ZBORNIK RADOVA PROCEEDINGS

12. SAVETOVANJE O ELEKTRODISTRIBUTIVNIM MREŽAMA sa regionalnim učešćem
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CIRED

APPLICATION OF MODERN IT TOOLS FOR EFFICIENT PROJECT MANAGEMENT IN DISTRIBUTION SYSTEM OPERATOR ELEKTROPRIVREDA BiH

PRIMJENA SAVREMENIH IT ALATA ZA EFIKASNIJE UPRAVLJANJE PROJEKTIMA U OPERATORU DISTRIBUTIVNOG SISTEMA JP ELEKTROPRIVREDA BIH

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ABSTRACT

Managing the power distribution system is very complex and depends on various related subprocesses. Without having appropriate IT systems, it would be impossible to achieve a satisfying level of interconnections between processes and their efficiency.

The main goal of this paper is to demonstrate the use of the MS Project server as a software tool for managing projects in the Distribution System Operator (DSO) of Public Enterprise Elektroprivreda B&H (EP B&H). Initially, the Project server was implemented to manage investment projects in the DSO, but over time it's application expanded to manage the connections to the power distribution system (PDS).

This paper considers how the software is used for more transparent and efficient management of project tasks, documentation and resources of the project (human resources, cost, materials).

A special overview is given regarding interfaces for data exchange with other databases such as a database for project initiatives, database for connections to PDS, financial database SAP, and others.

Keywords: power distribution system (pds), project server (ps), distribution system operator (dso)

KRATAK SADRŽAJ

Procesi upravljanja elektrodistributivnim sistemima su kompleksni i zavise od različitih povezanih podprocesa. Bez primjene adekvatnih IT alata, ne bi bilo moguće postići zadovoljavajući nivo povezanosti procesa niti njihovu efikasnost.

Cilj ovog referata je da prikaže primjenu MS Project servera u JP Elektroprivreda BiH, kao softverskog alata za upravljanje projektima u distributivnoj djelatnosti. Inicijalno, Project server je implementiran sa ciljem upravljanja projektima ulaganja u elektrodistributivne sisteme, ali se vremenom njegova primjena proširila i na upravljanje procesom priključenja, tačnije složenim priključcima.

Referat će pokazati na koji način se softver koristi za transparentnije i efikasnije upravljanje projektnim zadacima, dokumentacijom, ali i resursima samog projekta (ljudi, troškovi, materijali).

Posebno će se opisati integracioni interfejsi Project servera sa drugim informacionim sistemima sa kojim se razmjenjuju potrebni podaci: baza ulaganja od koje se preuzimaju odobreni investicioni projekti, baza podataka za priključenja krajnjih kupaca i proizvođača na distributivnu mrežu, te informacioni sistem za upravljanje finansijama (SAP FMIS).

Ključne riječi: eds, project server, ods, baza ulaganja

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I INTRODUCTION

Due to its function and mission, the electric energy distribution business has a constant need to invest in the power distribution system (PDS). The PDS investment process consists of a sub-processes such as analyzing PDS needs, defining optimal techno-economic solutions, defining PDS development plans, securing investment funding, procuring goods and services, managing project implementation, etc. Since inadequate investment in PDS can lead to problems in providing access for new PDS users (consumers and producers), as well as the inability to provide secure, stable and quality supply to PDS users, it is necessary that the investment process follows the dynamics of PDS needs.

A prerequisite for successful business processes is adequate system quality documents and the use of IT tools. IT tools have the function of applying the process flow described in system quality documents, as well as increasing employee efficiency and enabling reporting in order to make the right decisions.

The process of managing distribution investments is so complex that any of the tools available cannot cover all sub-processes. The company-wide recommendations for optimizing investment project management are as follows:

- maximum use of existing IT systems (SAP ERP, MS Project, internally developed modules).
- enable the use of IT tools precisely for those activities for which they were purposefully developed (internally or externally).
- define unique sources of data.

