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Original Scientific Paper

APPLICATION OF PROCESS FUNCTION METHOD FOR THE EVALUATION OF WATER TREATMENT PLANT ORGANIZATIONAL PERFORMANCE – PUC "NAISSUS" NIŠ CASE STUDY

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Sandra Stanković¹, Dejan Vasović², Natalija Petrović¹, Aleksandra Boričić¹, Ljiljana Takić³

¹Academy of Applied Technical and Preschool Studies, Niš, Serbia ²University of Niš, Faculty of Occupational Safety, Niš, Serbia ³University of Niš, Faculty of Technology in Leskovac, Serbia

Abstract. The analysis of the administrative public utility bodies in charge of water treatment and distribution revealed the need for improvement and a clear definition of the place and role of the administrative-planning bodies for water delivery, as well as the improvement of the implementation of works in water supply systems. In this research, the assessment of the organizational performance of the water treatment plant is performed by means of the process functions method. Furthermore, this method improves the efficiency of operations in the water treatment plants through the evaluation of job implementation in the field of water supply. The concept of process functions includes the analysis of key jobs necessary for timely and successful task implementation by each job role within the organization. This method is most extensively applied in the organizational sciences, such as human resource management organizational design, including the analysis of functional organizational charts, while its application is limited in engineering sciences. Since the most important resource of any organization is the human capital (i.e., its employees), this paper focuses on a water utility company "Naissus" from Serbia regarding its evaluation of organizational performance. Furthermore, the aim of this study is to introduce process functions as a standard analytical method, thus connecting all activities within the water treatment plant in order to optimize its operations.

Key words: water supply, water management, process function method, water treatment plant, organizational performance

Corresponding author: Dejan Vasović

Academy of Applied Technical and Preschool Studies, Generala Milojka Lešjanina 39, 18000 Niš, Serbia E-mail: dejan.vasovic@znrfak.ni.ac.rs

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1. INTRODUCTION

Due to urbanization as well as global and local overpopulation, the need for continuous qualitative and quantitative water distribution to all users poses an increasing challenge for the public utility systems dealing with water supply [1, 2]. Water supply and sanitation systems in both urban and rural areas are among the most important parts of communal infrastructure. Interruptions and changes in their functioning can cause major disturbances in people's lives, endangering the sanitary and hygienic conditions of the users of these services. The supply of water to users is performed by a public utility company, i.e., a water supply company that is mandated to perform uninterrupted work under equal conditions for the purpose of constant and uninterrupted provision of utility services [3]. If the water supply is interrupted or disrupted due to extreme events or technical reasons, the water supply company is obligated to immediately take the necessary measures to eliminate the problem by ensuring temporary water delivery from alternative sources (e.g., water tank trucks), or dispatch PUC employees to eliminate the causes of disturbances in water supply, etc. [3]

Organizational design and job evaluation are regulated by division as a complex of content-related work duties and according to the job families. The organization and systematization of work are determined in a way that can provide, among other things [4]:

- Application of modern methods and means of work;
- Clear division of responsibilities;
- Optimal flow of information between organizational units within the water supply system;
- Greater productivity and economy of human resources;
- Clear definition of jobs for employees.

The work process for water supply activities takes place as a unique and complete process in which the work is performed by appropriate organizational units in order to be productive. The method of process functions, as one of the methods for assessing the organizational level, serves to provide insight into what needs to be changed or improved during the work process. Therefore, this study aims to introduce process functions as a standard method for analysis and interconnection of activities within the drinking water treatment plant and thus optimize the operation of the plant, as well as enable recommendations for plant utilization in hazardous situations (e.g., extreme hydrological events).

2. MATERIAL AND METHODS

The city of Niš includes the area of valleys, relatively alluvial plains of the Nišava and South Morava rivers, as significant watercourses and part of the Niš Neogene basin. Public water supply for the city's population and industry is performed through NIVOS – Niš water supply system and MOVOS – Moravian water supply system (a significantly smaller system) [4]. The *Rulebook on organization and systematization of work* regulates the internal organization and systematization of work in all public utility companies, including the Public Utility Company for Water Supply and Sanitation "Naissus", located in Niš [5].

Several methods have been developed to assess the existing organizational level [6, 7, 8]. The method of process functions can be used to assess the organizational level of the entire organization or only individual organizational units, functions, etc. Process

functions are defined as activities that are necessary for the successful execution of the entire task at all levels of jobs in the organization [9, 10]. There are nine basic process functions in the work process, which include: recording (Re), notification (No), control (Co), analysis (An), decision making (Dm), planning (Pl), alignment (Al), organization (Org), and performance (Pe).

