

# 2018 Software Development Salary Survey

RESEARCH REPORT

Maja Ninković, Alatheia R&S  
Sandra Prvulović, Fenix HR  
Nevena Stanisavljević, HR World



# Table of contents

Executive Summary	2
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Methodology	4
Sampling and sample structure.....	4
Sample by location.....	4
Sample by company size.....	5
Sample by ownership.....	5
Data collection and handling.....	6
Data analysis and reporting.....	6

Results	9
Salaries, overview.....	10
Salaries, data (click on position below).....	13
Benefits	
Bonuses.....	29
Other benefits.....	30
Promotion rate.....	35
Promotion speed.....	36
Voluntary turnover.....	37

C#	C++	Java	PHP	DevOps	Embedded	
IOS	Android	Java Script	UI/UX	Designer	Tester	Click on the position button for detailed salary data
Business Analyst	QA Lead	QA Manager	Technical Team Lead	Software Architect	Project Manager	Product Manager

# Methodology

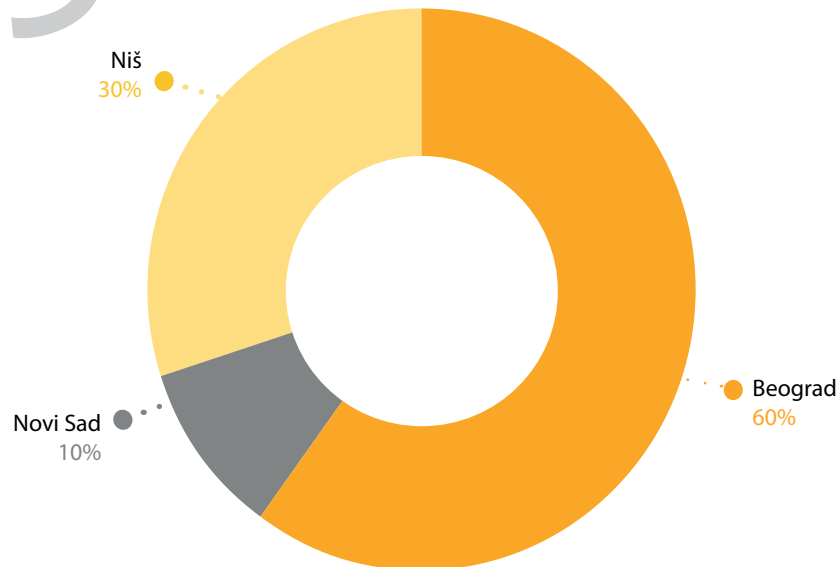
## SAMPLING and sample structure

Thirty (30) software development companies representing 1,403 IT professionals from the Serbian Software Development industry were included in the survey. A comprehensive pool of potential participants was created using the Serbian Business Registers Agency databases and researchers' business contacts in the Serbian IT industry. Two rounds of research invitations were sent to the relevant business email addresses. The resulting sample was formed through self-selection in response to the research invitations.

Companies from Belgrade make up the majority of the sample - 60.0%, companies from Niš represent 30.0% of the sample and companies from Novi Sad 10.0% of the sample (Chart 1). 50% of the participating companies were micro (1-50), 13.3% were small (51-100), 10.0% were medium (101-200), 10.0% were large (200-500) and 16.7% were extra large (500+) (Chart 2). The sample was composed of 63.3% foreign-owned and 36.7% Serbian-owned companies (Chart 3).