In order for PDS investments to produce the desired results, it is necessary to have an adequate PDS investment planning process. Development of PDS investment plans implies analysis of the current situation, respect for regulatory plans and dynamics of their realization, implementation of energy budgets, the definition of technical solutions. Therefore, a combination of many technical expert knowledge and the ability to apply them is needed to define PDS investment project proposals. At the company level, a system is established whereby investment proposals are included in the Investment Plan if they meet all technical and procedural criteria, which is ensured by clearly defined levels of control of each project proposal.

After analyzing the available IT solutions and not finding an adequate tool for planning the investment in PDS, the company decided to develop custom solutions internally. Therefore, for the development of investment project proposals, their control and the definition of investment plans the internally developed PDS Investment Database (PID) application is used.

The first step in the investment process is to propose investment projects. The proposer defines the proposal for the construction of a new or reconstruction of the existing electrical power facility (PF) by entering into the PID investment module. Each investment proposal must go through control, certification and approval by competent employees through PID, after which the project automatically enters into the Investment Plan, and its realization can start.

Project realization is also a complex process, and for its success, it is necessary to have the skills and knowledge of project management. After the final approval of the proposal for investment in PID, the project becomes an integral part of the Investment Plan and is transferred to the Project server database via the synchronization interface. EP B&H uses the Project server as a tool for managing project realization. The Project server is a flexible IT solution designed for managing project portfolios, which is the case in EP B&H's distribution business, which realizes over 1000 projects annually. The Project server, besides assisting the employees involved in the process of Investment Plan realization, also represents a significant amount of know-how, i.e. the transfer of knowledge and best practices of project management. The Project server monitors the dynamics of project realization and updates the project statuses. Based on the status of the project, data interfaces with other modules (Internal Technical Reception, Investment Plan, etc.) are activated.

The organization of the investment realization process of the EP B&H distribution business is described in Section II. Section III presents Project server usage for investment realization. Section IV gives an overview of accomplished Project Server integrations with other applications. Section V considers implemented the BI reporting system for investment projects. Concluding considerations are presented in Section VI.

II PROCESS FLOW OF MANAGEMENT INVESTMENT PROJECTS

The process of investing in PDS starts with recognizing the need to invest in PDS, which can be accomplished by DSO analysis or application of new PDS users for the connection. This implies that it is necessary to continuously plan PDS development projects throughout the year.

In the DSO regions, Department for energy analysis constantly analyzes the energy state of the system, on the basis of which project proposals for investments in PDS are generated through the internally developed PID application. After the project proposal is defined, it goes through several levels of control in the DSO region and

the Directorate of the company controlling the real need for the project, its priority, the proposed technical solution, the technologies used, fitting into long-term PDS development strategies. It is important to emphasize that in the planning process, at no time should planners and controllers be burdened with budgets or administrative difficulties to implement the project. The basic motive in the planning process is to define optimal technical solutions in accordance with the dynamics of PDS development needs.

In addition to the analyzes conducted by the DSO, the process of connecting new PDS users (consumers and distributed generators) is ongoing. An existing PDS may not always meet the requirements for connecting new users to PDS, and it is necessary to invest in PDS to meet the requirements for the connection. DSO EP B&H uses internally developed application DISP for the connection process. If a significant investment in PDS is required to create the conditions for connection to the PDS, such connection is characterized as a complex connection. Due to the logic implemented in the Project server (task, task holder, deadline), the Project server is used to manage the realization of complex connections.

The PDS investment plan consists of PDS development projects and complex connections that are transferred to the Project server by the interface after their control obtained by the competent employees. So all PDS investment projects are managed through the Project server. In addition to the interface with the PID and DISP applications, the Project server also has an interface with the SAP application. SAP records all financial flows of the company, including those related to investment projects. A graphical representation of the interface between the Project server and other applications is shown in Figure 1.

Clear roles have been established for all project realization participants. The project manager is the person responsible for project realization, who defines tasks, allocates resources, sets timelines, manages team communication, manages project budgets, analyzes risks. The task holder is the person responsible for the realization of the activity/task obtained from the project manager. The management is responsible for the realization of the DSO business goals.