A description of the meaning of certain functions is given in the literature [6]. The application of the process function method is presented using job analysis in the water production and distribution sector, as well as accredited sanitary control services with a laboratory (in the field of water supply and sanitation), taking PUC "Naissus" Niš as the example. The sector consists of the following four services [5]:

- SCADA system;
- Water production at the Mediana spring;
- Water production at water sources and distribution;
- Electro-mechanical maintenance.

The accredited sanitary control service with a laboratory, as an independent organizational unit, consists of sampling departments, laboratory departments of physical chemistry, and laboratory departments for microbiological testing of water quality.

This paper analyzes the work performed at PUC "Naissus", which is regulated by the *Rulebook on organization and systematization of work* (Table 1) [5].

Label	Responsibility									
1	Capture and processing of river water using appropriate technological process (Nišava -									
	water factory Mediana)									
2	Exploitation of springs and wells (Mediana)									
3	Water abstraction from natural springs (Studena, Ljuberaða, Mokra, Divljana, Krupac,									
	Pešter, and Toplik)									
4	Capture and exploitation of water from wells (Miljkovac)									
5	Water chlorination									
6	Pushing water into tanks, break chambers, and network									
7	Storage of water in tanks and pumping into the network									
8	Sanitary protection of water facilities									
9	Disinfection of (newly built) water facilities, water supply networks, pumping stations and									
10	Recording of processes at all water supply points (leaks chlorine turbidity pressure etc.)									
11	Complete records of all installed devices at source plants									
12	Development of maintenance plans for water supply equipment (leaks, chlorine, turbidity,									
	pressure, etc.)									
13	Complete records of all installed devices at source plants									
14	Development of maintenance plans for water supply hydromechanical equipment									
15	Regular and timely servicing of hydromechanical equipment and devices at the existing ones									
16	Ongoing investment maintenance of water supply equipment									
17	Cleaning of infiltration pools at Mediana									
18	Technical acceptance of newly built and reconstructed water supply facilities (pumping									
	stations, tanks, pumping stations, etc.) and equipment									
19	Implementation and maintenance of quality management system (QMS) in accordance with									
	the SRPS ISO / IEC 17025 international standard									
20	Water sampling for physicochemical and microbiological tests of water, as well as									
	determination of field parameters									

Table 1 Overview of labeled jobs (continued)

Label	Responsibility
21	Transport and reception of water samples
22	Control of hygienic safety of drinking water
23	Physicochemical and microbiological analyses of surface, technological groundwater, and
24	wastewater quality
24	Examination of device efficiency in terms of physicochemical and microbiological results
25	Issuance of test reports with expert opinion on water hygiene
26	Issuance of reports on testing of surface, technological, groundwater, and wastewater quality
27	Testing the quality of water from springs that are treated as potential solutions for water supply $-a$ new project
28	Control of hygienic safety of drinking water after disinfection of water supply network,
	tanks, swimming pools, and other water supply facilities
29	Hygienic control of samples from the newly built water supply network
30	Providing research and development and professional services in the field of application
	and improvement of modern equipment and technology to solve problems of water supply,
	quality control, and water purification
31	Monitoring and enforcement of legal regulations pertaining to work of the organizational unit
32	Ensuring confidence in the quality of test results in accordance with the requirements of the
	SRPS ISO / IEC 17025 international standard
33	Calculation of measurement uncertainty, validation and verification of test methods
34	Participation in PT laboratory competence testing activities / interlaboratory comparisons
35	Assessment by the Accreditation Body of Serbia in order to maintain the accreditation certificate
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. Sir	ice not every job must contain all process functions, it is necessary to establish

interconnectedness [11, 12]. The connection of jobs with process functions is determined by the table "jobs – process functions" (Table 2). For a job that contains one of the process functions, the sign (+) is entered, whereby the sum of these signs represents the sum of frequencies (F). If the job does not contain any of the process functions, the sign (-) is entered in the table [11]. As not all jobs have the same meaning, i.e., some are more important than others, it is necessary to weigh them. The evaluation is performed by selecting one of the levels on a scale from 0 to 5, according to the following criteria [11]: 5 - Execution of business is necessary, business would not be possible; 4 - Execution of business greatly affects the overall business; 3 - Execution of business affects the economy of business; 2 - Failure to do business exemplifies a shortcoming in business, but business is nonetheless possible; 1 - Execution of business affects the integrity of the business; 0 - No workis required.

