensity of internet use, human capital, digitalisation of the economy, and effectiveness of digital transformation of the economy. In 2018 the consolidated rating for Belarus was 0.5421, which means it can be referred as one of the group of 'progressing' countries (Golovenchik and Kovalev, 2019, p. 367). Belarus is a leader among countries of the Eurasian Economic Union (EAEU), but at the same time it lags behind the European leaders (Figure 7).

Figure 7. Index of development of the digital economy of EU and EAEU countries, 2018



Source: Based on Golovenchik and Kovalev (2019), p. 367.

The data from a sample survey of households on living standards indicate that there was an increase in the use of ICT by the population in the period 2013–2018: 97.2% of households in Belarus uses mobile services, 73.5% used personal computers and 79.1% used internet services (Belstat, 2019a, p. 80). In the period 2013–2018, access to the internet expanded (Table 9).

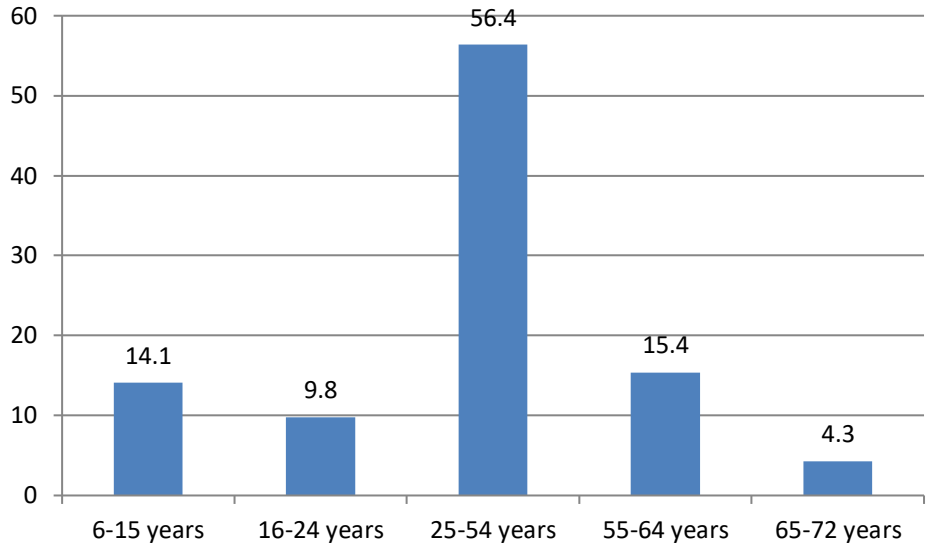
Table 9. Access to the internet as a share of the total population in the corresponding group (%)

	2013	2014	2015	2016	2017	2018
Internet users	58.4	63.6	67.3	71.1	74.4	79.1
Age group						
6–15	76.9	79.7	82.0	85.8	86.0	90.8
16–24	96.4	96.2	98.1	98.1	98.6	98.7
25–54	67.4	74.0	78.5	83.3	87.3	90.4
55–64	26.5	33.3	37.6	44.7	52.3	60.0
65–72	9.1	16.3	18.4	22.6	27.9	33.4
Education level						
Higher education, postgraduate	77.6	82.3	84.2	86.7	89.2	91.7

Specialised secondary education	53.4	59.9	64.7	69.5	73.6	78.2
Vocational education	45.7	51.3	55.4	57.9	61.3	68.2
Secondary education	44.9	47.5	51.4	54.5	58.7	62.1
Basic, primary, no education	69.4	73.8	68.6	75.7	83.1	86.1

Source: Belstat (2019a, p. 81; 2019c, p. 471).

Figure 8. Internet users by age group, 2018 (%)



Source: Belstat (2019a), p. 82.

Most people access the internet through home devices: 95.4% of users access the internet at home, 76.4% access it anywhere through a mobile connection and 79.2% access it every day (Belstat, 2019a, pp. 83–84).

According to Belstat (2019a, p. 85), the main purposes of using the internet in Belarus are:

- searching for information (93.7%);
- watching and downloading movies, music, etc. (86.4%);
- using social networks (80.2%);
- sending/receiving emails, chatting (60.8%);
- reading and downloading newspapers, books, etc. (59.3%);
- playing computer games (51.2%);

- financial transactions (40.9%);
- purchasing or ordering goods or services (38.2%);
- education services (22.9%);
- interaction with government agencies (16.5%).

However, the goals of individuals accessing the internet vary according to age (Belstat, 2020a, p. 70): children and young people under the age of 24 use the internet to a greater extent to watch and download movies, music and software, to play computer games and for educational purposes, while the adult population aged 25 years and older use it to search for information, communicate on social networks, use email, purchase goods and services, carry out financial transactions and communicate with government agencies.

4.2 Digitalisation of the economy and the impact on the labour market

The most influential areas of digitalisation that affect labour demand are:

- changes in the work profile that significantly affect the structure of required skills and lead to the emergence of new professions;
- changes in tasks and characteristics of the workplace in the process of performing work;
- emergence of new digital skills.

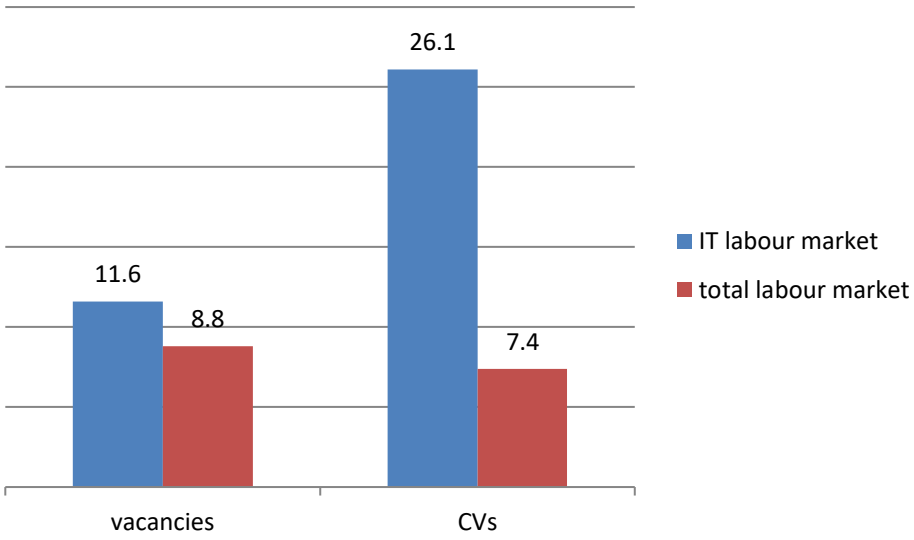
The directions of the influence of digitalisation on the supply in the labour market are:

- expansion of the labour supply by involving in economic activity (including remote forms of employment) older people and people with disabilities, who also have the opportunity to participate in various large-scale online educational programmes by means of digital technologies;
- expansion of the availability of advanced training systems, as well as training and retraining of personnel by means of remote open educational programmes, which, in turn, expands the supply of labour resources and improves their quality;
- increase in the mobility of the labour force in the context of digitalisation, as mobility is no longer tied to geographic location.

One important impact of the digitalisation of the economy on the labour market has been the virtualisation of social and labour relations. This involves the remote interaction of labour market actors by means of special online platforms, which primarily serve as intermediaries that help to set out working conditions and develop platform employment and electronic self-employment, including freelancing, telecommuting and crowdworking. A complete statistical measurement of these forms of employment has not yet been developed. However, according to the available data and individual expert assessment, it can be concluded that such forms are common. According to the research centre of Jobs.tut.by (one of the popular online job portals in Belarus), the IT labour market is developing faster than the rest of labour market (https://42.tut.by/681147). In terms of the number of vacancies posted, the IT sector is traditionally in second place (after the professional area ‘Sales jobs’). IT professionals’ CVs accounted for 5.8% of the total number of resumes posted on the

Jobs.tut.by website. During the first quarter of 2020, the IT professional labour market was more dynamic than the rest of the labour market.

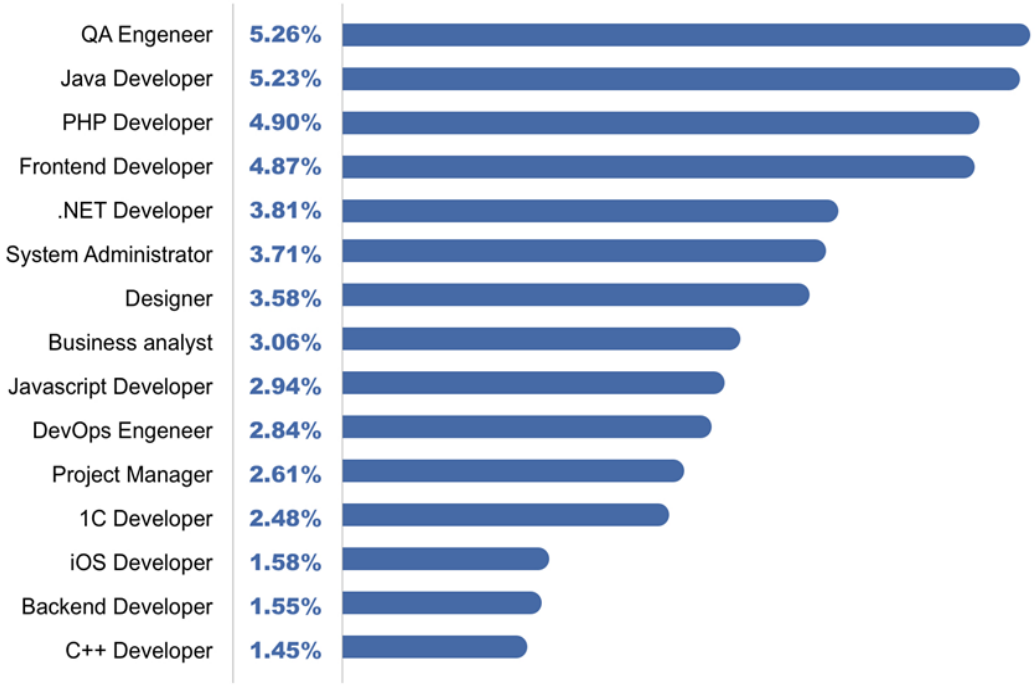
Figure 9. Dynamics of the IT labour market and the total labour market (Q1 2020 vs Q1 2019), %



Source: Jobs.tut.by Research Centre.

Competition in the IT segment of the labour market amounted to 3.5 CVs per vacancy (March 2020), while in the rest of labour market it was 8.1 CVs per vacancy **(**Jobs.tut.by Research Centre). Analysts also note the greater mobility of the IT segment of the labour market in the context of competencies demanded. In 2018–2019 PHP developers were the most highly demanded professionals in IT, and in 2020 the highest demand was for testers and Java developers (Jobs.tut.by Research Centre) (Figure 10).

Figure 10. Top 15 specialisations most in demand in the IT sphere, Q1 2020



Source: Jobs.tut.by Research Centre.

The analysis of the salary levels of the five most in-demand IT positions shows that the median value of employers' offers ranges from USD 1 500 to USD 3 000 per month, which is much higher than the median salary in the country[2]. The Rabota.tut.by research centre's survey of 2 515 job seekers and 151 employers showed that 68.3% of specialists work in an office, while more than 70% of them would like to work remotely or as freelancers (Jobs.tut.by Research Centre).

4.3 Conclusions

1. The trend towards the digitalisation of the economy in Belarus is confirmed by statistical data: both individuals and businesses use the internet and ICT at an increasing rate in all areas of activity, both in their professional duties and in their personal lives.

2. The most active internet users are individuals aged 16–24, 25–54 (over 90%) and children (90.8%). The main method of accessing the internet is through home devices (95.4%), and the main purpose of using the internet is to search for information (93.7%).

3. The digitalisation of the economy changes the configuration of the labour market. This is manifested in the virtualisation of labour relations and changes in the structure of labour demand and supply. As a result of the expansion of the use of ICT and the internet, the problem of provision of ICT specialists is becoming more acute, but the system for predicting future skills has not yet been developed. Thus, it is difficult to foresee the emergence of new competencies and organise training in them in advance. Institutional mechanisms have been created and are being improved, and the concept of an information and analytical system for

[2] The median salary is the value at which 50% of employers offer a salary higher than this figure and 50% offer less than this amount (Jobs.tut.by Research Centre).

the labour market and for the forecasting of the needs of the economy for employees is being developed. However, the system is aimed at predicting not skills and abilities (micro-diplomas) but the number of employees and diplomas (graduation in the areas of training and specialties).

5 CONTEXT AND CHARACTERISTICS OF THE ONLINE JOB VACANCY PORTALS IN BELARUS (PUBLIC EMPLOYMENT SERVICES AND PRIVATE PORTALS), THEIR LEGAL FRAMEWORK AND THE MAIN CLASSIFIERS USED

5.1 National Bank of Vacancies

The National Bank of Vacancies (http://gsz.gov.by/ru/about/rukovodstva/) on the website of the Ministry of Labour and Social Protection is a state-owned online vacancy portal where users can:

- create a personal account for each client of the National Employment Service;
- submit information online about vacancies to the bodies of the National Employment Service for further publication on the portal;
- receive information on the availability of vacancies (nationally or for each region);
- view CVs filled in by users in their personal accounts on the portal or submitted to the portal by the National Employment Service at the request of an unemployed person;
- set up a subscription for CVs and information about vacancies, and receive notifications by email about new suitable vacancies;
- send a response to a CV or a vacancy to the personal account of an applicant or employer, respectively;
- provide individuals and organisations with information about the situation on the country's labour market, ongoing events, and contact details of all departments of the National Employment Service and the services they provide;
- gain access to the data bank of professiograms for vocational guidance and for training unemployed individuals;
- gain access to regulations governing the activities of the National Employment Service in the field of ensuring employment.

Article 21 of the Law of the Republic of Belarus 'On Employment of Citizens' (15 June 2006 No. 125-З) stipulates that the employer must: 'in writing notify the labour, employment and social protection authorities about the availability of vacancies within five days of their occurrence, indicating the working conditions and payment. At the same time, employers shall not indicate discriminatory conditions in the information about available vacancies; inform labour, employment, and social protection authorities about filling the vacancies on the day of filling, providing that, in accordance with the law, the existence of these jobs was reported to labour, employment and social protection authorities beforehand' (the paragraph was introduced by the Law of the Republic of Belarus of 18 July 2016 No. 409-З 'About modification and additions in the Law of the Republic of Belarus 'On employment of population of the Republic of Belarus'). Any citizen of Belarus and any organisation

can use the services of the National Bank of Vacancies. In order to use the portal, the applicant must: have a registered email address; connect to the network and register on the portal (Gsz.gov.by); activate their personal account. Employers wishing to use the portal must: have a public key certificate for checking (electronic digital signature, EDS); activate their personal account by entering the portal (Gsz.gov.by) with an EDS key.

The instructions for filling out information on the availability of vacancies (approved by the Resolution of the Ministry of Labour and Social Protection of the Republic of Belarus No. 149 on 30 November 2006) determine the form in which organisations must provide information on the availability of vacancies (Annex 1). Organisations should submit the following information about the vacancy:

- name and address, taxpayer ID, form of ownership of the organisation (state-owned, private);
- codes of the type of economic activity in accordance with the National Classification of the Republic of Belarus 'Types of economic activity' OKRB 005-2011;
- name of the profession (position) from the National Classification of the Republic of Belarus 'Trades of workers and positions of employees' OKRB 006-2009, approved by the Resolution of the Ministry of Labour and Social Protection of the Republic of Belarus of 22 October 2009 No. 125, code of profession in accordance with OKRB 006-2009 (five digits);
- name of the profession (position) from the National Classification of the Republic of Belarus 'Occupations' OKRB 014-2007, approved by the Resolution of the Ministry of Labour and Social Protection of the Republic of Belarus of 30 October 2007 No. 139; in 2020, there has been a gradual transition to OKRB 014-2017 'Occupations', harmonised with the ISCO-08 classifier;
- the required tariff category, class, category;
- rate of remuneration, allowances, bonuses, etc.;
- minimum education required to work at a given workplace: general basic, general secondary, vocational, secondary specialised, higher, postgraduate;
- nature of the work (permanent, temporary, seasonal, part-time, paid public, home-based); several options are possible;
- work schedule, number of working hours (if necessary): one, two or three shifts, flexible working hours;
- number of vacancies for each profession or position;
- employer's requirements for applicants, including: work experience, computer skills, knowledge of computer programs, foreign languages, driver's licence, etc.

Employers are able to submit these data as electronic documents if they have an EDS. To do this, an employer must fill out the appropriate electronic form on the information portal of the National Employment Service.

The electronic form is posted on the specified portal on the 'Employer' tab and is filled out following to the instructions. After posting vacancies in the automated information system, the National Bank of Vacancies, the employer will receive a confirmation email.

Table 10. Number of vacancies, CVs and organisations listed on the National Employment Service portal (posted on the portal on a fixed date)

Date	Vacancies	CVs	Organisations
1 September 2019	87 613	2 981	120 882
29 September 2019	97 678	2 968	122 133
8 April 2020	85 402	3 218	135 479
30 July 2020	78 497	1 683	157 237

Source: Data from websites taken on 1 September 2019, 29 September 2019, 8 April 2020 and 30 July 2020.

Specialists from the labour, employment, and social protection authorities of the Ministry of Labour and Social Protection are constantly analysing the dynamics and structure of vacancies presented in the National Bank of Vacancies (Tables 11–13) by type of economic activity, region, wage rate, and ratings for the most and least demanded professions.

Table 11. Regional structure of vacancies on the National Bank of Vacancies portal, 1 April 2020

	Jobs		Average salary per month (BYN)
	Number	%	
Republic of Belarus	85 627	100	630.22
Brest Region	9 986	11.66	582.06
Vitebsk Region	7 541	8.8	588.94
Gomel Region	10 630	12.41	545.40
Grodno Region	12 056	14.08	618.03
Minsk	21 699	25.34	732.33
Minsk Region	15 658	18.28	642.68
Mogilev Region	8 057	9.4	570.83

Table 12. Vacancies with a salary above BYN 375 per month (excluding current jobs and places for which a part-time rate is indicated) according to OKRB 005-2011 'Types of economic activity', 1 April 2020

Section	Type of economic activity	Workers		Office workers	
		Number	Average salary (BYN)	Number	Average salary (BYN)
A	Agriculture, forestry and fishing	7 742	575.57	4 388	628.71
B	Mining	132	708.57	13	769.43
C	Processing industry	10 648	647.42	1 972	784.64
D	Electric power supply, supply of natural gas and steam, hot water supply and supply of conditioned air	974	597.37	281	1 142.54
E	Water supply; collection, processing and disposal of waste, activities to eliminate pollution	310	571.81	59	708.10
F	Construction industry	9 680	740.16	1 595	836.01
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	5 548	592.32	2 153	714.38
H	Transport activities, warehousing operations, postal and courier activities	3 823	687.99	594	1 098.28
I	Temporary lodging and catering services	1 157	550.90	155	858.25
J	Information and communications	148	458.51	349	866.93
K	Financial and insurance services	66	571.46	731	615.04
L	Real estate transactions	592	547.88	266	769.65
M	Professional, scientific and technical activities	1 846	549.41	1 635	692.73
N	Administrative and ancillary services	1 197	535.58	318	674.86
O	Public administration	1 651	631.02	1 733	687.98
P	Education	1 630	401.31	2 355	497.23
Q	Health care and social services	1 642	432.68	7 423	615.90
R	Arts, sport, entertainment and recreation	829	448.83	1 791	528.12

S	Other services	566	488.40	254	629.06
T	Activities of households as employers of domestic personnel and those producing goods and services for their own use	18	416.67		
Total	78 264	50 199		28 065	

Table 13. Vacancies with a salary above BYN 375 per month (excluding current jobs and places for which a part-time rate is indicated) in most demand among employers, 1 April 2020 and 1 July 2020

	1 April 2020		**1 July 2020**	
Rating	Trade	Number	Trade	Number
1	Driver	3 772	Driver	3 085
2	Salesperson	1 947	Salesperson	1 750
3	Driver of agricultural machinery	1 737	Driver of agricultural machinery	1 586
4	Cook	1 564	Nurse	1 442
5	Tailor	1 495	Tailor	1 439
6	Cleaner (production and office premises)	1 255	Cleaner (production and office premises)	1 342
7	Bricklayer	1 146	Labourer (unskilled worker)	1 222
8	Electrician for repair and maintenance of electrical equipment	1 097	Bricklayer	1 105
9	Electric and gas welder	981	Electrician for repair and maintenance of electrical equipment	973
10	Nurse	956	Milking machine operator	960
Rating	Profession	Number	Profession	Number
1	Specialist nurse (nurse)	2 702	Specialist nurse (nurse)	2 862
2	Medical specialist	2 479	Medical specialist	2 796
3	Specialist	835	Veterinarian	746
4	Engineer	790	Specialist	668
5	Veterinarian	774	Engineer	633

6	Accountant	553	Accountant	487
7	Medical laboratory assistant	513	Medical laboratory assistant	474
8	Executive	488	Forester	400
9	Forester	371	Medical assistant	355
10	Master	329	Executive	352

The register of employment agencies is posted on the website of the National Employment Service. The register was formed in 2017 (the Council of Ministers of the Republic of Belarus approved the Regulation on employment assistance services provided to individuals by employment agencies). All the agencies included on the register operate legally. The creation of the register has contributed to the quality of service and reduced the risks for individuals. Agencies collect information mainly on the CVs of job seekers. Employers are less likely to post their vacancies through agencies, but when they do so it is usually for higher-paying jobs. Information is added to the register of employment agencies on the basis of an application submitted by a business or individual entrepreneur who intends to provide services to assist in employment.