Project managers (PM) are responsible for the realization of the projects assigned to them and cannot influence the list of projects in the Investment Plan. The PMs are obliged to draw up a plan of realization of each individual project (tasks, task holders, deadlines) as soon as possible, respecting the defined deadlines for project realization and allocated resources. In defining the realization plan of activities on projects, PMs have to consider the whole planning year, the influence of weather conditions on the possibility of realization, time of holidays and vacations, optimal use of available resources. PM must regularly analyze and eliminate project standstills and delays. If the problem for the project realization goes beyond the jurisdiction of the PM, the PM delegates the problem to the management and helps in its solving.
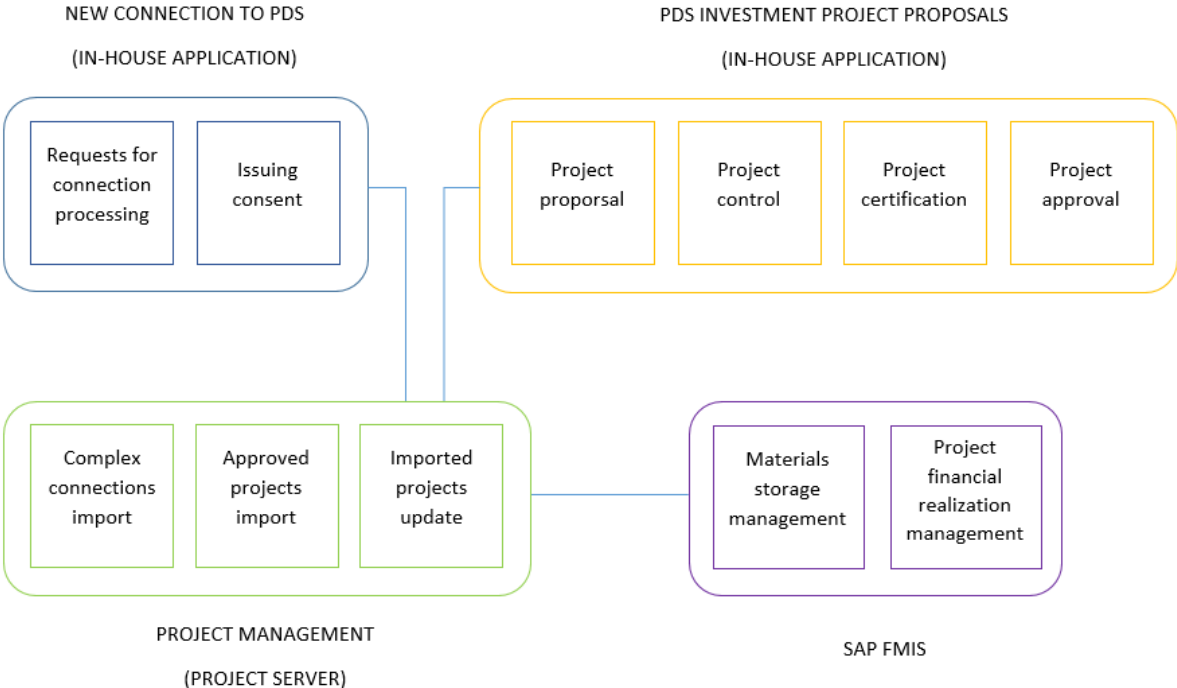

FIGURE 1 – INVESTMENT PROCESS DIAGRAM

The task holder analyzes the task after receiving it from the PM, and either accepts it or asks the PM for additional clarifications or documentation needed to complete the task. After completing the task, the task holder records in the Project server that the activity has been completed, and scans and archives the supporting documentation on the Project server resulting from that activity. If for some reason he encounters a problem that is not within his competence, the task holder selects the cause of the delay or deadlock from the predefined list (drop-down menu), thus informing the other participants in the project that there is a problem for the realization of the activity. If the task is the supervision of activity practically implemented by a third party, the task holder has all the rights and obligations under this task as if it is personally accomplished (accepting the task, entering information on the status of realization, recording delay or deadlock, scanning and recording documentation).