According to the same criteria, process functions are also evaluated, because they are not all equally important for doing business. The selected weights for the jobs, as well as the selected weights for the process functions, are the result of a survey conducted with the person performing these jobs in the drinking water treatment plant that was the subject of this analysis. The assessment of job levels and process functions is performed by multiplying the selected job levels by the selected process function levels and the obtained products represent the theoretical levels for jobs by process functions, i.e., for process functions by jobs (Table 3) [11].

Process function	Re	No	Co	An	Dm	Pl	Al	Oro	Pe	F
Iobs		110	00		2			018		-
1	+	+	+	+	+	+	+	+	+	9
2	+	+	+	-	+	+	+	+	+	8
3	+	+	+	+	+	+	+	+	+	9
4	+	+	+	+	+	+	+	+	+	9
5	-	+	+	+	+	+	+	+	+	8
6	+	-	+	+	+	+	+	+	+	8
7	+	+	+	-	+	+	+	+	+	8
8	+	+	+	+	+	+	+	+	+	9
9	+	+	+	+	+	+	+	+	+	9
10	+	+	+	+	+	+	+	+	+	9
11	+	+	+	+	+	+	+	+	+	9
12	+	+	+	+	+	+	+	+	+	9
13	+	+	+	+	+	+	+	+	+	9
14	+	+	+	+	+	+	+	+	+	9
15	-	+	+	+	+	+	+	+	+	8
16	+	+	+	+	+	+	+	+	+	9
17	-	+	-	-	+	+	+	+	+	6
18	+	+	+	+	+	+	+	+	$^+$	9
19	+	+	+	+	+	+	+	+	+	9
20	+	+	+	+	+	+	+	+	+	9
21	+	+	+	-	+	+	+	+	+	8
22	+	+	+	+	+	+	+	+	+	9
23	+	+	+	+	+	+	+	+	+	9
24	+	+	+	+	+	+	+	+	+	9
25	+	+	+	+	+	-	+	+	+	8
26	+	+	+	+	-	+	+	+	+	8
27	+	+	+	+	+	+	+	+	+	9
28	+	+	+	+	+	+	+	+	+	9
29	+	+	+	+	+	+	+	+	+	9
30	-	+	+	+	-	+	+	+	+	7
31	+	+	+	+	+	+	+	+	+	9
32	+	+	+	+	+	+	+	+	+	9
33	+	+	+	+	+	+	+	+	+	9
34	+	+	+	+	-	+	+	+	-	7
35	+	+	+	+	+	+	+	+	+	9
F	31	34	34	31	32	34	35	35	34	300

Table 2 Display of functional connection of jobs with process functions

Process function											
Jo	bs	Re	No	Co	An	Dm	Pl	Al	Org	Pe	~
	_]	Level					Ľ
Label	Level	5	5	4	5	4	4	1	4	2	
1	5	25	25	20	25	20	20	5	20	10	170
2	4	20	20	16	-	16	16	4	16	8	116
3	5	25	25	20	25	20	20	5	20	10	170
4	4	20	20	16	20	16	16	4	16	8	136
5	4	-	20	16	20	16	16	4	16	8	116
6	5	25	-	20	25	20	20	5	20	10	145
7	4	20	20	16	-	16	16	4	16	8	116
8	5	25	25	20	25	20	20	5	20	10	170
9	4	20	20	16	20	16	16	4	16	8	136
10	5	25	25	20	25	20	20	5	20	10	170
11	4	20	20	16	20	16	16	4	16	8	136
12	4	20	20	16	20	16	16	4	16	8	136
13	4	20	20	16	20	16	16	4	16	8	136
14	4	20	20	16	20	16	16	4	16	8	136
15	3	-	15	12	15	12	12	3	12	6	87
16	3	15	15	12	15	12	12	3	12	6	102
17	2	-	10	-	-	8	8	2	8	4	40
18	3	15	15	12	15	12	12	3	12	6	102
19	5	25	25	20	25	20	20	5	20	10	170
20	5	25	25	20	25	20	20	5	20	10	170
21	4	20	20	16	-	16	16	4	16	8	116
22	5	25	25	20	25	20	20	5	20	10	170
23	5	25	25	20	25	20	20	5	20	10	170
24	4	20	20	16	20	16	16	4	16	8	136
25	4	20	20	16	20	16	-	4	16	8	120
26	4	20	20	16	20	-	16	4	16	8	120
27	4	20	20	16	20	16	16	4	16	8	136
28	5	25	25	20	25	20	20	5	20	10	170
29	5	25	25	20	25	20	20	5	20	10	170
30	2	-	10	8	10	-	8	2	8	4	50
31	4	20	20	16	20	16	16	4	16	8	136
32	5	25	25	20	25	20	20	5	20	10	170
33	4	20	20	16	20	16	16	4	16	8	136
34	1	5	5	4	5	-	4	1	4	-	28
35	5	25	25	20	25	20	20	5	20	10	170
Σ		660	690	564	645	544	556	143	572	284	4658