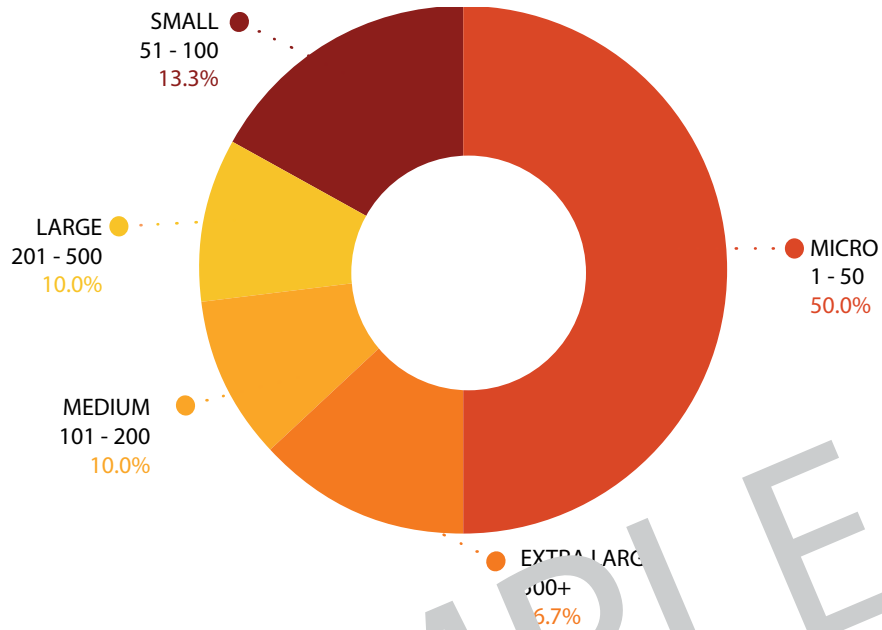
### SAMPLE by location

Chart 1. Sample structure according to company location



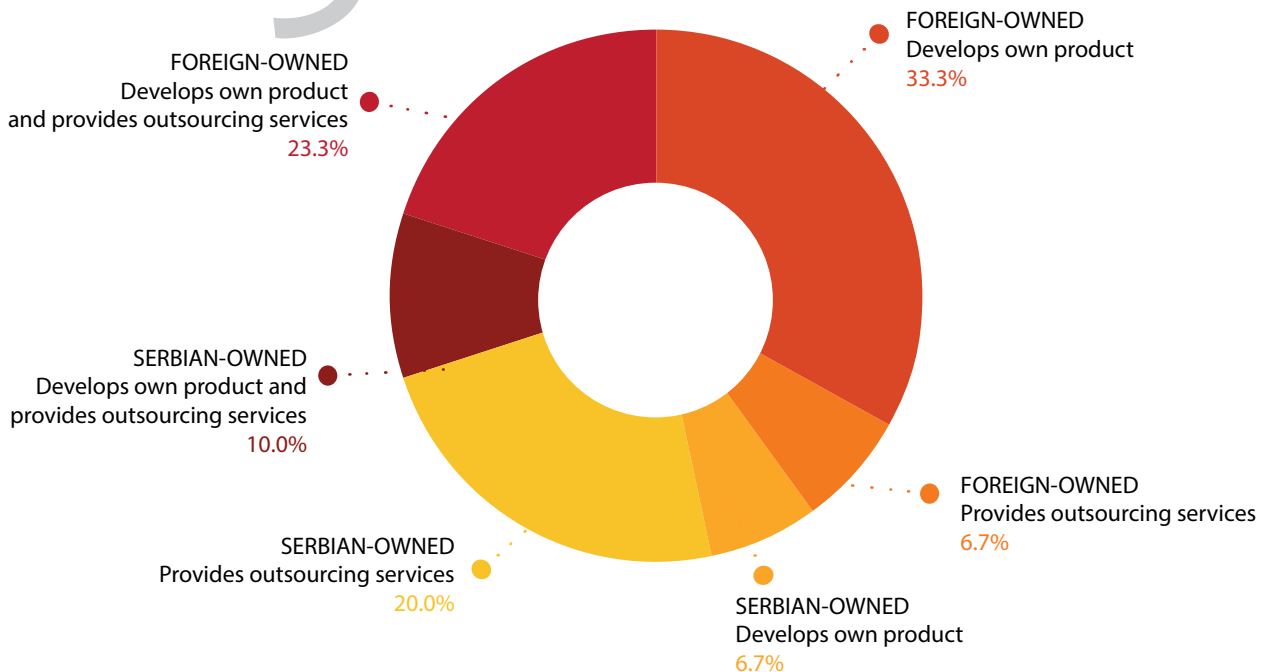
# SAMPLE by company size

Chart 2. Sample structure according to company size



# SAMPLE by ownership

Chart 3. Sample structure according to ownership type



# DATA collection and handling

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Salary and benefits survey was distributed online to all the participating companies in September 2018. The participants had four weeks to complete the survey. In the course of preparing the collected data for analysis, the data was cleaned and verified - values that appeared to be unusual or cases of missing data were checked with the participating company and subsequently verified, corrected or deleted.

Positions with less than 5 responses from the participating companies were not included in the analysis or the final report. These are marked in the report by “-”, signifying Insufficient Data. For these positions, only salary averages are reported in the salary tables.

Each company received both the national and the local breakdowns of all the data. Companies from Belgrade received reports with the national and Belgrade tables, companies from Niš received the national and Niš tables. Since the sample for Novi Sad consisted of 3 companies with divergent positions, Novi Sad data was combined with the Belgrade data for the purposes of analysis and reporting.

## DATA analysis

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### SALARY

The survey results for salaries are broken out into average, median and quartile values (25<sup>th</sup>, 50<sup>th</sup> and 75<sup>th</sup> percentiles) for both minimum and maximum monthly net salary amounts.

25<sup>th</sup> percentile: One quarter of all reported salaries for a given position are below this value. Paying at the 25<sup>th</sup> percentile rate means that 25% of organizations in the relevant sample pay less than that amount and 75% of organizations pay more than that amount for the given position.

50<sup>th</sup> percentile/Median: The median is in the middle of all data points, meaning that one half of all reported salaries are on either side of the median value. Median is not affected by extremely high and extremely low salaries (outliers) for a given position and is therefore a preferred measure in salary surveys over simple averages, although both are reported here.

75<sup>th</sup> percentile: Three quarters of all reported salaries lie below this value. Paying at the 75<sup>th</sup> percentile means that 75% of organizations pay less than that amount and 25% of organizations pay more than that amount.