Management is competent and responsible for the achievement of business goals, including the successful completion of the PDS investment process. To achieve this, management solves delays and deadlocks in the realization of investment projects for which PMs have no jurisdiction. Also, management is constantly informed about the current state of investments through appropriate business intelligence (BI) reports that show updated key process indicators and provide guidance to competent managers for business decisions.

III INVESTMENT PROJECT MANAGEMENT THROUGH PROJECT SERVER

Project management

Project server is a centralized application solution for managing the realization of investment projects, with a focus on the management of:
- project activities (tasks),
- realization dynamics and project statuses,
- project documentation,
- resources,
- costs,
- project risks/problems.

The proposal of the investment project defines the kind of the object, which implies the type of the object (transformer substation, cable transformer substation, overhead power line, cable, universal cable, low-voltage network) and voltage level. The proposal for investment also defines the type of works (construction, reconstruction, repair, purchase, etc.). Based on the type of object and the type of work that the proposer defines when preparing the investment proposal, type projects are created from predefined templates on the Project server (so-called "templates").

The defined project template contains:
- list of project activities/tasks,
- project start and end date,
- start and end dates for individual tasks,
- links between tasks that can determine the start time of a task (eg. The task "Revision of the project task" can not start before the task "Production of the project task" is completed),
- a break between two consecutive activities (the so-called "lag" during which the system does not account for the labor consumed),
- predefined folders for storing project documentation.

Templates and project types are intended to make it easier for the Project manager to manage projects, so as not to repeat certain activities common to all projects. After creating a standard project, the Project manager has the ability to delete or correct certain tasks, and add new ones as needed.

The predefined project template contains project activities/tasks divided into two groups:
- Project preparation
- Project realization

Based on the status of the updated tasks, the Project server, through its own algorithm, calculates the percentage of completion of the entire group of activities, and of the project as a whole. In this way, the project manager in charge has an insight into the status of the project.

TABLE 1 – OVERVIEW OF PREDEFINED PROJECTS AND TEMPLATES

ID	Enterprise Project Type	Project Plan Template
1	Substation construction	Template_Construction_EEO
2	Overhead line construction	Template_ Construction_EEO
3	LV power grid construction	Template_ Construction_EEO
4	Other constructions	Template_ Construction_EEO
5	Substation reconstruction	Template_Reconstruction_EEO
6	Overhead line reconstruction	Template_Reconstruction_EEO
7	LV power grid reconstruction	Template_Reconstruction_EEO
8	Other reconstructions	Template_Reconstruction_EEO
9	Rehabilitation	Template_Purchase_Rehabilitation_EEO
10	Purchase	Template_ Purchase_Rehabilitation_EEO
11	Device installation	Template_Other_Projects
12	Office building reconstruction	Template_Reconstruction_EEO
13	Measuring point reconstruction	Template_Reconstruction_EEO
14	Distribution generator reconstruction	Template_Reconstruction_EEO
15	Office building construction	Template_Construction_EEO
16	Supervisory control and data acquisiton	Template_Other_Projects
17	Complex connections to PDS	Template_Complex_Connections

