

PROJECT MANAGEMENT USING PRIMAVERA FOR ENTERPRISE SYSTEM

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Abstract: Presently, due to the globalization and internationalization of markets which have increased competitive pressures on enterprises, the companies are engaged in projects that are critical to their performance. These projects need to be managed, planned, organized, staffed, monitored, controlled, and evaluated. The project management system, Primavera, is a full solution to manage projects professionally. This paper presents an example of using the Primavera software for managing a project.

1. INTRODUCTION

Large business typically have hundreds – even thousands of projects underway at one time to create the new products and services that build their future. These projects cross normal business hierarchies and chains of command, making project management an organizational – wide challenge. The pressure to complete projects on time and within budget, and maintain a competitive edge, is driving corporations to develop and implement project management processes. Project management can be defined as “The manner of implementation, of expertise, paraphernalia, knowledge and modus operandi to an extensive range of activities for the fulfillment of prerequisite of the specific project.”[1]

A project is defined as a temporary endeavour undertaken to create a unique product or service (Project Management Institute, 2004). According to the Project Management Body of Knowledge (PMBOK), a project includes the following four phases: Initiating, Planning, Executing, Controlling and Closing”. Initiating the phase where a new project is formally authorized. This phase links the project to the ongoing work of the performing organization. Planning processes define and refine objectives and select the best of the alternative courses of action to attain the objectives that the project was undertaken to address. Executing processes coordinate people and other resources to carry out the plan. Finally, closing processes formalize acceptance of the project and bring it to an orderly end.

In figure 1 are presented the main stages of a project.

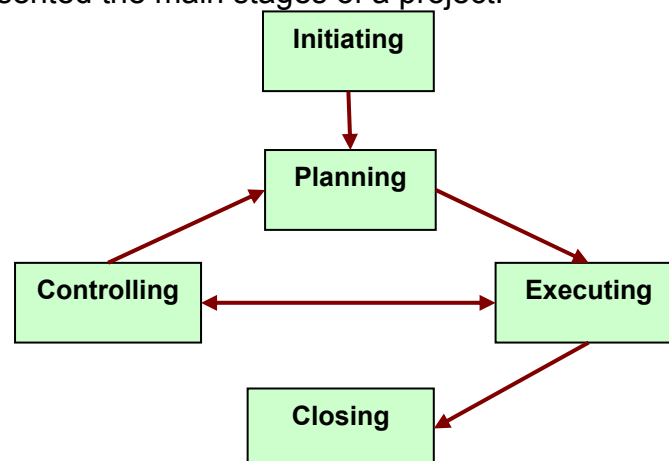


Figure 1. The stage of a project development

Project management provides comprehensive information on all projects in an organization, from executive - level summaries to detailed plans by project. Individuals across all levels of the company can analyze, record and communicate reliable information and make timely informed decisions that support their corporate mission [2], [3].

By putting the right tool in the right hands, project management enables an organization to

- + make strategic business decisions
- + control the minute detail that is necessary to finish projects
- + understand current resource demands, set priorities and evaluate long - term staffing requirements
- + use skilled resources effectively and productively
- + reorganize projects to fit shifting priorities without sacrificing quality

In this paper we present an example of using the Primavera software for managing a production project carried out in the Project Management laboratory of the Mechanic and Technology Faculty, University of Pitești

2. COMPONENTS OF PRIMAVERA

Primavera provides an integrated project management solution consisting of role-specific tools to satisfy each team member's needs, responsibilities, and skills. This solution uses standard Windows interface, client/server architecture, Web-enabled technology, stand-alone or network-based databases.

The product suite consists of the following components [2]:

Project Management Application. The Primavera project management application enables users to track and analyze performance.

It is a multiuser, multiproject system with scheduling and resource control capabilities supporting multitiered project hierarchies, resource scheduling with a focus on roles and skills, recording of actual data, customizable views, and user-definable data.

Methodology Management. The Methodology Management module is a system for authoring and storing methodologies, or project plan templates, in a central location. Project managers can select, combine, and tailor methodologies to create custom project plans.

These customized methodologies can be imported into the Project Management module and used as templates for new projects.

Portfolio Analysis. The Portfolio Analysis module is a reporting tool, providing senior managers with the summary view of project data that their roles require.