The register of employment agencies on the website of the Ministry of Labour and Social Protection is constantly expanding: as of 30 July 2020 it contained 193 organisations, including 21 private unitary enterprises (10.88%), 85 limited liability companies (44.05%), 75 individual entrepreneurs (38.86%), 1 closed joint-stock company, 11 organizations were excluded from the register. As of 2 June 2019 there were 156 organisations on the register.

The National Bank of Vacancies was created on the portal of the National Employment Service. Information about a vacancy is submitted in accordance with the Law of the Republic of Belarus 'On Employment of Citizens' within five days of its occurrence. The portal data are updated daily. Vacancies are classified by type of economic activity in accordance with OKRB 005-2011 'Types of economic activity' in the context of regions, urban and rural areas, vacancies for workers and employees. When entering vacancies, the reference book OKRB 006-2009 'Trades of workers and positions of employees' is used. In 2020 there has been a gradual transition to the use of the OKRB 014-2017 'Occupations' reference book, which is harmonised with the International Classification of Occupations ISCO-08, and the gradual formation of a classification of vacancies in the context of nine professional qualification groups.

The advantages of the National Bank of Vacancies are as follows.

It is the most complete collection of vacancies, as entering information about vacancies is required by law, and violation (that is, concealing information about a vacancy) entails administrative sanctions for organisations.

It uses classifications adopted in statistical reporting, harmonised with international approaches.

Everyone can post information about vacancies and CVs free of charge.

The National Bank of Vacancies has a number of limitations.

It has a small number of users (people who have registered their CVs and are looking for a job).

There are no statistics on the rate at which vacancies are filled or the time a vacancy is open (from registration to being filled or closed). Although there is a large statistical base, full-scale analytics is not carried out.

There are no services for selecting vacancies for job seekers or for selecting employees for employers. Therefore, employers note that they either do not receive a response after posting a vacancy, or the qualifications of job seekers are insufficient. Employers admit that this is one of the drawbacks of the National Bank of Vacancies. Thus, the National Bank of Vacancies only posts vacancies, but does not act as a recruiting agency (it neither selects applicants or vacancies, nor fills vacancies). This might explain the small number of people willing to post their CVs on the portal to search for vacancies.

5.2 Private portals in Belarus: legal framework and basic classifications used

Google and Yandex search results list numerous links to online portals and job aggregators in Belarus. However, practically none of these portals show the type of ownership. The basis for their activity is the certificate of state registration of the mass media issued by the Ministry of Information. Among the non-government portals, the largest and most active are the initial portals Jobs.tut.by, Praca.by and JobLab.by, and the search engines and vacancy aggregators Belmeta.com, GorodRabot.by, Trudbox.by and Mnogo-Raboty.by. Many portals operate as applications linked to other portals and platforms through tabs for job search (Kufar.by, Baraholka.onliner.by, etc.). There are also many links to the websites of direct employer organisations, where these organisations post vacancies. The main non-government online portals and aggregators of vacancies are presented in Table 14.

Table 14. Characteristics of online portals and aggregators of vacancies

Name, address	Volume (end of July 2020)	Characteristics
Belmeta.com **https://belmeta.com/**	70 161 vacancies	A specialised job search system that allows searching for vacancies published on websites and job portals
Praca.by **https://praca.by/**	376 483 CVs 10 497 vacancies 90 705 employers	A constantly updated database of vacancies and CVs that has tools for advanced search and data sorting
Jobs.tut.by **https://vitebsk.jobs.tut.by/** **(Rabota.tut.by)**	2 255 457 CVs 23 551 vacancies 81 893 businesses	An open Belarusian online platform containing a recruitment and job search service, a labour market research centre and an HR brand development centre Organises and holds various events in the field of human resource management
JobLab.by **https://joblab.by/**	19 311 vacancies	Intended to provide free search and posting of vacancies and CVs in Belarus All vacancies are grouped into subject directories 'Work in Belarus' tab publishes vacancies of both direct employers and recruitment agencies that are engaged in the selection of personnel or offer vacant jobs Partner: Belmeta

Trudbox.by **http://trudbox.by/jobs**	121 490 vacancies	A job aggregator that provides its own labour market analytics
By.jooble.org **https://by.jooble.org/**	No data available	A search engine that specialises in job search, which is carried out among all employment portals in Belarus Automatically filters out duplicates, so the same job posted on different job sites will show up here as one vacancy By submitting a query, the user obtains links to the most suitable vacancies from more than 380 job sites in Belarus
By.trudcom.by **https://by.trud.com/jobs/**	69 783 vacancies	A search aggregator of vacancies that provides its own labour market analytics
Rdw.by **https://rdw.by/**	5 309 vacancies 14 112 CVs	An online portal of vacancies and CVs
Belrabota.by **https://www.belrabota.by/**	1 009 vacancies	A weekly newspaper containing a bank of vacancies Assists in finding vacancies and recruiting personnel Partners: Jooble and Belmeta
Second Google page and beyond		
Riv.by **https://riv.by/**	1 513 vacancies	An online portal of CVs and vacancies About 30 000 users access it every day
24ru.com **https://24ru.com/rabota-belarus**	189 vacancies in Belarus 11 105 vacancies in total 9 649 CVs	Aggregator that offers vacancies in European countries and all over the world
Baraholka.onliner.by **https://baraholka.onliner.by/viewforum.php?f=35**	No data available	Additional service on a retailing website that facilitates search for vacancies Allows vacancies to be posted without indicating classification
Kufar.by **https://www.kufar.by/listings?cat=6010p**	1 909 vacancies	Additional service on a retailing website that facilitates search for vacancies Allows vacancies to be posted without indicating classification
GorodRabot.by **https://gorodrabot.by**	23 494 vacancies from 15 sources	Vacancy search system that collects vacancies from across the most popular and verified portals on a single website On 30 July 2020 it contained vacancies from 15 sources Cooperates with Belarusian job search websites: Gderabota.by, Riv.by, JobLab.by, etc.
Ludi.by **https://ludi.by/**	780 vacancies	IT company that successfully develops technologies for personnel and job search Also an online service for personnel and job search in Belarus Vacancies posted on Ludi.by are automatically indexed by Google Jobs and uploaded to popular aggregators, newsboards, city portals and networks

Flagma.by **https://flagma.by/**	17 694 vacancies from Belarus and 54 other countries	Website of free announcements for businesses, including vacancies and CVs
Ares.by **https://ares.by/rekrutingovoe_agentstvo/**	No data available	Specialised portal of vacancies posted directly by employers, large Belarusian and international companies Facilitates search for top-level specialists (top managers, highly qualified specialists) and conducts paid market research
Jobs.dev.by **https://jobs.dev.by/**	478 vacancies for IT specialists	Specialised initial online portal of vacancies for the IT industry
Gde.by **https://gde.by/rabota/vakansii**	No data available	Web page from information website containing vacancies from Belarusian employers
IT-academy.by **https://www.it-academy.by/employment/vacancies/**	No data available	Created in 2010 as an educational centre for the Belarus Hi-Tech Park Posts IT vacancies from other portals
Myjob.by **http://myjob.by/**	838 vacancies	Job search site with a database of vacancies and CVs that are processed manually by moderators, which reduces the number of duplicate ads and prevents false offers from being published Updated daily
Infox.by **http://rabota.infox.by/vacancy/**	2 028 vacancies 816 CVs 11 companies 23 recruitment agencies	Information portal with a section facilitating job search and employment
Vacancies from organisations (posted on companies' websites)		

Each portal and aggregator uses its own classification of vacancies. Some of them show statistics and basic tabs, and do their own analysis of the labour market, while others show information only upon request (categories, professions, regions, branches of industry). Comparison of classifications from various portals (Table 15, as at 31 July 2020) shows that they do not comply with OKRB 005-2011 'Types of economic activity' and OKRB 014-2007 'Occupation'. In addition, their tabs combine both classifications (Annex 2 shows the vacancy template used for registration on Jobs.tut.by). Moreover, there is a duplicating count of vacancies, i.e. the same vacancy can be found on several tabs.

Table 15. Comparison of vacancy classifications used by various portals (number of vacancies, 31 July 2020)

Belmeta.by **69 825 vacancies**	**Praca.by** **10 434 vacancies**	**Jobs.tut.by** **23 011 vacancies**	**JobLab.by** **19 290 vacancies**
IT, computers, the internet (995) **Accounting, audit services (1 228)**	IT, the internet, telecommunications (747) **Office services,**	Car business (549) Administrative staff (924) Banks, investments,	Administrative work, secretarial business (281) Design, polygraphy

Design, photography (403) **Engineering, technologies (3 448)** **Personnel, human resources management, HR (212)** **Culture, arts, entertainment, show business (567)** **Logistics, customs, warehouse, international business (1 017)** **Marketing, advertising, PR (360)** **Medicine, pharmacy services, health care (6 737)** **Education, science, translation (3 385)** **Office personnel, secretarial services, administration (2 387)** **Security and guarding services (633)** **Production, manufacturing, working specialities (17 349)** **Work without special training (5 748)** **Restaurants, cafes, catering services (2 562)** **Executives, top managers (1 624)** **Agriculture, agricultural business, livestock business (4276)** **Mass media, press, publishing (243)** **Sports, beauty services, fitness (1 429)** **Insurance services (76)** **Construction, architecture, real estate services (6 601)** **Telecommunications (253)** **Trade services, sales, procurement (9 925)** **Transportation, car business, car services (6 316)** **Tourism, recreation, hotel business (150)** **Services, service industry (2 348)** **Financial services, banks (639)** **Legal services, notarial services (588)**	**business services** HR, personnel management (208) Administrative staff (2186) Security, guarding services (130) Legal services (105) **Marketing, advertising, mass media** Marketing, advertising, PR (2 130) Mass media, publishing (367) **Service industry, sales** Sales, trading business, client management (4 900) Tourism, hotel business, public catering (1276) **Beauty, health** Beauty, fitness, sports (1 835) Medicine, pharmacy services, veterinary medicine (1 568) **Transportation services, logistics** Logistics, procurement, warehouse, international business (1 165) Transportation service, car services, aviation (2 561) **Arts, education, culture** Design, graphics, photography (266) Culture, arts, entertainment, show business (672) Education, science, translation (654) Finance, insurance, banking business, leasing services, insurance (2 132) Accounting, auditing, economy (1204) **Manufacturing, construction, agriculture and production complex** Manufacturing, production, polygraphy business (8 466) Agriculture, agriculture and production complex (1 533) Construction industry, buildings management, real estate (7 154) Management, top management (558)	leasing (562) Security services (180) Accounting, management accounting, corporate finance (773) Top management (154) Civil service, non-profit organisations (42) Extraction of raw materials (16) Housekeeping staff (161) Procurement (207) Installation and maintenance (127) IT, the internet, telecommunications (2 535) Arts, entertainment, mass media (335) Consulting services (194) Marketing, advertising, PR (1 131) Medicine, pharmacy services (474) Education, science (617) Entry-level positions, students (681) Sales services (3 339) Production, agriculture (1 275) Workers (1 930) Sports clubs, fitness, beauty salons (343) Insurance services (16) Construction, real estate services (1 377) Transportation services, logistics (1 525) Tourism business, hotels, restaurants (755) Human resource management, training services (266) Lawyers (154)	business, media (101) IT, telecommunications (307) Arts, culture, entertainment (97) Personnel management, training services, HR (58) Marketing, advertising, PR (680) Medicine, pharmacy services (233) Education, science (584) Security, guarding services (118) Housekeeping personnel (47) Production, manufacturing industry (2 889) Working specialities (3 802) Warehousing, logistic services, international business (260) Sports, beauty (542) Construction, real estate services (2 237) Trading business, sales services (3 730) Transportation, car business (1 920) Tourism services, restaurants, hotels (941) Finance, accounting and bookkeeping, banking business (409) Legal services (54)

The advantages of posting vacancies on non-government job portals are as follows.

- They allow targeted selection of vacancies according to CVs, and vice versa, increasing a company's chances of recruiting a good employee (and of closing the vacancy).
- They offer the ability to move a vacancy or CV to higher position in search engine rankings, thus increasing the efficiency with which a vacancy is filled (or an applicant employed).
- They are an easier form of communication, so companies duplicate information about their vacancies on non-state portals after their mandatory posting on the Gsz.gov.by portal.

The disadvantages of non-government job portals are as follows.

- Standard classifiers are not used, i.e. the same vacancy can be posted simultaneously on several tabs by areas of economic activity, which hinders the analysis and assessment of their contribution to the total demand for labour in the economy.
- They offer paid posting of vacancies and paid access to the CV database, as they are profit-making businesses.

6 ANALYSIS AND RANKING OF OJV WEBSITES

6.1 OJV portals and vacancy characteristics

The methodology of Mercorio and Mezzanzanica (2019) was adapted for the Belarusian labour market and used for the current analysis. Sources of vacancies were collected using various queries in a search engine[3]. The following search queries were used to determine the most popular job portals: 'job + Belarus', 'vacancies + Belarus', 'find a job + Belarus'. The results of the first 10 pages were reviewed to remove websites of organisations that post information about their own vacancies (for example, a number of organisations such as Belavia, VTB-Bank and Belarusbank post active links to their sites, informing individuals about available vacancies and inviting them to send CVs). Table 16 presents a summary of the analysis and ranking of portals as of 1–3 August 2020.

Table 16. List of online job portals for assessment and ranking, 1–3 August 2020

	Google search results	1 August 2020
	Page 1	
1	Belmeta.com https://belmeta.com/	70 161 vacancies
2	Praca.by https://praca.by/	376 705 resumes 10 434 vacancies 90 734 employers
3	Jobs.tut.by https://vitebsk.jobs.tut.by/	2 256 181 resumes

[3] Google and Yandex are the most popular search engines in Belarus. Google is used by 76.86% of users, and 22.35% users prefer Yandex. Therefore, search queries were made in Google.

		23 002 vacancies 81 920 employers
4	JobLab.by https://joblab.by/	19 311 vacancies
5	Trudbox.by http://trudbox.by/jobs	121 431 vacancies
6	By.jooble.org https://by.jooble.org/	53 000 vacancies
7	By.trud.com https://by.trud.com/jobs/	69 680 vacancies
8	Rdw.by https://rdw.by/	5 224 vacancies 14 132 resumes
9	Belrabota.by https://www.belrabota.by/	1 009 vacancies
	Page 2	
10	Ludi.by https://ludi.by/	780 vacancies
11	Gsz.gov.by http://gsz.gov.by	1 682 CVs 77 696 vacancies 157 255 companies
12	Kufar.by https://www.kufar.by/listings?cat=6010	1 930 vacancies
13	GorodRabot.by https://gorodrabot.by/	23 533 vacancies from 15 sources
14	Jobs.dev.by https://jobs.dev.by/	486 vacancies for IT specialists
15	Wargaming.com https://wargaming.com/ru/careers/	162 vacancies in company
	Pages 3–10	
16	Ares.by https://ares.by/vacancies/	
17	Flagma.by https://flagma.by/rabota.html	17 898 vacancies
18	Gde.by https://gde.by/rabota/vakansii	No data available
19	Myjob.by http://myjob.by/	838 vacancies
20	Rbg.by http://rbg.by/	19 731 vacancies
21	24ru.com https://24ru.com/rabota-belarus	189 vacancies in Belarus 11 105 vacancies in total 9 649 CVs
22	Riv.by https://riv.by/	1 513 vacancies

The attributes used to characterise vacancy sources are divided into two categories.

- Website characteristics: approximate position in the Google ranking, volume of OJVs, type of job portal, type of operator, geographical scope, sectoral scope, publication date of OJV, update frequency.

- Vacancy characteristics: occupation, type of contract, working time, sector, city, district, region, qualification level, wage.

The results are presented in Annex 3.

6.2 Transforming the variables to numeric values: OJV portals ranking

Each criterion should have different values for different sources. To differentiate each value, each job portal was manually analysed focusing on each variable to assign a value. The distribution of values by variable are shown in the tables in Annex 4, while the process and the results of OJV portal evaluation are presented in Tables 17 and 18

Table 17. Process of OJV portal ranking, 1–3 August 2020

	Name of job portal	Approximate position in Google ranking	Type of operator	Type of job portal	OJV volume	Geographical scope	Sectoral scope	Publication date of OJV	Update frequency	Occupation	Type of contract	Working time	Sector	City	District	Region	Qualification level	Wage	Skills	Media	Final ranking
1	Belmeta.com	1	1	0.8	69.9	1	1	1	1	0.5	1	1	1	1	1	1	1	1	0.5	0.9	
2	Praca.by	1	1	1	10.4	1	1	1	1	0.5	1	1	1	1	1	1	1	1	0.5	0.941	
3	Jobs.tut.by	1	1	1	23.0	1	1	1	1	0.5	1	1	1	1	1	1	1	1	0.5	0.941	
4	JobLab.by	1	1	1	19.3	1	1	1	1	0.5	1	1	1	1	1	1	1	1	0.5	0.941	
5	Trudbox.by	1	1	0.8	121.4	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0.958	
6	By.jooble.org	1	1	0.5	52.4	1	1	1	1	0.5	1	1	0	1	0	0	0	1	0.5	0.676	
7	By.trud.com	1	1	0.5	70.2	1	1	1	1	0.5	1	1	1	1	0	0	1	1	0.5	0.794	
8	Rdw.by	1	1	1	5.2	1	1	1	1	1	1	1	1	1	0	0	1	1	0.5	0.853	
9	Belrabota.by	1	0.5	1	-	1	1	1	1	0.5	0.5	0.5	1	0.5	0	0	0.5	0.5	0.5	0.647	
10	Ludi.by	0.8	1	1	0.65	1	1	1	1	0.5	0.5	1	0	1	0	0	0	0.5	0	0.6	
11	Gsz.gov.b	0.8	1	1	77.7	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0.958	

	y																			
12	Kufar.by	0.8	1	1	1.9	1	1	1	1	0.5	1	1	1	1	1	1	0	1	0.5	0.87	
13	GorodRabot.by	0.8	1	0.5	23.5	1	1	1	1	1	1	1	1	1	0	0	0.5	1	0.5	0.782	
14	Dev.by	0.8	1	1	0.48	1	0.5	1	1	0.5	0.5	1	1	1	0	0	1	0.5	0.5	0.782	
15	Wargaming.com	0.8	1	1	0.162	1	0.5	1	1	0.5	0	0	1	1	0	0	0.5	1	0.5	0.635	
16	Ares.by	0.5	1	1	-	0.5	0.5	1	0.5	0.5	0	0	1	1	0	0	0	0.5	0.5	0.5	
17	Flagma.by	0.5	1	0.8	17.8	1	1	1	1	0.5	0.5	0.5	1	1	0	0	1	1	0.5	0.723	
18	Gde.by	0.5	1	1	-	1	1	1	1	0.5	0	0	1	1	0	0	0	1	0.5	0.617	
19	Myjob.by	0.5	1	1	0.9	0.5	1	1	1	0.5	0	0	1	1	0	0	0	0	0	0.5	
20	Rbg.by	0.8	1	1	19.7	1	1	1	1	0.5	0.5	0.5	1	1	0	0	0.5	0	0.5	0.665	
21	24ru.com	0.5	0.8	1	0.188	1	1	1	1	0.5	0	0	0.5	0	0	0	1	0.5	0.5	0.547	
22	Riv.by	0.8	1	1	-	1	1	1	1	0.5	0.5	1	1	1	0	0	1	0	0.5	0.723	

The portals with the highest rating (1–5) are the initial online job portals, with the largest number of vacancies, the largest number of employment assistance services (resume writing assistance, CV database, articles, training courses, improving the position of CVs and vacancies in search engines, etc.), available analysis of the current situation of the labour market on the portal and more detailed classifications by all indications. Specialised portals are usually small in size and are used by a narrow segment of specialists. Not all online portals provide information about CVs. However, this indicator could be used for the assessment of a portal's popularity among job seekers.

Previous rounds of the online job portals ranking for Belarus (November 2019 and April 2020) show that certain changes are taking place in relation to the development of many portals, namely the appearance of additional functions, which promotes them in the rankings. That is, many portals are constantly improving their services, changing the scope of vacancies.