Average: Average value is an arithmetic mean of all reported salaries for a given position.

Percentile ranking: Each company that provided us with the salary data for their positions (except those companies that remained anonymous) received an individual percentile ranking for those salaries.

No. of incumbents: Total number of job incumbents in this position as reported by participating organizations.

### Salary ranges

Each of the 19 positions (at 3 experience levels, where applicable) has a salary range. Salary range is expressed as a minimum and maximum amount paid for the given position. The minimum is the lowest end of the salary range for a given position - whether due to incumbents' level of experience at entry to position or lower negotiated salary. The maximum is the highest end of the salary range reported for a given position.

Below-market salary range is a range that falls on or below the 25<sup>th</sup> percentile (25<sup>th</sup> percentile column min and max values).

Mid-market salary range is a range that falls on the 50<sup>th</sup> percentile (Median column min and max values).

Above-market salary range is a range that falls on or above the 75<sup>th</sup> percentile (75<sup>th</sup> percentile column min and max values).

## JOB MATCHING

**Junior Software Development Engineers** typically have 1-3 years of experience. They assist in the design, coding, testing, debugging and documenting new or existing software. Junior Software Engineers are generally assigned the least complex tasks and are supervised fairly closely. Under close and direct supervision, Juniors may analyze user needs, develop software solutions, customize existing software, evaluate software, assist in maintenance or problem identification and other similar tasks. The position typically requires bachelor's degree (engineering, science, math or similar).

**Intermediate Software Development Engineers** typically have 3-5 years of experience. They work to design, code, test, debug and document new or existing software. Intermediate Software Engineers are assigned more complex tasks, but generally not high level design or highly complicated tasks. They work independently, requiring only consultative supervision. Under some supervision, Intermediates may analyze user needs, develop software solutions, customize existing software, evaluate software, do maintenance, identify problems and design solutions and other similar tasks. The position typically requires bachelor's degree (engineering, science, math or similar).