Timesheets Application. The Primavera suite of products also includes a Web-based interproject communication and timekeeping system.

As a team-level tool for project participants, it helps team numbers focus on the work at hand with a simple cross-project to-do list of their upcoming assignments. It also provides views of project changes and timecards for manager approval.

Role-based Web Application. The role-based Web application allows users to access project management data via the internet.

Primavera Software Development Kit. The Primavera Software Development Kit (SDK) enables users to integrate the data in the project management database with external databases and modules.

It provides access to the schema and to stored procedures that encapsulate business logic.

3. USING PRIMAVERA SYSTEM FOR MANAGING A PRODUCTION PROJECT

The project concerns the implementation of the three parts constituting a product whose operating processes are simplified in the table 1. Original duration and lag time for the relationship are expressed in working days.

Component 1			Component 2			Component 3		
Activity Name	Original Duration [day]	Lag [day]	Activity Name	Original Duration [day]	Lag [day]	Activity Name	Original Duration [day]	Lag [day]
Milling-Drilling-Reaming	4,25	1,5	Surface Milling	1	0,25	Turning1	1	-
Cherrying	3,25		Drilling - Reaming	1,25		Turning2	0,5	
Drilling	1,75	0,75	Milling-Drilling-Reaming-Rolling	3,5	0,5	Drilling	0,5	-
		0,75			0,5			-
Internal Grinding	1,5	0,25	Surface grinding	1, 5	0,25	Milling	0,25	-
Final control	1		Final control	1		Grinding	0,5	-
						Final control	1	-

Table 1. The project activities and their original duration

The resources used for the project are shown in Figure 2.

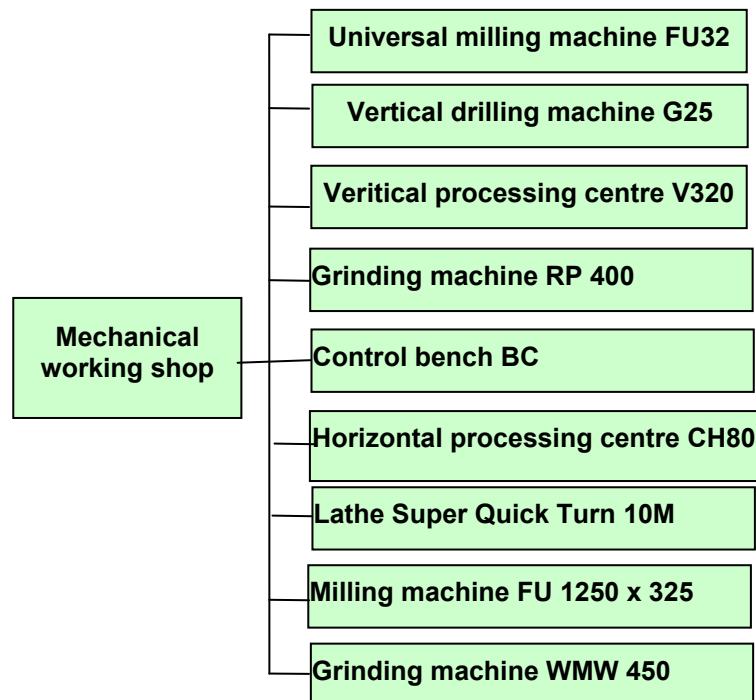


Figure 2. The resources of project

The stages for managing the our project using the Primavera software are [4]:

1. Adding a new project to the Enterprise Project Structure (EPS);
2. Reviewing Work Breakdown Structure;
3. Define the activities, their original duration, relationships and constraints needed to be done;
4. Defining the resources available.

Adding a new project to the Enterprise Project Structure (EPS)

In the first stage is selected a Enterprise Project Structure, in this case “Commercial, Manufacturing and Distribution” for the new project. The next step defines the calendar the software, Saturday and Sunday are to be not working days.