Task Mode	Task Name	Resource Names	Duration	Start	Finish	Predecessors	% Complete	S
	◢ Construction_EEO		435 days	Wed 2.10.19	Tue 1.6.21		0%	
	◢ Preparation		315 days	Wed 2.10.19	Tue 15.12.20		0%	
	Project task		30 days	Wed 2.10.19	Tue 12.11.19		0%	
	Preliminary project		10 days	Wed 13.11.19	Tue 26.11.19	3	0%	
	Urbanistic consent		120 days	Wed 27.11.19	Tue 12.5.20	4	0%	
	Legal-property relationships		60 days	Wed 13.5.20	Tue 4.8.20	5	0%	
	Main project		20 days	Wed 5.8.20	Tue 1.9.20	5;6	0%	
	Building permit		60 days	Wed 2.9.20	Tue 24.11.20	7	0%	
	Work order and investment decision		15 days	Wed 25.11.20	Tue 15.12.20	8	0%	
	◢ Realization		289 days	Thu 23.4.20	Tue 1.6.21		0%	
	Preparatory work		15 days	Wed 16.12.20	Tue 5.1.21	9	0%	
	Introduction into work		15 days	Wed 6.1.21	Tue 26.1.21	11	0%	
	Construction works		30 days	Wed 27.1.21	Tue 9.3.21	12	0%	
	Electro-assemby works		30 days	Wed 10.3.21	Tue 20.4.21	13	0%	
	Internal technical review		15 days	Wed 21.4.21	Tue 11.5.21	14	0%	
	External technical review		15 days	Wed 12.5.21	Tue 1.6.21	15	0%	
	Project handover		5 days	Thu 23.4.20	Wed 29.4.20		0%	

FIGURE 2 – EXAMPLE OF A TYPICAL PROJECT

Project documentation management

At the level of each project, when creating a standard project, a directory structure is formed:
- *Project Initiative*
- *Project Initialization*
- *Project Realization*

The first directory contains documentation that emerges from the project proposal process and is uploaded through the integration interface from PID. These are sketches of the technical solution of the investment project, the geo-referenced technical solution from the GIS system, etc.
The other two directories are initially blank and are intended for storing and keeping the records of project initialization and project realization. The role of the Project manager, as well as of the recipients of the assignments, is to store the documentation after completing a specific assignment in the associated directory.

Resource management

Four user groups have been implemented on the Project server, integrated with the Windows Active Directory network infrastructure. This way access to the Project server is regulated through membership in the group, and

therefore no special login to the server is required. In other words, Single Sign-On Active Directory authentication is implemented, based solely on the user group of the Windows group, and the set rights at the Project server level. The table below provides an overview of user groups and associated roles.

At the level of each individual project, the responsible Project manager should create his/her own project team (the so-called Resource pool). To facilitate this activity, predefined project team groups are created, at the level of each DSO region, and at the level of each individual resource, a predefined membership to a given group has been created. In this way, by selecting a project team, all team members become at the same time members of the resource pool.

TABLE 2 - OVERVIEW OF TYPICAL PROJECT SERVER USERS

AD group	Role	Rights
EPM_PROJECT_MANAGERS	Project manager	Full management: Projects, Task/Time, Resources, Views, Status Reports
EPM_MANAGEMENT	Managers	Read-only: Projects, Views
EPM_TEAM_MEMBERS	Task holders	Full: Tasks
EPM_ADMINISTRATORS	Administrators	Full: All

IV INTEGRATION INTERFACES

On the one hand, due to its complexity, the investment process cannot be covered by one application, while on the other hand, it is necessary to have all the necessary information for managing projects in one place. Therefore, interfaces between Project servers and other applications have been developed.

Integration with Oracle PDS Investments Database

The project server is integrated with the PID application in such a way that all project proposals approved by authorized employees are transferred to the Project server database with:
- related data, such as project name, planned year of realization, explanation of investment, the reason for investment, type of works, type of object, effects of realization, created by, controlled by, verified by, approved by, planned costs, detailed specification of required materials, works and services, etc.
- project documentation (geo-referenced technical solution, sketches, etc.)