At the same time, the ranking of the portals enables some limitations to be identified.

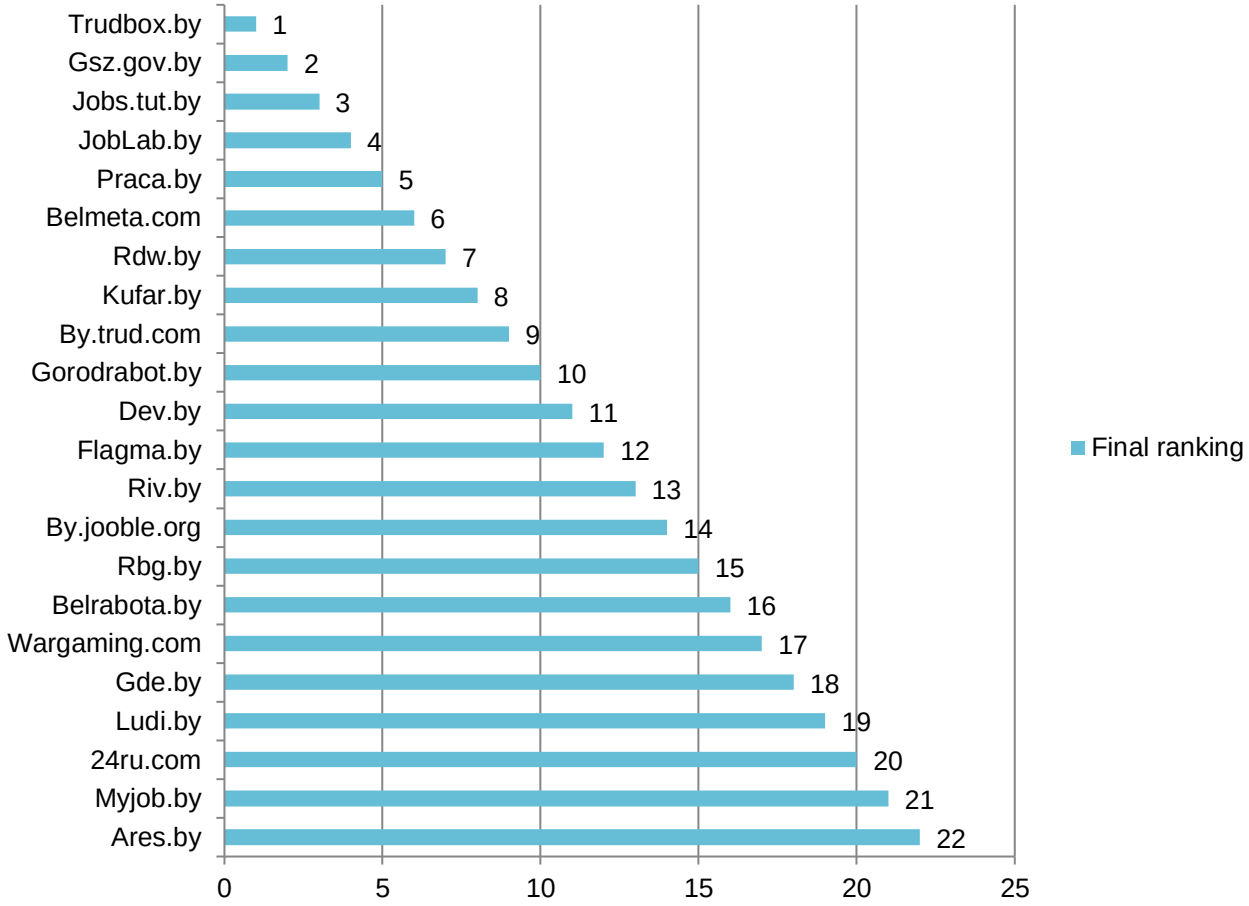
- It is difficult to differentiate the portals by the completeness of the vacancy classification by sector and profession.
- The rankings do not take into account the convenience of navigation and visualisation of the portals.
- Various portals offer different types of employment services (analytics, articles, recommendations, services for raising a vacancy position, CVs, brand promotion, advanced training of HR managers, etc.).
- Sites differ in terms of volume and structure of vacancies.
- Not all online portals provide information about CVs. However, this indicator could be used to characterise the portal's popularity among job seekers.

Table 18. Results of OJV portal ranking, 1–3 August 2020

	Name of job portal	OJV volume	Media	Final ranking
1	Belmeta.com	69.9	0.9	6 (aggregator)
2	Praca.by	10.4	0.941	5
3	Jobs.tut.by	23.0	0.941	3
4	JobLab.by	19.3	0.941	4
5	Trudbox.by	121.4	0.958	1
6	By.jooble.org	52.4	0.676	14
7	By.trud.com	70.2	0.794	9
8	Rdw.by	5.2	0.853	7
9	Belrabota.by	-	0.647	16
10	Ludi.by	0.65	0.6	19
11	Gsz.gov.by	77.7	0.958	2
12	Kufar.by	1.9	0.87	8
13	GorodRabot.by	23.5	0.782	10

14	Dev.by	0.48	0.782	11
15	Wargaming.com	0.162	0.635	17
16	Ares.by	-	0.5	22
17	Flagma.by	17.8	0.723	12
18	Gde.by	-	0.617	18
19	Myjob.by	0.9	0.5	21
20	Rbg.by	19.7	0.665	15
21	24ru.com	0.188	0.547	20
22	Riv.by		0.723	13

Figure 11. Rating of main online job portals in Belarus, 1–3 August 2020



7 ASSESSMENT OF THE WEB-LABOT MARKET COVERAGE, DIFFERENCES BETWEEN PUBLIC AND PRIVATE OJV SOURCES, METHODOLOGICAL UNDERPINNING OF ASSESSMENT AND RESULTS

7.1 Approximate share of total labour market demand, segments, educational levels, occupations

The demand for labour reflects the needs of the national economy for employees. This can be short term (for a period of time during which the technology remains unchanged) or long term (responding to technological changes or economic cycles). Market demand for labour is the total demand for labour from all companies in a given labour market at any given level of real wages (Ehrenberg and Smith, 1996, pp. 84–85).

According to the UK Commission for Employment and Skills (UKCES, 2014, pp. 3–6):

'Aspects of skills and labour demand worthy of coverage in a local labour market assessment include:

- number of people employed[4];
- forecast employment data[5];
- hours of work;
- sectoral structure of employment – provides an indication of demand for skilled labour;
- occupational structure of employment – also provides an indication of demand for skilled labour;
- qualifications of the employed workforce – this provides an indicator of demand for skills.'

Hence, demand in the labour market is measured by the number of people employed in the economy by types of economic activity, occupation and qualifications (as a characteristic of the volume of realised demand)[6]. The indicator for the number of vacancies can also be used as a characteristic of unrealised demand (Kureková et al., 2015). 'An excess of skills demand over skills supply is measured conventionally in terms of skill shortage vacancies' (UKCES, 2014, p.3). Thus, to assess the labour demand reflected in online job portals as a share of total demand, it is possible to use the number of vacancies on each portal as a share of the number of employed people in the economy and the

[4] The key sources are the Annual Population Survey and the Census of Population.

[5] The key data source is Working Futures from UKCES.

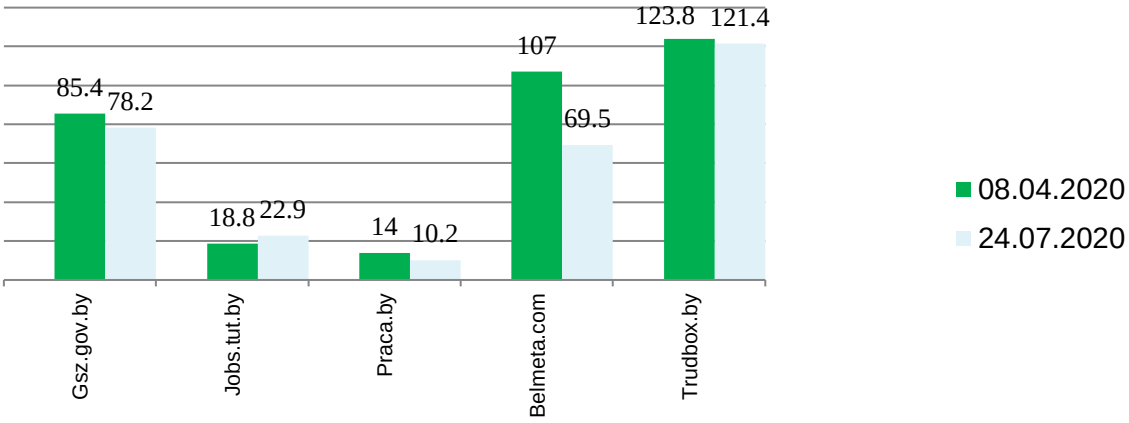
[6] According to a sample survey of households, the workforce is represented by people aged 15–74 years who provide labour supply for the production of goods (or provision of services). The workforce is calculated as the sum of the employed and the unemployed. (The definitions used are developed by the National Statistical Committee of the Republic of Belarus, based on the standard definitions of employment and unemployment recommended by the ILO.) The employed (engaged in economic activity) are those employed for remuneration, as well as the self-employed who work to gain profit or income, even if they were employed during the survey week for only one hour, as well as people temporarily absent from work. The employed population includes people who worked as assistants in a company (or their own business), where the founder (or participant) is a household member or a relative. The methodological differences in the calculations of the employed in the economy based on the results of a sample household survey compared with the current estimate (presented in Belstat (2019b)) are caused by the following: the sample survey registers the employed by the place of residence, not by the place of work; the number of employed people includes such categories as persons who are absent from the workplace due to maternity and three-year childcare leave, conscripts and people working abroad, while the current assessment of these categories does not consider the number of the employed (Belstat, 2020b, pp. 147–148).

number of companies posting their vacancies on the portal as a share of the total number of companies in Belarus. The size of companies posting their vacancies on the portal, in terms of the number of employees, can also be considered (Cedefop, 2019a, pp. 47–48).

However, there is no exact total number of vacancies. It is different on different portals, and there are duplications.

According to the Law of the Republic of Belarus 'On Employment of Citizens', all companies must report data on available vacancies to the National Bank of Vacancies within five days. Therefore, the most complete pool of vacancies must be the data from the National Bank of Vacancies. However, there are portals and aggregators (Belmeta.com, Trudbox.by) that have more vacancies than the National Bank of Vacancies (Figure 12). It is reasonable to assume that not all vacancies are included in the National Bank of Vacancies.

Figure 12. Dynamics of the number of vacancies on the primary online portals and aggregators (thousand vacancies)



Source: Websites of OJV portals

Table 19. Assessment of labour demand coverage by various online portals, 31 July 2020 – 1 August 2020 (first six places in the rating) in relation to the total labour demand in Belarus (2019)

	2019, Belarus	Number of vacancies on the portal, thousands (portal vacancies as share of the employed population, %)					
		Trudbox.by	Gsz.gov.by (public)	Jobs.tut.by	JobLab.by	Praca.by	Belmeta.com
Number of employed, thousands	4 909.111	121.49 (2.47%)	78.497 (1.59%)	23.551 (0.48%)	19.311 (0.39%)	10.497 (0.21%)	70.161 (1.43%)
		Number of companies that posted vacancies on the portal (share of the total number of companies, %)					
Number of companies	142 685	No data available	135 479 (1 April 2020) (94.94%)	81 893 57.39%	No data available	90 705 3.57%	No data available

Source: Belstat (2020b), p. 9; data from portals.

Thus, online job portals cover from 0.2% to 2.5% of the labour demand (assessed by the number of employees), while companies are quite actively posting their vacancies on websites.

Table 20. Portals' coverage of labour demand by types of economic activity

Section	Average payroll number of employees per year, by type of economic activity according to OKRB 005-2011, 2019: 3 758 000	Gsz.gov.by: 78 264 vacancies (with wage over BYN 375, excluding part-time vacancies, 1 April 2020)	Belmeta.by: 69 825 vacancies, 3 August 2020	Praca.by: 10 434 vacancies, 3 August 2020	Jobs.tut.by: 23 011 vacancies, 3 August 2020	JobLab.by: 19 290 vacancies, 3 August 2020
A	Agriculture, forestry and fishing: 325 000	12 130	Agriculture, agricultural business, livestock business: 4 276	Agriculture, agriculture and production complex: 1 533	Production, agriculture: 1 275	
B	Mining industry: 10 900	145	-		Extraction of raw materials: 16	-
C	Processing industry: 788 200	12 630	Manufacturing, working specialities: 17 349	Manufacturing, production, polygraphy business: 8 466		Production, manufacturing industry: 2 889
D	Electric power supply, supply of natural gas and steam, hot water supply and supply of conditioned air: 94 900	1 255	-	-	-	-
E	Water supply; collection, processing and disposal of waste, activities to eliminate pollution: 36 600	369	-	-	-	-
F	Construction industry: 223 600	11 275	Construction, architecture, real estate services: 6 601	Construction industry, buildings management, real estate: 7 154	Construction, real estate services: 1 377	Construction, real estate services: 2 237

G	Wholesale and retail trade; repair of motor vehicles and motorcycles: 470 900	7 701	Trade services, sales, procurement: 9 925	Sales, trading business, client management: 4 900	Procurement services: 207 Car business: 549 Sales services: 3 339	Trading business, sales services: 3 730
H	Transport activities, warehousing operations, postal and courier activities: 260 300	4 417	Transportation, car business, car services: 6 316	Transportation, service, aviation: 2 561 Logistics, procurement, warehouse, international business: 1 165	Transportation services, logistics: 1 525	Warehousing, logistic services, international business: 260 Transportation, car business: 1 920
I	Temporary lodging and catering services: 86 070	1 312	Services, service industry: 2 348	Tourism services, hotel business, public catering: 1 276	Tourism services, hotels, restaurants: 755	Tourism services, restaurants, hotels: 941
J	Information and communications: 107 600	497	Telecommunications: 253 IT, the internet, computer services: 995	IT, the internet, telecommunications: 747	IT, the internet, telecommunications: 2 535	IT, telecommunications: 307
K	Financial and insurance services: 61 070	797	Financial services, banks: 639 Insurance services: 76	Banking business, leasing services, insurance: 2 132	Banking business, investments, leasing services: 562	Finance, accounting and bookkeeping, banking business: 409
L	Real estate transactions: 40 700	858	Vacancies are combined with Section F 'Construction industry'			
M	Professional, scientific and technical activities: 100 900	3 481	Education, science, translation: 3 385	Education, science, translation: 654	Education and science: 617	Education and science: 584
N	Administrative and ancillary services: 89 400	1 515	Office personnel, secretarial services, administration: 2 387	Office services, business services (HR, personnel management: 208; administrative staff: 2 186;	Consulting services: 194 Human resource management, training services: 266 Civil service, non-profit	Administrative work, secretarial business: 281 Personnel management, training services: 58 Legal services: 54

				security and guarding services:130; legal services: 105)	organisations: 42	
O	Public administration: 176 500	3 384	-	-	-	-
P	Education: 440 500	3 985	Vacancies are combined with Section M 'Professional, scientific and technical activities'			
Q	Health care and social services: 326 900	9 065	Medicine, pharmacy services, health care: 6 737	Medicine, pharmacy services, veterinary medicine: 1 568	Medicine, pharmacy services: 474	Medicine, pharmacy services: 233
R	Arts, sport, entertainment and recreation: 77 100	2 620	Design, photography: 403 Culture, arts, entertainment, show business: 567	Design, graphics, photography: 266 Culture, arts, entertainment, show business: 672	Sports clubs, fitness, beauty salons: 343	Design, polygraphy business, mass media: 101 Arts, culture, entertainment: 97
S	Other services provision: 40 500	820	Vacancies are combined with Section M 'Administrative and ancillary services'			
T	Activities of households as employers of domestic personnel and those producing goods and services for their own use	18	-	-	-	Housekeeping personnel: 47

Source: Belstat (2019b), pp. 13–15; data from portals.

Thus, it is possible, with small deviations, to adjust the vacancy classifications used by non-state portals to OKRB 005-2011 'Types of economic activity'. The analysis also shows that there are differences among the portals in terms of coverage:

- Gsz.gov.by and Belmeta.com are focused on sections A, C, F, M, N, Q;
- Praca.by is focused on sections C, F, G, H, I;
- Jobs.tut.by is focused on sections G, J, I;
- JobLab.by is focused on sections C, G, F.

Thus, the portals are focused on slightly different segments of the labour market (by type of economic activity). The situation is the same with the representation of vacancies in terms of occupation, but in this case portals provide insufficient data for comparison (Table 21).

Table 21. Portals' coverage of labour demand across occupations (OKRB 014-2007 'Occupation')

OKRB categories	Number of people employed at primary job	Belmeta.by: 69 825 vacancies, 3 August 2020	Praca.by: 10 434 vacancies, 3 August 2020	Jobs.tut.by: 23 011 vacancies, 3 August 2020	JobLab.by: 19 290 vacancies, 3 August 2020
Total	4 909 111				
Executives (legislators, heads of government bodies, public organisations (associations), commercial and non-profit organisations)	426 997	Executives, top managers: 1 624	Top management: 558	Top management: 154	
Professional specialists	1 048 403				
Specialists	516 217				
Employees engaged in the provision of office, administrative and ancillary services, consumer services, preparation, processing and recording of information	166 469	Office personnel, secretarial services, administration: 2 387	Administrative staff: 2 186	Administrative staff: 924	Administrative work, secretarial business: 981
Employees in the service sector, trade and other related activities	734 546				
Skilled agricultural and fisheries workers	149 171				
Skilled workers in industry, construction, workers of similar occupations	788 413	Working specialities:17 349		Workers: 1 930	Working specialities: 3 802
Operators, machine operators, machinists and other workers involved in the control, operating and maintenance of installations and machines, product assemblers	643 849				

Unskilled workers	384 538	Work without special training: 5 748		Entry-level positions, students: 681	
…					

Source: Belstat (2020b), p. 54; data from portals.

Thus, taken separately, both state and non-state portals give an incomplete picture of demand, as they do not cover all professions nor all types of economic activity. The situation is consistent with the results of similar studies in other countries (Cedefop, 2019a, p.71).

7.2 Coverage of labour market supply

The supply in the labour market is estimated using the size of the workforce or the economically active population, which is the sum of employed and unemployed populations (this is a wider coverage), or using the number of unemployed people (narrow definition).

According to UKCES (2014, pp. 3–4): 'In order to measure skills and labour supply, it is necessary to have data on the number of people who could potentially work and the likelihood of those people actually participating in the labour market … An excess of skills supply over skills demand is measured conventionally as unemployment; (although some individuals may not participate in the labour market and so become economically inactive)'.

To assess online portals as a share of the total labour supply in the labour market, it is legitimate to use the following indicators: the number of CVs posted on the portal, their share of the workforce, the structure of CVs (by type of economic activity, profession, education level) and their share of the corresponding category of the workforce. However, not all online portals provide information about CVs.

Table 22. Portals' coverage of the labour supply (31 July – 1 August 2020)

Workforce aged 15-74 (2019)	Number of CVs (% of the workforce)		
	Gsz.gov.by	Jobs.tut.by	Praca.by
5 122 447	1 683 (0.0328%)	2 255 457 (44.03%)	376 483 (7.34%)

Source: Belstat (2020b), p. 9; data from portals.

The coverage of labour supply by online portals varies, while the coverage of non-state portals is much wider in terms of the number of users.

7.3 Differences between public and non-state OJV sources

There are many quantitative and qualitative differences between state and non-state open job portals in Belarus. Information about vacancies can be classified in different ways depending on whether public or non-state portals are being considered. There are five basic differences in the presentation of vacancies: number of vacancies, classifications used, structure of vacancies, job description (Annexes 1, 2), job submission method (Table 23).