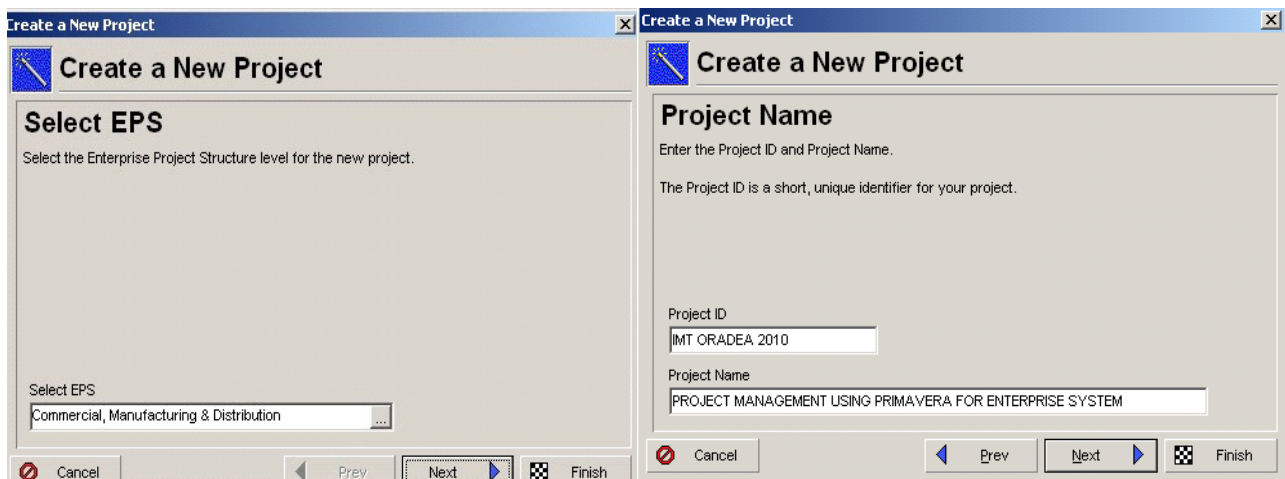


Figure 3. Add a new project to EPS

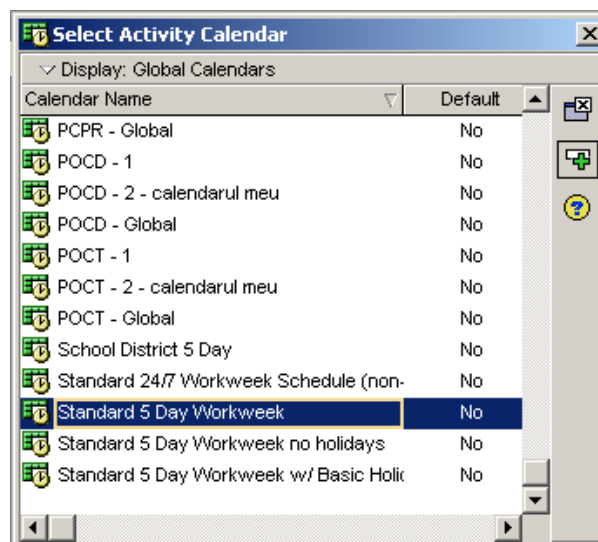


Figure 4. Calendar set up

Reviewing Work Breakdown Structure

A work breakdown structure (WBS) is a hierarchical arrangement of the products and services produced during and by project. The project is the highest level of the WBS while an individual activity required to create a product or service in the lowest level. Each project in the enterprise project structure (EPS) has its own WBS. When creating a project, the project manager typically develops the WBS first, assign work products and

documents to each WBS element, and then defines activities for performing the element's work. For our project, the work breakdown structure is presented in figure 5.

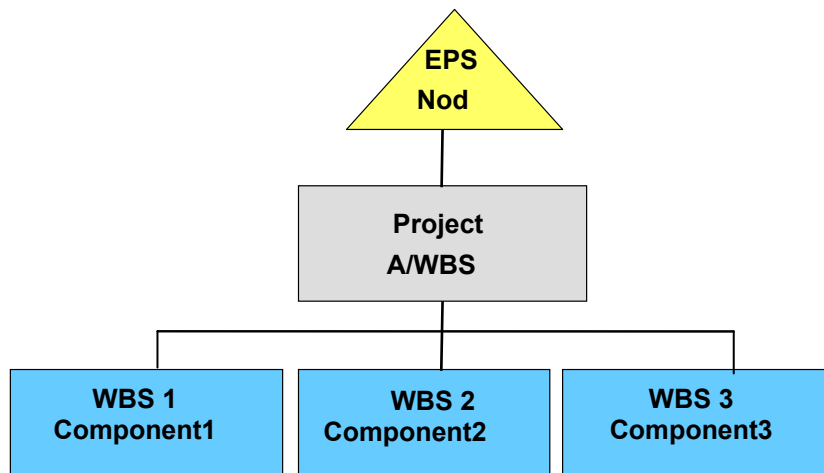


Figure 5. The Work Breakdown Structure - WBS of project

Define the activities, their original duration, relationships and constraints needed to be done