Technically speaking, integration is implemented through views on the original database (called Views):
- *ulv_mssp_project*
- *ulv_mssp_project_attachment*
- *ulv_mssp_finance_structure*
- *ulv_mssp_investment*
- *ulv_mssp_projectserver*

Integration with Oracle database DISP

Two views have been created in the DISP database for the transfer and project management of complex connections:
- dpvw_complexconnections
- dpvw_scannedconsent

Considering that the investment database is the only source of data for the Project server, at the level of the existing views, a union of the investment database (ulv_mssproject, ulv_mssp_project_attachment) and DISP database (dpvw_complexconnections, dpvw_scannedconsent) was created, which completely unified the source and structure of the data which are transferred to the Project server. New columns specific to complex connections are added: PLAN, ELIGIBILITYDATE, PREPARATIONWORKS, and COMPLEXITYCATEGORY, with the PLAN column automatically filling in with YES if at least one of the following two conditions is met: APPROVED_DSO *not null* or *ELIGIBILITYDATE not null.*

Integration with MS Exchange server

The integration of the Project server with the Exchange server is implemented through mail notifications, for certain events defined by the system administrator (assigning a new task, updating the task, a problem in executing a specific job, etc.).
There are two ways to set up mail notifications:
- project managers can set up mail notifications for their resources, ie project team members,
- project team members can customize their mail notification mode.

The following mail notifications have been implemented at Project Server level:
- When assigning a new assignment, the recipients receive a mail notification containing: project name, assignment name, start date and end date of the activity,
- The Project manager receives a mail notification when the task holder updates a task status,
- In the case of certain problems in executing predefined system jobs (import projects) or in case of problems when starting system tasks (eg deleting certain projects, tasks or resources), administrators receive a mail notification (the so-called Status report).

In addition to sending mail notifications to project participants who are employees of EP B&H, there is the possibility of creating external resources (Contractors) that can be issued a task, and accompanying mail notification.
In addition to these mail notifications, there is an option to set reminders in the following situations:
- before the start of the task,
- before the deadline for completion of the task,
- for unfinished tasks,
- after the deadline for completion of the task.

Integration with SAP ERP system

For the purpose of more efficient monitoring of project costs, the following information is monitored through the Project server: total planned project cost, project preparation cost, project realization cost, realized project cost.
The figure "% of financial realization of the project" is calculated by the formula:

[Realized project cost] * 100 / [Total planned project cost].

For the purpose of monitoring the realized project costs and comparing them with the planned project costs, the integration of the Project server with the SAP ERP system via BI Theobald connectors was established. The connection between the Project server and the SAP ERP system is established by USR02 field, which must be manually filled out with project ID information on the SAP side. Cost data is transferred through the daily job to the Project Server database and joined with the associated project ID.

V BI REPORTS

The establishment of BI reporting replaced the traditional inert, unreliable and non-uniform reporting system, and established a system where all competent employees have up-to-date insight into automatically generated reports formed from databases according to uniformly defined criteria for all DSO organizational parts.
The philosophy that EP B&H has followed in creating the BI reports is that top management defines the criteria based on which the individual cases are classified into successful or unsuccessful. Based on the defined criteria, algorithms are set up to access data from different databases and process them into certain categories.
The results of the algorithm are presented in a simple interactive Excel spreadsheet where all report recipients have an insight into the results of all organizational units.
In addition to the cumulative overview, BI reports are designed to easily provide insight into each of the subjects that participate in the formation of the report. Double-clicking on a number of interest will break it down into individual cases with associated detailed information.
The recipients of the BI reports are all competent employees within a specific process, from the immediate manager to the CEO. In this way, it all competent employees have the same report as a reference, thus avoiding subjectively created reports.
The BI reports of the EP B&H are following the idea that every morning upon arrival, the direct executives can plan daily activities within their competence according to the performance criteria defined in the report. In addition, the reports are designed in such a way that it is possible to carry out periodic analyzes as well as the formation of statistical indicators.