Table 23. Presentation of vacancies on state and non-state OJV portals

	State OJV portals (31 July 2020)	Non-state OJV portals (31 July 2020)
Number of vacancies	78 497 vacancies (1.6% of the employed population) from 157 212 organisations (approximately 100%)	Belmeta.com: 70 161 vacancies (1.43% of the employed) Jobs.tut.by: 23 551 vacancies (0.48%) from 81 893 companies (57.39%) Trudbox.by: 121 490 vacancies (2.47%)
Using classifications	By type of economic activity according to OKRB 005-2011 'Types of economic activity' By occupations according to OKRB 014-2017 'Occupations' reference book, which is harmonised with ISCO-08	Own classifications by professional fields and areas of activity
Structuring vacancies	Regional section equates to administrative regions, for workers and specialists, by wages rate, educational level, etc.	Own classifications
Job description	Structure and characteristics of vacancies are hardcoded (Annex 1)	Not hardcoded, or hardcoded in different ways (Annex 2)
Job submission method	Mandatory, within five days, according to the Law of the Republic of Belarus 'On Employment of Citizens'	Optional, voluntary

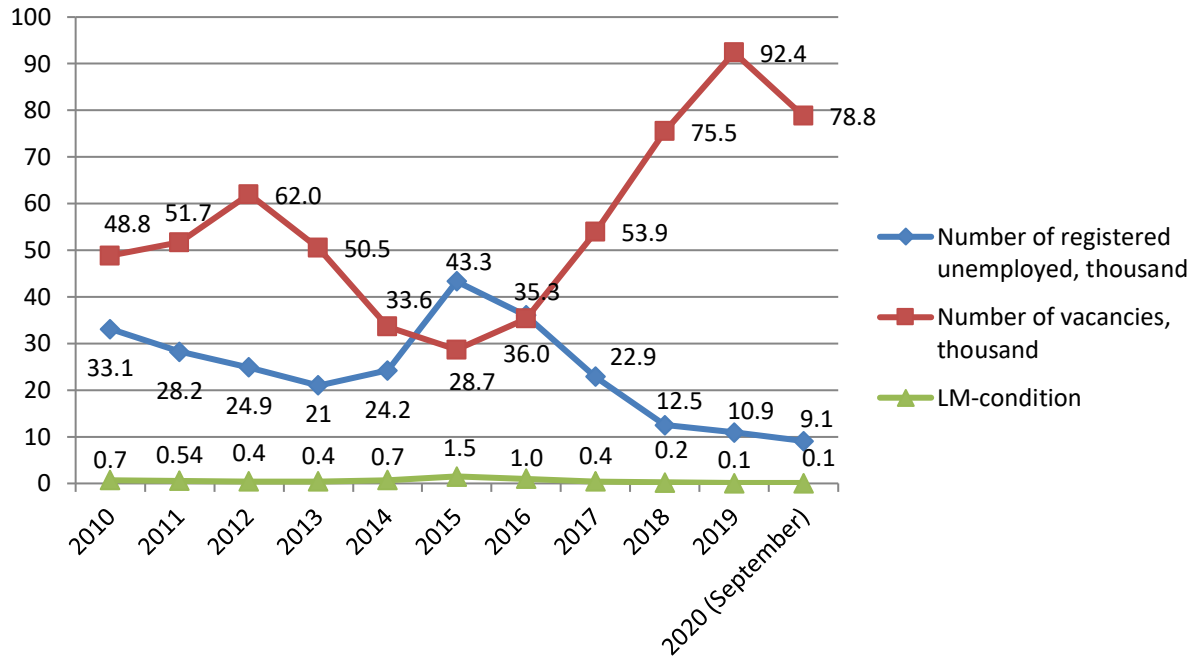
Four differences can be distinguished in the description of CVs between state and non-state OJV portals: users (job seekers), volume of CVs, CV form and additional skills description (Table 24).

Table 24. Presentation of information about CVs on state and non-state OJV portals

	State OJV portal	Non-state OJV portals (31 July 31 – 1 August 2020)
Users (job seekers)	Anyone, registration needed	Anyone, registration needed Some OJV portals do not provide information about the number of CVs
Volume of CVs	8 April 2020: 3 128 CVs 31 July 2020: 1 683 CVs	Some OJV portals do not provide information about the number of CVs Jobs.tut.by: 2 255 457 CVs Praca.by: 376 483 CVs
CV form	Preset resume form, with occupations/positions selectable in accordance with the classification	Preset resume form (custom resume form)
Additional skills	Voluntary description	Voluntary description

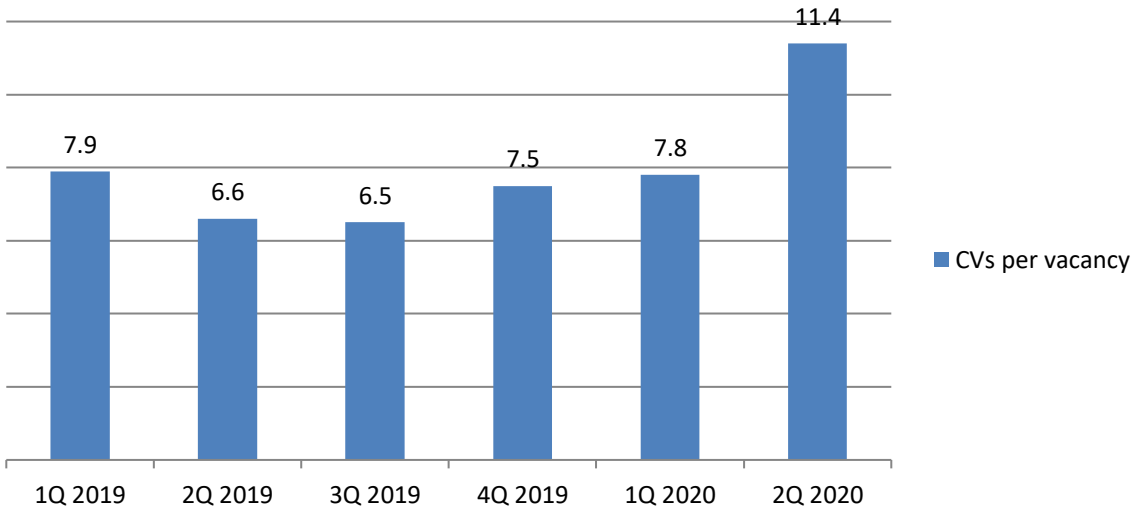
These features explain why OJV portals use different parameters and see the job market situation differently (or characterise various job market segments), for instance by labour market conditions (number of CVs per vacancy) or by structure according to type of economic activity, occupations, regional score, etc. (Figures 13 and 14).

Figure 13. Labour market condition according to Gsz.gov.by (0.1 unemployed per vacancy)



Source: Belstat (2020c), pp.228-229; data from www.gsz.gov.by.

Figure 14. Labour market condition according to Jobs.tut.by (11.4 CVs per vacancy, Q2 2020)



Source: data from www.jobs.tut.by

Figures 13 and 14 demonstrate that different portals are reflecting different situations on the labour market. The state portal considers the labour market condition as the ratio of the number of registered unemployed to the number of vacancies posted in the National Bank of Vacancies (0.1 unemployed per 1 vacancy in September 2020). Non-state portal (for example, jobs.tut.by) assesses the labour market condition as the ratio of the number of CVs (posted on their portal) to the number of vacancies - 11.4 CVs per 1 vacancy in September 2020.

Based on the analysis, it can be concluded that it would be difficult to form a single job portal for labour market analytics using Big Data because of the following factors.

- Each portal forms its own view of the labour market. These cannot simply be added together to gain an overall picture, as some of the data are duplicated.
- There are different criteria for structuring information in job descriptions and CVs.
- There is no consistency in classifications nor in the methodological approaches to labour market description (understanding the labour supply and demand, dividing into types of economic activity, categories of vacancies and CVs).
- Descriptions of the required skills are insufficient.
- There are issues surrounding privacy of information and scarcity of information.

Table 25. Characteristics of online job portals

Characteristics	State portal	Non-state portal
Type of economic activity	All types of economic activity	Focus on the following types of economic activity: manufacturing, construction, trade, transportation, IT, financial services, temporary lodging and catering services
Occupations	Over 60% of vacancies are intended for workers, and specialist vacancies are mainly offered in the education, healthcare	Focus on specialists and skilled workers
Educational level and description of required skills	Structured according to classifications	Required level of education is indicated, skills are formulated descriptively, not structured
Number and size of partner organisations	All organisations	Voluntary participation, portals form their list of partner organisations
Geographical coverage and detailed breakdown	According to administrative division	Mainly in the context of cities
Operational context	National Bank of vacancies	Multifunctional

Source: Compiled by the author based on Cedefop (2019a), p. 71.

Comparing the demand for vacancies from the National Bank of Vacancies and non-state portals, it is legitimate to note that organisations prefer non-state portals when searching for an employee (because they may receive help from such portals in selecting a suitable candidate and finding an employee – of better quality – more quickly). Likewise, workers are also looking more actively for new

jobs on non-state portals, or are bypassing them and finding jobs direct contacts with employers, using recommendations, etc.

7.4 Results of analysis of vacancy data obtained by scraping method

More detailed information on the assessment of online portals can be obtained using primary information about vacancies obtained from their sites by scraping, or from the portal of the state employment service through the API (Mezzanzanica and Mercorio, 2019, p.18).

Using scraping, we analysed occupations and skills in CVs and in vacancy descriptions on the state OJV portal and two popular non-state OJV portals, Belmeta.com and Jobs.tut.by (Annex 5).

Table 26. Number of vacancies downloaded (July–August 2020)

	Jobs.tut.by	Belmeta.com	Gsz.gov.by
Number of vacancies, obtained by scraping	5 900	22 800	24 700
Share of total volume of vacancies, % on portal	25.05	32.5	31.46

Table 27. Top 10 vacancies (July–August 2020)

	Belmeta.com	Gsz.gov.by	Jobs.tut.by
1	Medical specialist: 1 670	Medical specialist: 1 910	Sales manager: 92
2	Nurse specialist: 1 060	Nurse: 1 340	Sales specialist: 91
3	Electrician, electrical equipment repair and maintenance: 747	Driver: 1 330	Sales assistant: 82
4	Electric and gas welder: 611	Cleaner (production and office premises): 782	Accountant: 81
5	Driver of agricultural machinery: 538	Electrician, electrical equipment repair and maintenance: 659	Customer service manager: 53
6	Tailor: 427	Salesperson: 625	Sales representative: 51
7	Plumber: 401	Building maintenance and repair worker: 565	Chief accountant: 48
8	Turner: 384	Driver of agricultural machinery: 556	Storekeeper: 45
9	Executive: 334	Veterinarian: 520	Customer service manager: 41
10	Specialist: 30	Cook: 504	Legal counsel: 37

Comparison of the most in-demand vacancies among three portals shows that the ratings of the National Bank of Vacancies and the aggregator Belmeta.com coincide by 40%, while health care and trades dominate in the rating. Specialists prevail in the rating on Jobs.tut.by (mainly in the field of trade). Thus, this portal is covering a different segment of the labour market. Setting up filters in the application when processing an array of downloaded vacancies (geo-filters, job classification according to ISCO-08, job requirements, education, experience, work schedule, type of employment,

etc.) showed that, for example, on Belmeta.com, 21% of vacancies require higher education, 19% specialised secondary education, 19% vocational training and 20% general secondary education, while 11% of vacancies do not require any education. By type of employment, 83% of vacancies offer permanent work, and by work schedule, 29% involve a full-time job and 42% involve one shift (Annex 5).

Artificial intelligence can be used to group professions and skills into standardised classifications, to analyse the relationship between job characteristics and the rate at which they are filled, and to determine new skills. For example, analysis of the list of competencies shows that essentially the same competencies are described in vacancies in different ways. This means that 50 of the listed competencies can be grouped into 12, which results in a different rating of in-demand competencies (Table 28).

Table 28. Comparison and grouping of in-demand competencies in job descriptions on Jobs.tut.by (top 50 competencies from vacancies), 2019

Primary ranking	Competencies (primary)	Competencies (after grouping)	Total groups	Ranking after grouping
1	PC user: 1 619	PC user: 1 619 JavaScript: 216 Adobe Photoshop: 204 Working with large amounts of information: 189 CRM: 188 Git: 185 AutoCAD: 176 SQL: 167 Java: 153 HTML: 151	3 044	2
2	Teamwork: 1 070	Teamwork: 1 070 Team-player skills: 575 Working with people: 180 Interpersonal skills: 171	1 996	4
3	Good grammar and oral speech: 955			
4	Direct sales: 753	Direct sales: 753 Search and acquisition of new clients: 483 Sales skills: 461 Cold sales: 299 Client-oriented approach: 290 Growth of sales: 269 B2B sales: 262 Direct sales: 254 Sales management: 212 Retail: 162	3 445	1
5	Negotiating: 632	Negotiating: 632 Telephone negotiating: 397 Business communication: 385 Contracting: 327 Business correspondence: 298 Business communication: 212 Documentation: 166	2 417	3
6	Team-player skills: 575			

7	English language skills: 556	English language skills: 556 English language skills – B2 – upper-intermediate: 224 English language skills – B1 – intermediate: 181	961	6
8	Search for and acquisition of new clients: 483			
9	Sales skills: 461			
10	Telephone negotiating: 397			
11	Business communication: 385			
12	Contracting: 327			
13	Organisational skills: 323	Organisational skills: 323 Commitment to results: 211 Training and development: 205 Responsibility: 193 Sociability: 187 Creativity: 178 Good grammar and oral speech: 955 Literacy: 295	2 547	5
14	Driving licence (B category): 301	Driving licence (B category): 301	301	8
15	Cold sales: 299			
16	Business correspondence: 298			
17	Literacy: 295			
18	Client-oriented approach: 290			
19	Growth of sales: 269			
20	B2B sales: 262			
21	Direct sales: 254			
22	English language skills – B2 – upper-intermediate: 224			
23	JavaScript: 216			
24	Business communication: 212			
25	Sales management: 212			
26	Commitment to results: 211			
27	Training and development: 205			
28	Adobe Photoshop: 204			
29	1C: Enterprise 8: 202	1C: Enterprise 8: 202	537	7

		Operations with accounts receivable: 169 Working with the cash register: 166		
30	Responsibility: 193			
31	Working with large amounts of information: 189			
32	CRM: 188			
33	Sociability: 187			
34	Git: 185			
35	English language skills – B1 – intermediate: 181			
36	Working with people: 180			
37	Creativity: 178			
38	Consulting: 176	Consulting: 176 Consulting clients: 80	256	9
39	AutoCAD: 176			
40	Interpersonal skills: 171			
41	Operations with accounts receivable: 169			
42	SQL: 167			
43	Working with the cash register: 166			
44	Documentation: 166			
45	Personnel management: 163	Personnel management: 163	163	10
46	Knowledge of motor vehicle construction and layout: 162	Knowledge of motor vehicle construction and layout: 162	162	11
47	Retail: 162			
48	Project management: 156	Project management: 156	156	12
49	Java: 153			
50	HTML: 151			

Grouping competencies using artificial intelligence according to the ESCO classification will help to analyse more precisely the coordination of labour demand and supply, as well as to classify vacancies

according to the dynamics of the required competencies (Strack et al., 2019)[7]. Such data are also useful to educational institutions for adjusting curricula and developing in-demand skills.

The Jobs.tut.by portal is the largest in terms of the number of CVs presented on it: it has more than 2.2 million CVs registered, which is 44.03% of the workforce in Belarus (i.e., it covers the largest share of labour supply in Belarus). It is therefore of great interest to study the structure and dynamics of the CV. A scraper application on the Jobs.tut.by portal was used to download 423 000 CVs for the period 2015–2019 (Annex 5). The analysis of these CVs shows that there is a seasonality in CV submission and that the average age of applicants is in the range 25–40 years. The description of existing skills and competencies on the CVs, as in the case of vacancies, is quite arbitrary. Thus, grouping the top 50 competencies into 15 groups also presents the profile of applicants in a slightly different way (Table 29).

Table 29. Grouping of existing skills and competencies in the CVs on Jobs.tut.by (2019)

Primary ranking	Competencies (primary)	Competencies (after grouping)	Total groups	Ranking after grouping
1	PC user: 55 413	PC user: 55 413 Working with large amounts of information: 10 454 Internet research: 10 014 Internet: 8 875 MS Word: 9 145 MS Excel: 8 657 MS PowerPoint: 8 289 Email service: 6 692 MS Office: 5 624 Adobe Photoshop: 9 603 AutoCAD: 5 653	138 419	1
2	Teamwork: 39 815	Teamwork: 39 815 Team-player skills: 22 079 Ability to work in a team: 6 969 Working with people: 6 707	75 570	2
3	Good grammar and oral speech: 27 180			
4	Driving licence (B category): 24 059	Driving licence (B category): 24 059 Driving licence (B and C category): 7 778 Accident-free driving: 6 724	38 561	6
5	Organisational skills: 22 632	Organisational skills: 22 632 Personnel management: 15 878	38 510	7

[7] The study by Strack et al. (2019) examined over 95 million online job postings over three years to identify both the fastest-growing jobs and fastest-growing skills in the US job market. The jobs analysed are broken down into five categories.
• Flagship jobs are those in high demand (10 000 to 1 million postings) and still growing (up to a 20% increase in postings yearly).
• Fast-growing jobs also experience high demand but are growing even faster (more than 20% yearly).
• High-growth jobs are those that have fewer than 10 000 annual postings but are growing at an extremely high rate (more than 40% per year).
• Modest-growth jobs show the lowest demand.
• Declining jobs are those for which demand is shrinking.
Job skills are broken down into similar categories, although the rate of change can be more dramatic because a skill may be required in a large number of jobs. For example, in 2018 there were 14 times as many jobs calling for cloud computing skills as there were jobs for cloud engineers, and demand for these skills spanned occupations as diverse as software engineer, data scientist, product manager and business development manager.

6	Team-player skills: 22 079			
7	Negotiating: 17 670	Negotiating: 17 670 Business communication: 15 423 Contracting: 11 993 Business correspondence: 11 945 Telephone negotiating: 10 036	67 067	3
8	Personnel management: 15 878			
9	Business communication: 15 423			
10	Contracting: 11 993			
11	Business correspondence: 11 945			
12	Direct sales: 11 618	Direct sales: 11 618 Search and acquisition of new clients: 10 027 Sales skills: 9 990 Customer care: 7 776 Display of goods: 6 593 Direct sales: 6 442 Expediting: 5 515 Sales management: 5 079	63 040	4
13	Working with large amounts of information: 10 454			
14	Telephone negotiating: 10 036			
15	Search and acquisition of new clients: 10 027			
16	Internet research: 10 014			
17	Sales skills: 9 990			
18	Adobe Photoshop: 9 603			
19	Working with the cash register: 9 484	Working with the cash register: 9 484 Cash operations: 8 841 Cash documents: 5 783 1C: Enterprise 8: 4 934	29 042	8
20	MS Word: 9 145			
21	Internet: 8 875			
22	Cash operations: 8 841			
23	MS Excel: 8 657			
24	English language skills: 8 627	English language skills: 8 627	8 627	11
25	Accountability for assets: 8 339	Accountability for assets: 8 339	8 339	12
26	MS PowerPoint: 8 289			

27	Responsibility: 8 029	Responsibility: 8 029 Sociability: 7 130 Good grammar and oral speech: 27 180 Literacy: 6 155 Ability to work under pressure: 4 977	53 471	5
28	Work with office equipment: 7 939	Work with office equipment: 7 939	7 939	13
29	Driving licence (B and C category): 7 778			
30	Customer care: 7 776			
31	Consulting: 7 740	Consulting: 7 740 Personnel training: 7 500	15 240	9
32	Personnel training: 7 500			
33	Sociability: 7 130			
34	Ability to work in a team: 6 969			
35	Accident-free driving: 6 724			
36	Working with people: 6 707			
37	Email service: 6 692			
38	Display of goods: 6 593			
39	Paperwork: 6 537	Paperwork: 6 537 Documentation: 5 971	12 508	10
40	Direct sales: 6 442			
41	Literacy: 6 155			
42	Documentation: 5 971			
43	Cash documents: 5 783			
44	Knowledge of motor vehicle construction and layout: 5 738	Knowledge of motor vehicle construction and layout: 5 738	5 738	14
45	AutoCAD: 5 653			
46	MS Office: 5 624			
47	Expediting: 5 515			
48	Sales management: 5 079			
49	Ability to work under pressure: 4 977			
50	1C: Enterprise 8: 4 934			

Comparison of the most in-demand competencies (grouped from the top 50 competencies from vacancies, Table 28) with the competencies most represented among applicants (grouped from the top 50 competencies from CVs, Table 29) resulted in the following conclusions (Table 30).

- The competencies most in demand from employers are 'direct sales', 'PC user (various applications)', 'negotiating, business communication', 'teamwork' and personal business skills.
- The competencies most represented on CVs are 'PC user (various applications)', 'teamwork', 'negotiating', 'direct sales' and personal business skills.
- The labour market condition, measured as the number of competencies in CVs per 1 competency in the vacancies, is as follows: direct sales – 18.3; PC user, various applications – 42; negotiating, business communication – 27.7; teamwork – 37.9; English language skills – 8.9.