Activities are the fundamental work elements of a project. They are the lowest level of a WBS and, as such, are the smallest subdivision of a project that directly concerns the module. In order to completely define a activity the user must know the name of the activity, the original duration of activity, the relationships between activities, the lag time for relationships and the constraints for activities.

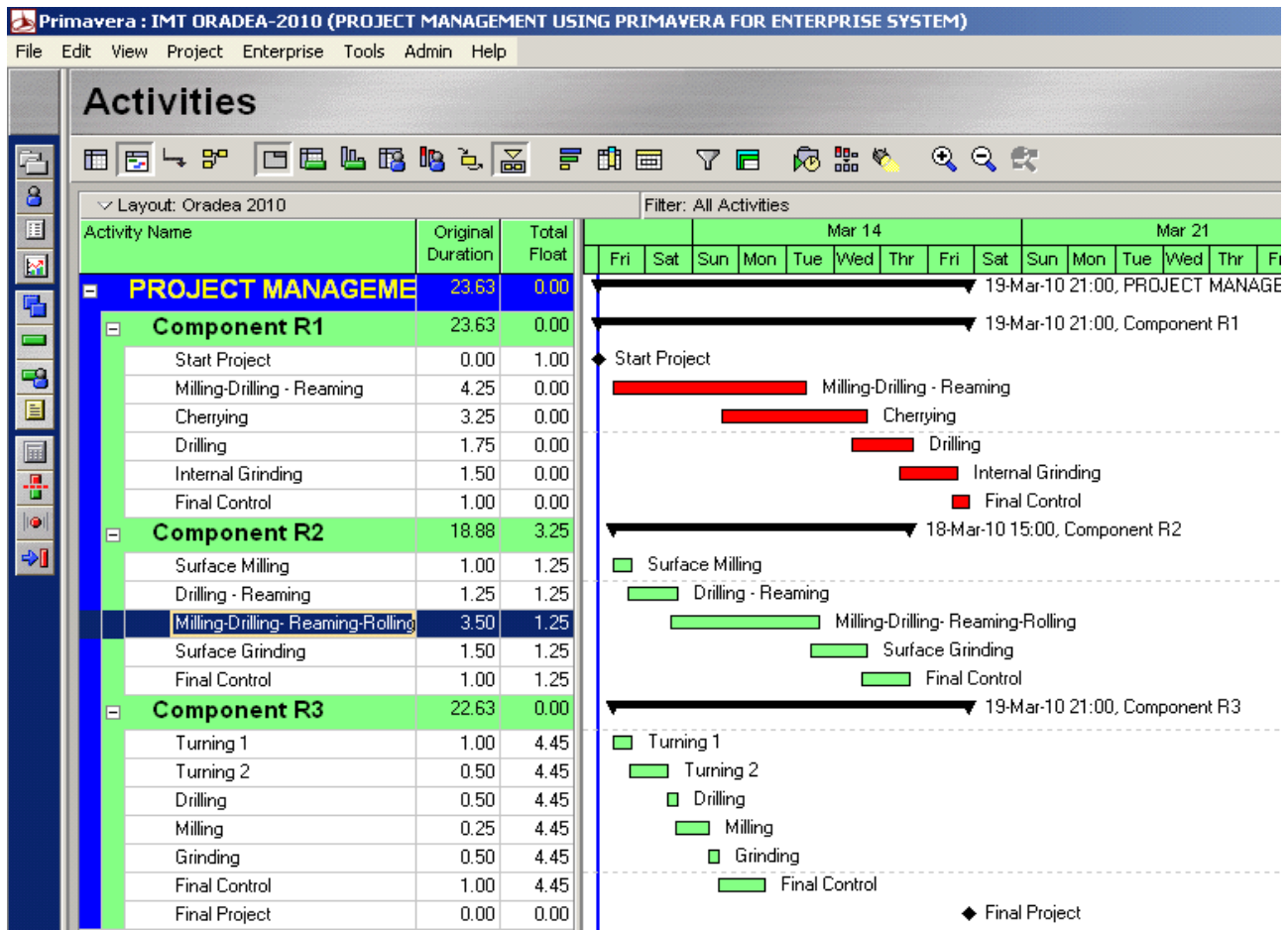


Figure 6. The activities of project

Using Primavera we can define the following four types of relationships. Typically we define relationships from the predecessor to the successor activity.