Figure 2 shows some views of the BI report regarding the realization of the Investment Plan.
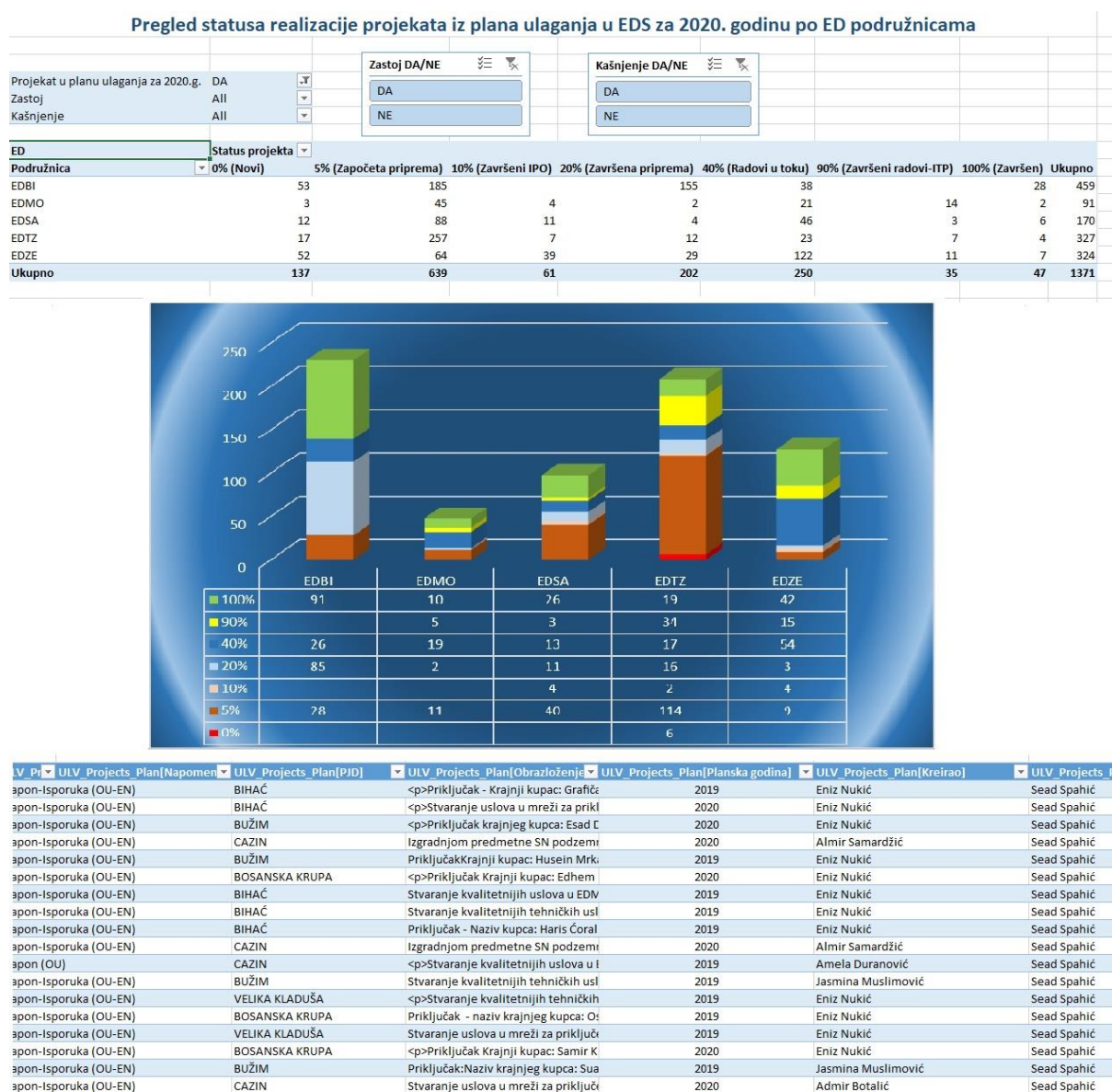
Pregled statusa realizacije projekata iz plana ulaganja u EDS za 2020. godinu po ED podružnicama

