

RESEARCH OF CURRENT MARKET NEEDS USING MODERN METHODS OF DATA ANALYSIS

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The article shows the results of a study of the market for vacancies in the field of information technology. The study was conducted to determine the most demanded specializations, programming languages, as well as salary levels, depending on the professional gradation and the programming language that is used.

The problem of training specialists who will be in demand in the labor market has become especially urgent in recent years. This is especially noticeable in the field of information technology. In the recent past, all development associated with the accurate computations, belonged mainly to military and space fields. Now there is a huge variety of domains where such specialists are needed, for example, e-commerce, bioinformatics, medical research, geology, product quality control etc. The rapid digitalization of all areas related to the life of society implies that graduates of the IT profile of universities will be able to demonstrate their knowledge and skills regardless of the subject area, which makes special requirements for the developers of educational programs. It is necessary to regularly analyze the labor market in this category and make changes that allow students to master the necessary competencies.

This study analyzes the vacancies of IT-profile specialists posted on the HeadHunter website, one of the largest job search and employee search resources in the world (according to the Similarweb rating). The site has 49 million resumes in the database, 793 thousand vacancies, 1423 thousand verified companies regularly place their ads. The website is visited by 18 million visitors monthly, leaving about 1 billion responses to vacancies.

Special program was written using Python language to collect data from the site. The HeadHunter service provides a special API (application programming interface) that makes it possible to get information about applicants and companies. The main activity of the company is the sale of information from the resume database (information about the database and the opportunity to post a vacancy for employers are carried out on a paid basis). The search in the vacancy database is provided free of charge for applicants, which made it possible to organize the collection of data using the API for this study. The company regularly publishes analytical information on the state of the labor market, publishing information on the annual or monthly dynamics of vacancies and resumes. The hh-index is a coordination statistic that is used to characterize the relationship between supply and demand. It shows how many resumes are per vacancy. The more important this index is, the higher the competition in the analyzed professional sphere is.

Python has been used to connect to the databases of the HeadHunter site. This programming language also has been used to collect and process information.

API HeadHunter can be used to access the database of vacancies of companies in Ukraine, Belarus, Azerbaijan, Uzbekistan, Kazakhstan, Georgia, Kyrgyzstan. This opportunity allows large companies to expand their business outside of Russia. It also helps citizens of the former Soviet Union to find jobs in Russia.

We have analyzed 17,620 ads in the Information Technology, Internet, Telecom category published on the website from January 11 to February 27, 2021. Vacancies were organized into a dataframe (a special table that consists of records whose fields are variables of various types) using a special algorithm. The bounds of the salary range are a quantitative attribute of a vacancy. It is present in the records if it is completed by the employer. The rest of the attributes are categorical. Table 1 shows the fields that the employer fills in.

Table. – List of fields in the analyzed dataset

Field name	Semantic content
id	ad identifier
language	programming language
grade	skill level
vacancy_name	vacancy title from the website
employer	name of employer's company
city	city of employer's company location
experience	required previous experience
schedule	type of employment
published_at	publication date
salary_from	lower bound of the salary range
salary_to	upper bound of the salary range
currency	currency of salary
specialization1	subject area
specialization2	subject area

The cities with the greatest need for IT specialists and the most common programming languages were selected for conducting reliable statistical analysis. Moscow (8938 vacancies), St. Petersburg (4104 vacancies), Novosibirsk (1588 vacancies), Minsk (1223 vacancies), Yekaterinburg (902 vacancies), Kiev (864 vacancies) are cities that can be attributed to this group. We have selected vacancies with the following programming languages: 1C (795 vacancies), C# (1078 vacancies), C++ (448 vacancies), Java (1219 vacancies), JavaScript (642 vacancies).

We have conducted an analysis of variance to determine the factors that influence the salary range. As a result, we have found out that there is a difference in the average level of salaries depending on the city, currency, subject area. Figure 1 shows average values of the bounds of the salary range depending on the subject area.

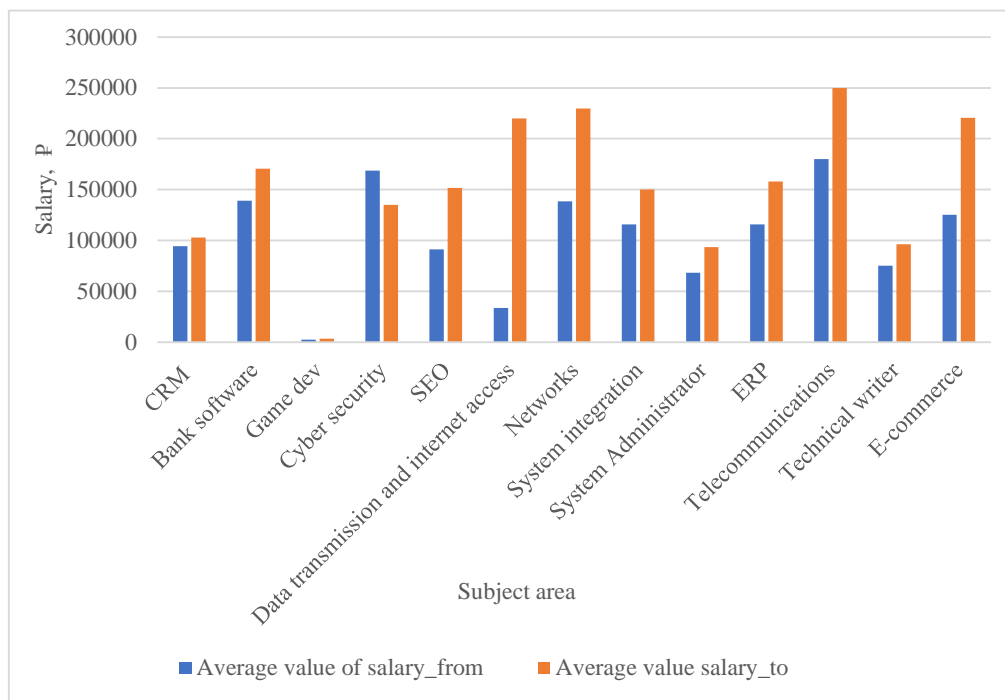


Fig. 1. – Average values of the bounds of the salary range depending on the subject area

The greatest length of the salary range is observed in the field of data transmission and Internet access. It means that professional skills are very significant in this area.

REFERNECES

1. Wikipedia.org : website. – Moscow, 2021. – Mode of access: <https://ru.wikipedia.org/wiki/HeadHunter>. – Date of access: 27.03.2021.