Finish to start. The successor activity can begin only when the predecessor activity completes.

Finish to finish. The finish of the successor activity depends on the finish on the predecessor activity.

Start to start. The start of the successor activity depends on the start of the predecessor activity.

Start to finish. The successor activity cannot finish until the predecessor activity starts.

When a successor activity cannot start or finish as soon as its predecessor starts or finishes, we can define a lag time for the relationship. Lag is the number of time units from the start or finish of an activity to the start or finish of its successor. Lag can be a positive or negative value. For our project the relationship type is *Finish to start* and the lag is negative. The figure 6 presents the Gantt charts with the activities for the project.

Defining the resources available.

For each activity we define a resources. Resources include the personnel and equipment that perform work an activities across all projects. The list of resources is presented in the figure 7.

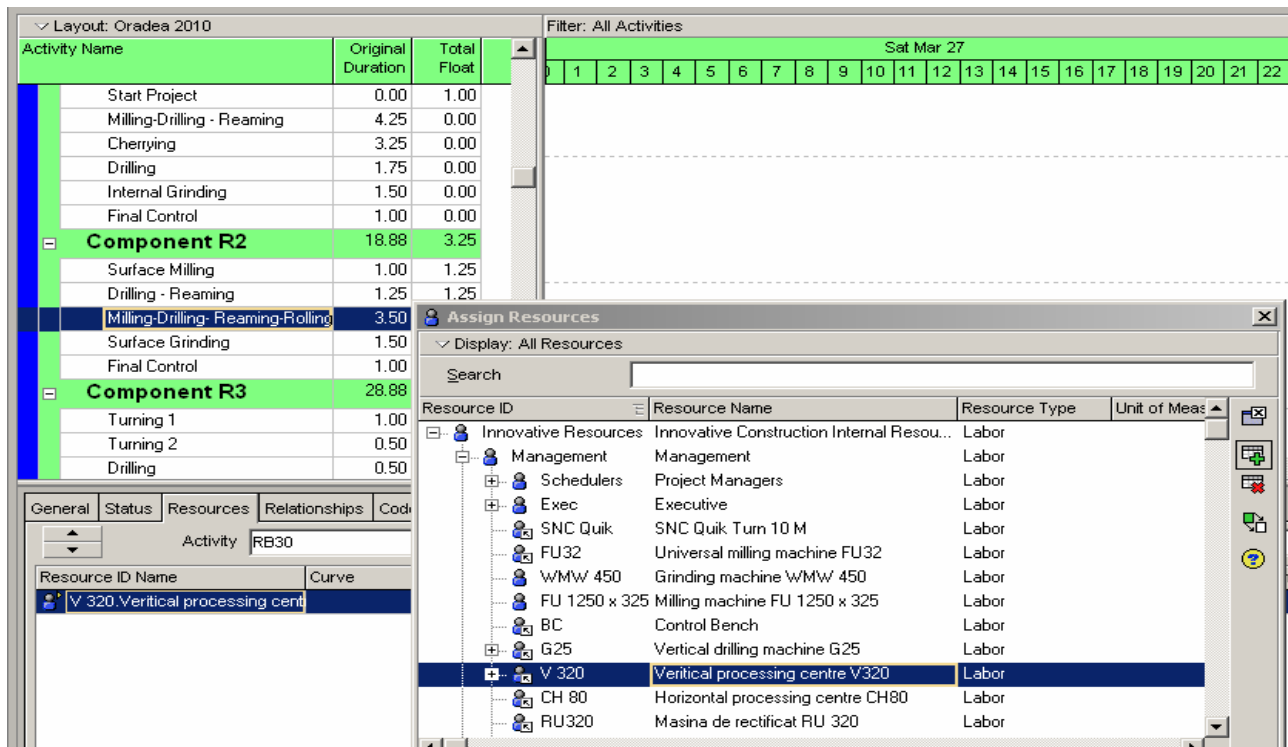


Figure 7. Defining the resources available

In the figure 8 we present a resource usage profile – Control Bench. After establishing resources, they are analyzed to identify the overload, figure 8. These are eliminated using *level resources*. The leveling priorities, for our project, are:

Early Start – Ascending,
Total float – Ascending,
Activity leveling priority –Ascending, figure 9.