Projekat u planu ulaganja za 2020.g.	DA
Zastoj	All
Kašnjenje	All

| Zastoj DA/NE |
| DA |
| NE |

| Kašnjenje DA/NE |
| DA |
| NE |

ED Podružnica	Status projekta 0% (Novi)	5% (Započeta priprema)	10% (Završeni IPO)	20% (Završena priprema)	40% (Radovi u toku)	90% (Završeni radovi-ITP)	100% (Završen)	Ukupno
EDBI	53	185		155	38		28	459
EDMO	3	45	4	2	21	14	2	91
EDSA	12	88	11	4	46	3	6	170
EDTZ	17	257	7	12	23	7	4	327
EDZE	52	64	39	29	122	11	7	324
Ukupno	137	639	61	202	250	35	47	1371

	EDBI	EDMO	EDSA	EDTZ	EDZE
100%	91	10	26	19	42
90%		5	3	34	15
40%	26	19	13	17	54
20%	85	2	11	16	3
10%			4	2	4
5%	28	11	40	114	9
0%				6	

ULV_Pr ULV_Projects_Plan[Napomen	ULV_Projects_Plan[PJD]	ULV_Projects_Plan[Obrazloženje	ULV_Projects_Plan[Planska godina]	ULV_Projects_Plan[Kreirao]	ULV_Projects_Pla
apon-Isporuka (OU-EN)	BIHAĆ	<p>Priključak - Krajnji kupac: Grafič	2019	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	BIHAĆ	<p>Stvaranje uslova u mreži za prikl	2020	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	BUŽIM	<p>Priključak krajnjeg kupca: Esad D	2020	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	CAZIN	Izgradnjom predmetne SN podzem	2020	Almir Samardžić	Sead Spahić
apon-Isporuka (OU-EN)	BUŽIM	PriključakKrajnji kupac: Husein Mrk	2019	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	BOSANSKA KRUPA	<p>Priključak Krajnji kupac: Edhem	2020	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	BIHAĆ	Stvaranje kvalitetnijih uslova u EDN	2019	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	BIHAĆ	Stvaranje kvalitetnijih tehničkih usl	2019	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	BIHAĆ	Priključak - Naziv kupca: Haris Ćoral	2019	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	CAZIN	Izgradnjom predmetne SN podzem	2020	Almir Samardžić	Sead Spahić
apon (OU)	CAZIN	<p>Stvaranje kvalitetnijih uslova u	2019	Amela Duranović	Sead Spahić
apon-Isporuka (OU-EN)	BUŽIM	Stvaranje kvalitetnijih tehničkih usl	2019	Jasmina Muslimović	Sead Spahić
apon-Isporuka (OU-EN)	VELIKA KLADUŠA	<p>Stvaranje kvalitetnijih tehničkih	2019	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	BOSANSKA KRUPA	Priključak - naziv krajnjeg kupca: Os	2019	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	VELIKA KLADUŠA	Stvaranje uslova u mreži za priključ	2019	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	BOSANSKA KRUPA	<p>Priključak Krajnji kupac: Samir K	2020	Eniz Nukić	Sead Spahić
apon-Isporuka (OU-EN)	BUŽIM	Priključak:Naziv krajnjeg kupca: Sua	2019	Jasmina Muslimović	Sead Spahić
apon-Isporuka (OU-EN)	CAZIN	Stvaranje uslova u mreži za priključ	2020	Admir Botalić	Sead Spahić

FIGURE 3 – BI REPORT ON REALIZATION OF INVESTMENT PLAN

VI CONCLUSION

Given the complexity of the PDS investment process, it is impossible to successfully manage this process without the use of adequate IT tools. ODS JP Elektroprivreda B&H has decided to use internally developed applications for investment planning in PDS, while the MS Project server brand solution has been implemented to manage the realization of investment projects. In order for the Project server to meet the needs of the process, appropriate interfaces were also created with applications through which investment projects are created, then with the accounting system, as well as the mail server.

The use of IT tools in the process of investing in PDS provided complete insight into the state of realization of each individual project. Thanks to the implemented IT tools, the necessary data were generated in databases, on the basis of which expert analyzes of the investment process in PDS were made. Based on analyzes, the improvements needed to improve the efficiency of this process have been proposed and implemented.

VII LITERATURE

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