**Senior Software Development Engineers** typically have 5+ years of experience. They work to design, code, test, debug and document new or existing software. Senior Software Engineers are assigned more complex and creative tasks, exercising independent judgment and applying expert-level technical knowledge to a broad range of assigned tasks. They may act as leads on projects and provide instruction/mentoring to less-experienced engineers. Seniors may analyze user needs, develop software solutions, customize existing software, evaluate software, do maintenance, identify problems and design solutions and other similar tasks. The position typically requires bachelor's degree (engineering, science, math or similar).

**Junior QA/Testers** typically have 1-3 years of experience. They work in the quality assurance stage of software development and deployment, ensuring that products and services meet required standards and end-user requirements. Under close and direct supervision, they may review and analyze software and systems, carry out manual and automated tests, review results, report and document technical issues. The position typically requires bachelor's degree (engineering, science, math or similar).

**Intermediate QA/Testers** typically have 3-5 years of experience. They work in the quality assurance stage of software development and deployment, ensuring that products and services meet required standards and end-user requirements. Under consultative supervision, they may review and analyze software and systems, carry out manual and automated tests, review results, resolve problems, report and document technical issues. The position typically requires bachelor's degree (engineering, science, math or similar).

**Senior QA/Testers** typically have 5+ years of experience. They work in the quality assurance stage of software development and deployment, ensuring that products and services meet required standards and end-user requirements. Under little or no supervision, they may review and analyze software and systems, carry out manual and automated tests, review results, resolve problems, report and document technical issues. The position typically requires bachelor's degree (engineering, science, math or similar).

## BONUSES

Data on bonuses was also collected in the survey. The bonuses were initially divided into two types - guaranteed and performance-based. Guaranteed bonus refers to an amount received by the employee that is not tied to performance results (e.g., 13th salary). Performance-based bonus refers to an amount received as a result of good performance (i.e., target bonus).

Data analysis on bonuses is presented within the Benefits section of the report. First, the data is submitted to a frequency analysis to determine how are different kinds of bonuses distributed across different experience levels. Second, for each type of bonus an average amount was calculated (where applicable), indicating the minimum and maximum values (expressed as percentages of the employees' annual salary amounts).

## BENEFITS

We collected data on 29 different kinds of benefits that could be offered to employees at different experience levels. Data on benefits was submitted to a frequency analysis, showing the percentage of companies offering each benefit to their Juniors, Intermediates and Senior-level employees, both at the national and local levels. All the participating companies (except those who remained anonymous) also received the personalized section of the benefits analysis. The benefits offered by the participating company were checked in each individual report, providing an easy overview of the company's performance in this area.

The participating companies could add up to 3 additional benefits not covered by the survey. These benefits were summed up and presented in the "Emerging trends" section of the Benefits.

## PROMOTION RATE, PROMOTION SPEED AND VOLUNTARY TURNOVER

Promotion rate data was collected as part of the survey. The participating companies were asked to report on the number of promotions in the past 12 months (Sep 2017 - Sep 2018) for the 19 positions sampled in this research. The promotion rate was calculated for each company by dividing the number of promotions in this time period by the average number of employees in the organization (in the 20 positions), multiplied by 100 to obtain the rate in percentages.

Promotion speed data was also collected. The participating companies were asked to estimate the average number of months it takes for Juniors, Intermediates and Seniors to become eligible to advance to the next level in their organizations (e.g., from Junior to Intermediate, from Intermediate to Senior, from Senior to upper management, etc.). The average promotion speed was calculated separately for each of the levels, and then further broken down by the size of the company.

Voluntary turnover data was collected by asking the participating companies to report on the number of employees who voluntarily left the organization in the past 12 months, counting only separations in the 19 sampled positions. Voluntary turnover rate was calculated for each company by dividing the number of voluntary separations in this time period by the average number of employees in the organization (in the 19 positions), multiplied by 100 to obtain the rate in percentages.