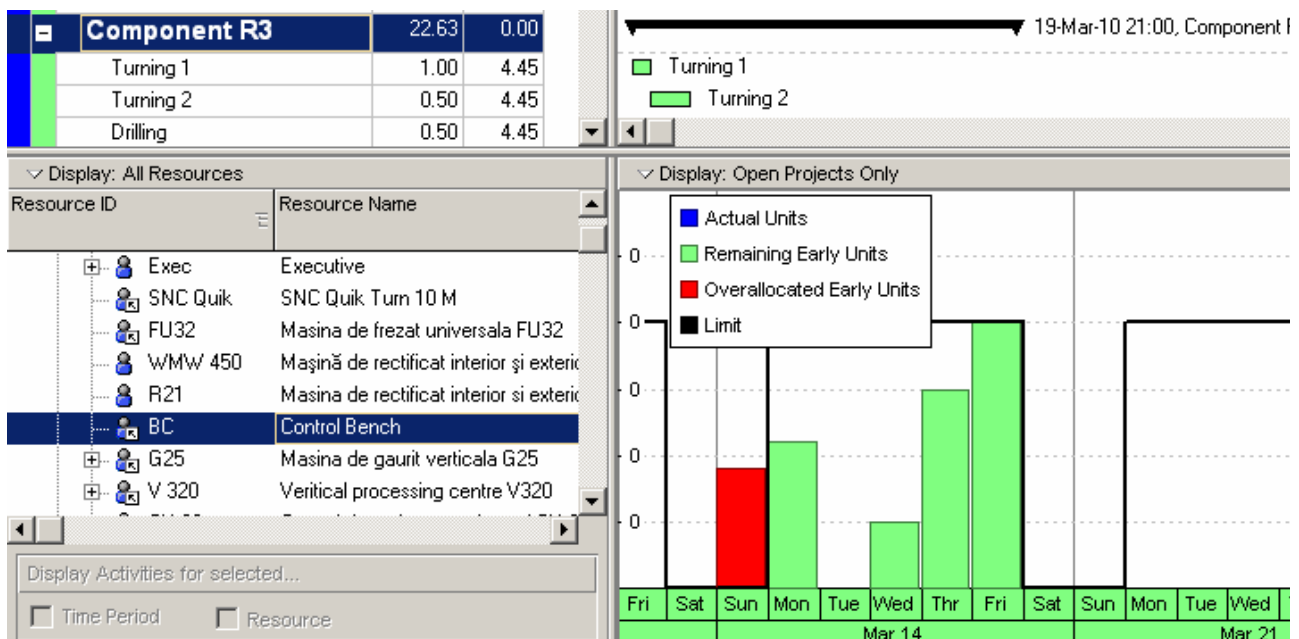


Figure 8. The resource usage profile

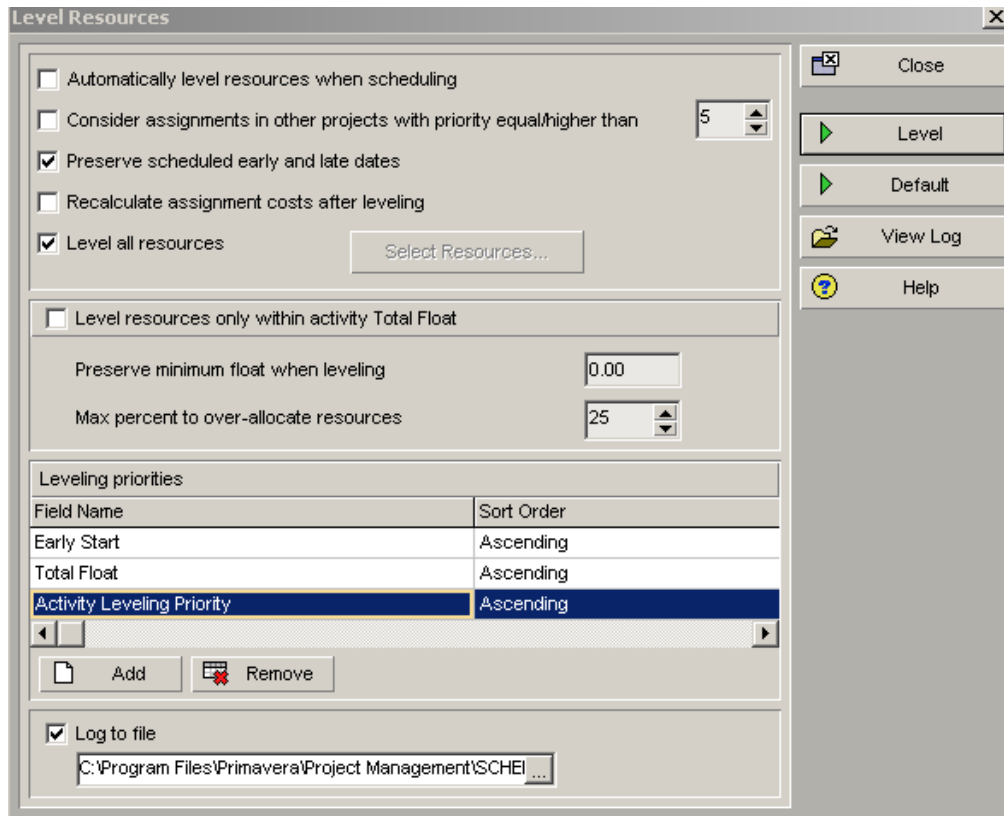


Figure 9. Levelling priority

Figure 10 presents the level of resource.

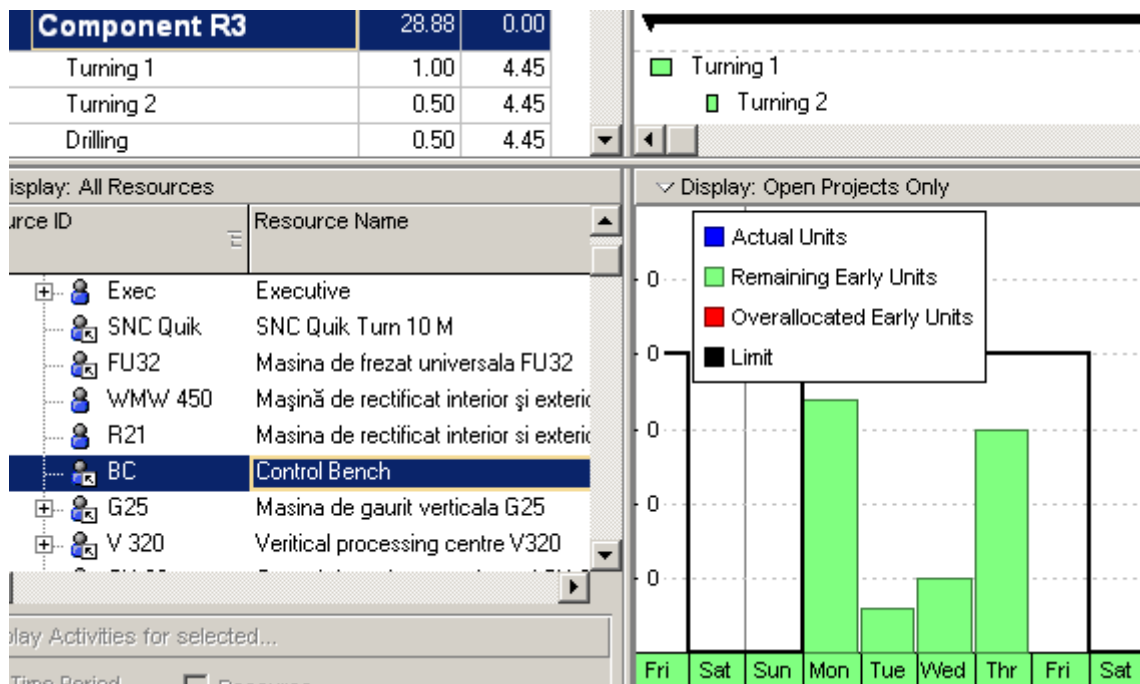


Figure 10. The Level of resource

Primavera Enterprise provides several methods of distributing information, the project team. Reporting is a key part of monitoring a project and communicating its progress to

team members. In the figure 11 is presented a lot of reports for our project. Figure 12 presents the Report - Sorted by Total Float for project.