Table 3 Theoretical levels of work by process functions

This is followed by the evaluation of work by process functions with grades from 1 to 5, according to the criteria for determining grades based on the observed organizational attitude in the observed workplace, as follows: 1 - Jobs are not performed; 2 - Jobs are performed occasionally; 3 - Jobs are performed at workers' own initiative, but by agreement; 4 - Jobs are performed according to the instructions of superiors; 5 - Jobs are performed according to organizational regulations.

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3. RESULTS AND DISCUSSION

Evaluations of tasks by process functions are shown in Table 4 and are also the result of a survey conducted with persons performing tasks that are the subject of this analysis.

Process									
function	Re	No	Co	An	Dm	Pl	Al	Org	Pe
Jobs									
1	5	5	5	5	4	4	3	4	4
2	5	5	4	-	4	3	3	4	4
3	5	5	5	5	5	5	5	5	5
4	5	5	5	5	4	4	4	4	3
5	-	5	5	5	4	2	4	4	3
6	5	-	5	5	4	4	3	4	4
7	5	5	5	-	4	5	3	4	5
8	5	5	5	5	5	5	5	5	5
9	5	5	5	5	4	4	4	5	5
10	5	5	5	5	4	4	3	4	5
11	5	4	4	3	4	3	2	3	2
12	5	5	4	5	4	4	3	5	5
13	2	5	5	5	4	4	5	4	2
14	4	4	5	5	4	3	4	3	4
15	-	4	3	3	3	4	2	3	2
16	4	4	3	2	3	4	3	2	4
17	-	3	-	-	3	4	3	4	4
18	5	5	5	5	5	4	4	5	5
19	5	5	5	5	5	5	5	5	5
20	5	5	5	5	4	5	5	4	5
21	5	5	5	-	4	3	4	5	5
22	5	5	5	5	5	5	5	5	5
23	5	5	5	5	5	5	5	5	5
24	5	5	5	5	4	4	4	5	5
25	5	5	5	5	5	-	4	5	5
26	5	5	5	5	-	4	4	5	5
27	5	5	5	5	4	4	5	4	4
28	5	5	5	5	5	5	5	5	4
29	5	5	5	5	5	4	5	4	5
30	-	4	4	5	-	3	3	4	2
31	5	5	5	4	4	5	5	4	4
32	5	5	5	5	4	5	5	5	4
33	5	4	5	5	4	4	4	4	3
34	5	5	5	5	-	5	5	5	-
35	5	5	5	5	5	5	5	5	5

Table 4 Job evaluations by process functions

After evaluating jobs by process functions, the final job levels (P_s) are calculated using the formula (1): [9, 10]

$$P_s = \frac{P_p \times O}{S_0} \tag{1}$$

where: P_p – required (theoretical) level of work; O – evaluation of work by process functions, and S_0 – evaluation scale [9]. Actual job levels are shown in Table 5.