Table 30. Comparison of the most in-demand competencies in vacancies and the most often proposed competencies on CVs (based on the results of vacancy scraping and CVs from Jobs.tut.by), 2019

Rank in vacancies	Competencies most in demand (grouped by top 50 competencies from vacancies)	Job rank match (=), mismatch	Rank in CV	Competencies most represented among applicants (grouped by top 50 competencies from CVs)
1	Direct sales: 3 445	Corresponds to rank 4 in CV	1	PC user, various applications: 138 419
2	PC user, various applications: 3 044	Corresponds to rank 1 in CV	2	Teamwork: 75 570
3	Negotiating, business communication skills: 2 417	=	3	Negotiating, business communication skills: 67 067
4	Teamwork: 1 996	Corresponds to rank 2 in CV	4	Direct sales: 63 040
5	Business qualities (responsibility, etc.): 2 547	=	5	Business qualities: 53 471
6	English language skills: 961	Corresponds to rank 11 in CV	6	Driving licence: 38 561
7	Accounting and bookkeeping, cash register: 537	Corresponds to rank 8 in CV	7	Organisational skills, personnel management: 38 510
8	Driving licence: 301	Corresponds to rank 6 in CV	8	Accounting and bookkeeping, cash register: 29 042
9	Consulting services: 256	=	9	Consultation and training: 15 240
10	Personnel management: 163	Corresponds to rank 7 in CV	10	Documentation Management: 12 508
11	Knowledge of motor vehicle construction and layout: 162	Corresponds to rank 14 in CV	11	English language skills: 8 627

12	Project management: 156		12	Financial liability: 8 339
13			13	Work with office equipment: 7 939
14			14	Knowledge of motor vehicle construction and layout: 5 738

The analysis shows that, according to the rating, the competencies demanded by employers and those presented on the labour market coincide in general, while there is a significant excess of labour supply over labour demand. Development of an application and the training of artificial intelligence to classify competencies described in vacancies and in CVs, and their comparison in the context of professions, regions and types of economic activity, will increase the validity of measures in the development of employment policy and education policy, as well as decisions made by individuals.

'This also presents new opportunities to collect and analyse web-based data about labour market demand and supply, which can enrich our micro-level understanding of pertinent issues such as skill and task requirements of employers, occupational change, wages and working conditions' (Kureková et al., 2015). Scraping of job data from portals provides a lot of interesting information for analysis, but its main drawback is the problem of data representativeness and quality. This has been highlighted by many authors. However, '… as the Internet population becomes more and more equal to the total population, sampling may even become obsolete in cases where researchers would have access to the full data' (Kureková et al., 2015).

7.5 Methodological underpinning of the assessment and results

It is legitimate to evaluate the portals by comparing the number and structure of users of an online resource with data from a population census or household employment survey. This has been highlighted by a number of authors (Kureková et al., 2015; Horton and Tambe, 2015). 'Censuses or representative labour market surveys can be used to compare the characteristics structure of web survey respondents and potentially make adjustments' (Kureková et al., 2015).

In theory, the total level of labour demand in a country is measured by the total number of jobs in the country (filled jobs, i.e., the number of employees, and vacant jobs, i.e., the number of vacancies). Assessment of online portals' coverage of labour demand can be carried out as follows.

1) Data on the portal (the number of vacancies) can be compared with the data on the number of people employed according to the household employment survey or census data. But, as a number of economists have pointed out, the labour force survey reflects the labour supply to a greater extent than it reflects the labour demand (Kureková et al., 2015; Horton and Tambe, 2015). Thus, it is not the portal's coverage of labour demand that is assessed but its share of the realised demand (the number of people employed).

2) Data on the portal can be compared with the total number of vacancies in a country. For such an assessment (calculating the portal's share of the labour demand in a country), it is necessary to have data on the total number of vacancies. But these data are not easily accessible, since the total number of vacancies across all portals contains duplicated counts and is based on different classifications, which results in the same vacancy being listed several times and posted under several headings simultaneously. A mandatory requirement to post data on all vacancies to a single portal of the state employment service would be a solution to this problem, and this is a method used in some countries[8]. Such a portal exists in Belarus. But even though the mandatory database of vacancies is compiled on the state portal, some vacancies in it may not be taken into account. Some vacancies may not be

[8] 'Denmark is an example of a country in which the public authorities are legally obliged to report all job vacancies online' (Kureková et al., 2015).

posted on the portal, as companies could fill jobs themselves by means of internal reserves (moving workers, regrouping tasks, etc.). Companies can independently offer vacancies to familiar candidates, and, if this process is not successful, can post the information on portals. Companies can also close a vacancy and then reopen it if they find a suitable candidate. Demand is subject to seasonal fluctuations, so measuring it at different times can give different results. Nevertheless, even taking into account these limitations, data on vacancies posted on a mandatory basis on a single platform (usually belong to the state employment service) can be treated as the amount of unfulfilled labour demand in a country. 'From this perspective, even if we collect all online reported job vacancies, there is a share of vacancies that are never publicly advertised, and will therefore fall outside our population sample. On the other hand, vacancies tend to occur where there is either an unfulfilled demand or where employers for some reason prefer to have a selection process. Therefore, if we are interested to know which types of jobs employers find difficult to fill through internal or informal search channels, then online vacancy data can be highly useful' (Kureková et al., 2015).

3) The number of vacancies on the portal can be compared with the dominant vacancy portal; in this case, the method for ranking job portals can be a useful tool (Mercorio and Mezzanzanica, 2019). The ranking procedure revealed that different portals receive similar ratings, although their volumes and services are different. This can be explained by the fact that during ranking it is difficult to consider the completeness of the classification by sector and profession, ease of navigation and data visualisation, and additional services for employment (analytics, charts, description of professions, availability of a CV base, etc.). In addition, the ranking has a certain degree of subjectivity in its assessments.

Therefore, to assess the portals, it is advisable that the ranking methodology is supplemented with the portal assessment methodology, implemented in the following areas:

- characteristics of the portal volume as indicators of the portal coverage of labour demand (Table 31);
- characteristics of vacancies and their dynamics (Table 32);
- characteristics of the portal coverage of labour supply (Table 33);
- labour market condition: the number of CVs per 1 vacancy, wages (Table 31, Indicator 5);
- clustering of vacancies and competencies;
- search for match (mismatch);
- search for dependencies (statistical methods of analysis).

Table 31. Indicators for characterising the volume of the portal

	Indicator	Structuring criteria
1	Volume of vacancies	By types of economic activity, regions, professions (National Classification of the Republic of Belarus OKRB 005-2011 'Types of economic activity'; National Classification of the Republic of Belarus OKRB 014-2017 'Occupations')
2	Vacancies on the portal as a share of the total workforce (or the total number of vacancies in the country)	-//-
3	Number of companies	By types of economic activity, regions, size of companies
4	Organisations that posted information about vacancies on the portal as a share of the total number of organisations, %	By types of economic activity, regions
5	Labour market condition (number of CVs per 1 vacancy)	By types of economic activity, professions

Table 32. Indicators for characterising vacancies on the portal

Indicator	Structuring criteria
Dynamics of vacancies	By types of economic activity, regions, professions (National Classification of the Republic of Belarus OKRB 005-2011 'Types of economic activity'; National Classification of the Republic of Belarus OKRB 014-2017 'Occupations')
Structure of vacancies	-//-
New vacancies as a share of the total number of vacancies, %	-//-
Salary, BYN	-//-
Rate of filling (closing) vacancies, days	Average duration of vacancy

Table 33. Indicators for characterising CVs on the portal

indicator	Structuring criteria
Number of CVs	By professions
Number of CVs as a share of the workforce, %	By professions
Dynamics of CVs	
Average duration of job search and employment, days	

As data sources, online platforms have a number of advantages over administrative databases in terms of cost and the ability to form different target samples (Horton and Tambe, 2015). Another way to assess online portals as a share of labour demand is to create a database of vacancies using scraping methods. Scraping data has proven effective for conducting research with a specific purpose, that is, to form a database and test any hypothesis on it. The literature (Kureková et al., 2015) presents the results of individual research projects using Big Data collected from online job portals and other internet sources (Annex 6). But in this case, the problems of representativeness of the sample and data quality are paramount: 'The most significant challenge associated with using these data sources relates to working within an unknown sampling frame' (Horton and Tambe, 2015).

To solve the problem of the representativeness of data on vacancies obtained from online job portals, the literature on economics suggests the following.

- Different sources of data should be combined; for example, use administrative data, company surveys (supplemented by interviews with representatives of HR departments), etc.
- Statistical tools can be used to analyse the data obtained (Kureková et al., 2015).
- The focus should be on the characteristics of vacancies (the need for skills and competencies that are described in the vacancy) rather than on their number in order to understand the preferences of employers not by the number of vacancies, but by what competencies they are filled with. In this

case, it is advisable to adhere to a single (or similar) vacancy description format based on generally accepted classifications (Table 34).

Table 34. Classifications and standards used to describe professions and skills

Classifications	Description
ISCO-08	Divides all types of work into 10 basic groups: managers professionals technicians support staff personnel in service industry and sales workers in agriculture, forestry, fisheries craftspeople workers in crop farming, machine operators, installers workers in elementary occupations armed forces
ESCO	Consists of modules: professions (in ESCO, each profession is indicated by exactly one ISCO code) knowledge, skills and competencies: knowledge (depending on the field of activity: agriculture, forestry, fishing and veterinary medicine, arts and humanities, business, management and law, education, engineering, manufacturing and construction, ICT, natural sciences, mathematics and statistics, services, journalism); skills: S1 – communication, collaboration and creativity S2 – information skills S3 – assistance and caregiving S4 – management skills S5 – computer skills S6 – handling and moving S7 – construction S8 – operation of machines and specialised equipment; attitudes and values (individual work styles, preferences and work-related beliefs); language skills and knowledge.

Requirement for mandatory information in job templates (CVs) will allow data on the labour market to be processed and analytics results to be provided to all interested users.

7.6 Recommendations

Compared with traditional employment channels (such as employment services, recruitment agencies, mass media, friends and acquaintances), online job portals can provide a broader information base and more efficient ways to find a job or employee, and provide a better and more complete understanding of the situation on the labour market and trends in its development. This can strengthen state policy in the field of employment and training, provide more effective tools for the work of the state employment service, provide better signals for the education system and additional education for adults, and facilitate the integration of socially vulnerable people into the full life of society.

To expand the use of these online portals in labour market analytics, the following recommendations are made.

1. Mandatory submission of vacancies to the state vacancy portal should be approved at the legislative level in all countries, since in this case the portal can serve as a measure of the unmet portion of labour demand.

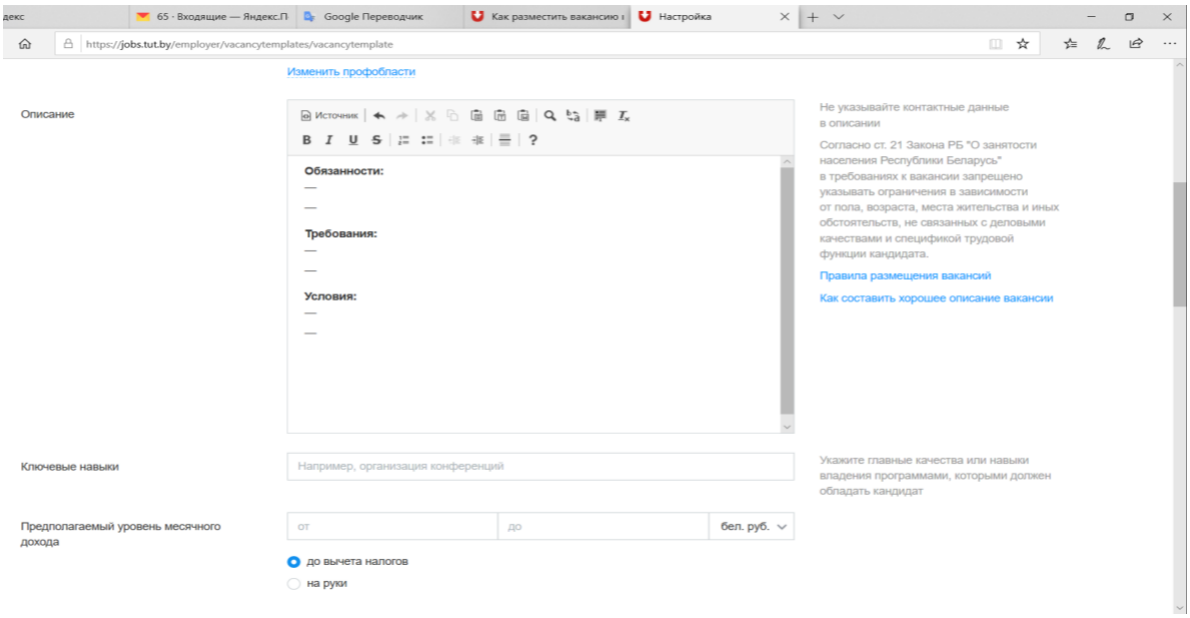
2. The state vacancy portal, as the most complete database of vacancies, should analyse vacancies and be obliged to present its results visually for all interested users.
3. It is necessary to standardise the forms of job descriptions and CVs, introduce a structured description of skills (according to the ESCO classification) in order to ensure that the required skills can be quickly identified, and develop recommendations for the education and lifelong learning systems.
4. Targeted projects should be organised to study specific aspects of the labour market (for example, the skills that are most in demand, or employers' assessments based on web surveys, studying individual segments of the labour market or regions) and to identify connections within it (for example, the relationship of specific skills to speed of employment, etc.). Such projects will help to achieved a better understanding of the online labour market.
5. The representativeness and reliability of the data should be assessed at the country level and in relation to a specific area of research. The use of a data segment or sub-sample that can be considered (more) representative may address certain aspects of coverage and sampling errors. More sophisticated statistical techniques that are found in the literature on missing data, such as a model-based approach to correcting data that has been intentionally omitted, can also be used to correct bias associated with the structure of vacancy data on the internet.
6. Depending on the specific aim of the research, online job postings may be combined with other sources of vacancy data or text that describes the professions under analysis.
7. Methodological recommendations should be developed for training artificial intelligence in the implementation of technologies to analyse the labour market and the selection of vacancies.
8. A market place on the labour market coordinating the main databases and generating information for users should be created.

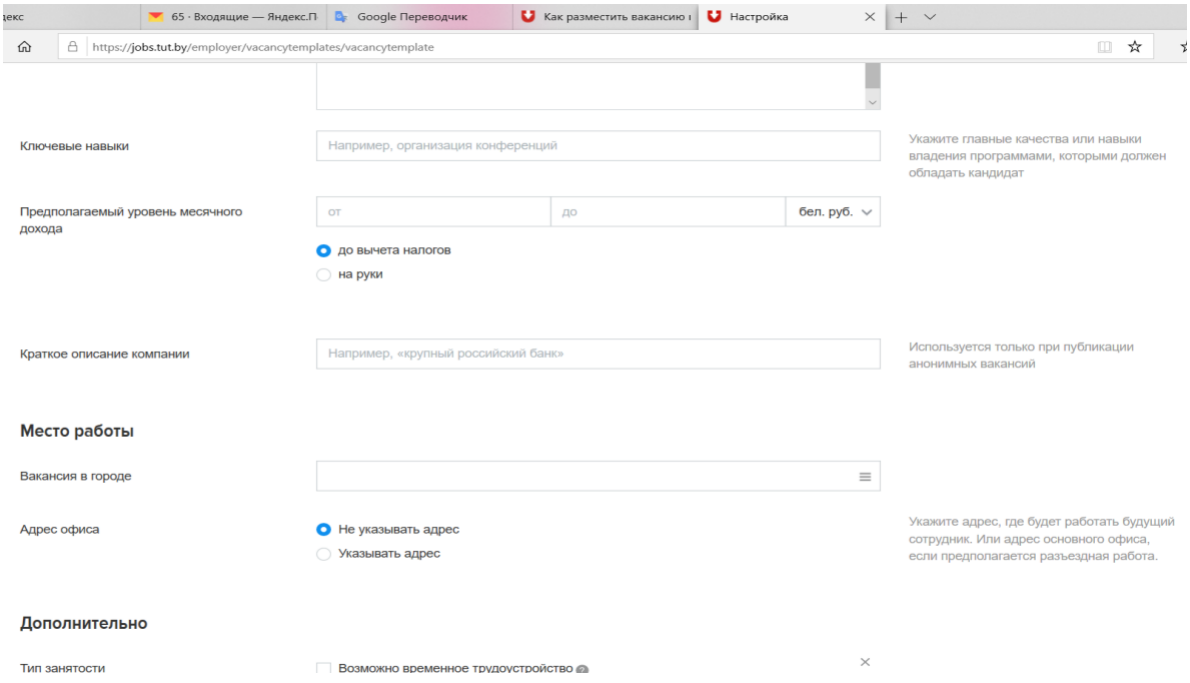
8 ANNEXES

8.1 Annex 1 Job registration template on Gsz.gov.by portal (National Bank of Vacancies)

Profession (position) by OKPD	Profession Code	OKZ Code	Tariff category	Rate of remuneration	Education	Type of work	Labour routine	Volume of vacancies									Accommodation provided	Additional requirements to applicants
								Total	Vacancies created with the use of funds from Belarus state non-budgetary fund for social protection	Paid community services	Provided by students	In accordance with the established booking for hiring						
												Young people looking for a job for the first time under the age of 21		Parents in large families, single-parent families and those raising children with disabilities	Disabled	Others	Parents obliged to reimburse costs incurred by the state for children on state provision	
												Total	Including those under 18 years					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

8.2 Annex 2 Job registration template on Jobs.tut.by





8.3 Annex 3 Website characteristics

Rough position in the Google ranking: the rough position of the website in the Google ranking list resulting from the queries 'emploi + name of the country' and 'job + name of the country'. The value can be either first (second) page, which means the website appears in the first (second) page of the Google results, or 'other', to represent that web page is listed from the third page onwards.

Type of job portal: defines whether the website is a primary job portal, a secondary job portal or a combination of job portal and secondary functions.

Type of operator: refers to the typology of the website, i.e. whether the website is related to a recruitment agency (e.g. GiGroup) or to a national newspaper (e.g. the Jobs section of the Guardian website), whether it is a specialised website (e.g. Monster), a public, sectoral or company website or a classified ad portal.

OJV volume (approximate number of OJVs): the number of vacancies included on the website at the time of the analysis.

Geographical scope: defines whether the source is regional or national (e.g. the Czech portal) or whether it has an international dimension (e.g. Monster is almost worldwide).

Sectoral scope: defines whether the website refers to only one sector or to the whole labour market (defined as 'one industry' vs 'all industries').

Publication date of OJV: indicates whether or not the publication date of the vacancy is present.

Update frequency: indicates the frequency of update of the sources ('daily' or 'not daily').

OJV characteristics

Occupation: defines whether the vacancy title is structured or textual.

Type of contract: defines whether the type of contract in the vacancy description text is structured, textual or not available.

Working time: defines whether the working time in the vacancy description text is structured, textual or not available.

Sector: defines whether the sector in the vacancy description text is structured, textual or not available.

City: defines whether the city in the vacancy description text is structured, textual or not available.

District: defines whether the district in the vacancy description text is structured, textual or not available.

Region: defines whether the region in the vacancy description text is structured, textual or not available.

Qualification level: defines whether the qualification level in the vacancy description text is structured, textual or not available.

Wage: defines whether the wage in the vacancy description text is structured, textual or not available.

Language: lists the language used on the website (not included in values).