## NOTE ABOUT COMPANY SIZE

Please note that even though we collected data on 5 company sizes – 1-50, 51-100, 101-200, 201-500 and 500+, they were aggregated in three groups (1-50, 51-200, 200+) for the purpose of further analysis and reporting.



## RESULTS SALARIES

This part of the report presents the analyzed salary data for the 19 software development positions, per experience level (where applicable) and the company location. Data for each of the 19 positions is presented on a separate page of the report. Each position page contains the following information:

- (1) Salary amounts for the given position on the national level for Junior, Intermediate and Senior levels (where applicable), for the minimum and maximum salaries provided;
- (2) Salary amounts for the given position on the local level (Belgrade, Novi Sad/Belgrade only) for Junior, Intermediate and Senior levels (where applicable), for both the minimum and maximum salaries provided;
- (3) Graphs representing the 25<sup>th</sup>-75<sup>th</sup> percentile salary ranges for the given position on Junior, Intermediate and Senior levels (where applicable), for both the minimum and maximum salary amounts. If your company provided salary amounts for the given position, your company's salary rank for the position will be represented in the graph (in the green, yellow and red circles);
- (4) If your company participated in the 2017 salary survey, the table will also include a competitiveness trend indicator (CTI), marked with green, yellow and red arrows next to the eligible p-rank values.

**PLEASE NOTE:**

If less than 5 organizations supplied salary data for the given position - regardless of the number of incumbents in the position (which can be greater than 5) - the salaries were not calculated for that position. These salaries are marked with "-", indicating insufficient data.

For these positions, only salary averages are reported in the salary tables.

For information  
on employee  
bonuses,  
click here.

For information  
on employee  
benefits,  
click here.



# RESULTS Software Engineer Java Belgrade

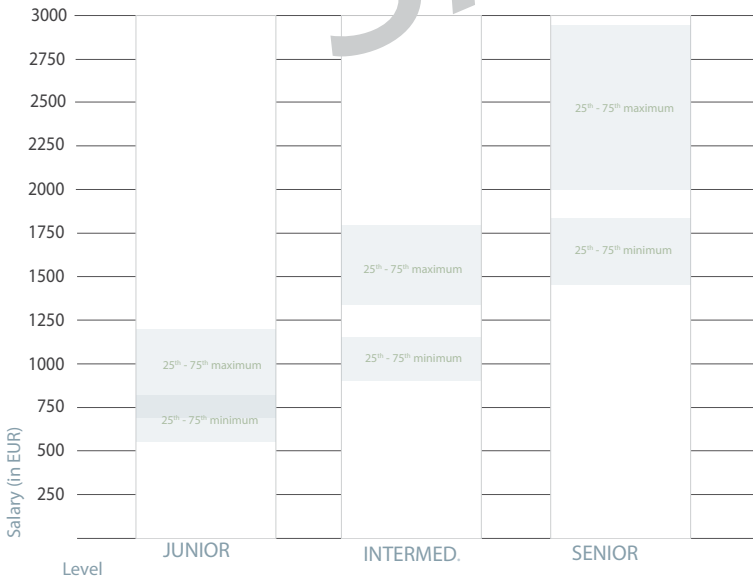
Table 5. Monthly net salary data (EUR) for position, per experience level (Junior, Intermediate, Senior) - Serbia

Level	No. of incumbents	Base Salary	25 <sup>th</sup> percentile	50 <sup>th</sup> (median)	75 <sup>th</sup> percentile	Avg.	Company value	P rank
			€ min	€ max	€ min	€ max		
JUNIOR	99	€ min	563	790	838	723	550	23
		€ max	825	1,082	1,200	1,035	1,200	75
INTERMED	134	€ min	925	1,035	1,187	1,069	900	23
		€ max	1,325	1,550	1,793	1,559	1,600	52
SENIOR	137	€ min	1,450	1,600	1,872	1,615	1,400	22
		€ max	2,000	2,300	2,950	2,453	2,000	25