Process										
function	Re	No	Co	An	Dm	Pl	Al	Org	Pe	Σ
Jobs										
1	25	25	20	25	16	16	3	16	8	154
2	20	20	12.8	-	12.8	9.6	2.4	12.8	6.4	96.8
3	25	25	20	25	20	20	5	20	10	170
4	20	20	16	20	12.8	12.8	3.2	12.8	4.8	122.4
5	-	20	16	20	12.8	6.4	3.2	12.8	4.8	96
6	25	-	20	25	16	16	3	16	8	129
7	20	20	16	-	12.8	16	2.4	12.8	8	108
8	25	25	20	25	20	20	5	20	10	170
9	20	20	16	20	12.8	12.8	3.2	16	8	128.8
10	25	25	20	25	16	16	3	16	10	156
11	20	16	12.8	12	12.8	9.6	1.6	9.6	3.2	97.6
12	20	20	12.8	20	12.8	12.8	2.4	16	8	124.8
13	8	20	16	20	12.8	12.8	4	12.8	3.2	109.6
14	16	16	16	20	12.8	9.6	3.2	9.6	6.4	109.6
15	-	12	7.2	9	7.2	9.6	1.2	7.2	2.4	55.8
16	12	12	7.2	6	7.2	9.6	1.8	4.8	4.8	65.4
17	-	6	-	-	4.8	6.4	1.2	6.4	3.2	28
18	15	15	12	15	12	9.6	2.4	12	6	99
19	25	25	20	25	20	20	5	20	10	170
20	25	25	20	25	16	20	5	16	10	162
21	20	20	16	-	12.8	9.6	3.2	16	8	105.6
22	25	25	20	25	20	20	5	20	10	170
23	25	25	20	25	20	20	5	20	10	170
24	20	20	16	20	12.8	12.8	3.2	16	8	128.8
25	20	20	16	20	16	-	3.2	16	8	119.2
26	20	20	16	20	-	12.8	3.2	16	8	116
27	20	20	16	20	12.8	12.8	4	12.8	6.4	124.8
28	25	25	20	25	20	20	5	20	8	168
29	25	25	20	25	20	16	5	16	10	162
30	-	8	6.4	10	-	4.8	1.2	6.4	1.6	38.4
31	20	20	16	16	12.8	16	4	12.8	6.4	124
32	25	25	20	25	16	20	5	20	8	164
33	20	16	16	20	12.8	12.8	3.2	12.8	4.8	118.4
34	5	5	4	5	-	4	1	4	-	28
35	25	25	20	25	20	20	5	20	10	170
Σ	641	666	543.2	618	466.4	467.2	117.4	498.4	242.4	4260

Table 5 Actual job levels.

The next stage in the application of this method is the calculation of average job grades \overline{O} using the formula (2): [9]

$$\overline{O} = \frac{\sum P_s}{\sum P_p} \times S_o \tag{2}$$

Average job ratings are shown in Table 6.

Process			
function	∑Pp	∑Ps	Ō
Jobs			
1	170	154	4.53
2	116	96.8	4.17
3	170	170	5
4	136	122.4	4.50
5	116	96	4.14
6	145	129	4.45
7	116	108	4.66
8	170	170	5
9	136	128.8	4.74
10	170	156	4.59
11	136	97.6	3.59
12	136	124.8	4.59
13	136	109.6	4
14	136	109.6	4.03
15	87	55.8	3.21
16	102	65.4	3.21
17	40	28	3.50
18	102	99	4.85
19	170	170	5
20	170	162	4.76
21	116	105.6	4.55
22	170	170	5
23	170	170	5
24	136	128.8	4.74
25	120	119.2	4.97
26	120	116	4.83
27	136	124.8	4.59
28	170	168	5
29	170	162	4.76
30	50	38.4	3.84
31	136	124	4.56
32	170	164	4.82
33	136	118.4	4.35
34	28	28	5
35	170	170	5
Σ	4658	4260	4.50

Table 6 Average job ratings

Using the levels from Table 3 and Table 5, the average estimates of process functions (O_{pf}) were calculated using the formula (3): [9]

$$O_{pf} = \frac{\sum P_s}{\sum P_p} \times S_0 \tag{3}$$

where: P_s – actual level of the process function; P_p – required level of process function, and S_0 – rating scale [9, 10].

Average estimates of process functions are shown in Table 7.

Process functions	∑Pp	∑Ps	Opf
Recording	660	641	4.86
Notification	690	666	4.83
Control	564	543.2	4.82
Analysis	645	618	4.79
Decision making	544	466.4	4.29
Planning	556	467.2	4.20
Alignment	143	117.4	4.10
Organization	572	498.4	4.36
Performance	284	242.4	4.27
Σ	4658	4260	4.50

Table 7 Estimates of process functions

Based on the average ratings of jobs and process functions, the ranking of process functions (Figure 1) and jobs (Table 8) is approached.

Ranking of process functions



Fig. 1 Ranking of process functions

By applying the method of process functions to PUC "Naissus", an average grade of work was obtained, which represents an assessment of the organization level. Considering that the numerical value is 4.50, it is concluded that the organization level is such that the execution of work is based not only on the instructions of superiors, but also on organizational regulations. This is primarily true for jobs that are rated higher than the average job rating, and in this case these jobs marked as: "3", "7", "8", "9", "18", "10", "12", "18", "20", "22", "23", "24", "25", "26", "28", "29", "32", "34", and "35", while the remaining jobs have room for improvement. Based on the average assessment of process functions, a clearer picture is obtained of which process functions need to be significantly changed or improved. This refers primarily to those process functions that are rated below the average score (4.50), so in this case, improvement measures should be focused on "planning" (4.20), "decision-making" (4.29), "harmonization" (4,10), "organization" (4.36) and "performance" (4.27).