1. **Belmeta.com**

Rough position in the Google ranking: First page

Type of job portal: Secondary job portal, combination of job portal and secondary functions

Type of operator: Job search portal

OJV volume: 69 825

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Structured

Working time: Structured

Sector: All sectors, structured by own classifier

City: Structured

District: Structured

Region: Structured

Qualification level: Textual

Wage: Structured

Skills: Various

Language: Russian

2. **Praca.by**

Rough position in the Google ranking: First page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: 10 434

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Structured by own classifier

Type of contract: Structured

Working time: Structured

Sector: Structured

City: Structured

District: Structured

Region: Structured

Qualification level: Structured

Wage: Structured

Skills: Various

Language: Russian

3. Jobs.tut.by (Rabota.tut.by)

Rough position in the Google ranking: First page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: 23 011

Geographical scope: International

Sectoral scope: Cross-sectoral

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Structured by own classifier

Type of contract: Structured

Working time: Structured

Sector: Structured

City: Structured

District: Structured

Region: Structured

Qualification level: Structured

Wage: Structured

Skills: Various

Language: Russian

4. JobLab.by

Rough position in the Google ranking: First page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: 19 263

Geographical scope: National

Sectoral scope: Cross-sectoral

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Structured

Working time: Structured

Sector: Structured

City: Structured

District: Structured

Region: Structured

Qualification level: Structured

Wage: Structured

Skills: Various

Language: Russian

5. Trudbox.by

Rough position in the Google ranking: First page

Type of job portal: Secondary job portal, combination of job portal and secondary functions

Type of operator: Job search portal

OJV volume: 121 431

Geographical scope: International

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Structured by own classifier

Type of contract: Structured

Working time: Structured

Sector: Textual

City: Structured

District: Structured

Region: Structured

Qualification level: Structured

Wage: Structured

Skills: Various

Language: Russian

6. By.jooble.org

Rough position in the Google ranking: First page

Type of job portal: Secondary job portal

Type of operator: Job search portal

OJV volume: 52 369

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Structured

Working time: Structured

Sector: None

City: Structured

District: None

Region: None

Qualification level: None

Wage: Structured

Skills: Various

Language: Russian

7. By.trud.com

Rough position in the Google ranking: First page

Type of job portal: Secondary job portal

Type of operator: Job search portal

OJV volume: 70 214

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Structured

Working time: Structured

Sector: Textual

City: Structured

District: None

Region: None

Qualification level: Structured

Wage: Structured

Skills: Various

Language: Russian

8. Rdw.by

Rough position in the Google ranking: First page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: 5 224

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Structured by own classifier

Type of contract: Structured

Working time: Structured

Sector: Structured

City: Structured

District: None

Region: None

Qualification level: Structured

Wage: Structured

Skills: Various

Language: Russian

9. Belrabota.by

Rough position in the Google ranking: First page

Type of job portal: Primary job portal

Type of operator: Newspaper

OJV volume: No data

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Textual

Working time: Textual

Sector: Structured

City: Textual

District: None

Region: None

Qualification level: Textual

Wage: Textual

Skills: Various

Language: Russian

10. Ludi.by

Rough position in the Google ranking: Second page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: 655

Geographical scope: National

Sectoral scope: Cross-sectoral

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Textual

Working time: Textual

Sector: Textual

City: Textual

District: None

Region: None

Qualification level: Structured

Wage: Textual

Skills: None

Language: Russian

11. Gsz.gov.by

Rough position in the Google ranking: Second page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: 77 696

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Structured

Type of contract: Structured

Working time: Structured

Sector: Structured

City: Structured

District: Structured

Region: Structured

Qualification level: Structured

Wage: Structured

Skills: Various

Language: Russian

12. Kufar.by

Rough position in the Google ranking: Second page

Type of job portal: Primary job portal

Type of operator: Specialised website of advertisement and announcement portal

OJV volume: 1 934

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Structured

Working time: Structured

Sector: Structured

City: Structured

District: Structured

Region: Structured

Qualification level: None

Wage: Structured

Skills: Various

Language: Russian

13. GorodRabot.by

Rough position in the Google ranking: Second page

Type of job portal: Second job portal, aggregator

Type of operator: Job search portal

OJV volume: 23 533

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Structured by own classifier

Type of contract: Structured

Working time: Structured

Sector: Structured

City: Structured

District: None

Region: None

Qualification level: Textual

Wage: Structured

Skills: Various

Language: Russian

14. Jobs.dev.by

Rough position in the Google ranking: Second page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: 486

Geographical scope: National

Sectoral scope: IT

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Textual

Working time: Textual

Sector: Structured

City: Structured

District: None

Region: None

Qualification level: Textual

Wage: Textual

Skills: Various

Language: Russian

15. Wargaming.com

Rough position in the Google ranking: Second page

Type of job portal: Primary job portal

Type of operator: Company website

OJV volume: 162

Geographical scope: International

Sectoral scope: IT

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Textual

Working time: Textual

Sector: Structured

City: Structured

District: None

Region: None

Qualification level: Textual

Wage: Textual

Skills: Various

Language: Russian, English

16. Ares.by

Rough position in the Google ranking: Fourth page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: No data

Geographical scope: Minsk, Minsk area

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: None

Occupation: Structured by own classifier

Type of contract: Textual

Working time: Textual

Sector: Structured

City: Structured

District: None

Region: None

Qualification level: Structured

Wage: Structured

Skills: Various

Language: Russian

17. Flagma.by

Rough position in the Google ranking: Fifth page

Type of job portal: Secondary job portal, combination of job portal and secondary functions

Type of operator: Job search portal

OJV volume: 17 800

Geographical scope: International

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Textual

Working time: Textual

Sector: Structured

City: Structured

District: None

Region: None

Qualification level: Structured

Wage: Structured

Skills: Various

Language: Russian

18. Gde.by

Rough position in the Google ranking: Fifth page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: No data

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Textual

Working time: Textual

Sector: Structured

City: Structured

District: None

Region: None

Qualification level: Textual

Wage: Structured

Skills: Various

Language: Russian

19. Myjob.by

Rough position in the Google ranking: Sixth page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: 861

Geographical scope: Minsk region

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Textual

Working time: Textual

Sector: Structured

City: Structured

District: None

Region: None

Qualification level: Textual

Wage: None

Skills: None

Language: Russian

20. Rbg.by

Rough position in the Google ranking: Second page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: 19 731

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Textual

Working time: Textual

Sector: Structured by own classifier

City: Structured

District: None

Region: None

Qualification level: Textual

Wage: None

Skills: Various

Language: Russian

21. 24ru.com

Rough position in the Google ranking: Fifth page

Type of job portal: Second job portal (aggregator)

Type of operator: Job search portal

OJV volume: 188 (Belarus), 11 097 all

Geographical scope: International

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Textual

Working time: Textual

Sector: Structured by own classifier

City: Textual

District: None

Region: None

Qualification level: Structured

Wage: Textual

Skills: Various

Language: Russian

22. Riv.by

Rough position in the Google ranking: Second page

Type of job portal: Primary job portal

Type of operator: Job search portal

OJV volume: No data

Geographical scope: National

Sectoral scope: All industries

Publication date of OJV: Yes

Update frequency: Daily

Occupation: Textual

Type of contract: Textual

Working time: Textual

Sector: Structured by own classifier

City: Structured

District: None

Region: None

Qualification level: Textual

Wage: None

Skills: Various

Language: Russian

8.4 Annex 4 OJV portals ranking (August 2020)

A score between 0 and 1 was assigned to each variable, with intermediate values depending on the values of the variable. The minimum value (0) indicates a strong negative valuation of the source: we consider 0 the value for those variables that are not (or cannot be) identified on the website being analysed, in spite of the relevance of the variable in the ranking model (Mercorio and Mezzanzanica, 2019). Intermediate values show that the variable has some unfavourable features. Null values in basic indexes fundamentally invalidate the rank index.

Each criterion might have different values for different sources, as shown in Table A4.1. To differentiate each value, we manually analysed each job portal focusing on each variable to assign a value, as discussed in this section. The following tables show the distributions of values by variable.

Table A4.1. Numeric values of 'rough position in the Google ranking' variable

Rough position in the Google ranking	Value
First page	1
Second page	0.8
From third page on	0.5

Table A4.2. Numeric values of 'type of operator' variable

Type of operator	Value
Job search portal	1
Public employment service	1
National newspaper	0.5
Recruitment agency	1
Classified ads portal	1
Company website	1
General	1
Null	0

Table A4.3. Numeric values of 'geographical scope' variable

Geographical scope	Value
International	1
National	1
Regional	0.5
Null	0

Table A4.4. Numeric values of ‘type of job portal’ variable

Type of job portal	Value
Primary job portal	1
Combination of job portal and secondary functions	0.8
Secondary job portal	0.5
Null	0

Table A4.5. Numeric values of ‘sectoral scope’ variable

Sectoral scope	Value
Cross-sectoral	1
Specific for one sector	0.5
Null	0

Table A4.6. Numeric values of ‘publication date’ variable

Publication date	Value
Yes	1
No	0
Various	0.5
Null	0

Table A4.7. Numeric values of ‘frequency of update’ variable

Frequency of update	Value
Daily	1
2–3 days	0.8
Weekly	0.5
Null	0

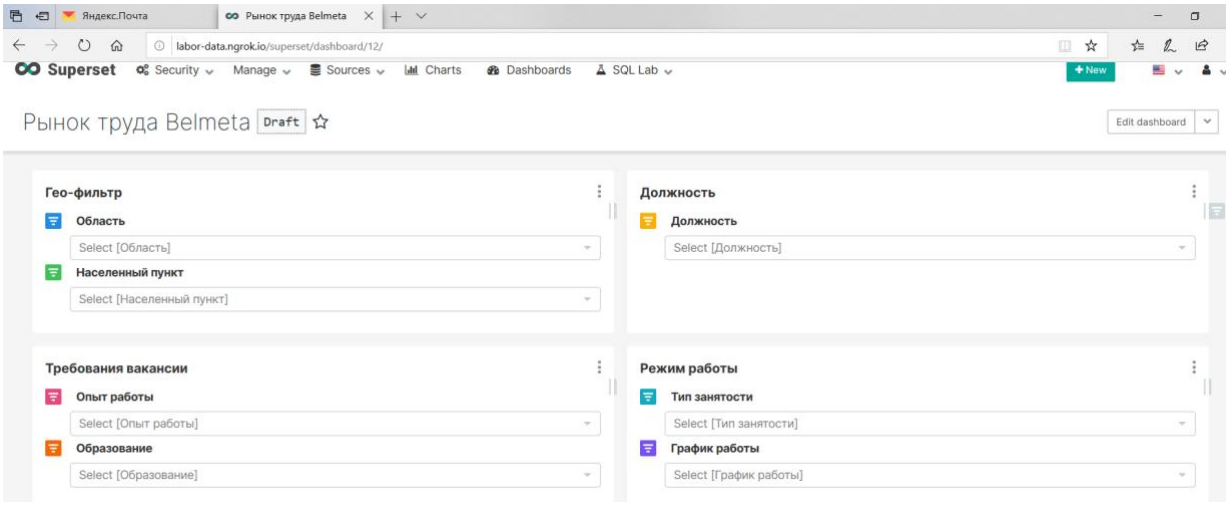
Table A4.8. Numeric values of ‘structured’ variables

Structured variables	Value

Structured	1
Textual	0.5
Various	0.5
Not available	0
Null	0

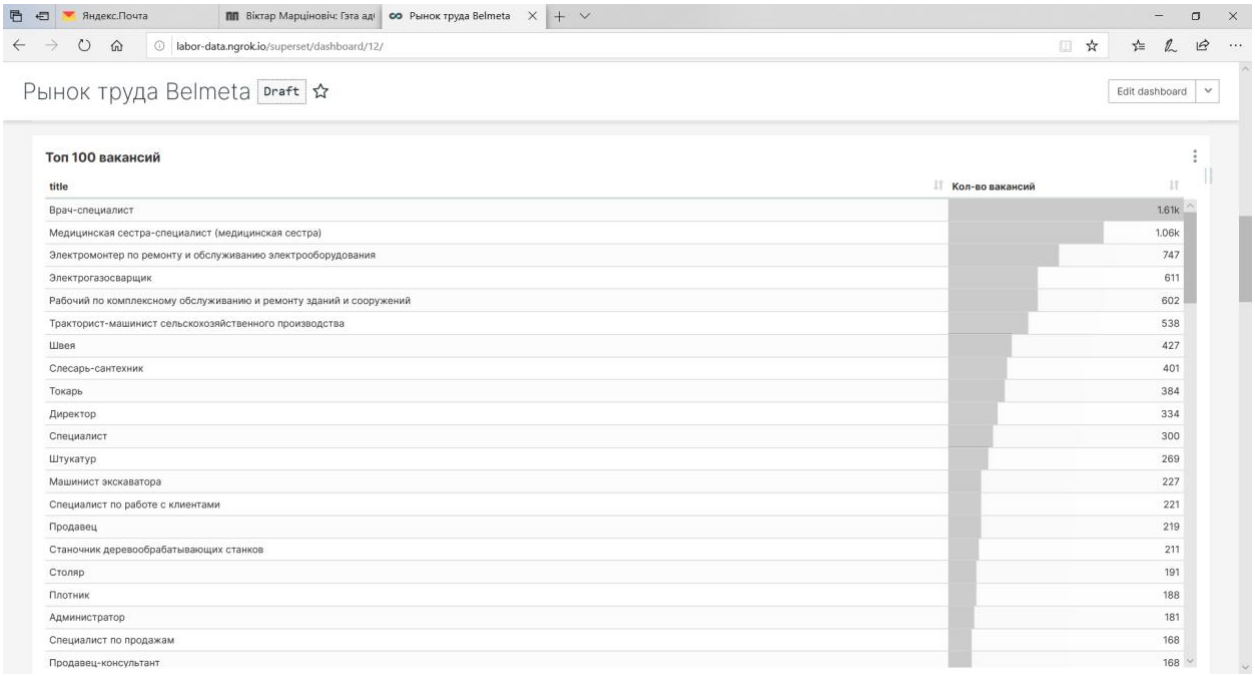
8.5 Annex 5 Characteristics of vacancies and resumes collected from selected online job portals by scraping (screenshots)