Table 6. Monthly net salary data (EUR) for position, per experience level (Junior, Intermediate, Senior) - Belgrade

Level	No. of incumbents	Base Salary	25 <sup>th</sup> percentile	50 <sup>th</sup> (median)	75 <sup>th</sup> percentile	Avg.	Company value	P rank
			€ min	€ max	€ min	€ max		
JUNIOR	87	€ min	683	800	875	792	550	13
		€ max	1,000	1,100	1,200	1,109	1,200	75
INTERMED	118	€ min	1,000	1,100	1,268	1,147	900	13
		€ max	1,325	1,600	1,725	1,575	1,600	50
SENIOR	95	€ min	1,400	1,605	1,957	1,718	1,400	12
		€ max	2,000	2,400	2,925	2,493	2,000	25

Graph 3. Company's P-rank\* in the given position (Min - Max)\*\* per experience level - Serbia



\*Your company salary rank (P-rank) is marked in the appropriate circle, on the left side of bar for the minimum salaries, on the right for the maximum salaries.

\*\*Shaded areas represent 25<sup>th</sup>-75<sup>th</sup> percentile ranges for both minimum and maximum salary amounts

### HOW TO INTERPRET SALARY DATA?

- **BELOW-MARKET RANGE**  
25<sup>th</sup> percentile column shows the below-market base salary ranges for Juniors, Intermediates and Seniors.
- **MID-MARKET RANGE**  
50<sup>th</sup> percentile (MEDIAN) column shows the mid-market salary ranges for Juniors, Intermediates and Seniors.
- **ABOVE-MARKET RANGE**  
75<sup>th</sup> percentile column shows the above-market base salary ranges for Juniors, Intermediates and Seniors.

Competitiveness Trend Indicator (CTI), in relation to 2017 data

- ▲ Higher CTI
- ▲ Same CTI
- ▼ Lower CTI

[Bonuses for this position click here](#)

[Benefits for this position click here](#)

## OTHER PEOPLE ANALYTICS REPORTS FOR THE SERBIAN IT



### EMPLOYER BRANDING IN IT - report

New 2018 Employer Branding in IT report is out! In addition to the mountain of data on what IT industry is currently doing (and not doing) in this area, we are taking our readers on a employer branding journey through all the phases of employer branding strategy development. The report has 26 pages and 9 parts that present a detailed roadmap for how to design and implement EB strategy, measure impact and overcome common challenges. Thirty-two companies in the Serbian IT industry participated in our survey - three quarters of our sample (74%) were foreign-owned and 26% Serbian-owned IT companies. We've sampled small, medium and large IT companies and our respondents included IT CEOs (22.6%), HR/Talent managers (45.2%)

[READ MORE](#)



### HIRING IT PROFESSIONALS AS INDEPENDENT CONTRACTORS: TRENDS IN THE SERBIAN IT INDUSTRY - report

IT companies in Serbia make use of different employment models for their IT staff. For this report, we looked at the extent to which IT companies in Serbia practice hiring IT professionals as 'independent contractors' ('agencijski' model). Based on the sample of 60+ IT companies in Serbia, the report presents information on the frequency of use for the 'independent contractor' model in the IT industry, per company size, ownership, and location. It also presents trends for the use of independent contractors from 2016-2018 in Serbian IT.

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### CUSTOMIZED EMPLOYEE BENEFITS BENCHMARKING - report

Customized Benefits Benchmarking report allows you to compare your company's benefits package to the desired peer group from our database of Serbian Software Development companies (list available upon request). The report provides information on your company's standing (above market, aligned to market, below market) on 22 employee benefits: Annual Leave, Paid overtime, Paid Parking, Private Health insurance, Training professional and soft skills, Pension plans, Time off, Flexible work time, Telecommuting, Food/drinks, Fitness, Relaxation, Mobile, Laptop, Cars, etc.

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