Rank	Jobs	Level	Average rating	Rank	Jobs	Level	Average rating
1	3	5	5	19	12	4	4.59
2	8	5	5	20	27	4	4.59
3	19	5	5	21	31	4	4.56
4	22	5	5	22	21	4	4.55
5	23	5	5	23	1	5	4.53
6	35	5	5	24	4	4	4.50
7	34	1	5	25	6	5	4.45
8	25	4	4.97	26	33	4	4.35
9	28	5	4.94	27	2	4	4.17
10	18	3	4.85	28	5	4	4.14
11	26	4	4.83	29	13	4	4.03
12	32	5	4.82	30	14	4	4.03
13	20	5	4.76	31	30	2	3.84
14	29	5	4.76	32	11	4	3.59
15	9	4	4.74	33	17	2	3.50
16	24	4	4.74	34	15	3	3.21
17	7	4	4.66	35	16	3	3.21
18	10	5	4.59	Σ			4.50

Table 8 Job ranking

The positive and negative sides of the level of organization are also shown by the rank of process functions and jobs. From that rank, it can be seen which process functions and jobs should be paid more attention to, and that refers primarily to those process functions and jobs that have been assigned high levels and have low average grades. In this case, jobs with the marks "33", "2", "5", "13", "14", "30", "11", "17", "15", and "16" have average scores that are lower than the values assigned to them. The results of this analysis should be viewed critically because a more appropriate analysis of the observed problem should take into account the opinions of a large number of people who are familiar with the subject (or a group of experts) [13, 14, 15].

3. CONCLUSION

The position of the water sector and its responsibility for water supply and sanitation systems and facilities, as well as sustainable operations, are strong reasons for experts and the professional public to become more involved and contribute to improving regulations, application of modern tools and techniques, and other conditions. Compliance with regulations and continuous training of employees to perform all jobs and work at all levels in the field of drinking water supply and sanitation and wastewater treatment is of particular importance for improving the qualification, age, and gender structure of companies and professionals, as well as their competencies.

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PRIMENA METODE PROCESNIH FUNKCIJA ZA OCENU ORGANIZACIONIH PERFORMANSI POSTROJENJA ZA PREČIŠĆAVANJE VODE – PRIMER JKP "NAISSUS" NIŠ

Analizom organa uprave komunalne delatnosti nadležne za prečišćavanje i distribuciju vode, otkrivena je potreba za unapređenjem izvođenja radova u sistemima vodosnabdevanja, kao i jasnim definisanjem mesta i uloge upravljanja i planiranja u kontekstu isporuke pijaće vode. Stoga se u ovom istraživanju procena organizacionih performansi postrojenja za prečišćavanje vode vrši metodom procesnih funkcija. Takođe, ova metoda unapređuje efikasnost rada postrojenja za prečišćavanje vode, kroz ocenu performansi realizacije poslova u oblasti vodosnabdevanja.

Koncept procesnih funkcija uključuje analizu ključnih poslova neophodnih za pravovremenu i uspešnu realizaciju zadataka od strane svakog zaposlenog u organizaciji. Ovaj metod ima najveću primenu u organizacionim naukama, kao što je upravljanje ljudskim resursima odnosno organizacioni dizajn (uključujući analizu funkcionalnih organizacionih šema), dok je u inženjerskim naukama manje zastupljen. Budući da je najvažniji resurs svake organizacije ljudski kapital (odnosno njeni zaposleni), cilj ovog rada je analiza organizacije javnog komunalnog preduzeća iz Republike Srbije "Naissus" Niš, u smislu ocene performansi različitih organizacionih nivoa. Osnovni zaključak rada sugeriše uvodjenje metode procesnih funkcija kao standardne analitičke metode kojom se analiziraju sve aktivnosti unutar postrojenja za prečišćavanje i ditribuciju vode u cilju optimizacije njegovog rada.

Ključne reči: vodosnabdevanje, upravljanje vodama, metoda procesnih funkcija, postrojenje za prečišćavanje voda, organizacioni nivo