8.5.1 Vacancies from Belmeta.com

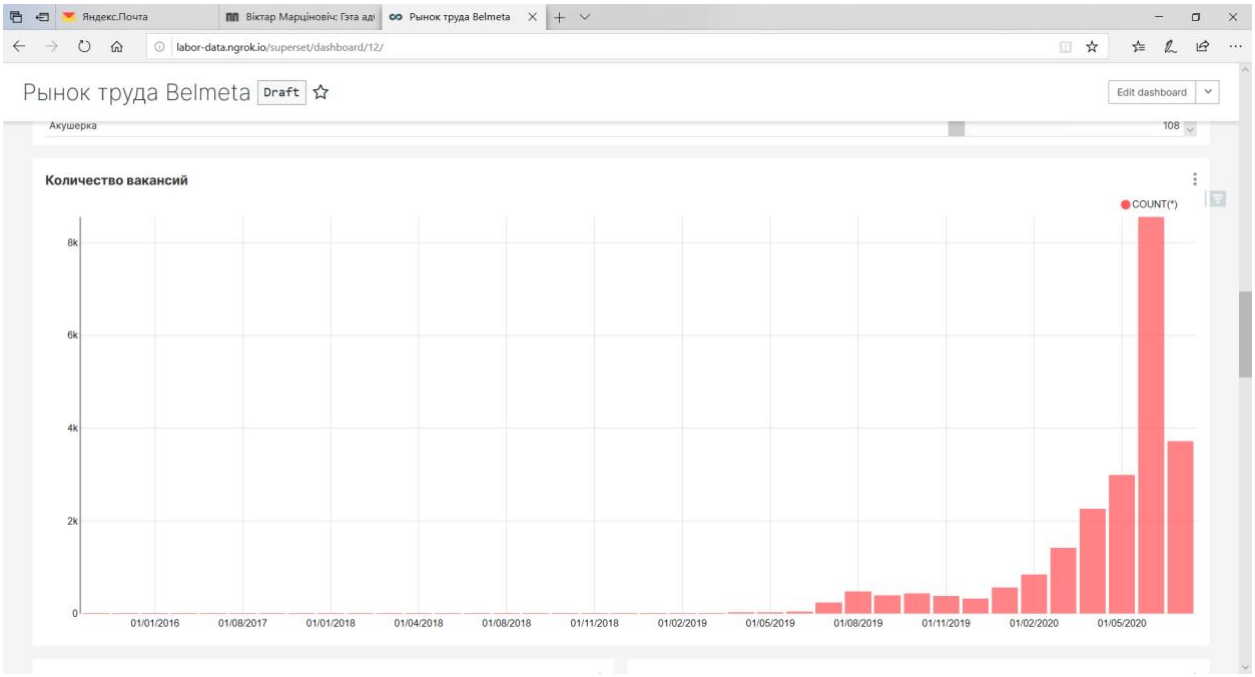


Map of vacancies from Belmeta.com

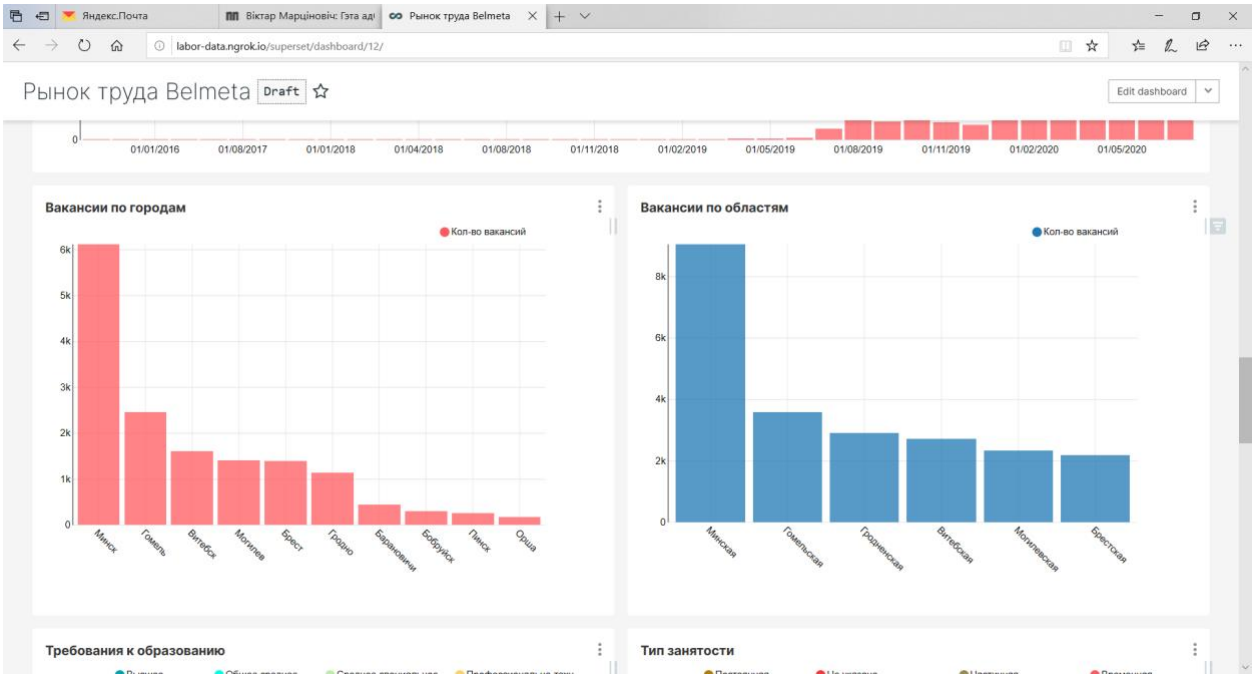
Top 100 vacancies from Belmeta.com

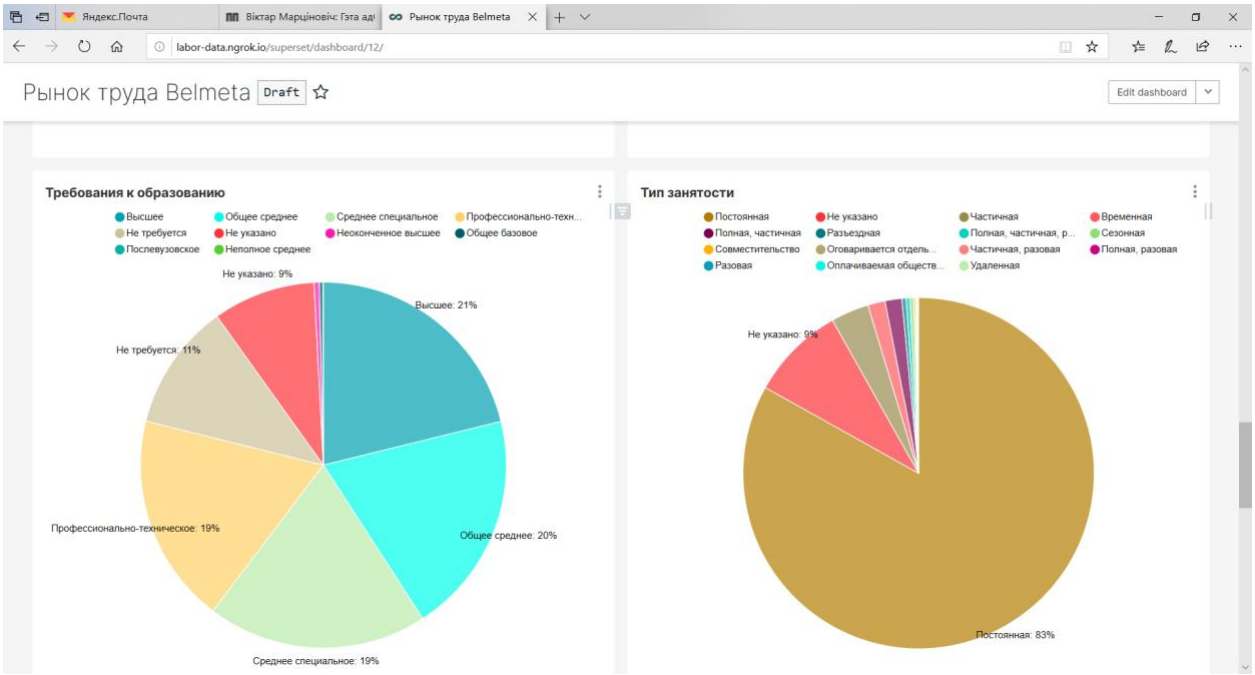


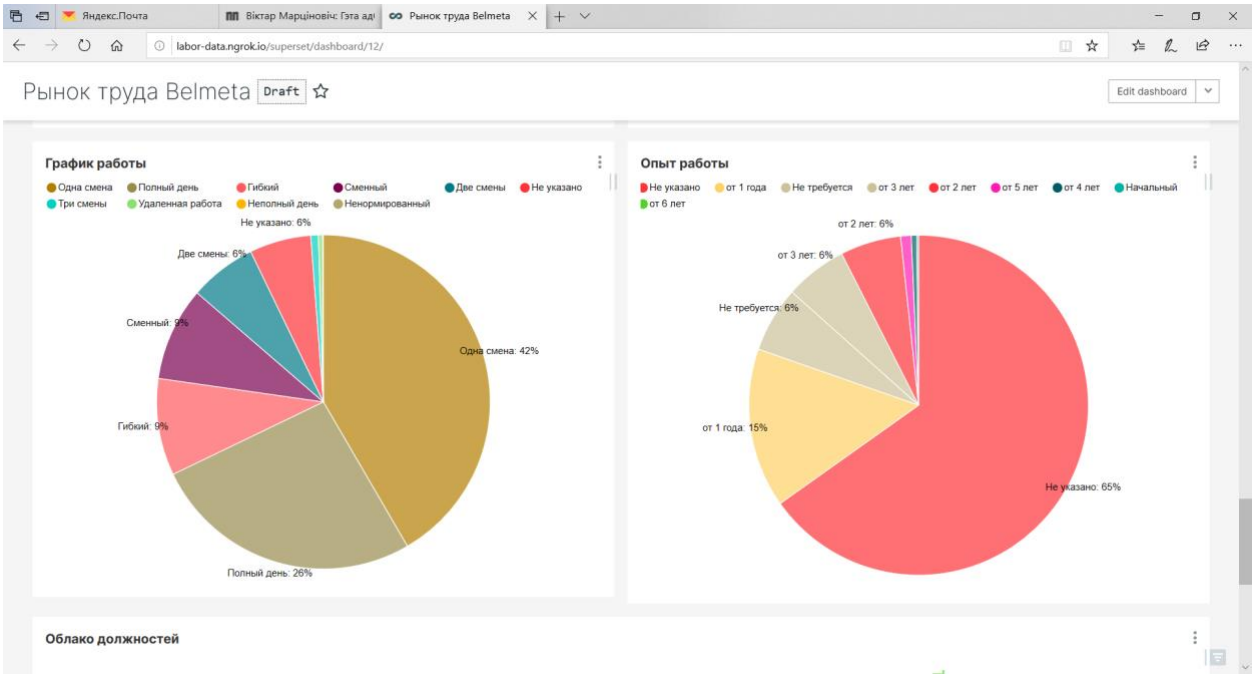
Dynamics of vacancies from Belmeta.com



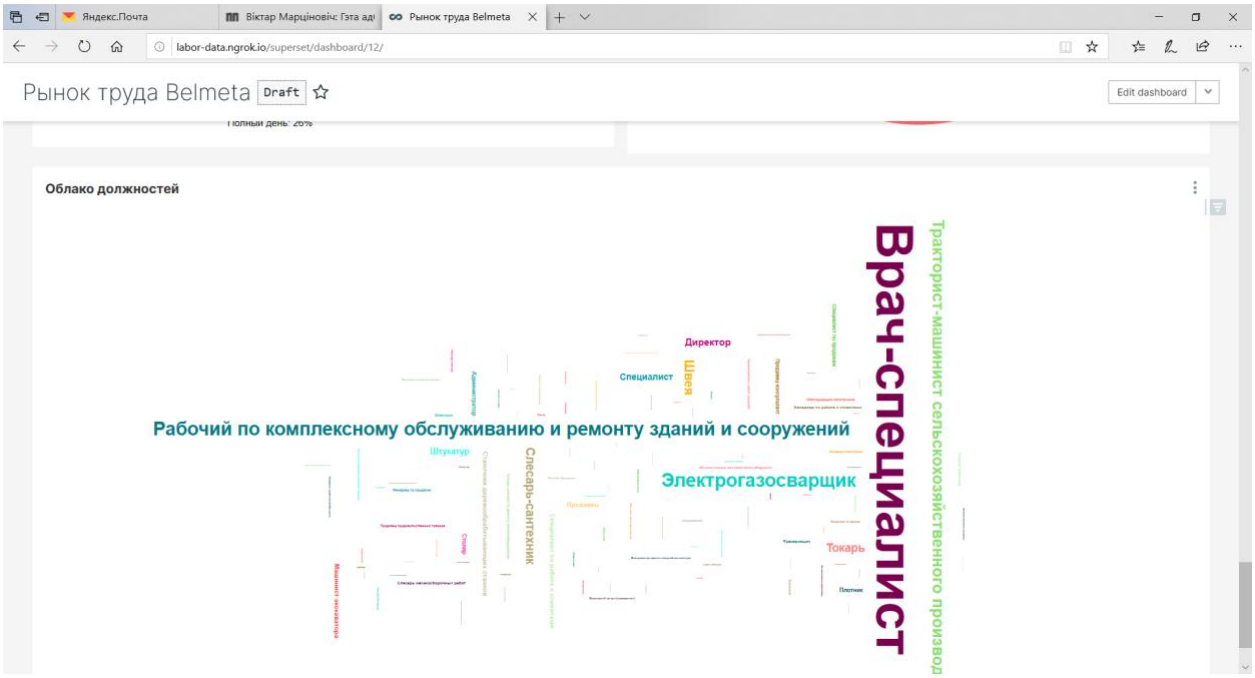
Structure of vacancies from Belmeta.com


Яндекс.Почта
Віктар Марціновіч: Гэта адз
Рынок труда Belmeta
labor-data.ngrok.io/superset/dashboard/12/
Рынок труда Belmeta
Draft
Edit dashboard
01/01/2016
01/08/2017
01/01/2018
01/04/2018
01/08/2018
01/11/2018
01/02/2019
01/05/2019
01/08/2019
01/11/2019
01/02/2020
01/05/2020
Вакансии по городам
Кол-во вакансий
6k
5k
4k
3k
2k
1k
0
Минск
Гомель
Витебск
Могилев
Брест
Гродно
Барановичи
Бобруйск
Пинск
Орша
Вакансии по областям
Кол-во вакансий
8k
6k
4k
2k
0
Минская
Гомельская
Гродненская
Витебская
Могилевская
Брестская
Требования к образованию
Тип занятости

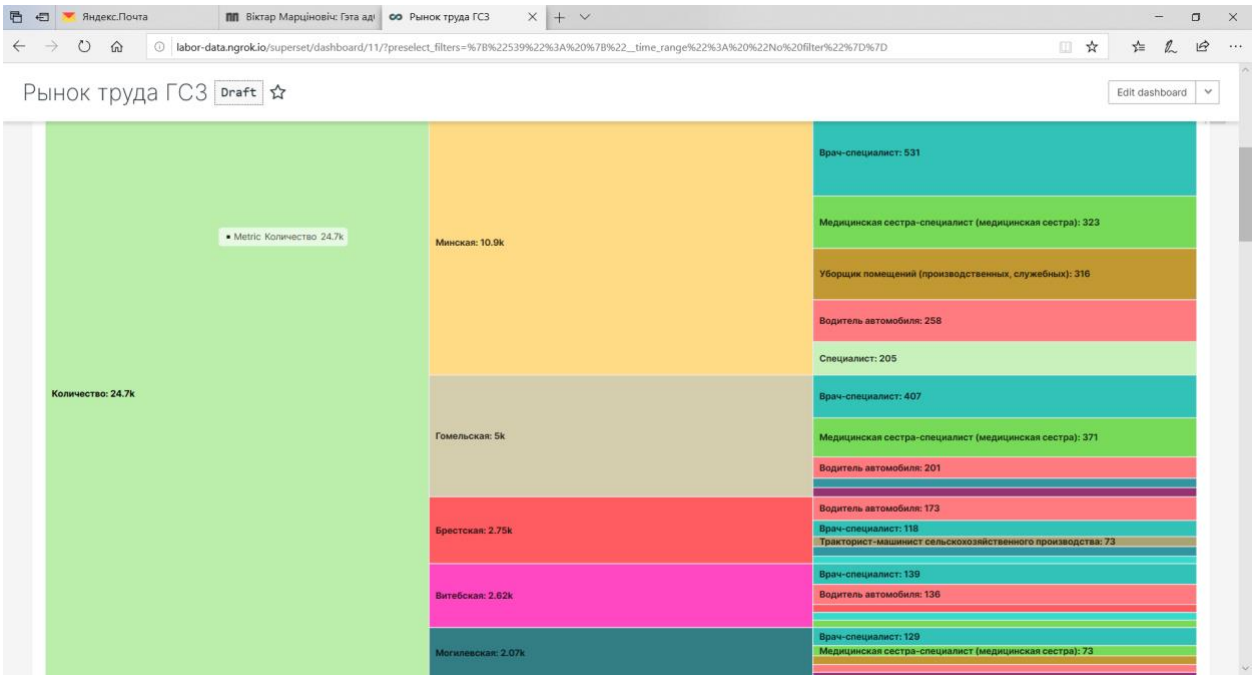

Яндекс.Почта
Віктар Марціновіч: Гэта адз
Рынок труда Belmeta
labor-data.ngrok.io/superset/dashboard/12/
Рынок труда Belmeta
Draft
Edit dashboard
Требования к образованию
Высшее
Общее среднее
Среднее специальное
Профессионально-техн...
Не требуется
Не указано
Неоконченное высшее
Общее базовое
Послевузовское
Неполное среднее
Не указано: 9%
Высшее: 21%
Не требуется: 11%
Профессионально-техническое: 19%
Общее среднее: 20%
Среднее специальное: 19%
Тип занятости
Постоянная
Не указано
Частичная
Временная
Полная, частичная
Разъездная
Полная, частичная, р...
Сезонная
Совместительство
Оговаривается отдель...
Частичная, разовая
Полная, разовая
Разовая
Оплачиваемая обществ...
Удаленная
Не указано: 9%
Постоянная: 83%



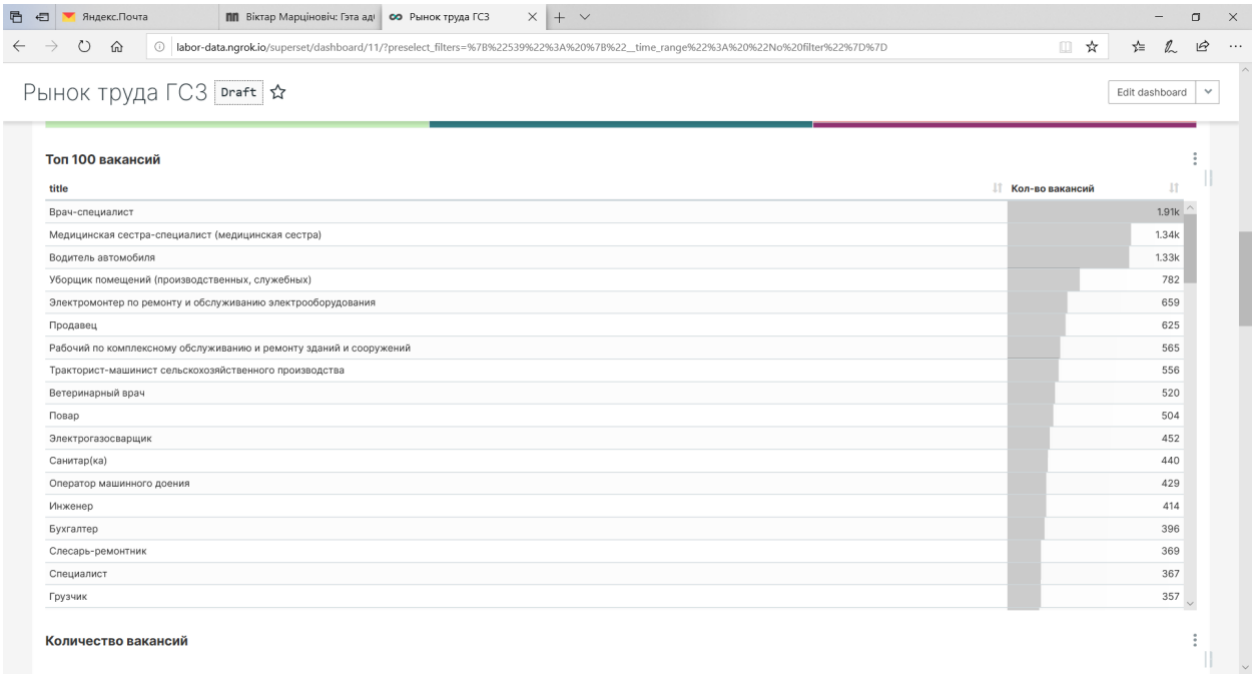
Cloud of vacancies from Belmeta.com



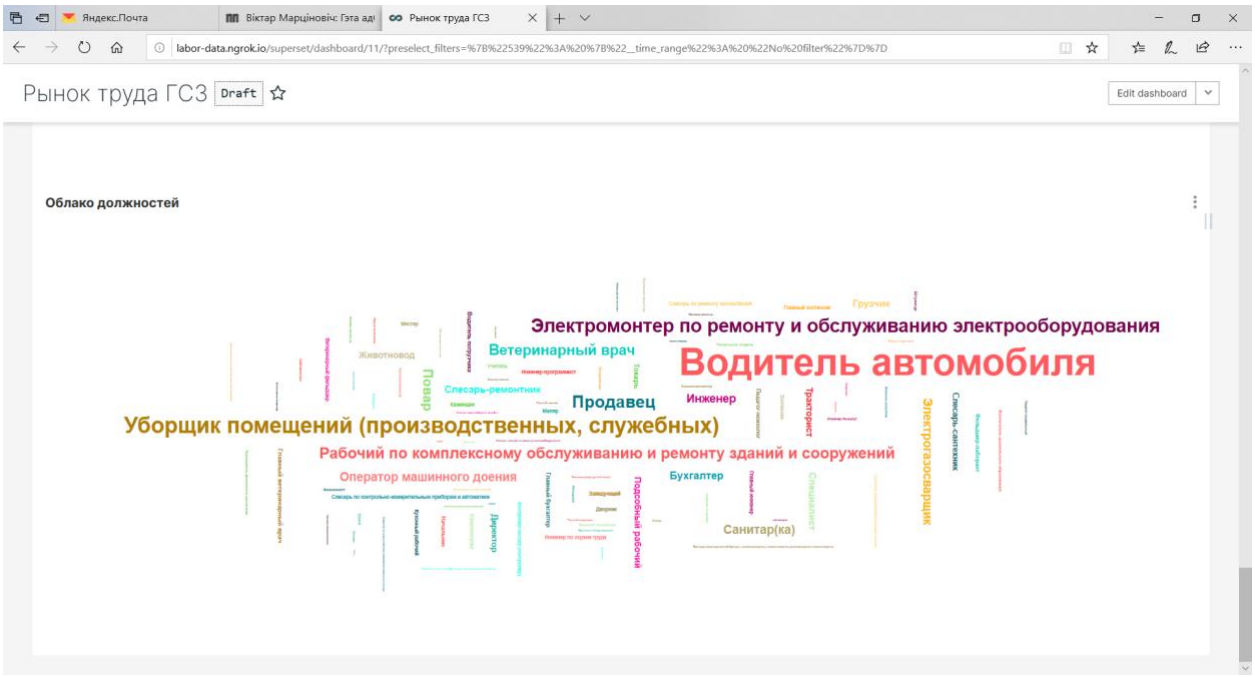
8.5.2 Vacancies from Gsz.gov.by



Top 100 vacancies from Gsz.gov.by

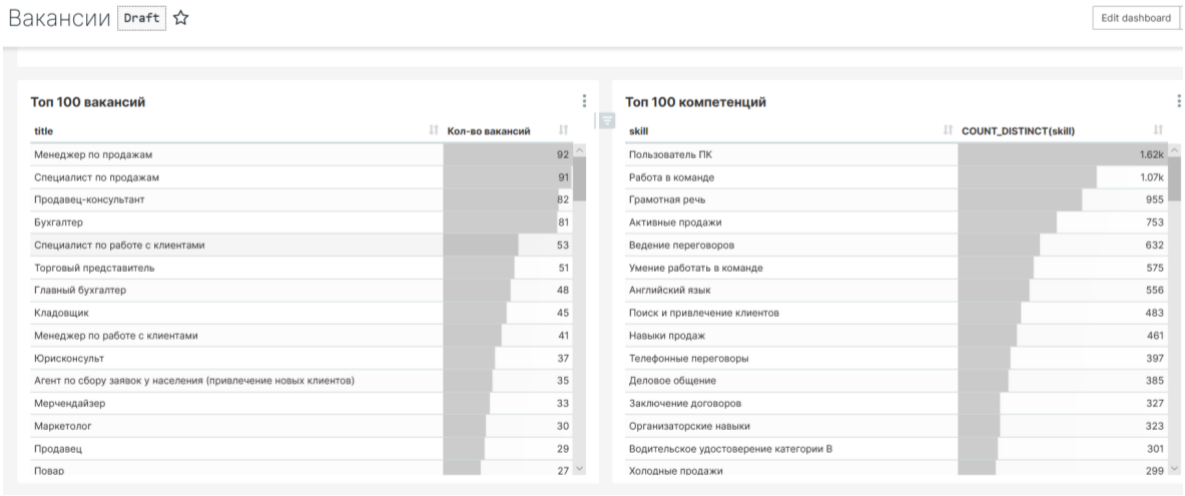


Cloud of vacancies from Gsz.gov.by

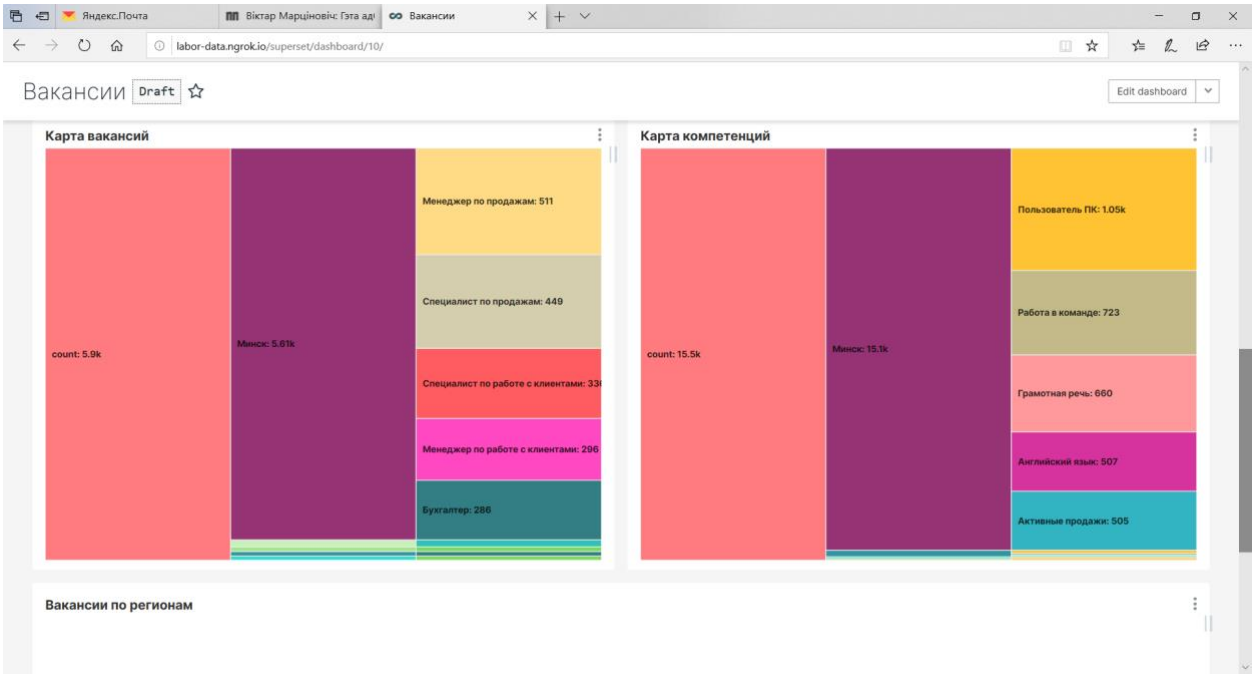


8.5.3 Vacancies and competencies from Jobs.tut.by

8.5.3.1 Top 100 vacancies and Top 100 competencies

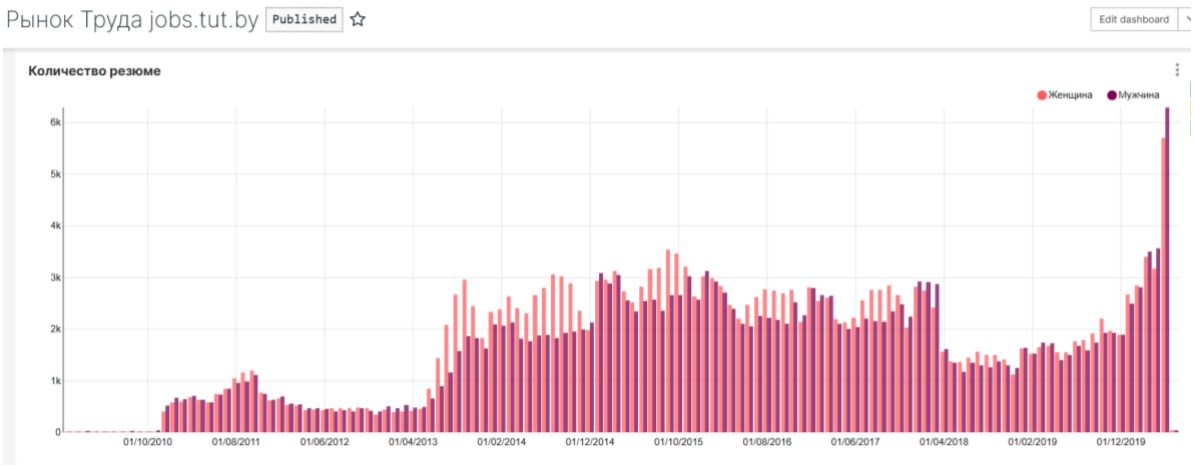


Maps of vacancies and competencies from Jobs.tut.by

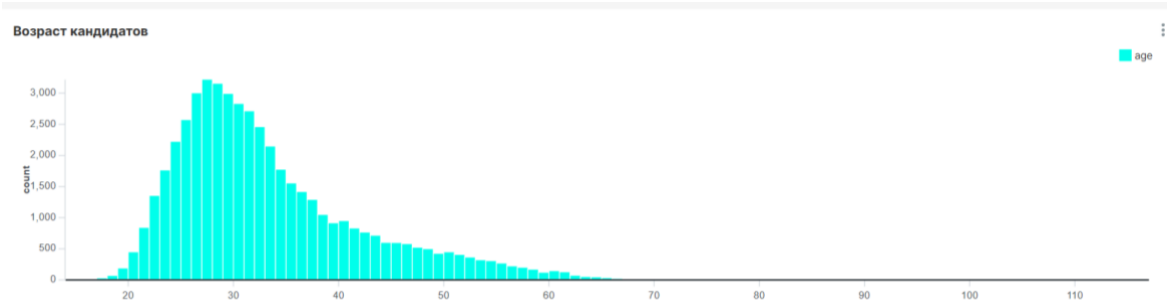


8.5.3.2 CVs (resumes) from Jobs.tut.by

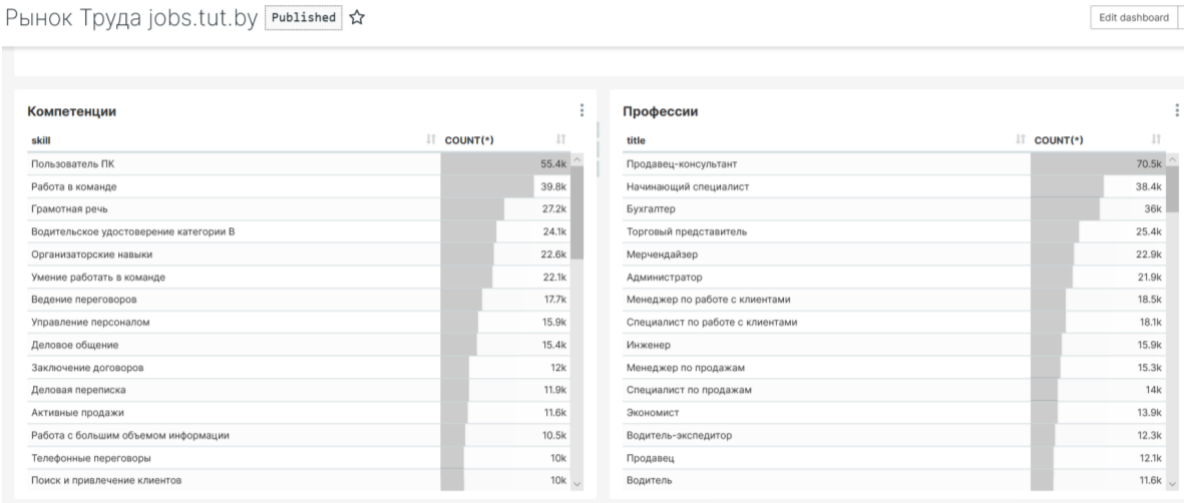
Dynamics of CVs from Jobs.tut.by



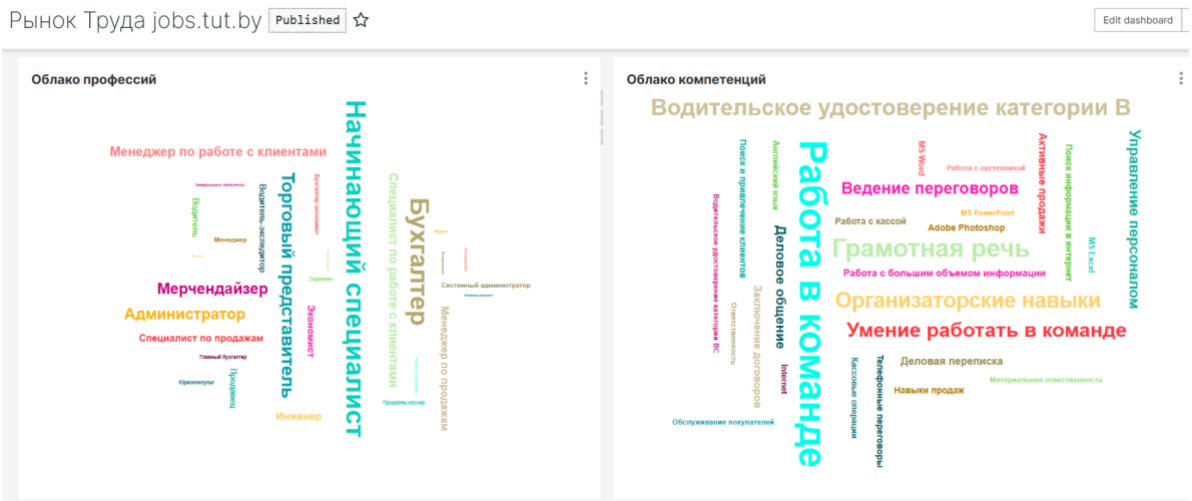
Age of job seekers from Jobs.tut.by

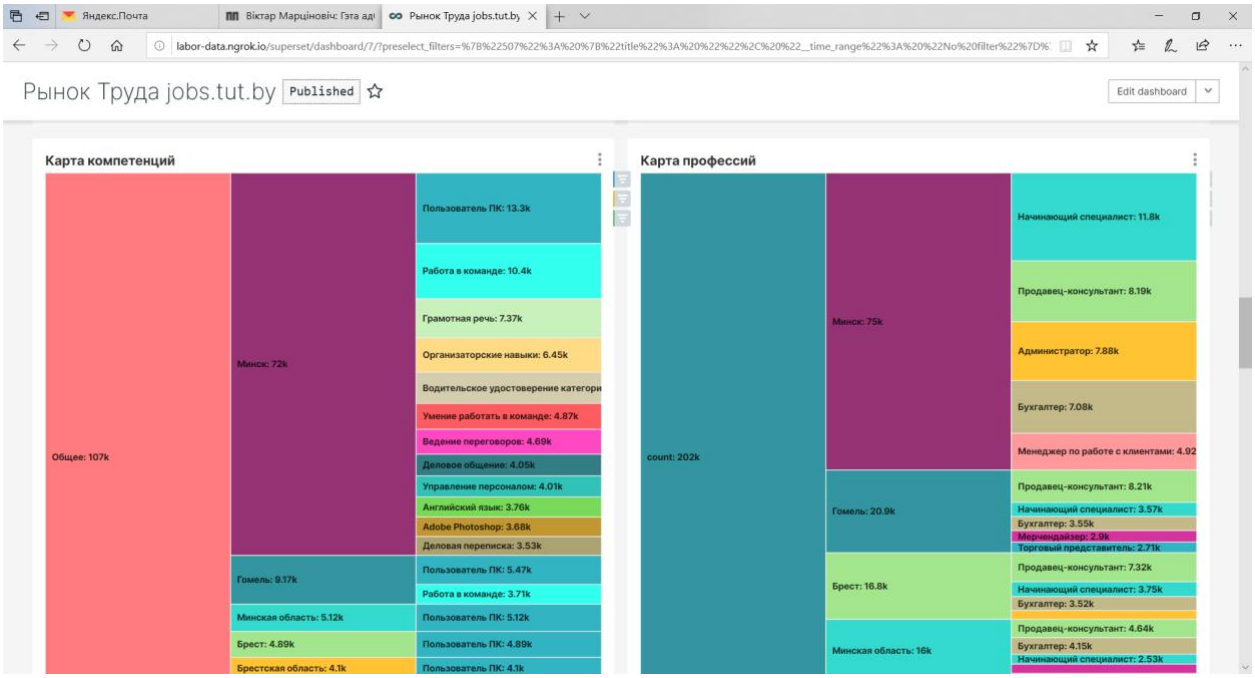


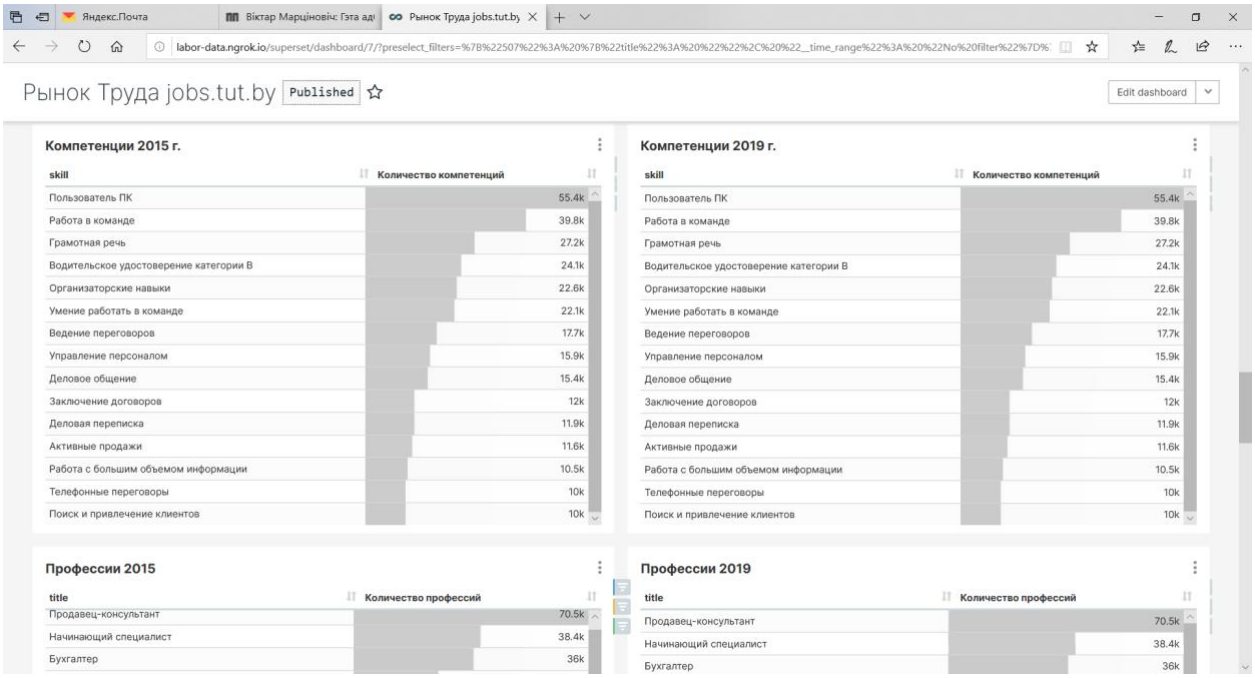
Ranking of skills and occupations from Jobs.tut.by



Clouds of vacancies and competencies from Jobs.tut.by




Яндекс.Почта
Віктар Марціновіч: Гэта ад
Рынок Труда jobs.tut.by
labor-data.ngrok.io/superset/dashboard/7/?preselect_filters=%7B%22507%22%3A%20%7B%22title%22%3A%20%22%2C%20%22__time_range%22%3A%20%22No%20filter%22%7D%
Рынок Труда jobs.tut.by
Published
Edit dashboard
Карта компетенций
Общее: 107k
Минск: 72k
Пользователь ПК: 13.3k
Работа в команде: 10.4k
Грамотная речь: 7.37k
Организаторские навыки: 6.45k
Водительское удостоверение категори
Умение работать в команде: 4.87k
Ведение переговоров: 4.69k
Деловое общение: 4.05k
Управление персоналом: 4.01k
Английский язык: 3.76k
Adobe Photoshop: 3.68k
Деловая переписка: 3.53k
Гомель: 9.17k
Пользователь ПК: 5.47k
Работа в команде: 3.71k
Минская область: 5.12k
Пользователь ПК: 5.12k
Брест: 4.89k
Пользователь ПК: 4.89k
Брестская область: 4.1k
Пользователь ПК: 4.1k
Карта профессий
count: 202k
Минск: 75k
Начинающий специалист: 11.8k
Продавец-консультант: 8.19k
Администратор: 7.88k
Бухгалтер: 7.08k
Менеджер по работе с клиентами: 4.92
Гомель: 20.9k
Продавец-консультант: 8.21k
Начинающий специалист: 3.57k
Бухгалтер: 3.55k
Мерчендайзер: 2.9k
Торговый представитель: 2.71k
Брест: 16.8k
Продавец-консультант: 7.32k
Начинающий специалист: 3.75k
Бухгалтер: 3.52k
Минская область: 16k
Продавец-консультант: 4.64k
Бухгалтер: 4.15k
Начинающий специалист: 2.53k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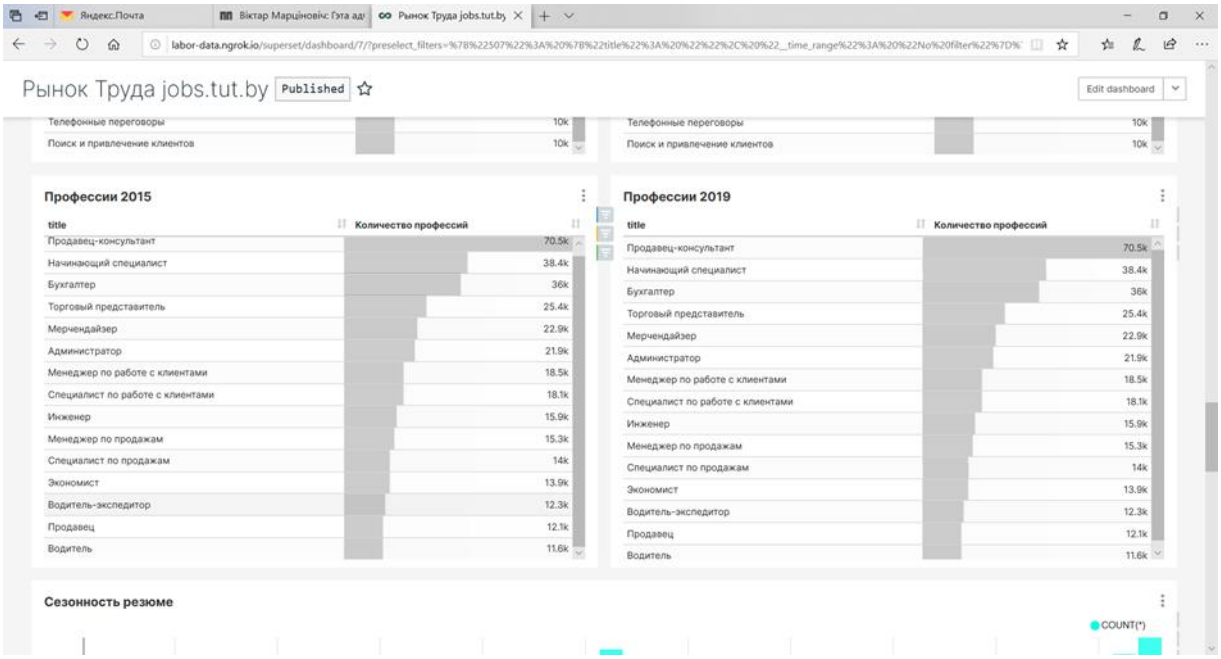
Віктар Марціновіч: Гэта ад
Рынок Труда jobs.tut.by
labor-data.ngrok.io/superset/dashboard/7/?preselect_filters=%7B%22507%22%3A%20%7B%22title%22%3A%20%22%2C%20%22__time_range%22%3A%20%22No%20filter%22%7D%
Рынок Труда jobs.tut.by
Published
Edit dashboard
Компетенции 2015 г.
skill
Количество компетенций
Пользователь ПК 55.4k
Работа в команде 39.8k
Грамотная речь 27.2k
Водительское удостоверение категории В 24.1k
Организаторские навыки 22.6k
Умение работать в команде 22.1k
Ведение переговоров 17.7k
Управление персоналом 15.9k
Деловое общение 15.4k
Заключение договоров 12k
Деловая переписка 11.9k
Активные продажи 11.6k
Работа с большим объемом информации 10.5k
Телефонные переговоры 10k
Поиск и привлечение клиентов 10k
Компетенции 2019 г.
skill
Количество компетенций
Пользователь ПК 55.4k
Работа в команде 39.8k
Грамотная речь 27.2k
Водительское удостоверение категории В 24.1k
Организаторские навыки 22.6k
Умение работать в команде 22.1k
Ведение переговоров 17.7k
Управление персоналом 15.9k
Деловое общение 15.4k
Заключение договоров 12k
Деловая переписка 11.9k
Активные продажи 11.6k
Работа с большим объемом информации 10.5k
Телефонные переговоры 10k
Поиск и привлечение клиентов 10k
Профессии 2015
title
Количество профессий
Продавец-консультант 70.5k
Начинающий специалист 38.4k
Бухгалтер 36k
Профессии 2019
title
Количество профессий
Продавец-консультант 70.5k
Начинающий специалист 38.4k
Бухгалтер 36k



8.6 Annex 6 Results of selected studies of online job portals by scraping

1. Dörfler and van de Werfhorst (2009) analysed the Austrian labour market and tested the merit selection hypothesis over time. They applied inferential statistical methods (multivariate regression analysis) to test inductively formulated hypotheses. They found that employers require a wider set of skills over time, including social and personal skills.

2. Capiluppi and Baravalle (2010) developed a ‘web spider’ to download vacancies from the Monster.com website and then analysed the skills required of IT personnel in the UK using content analysis. They found a mismatch between the requirements of UK industry and the offer of educational and training institutions.

3. Backhaus (2004) analysed job advertisements from Monster.com from the perspective of employers. Using content analysis she studied corporate descriptions in job adverts. She found that firms focus more on presenting company characteristics than employee advancement and that differences exist across firms in different industries in their recruitment tactics.

4. Kuhn and Shen (2013) studied gender discrimination in the recruitment process in the Chinese labour market. Their results revealed high levels of gender preference.

5. Štefánik (2012) studied online data from a private job portal in Slovakia, Profesia.sk, analysing both vacancies and CV data. His studies concentrated on the highly skilled segment of the labour market and examined the matching of demand and supply of university graduates. His representativeness test was based on comparing the structure of portal vacancies and CVs to the structure of the whole population based on the national labour force survey.

6. Beblavý et al. (2015) used the same private online job portal data to study the demand for formal qualifications and other skills in a wide range of low- and medium-skilled occupations by means of content analysis and simple statistical methods. They found that employers in Slovakia are fairly demanding, even for formally low-skilled jobs requiring a wide set of skills.

7. Kureková and Žilincíková (2015) used a population of vacancies from the Profesia.sk portal to study characteristics of the student labour market and test the crowding-out theory. They performed logistic regression and found that low-educated workers and student workers do not compete for jobs but rather provide employers with different skill sets in a complementary way.

8. Online data have also been used in studies about migration where data collection is problematic.

9. Wider research attention has been given to IT-related professions.

10. Kureková et al. (2015) pioneered the use of the European-wide publicly administered job vacancy portal EURES. They performed content analysis and carried out a comparative study of employers' skill demands in small European economies. They found that the mix of skills called for is very diverse across the countries, implying that there is no universal set of requirements and also that domestic institutions and structures strongly affect how demand is formulated.

Source: Kureková et al. (2015)

9 LIST OF ABBREVIATIONS

CV	Curriculum vitae
EAEU	Eurasian Economic Union
EDS	Electronic Digital Signature
ESCO	European Skills, Competences, Qualifications and Occupations
EPI	E-Participation Index
EGDI	E-Government Development Index
GCI	Global Connectivity Index
GDP	Gross domestic product
GII	Global Innovation Index
GNI	Gross national income
GVA	Gross value added
HDI	Human Development Index
HR	Human resources
ICT	Information and communication technologies
IDI	ICT Development Index
ILO	International Labour Organization
ISCO	International standard classification of occupations
IT	Information technology
NEET	Not in education, employment or training
OJV	Online job vacancy
OKRB	National Classification of the Republic of Belarus

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