Reports		
▼ Display: All Reports		
Report Name	Report Scope	Last Run Date
Report Group: Standard Construction Reports		
AD-01 Activity Status Report	Global	14-Feb-10 15:15
LA-01 Two Week Lookahead	Global	
LG-01 Logic Report, By Project	Global	
Notebook Topics	Global	
RC-01 Resource Control Report	Global	
Report Group: Schedule		
SR-06 Schedule Report - Predecessors & Successors	Global	18-Apr-10 12:21
SR-02 Schedule Report with RESP - Sort by ES, TF	Global	
SR-03 Schedule Report with Activity Budgets	Global	
SR-04 Schedule Report with Logs	Global	04-Feb-10 12:40
SR-11 Schedule Report with Resource Budgets	Global	
SR-01 Classic Schedule Report - Sort by ES, TF	Global	
SR-10 Schedule Report Turnaround Document	Global	
SR-15 Schedule Report - Sorted by Total Float	Global	
SR-16 Schedule Report by Total Float (60 Day Lookahead)	Global	14-Feb-10 15:15
SR-18 Schedule Report - Sorted by Activity ID	Global	04-Feb-10 12:41
SR-22 Schedule Report with Resource Usage	Global	12-Jul-05 17:58
Report Group: Resource		

Figure 11. Reports of project

PROJECT MANAGEMENT USING
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Project Start 12-Mar-10
Project Finish 21-Mar-10
Data Date 12-Mar-10

SR-15 Schedule Report - Sorted by Total Float

Activity ID	Orig Dur	Rem Dur	Calendar	%	Department	Activity Name	Early Start	Early Finish	Late Start	Late Finish	Total Float
RA10	4.25	4.25	7-Day Workweek	0		Milling-Drilling - Reaming	12-Mar-10 08:00	16-Mar-10 10:00	12-Mar-10 08:00	16-Mar-10 10:00	0.00
RA20	3.25	3.25	7-Day Workweek	0		Cherryling	17-Mar-10 08:00	20-Mar-10 10:00	14-Mar-10 15:00	17-Mar-10 17:00	0.00
RA30	1.75	1.75	7-Day Workweek	0		Drilling	19-Mar-10 13:00	21-Mar-10 10:00	17-Mar-10 10:00	18-Mar-10 17:00	0.00
RA40	1.50	1.50	7-Day Workweek	0		Internal Grinding	20-Mar-10 13:00	21-Mar-10 17:00	18-Mar-10 10:00	19-Mar-10 15:00	0.00
RA50	1.00	1.00	PC P1 - 1	0		Final Control	21-Mar-10 15:00	21-Mar-10 23:00	19-Mar-10 13:00	19-Mar-10 21:00	0.00
ZZ99	0.00	0.00	PC P1 - 1	0		Final Project		21-Mar-10 23:00		19-Mar-10 21:00	0.00
AA00	0.00	0.00	PC P1 - 1	0		Start Project	12-Mar-10 00:00		12-Mar-10 08:00		1.00
RB10	1.00	1.00	7-Day Workweek	0		Surface Milling	12-Mar-10 08:00	12-Mar-10 17:00	13-Mar-10 10:00	14-Mar-10 10:00	1.25
RB20	1.25	1.25	7-Day Workweek	0		Drilling - Reaming	12-Mar-10 15:00	13-Mar-10 17:00	14-Mar-10 08:00	15-Mar-10 10:00	1.25
RB30	3.50	3.50	7-Day Workweek	0		Milling-Drilling - Reaming-Rolling	13-Mar-10 13:00	16-Mar-10 17:00	14-Mar-10 15:00	18-Mar-10 10:00	1.25
RB40	1.50	1.50	7-Day Workweek	0		Surface Grinding	16-Mar-10 13:00	17-Mar-10 17:00	17-Mar-10 15:00	19-Mar-10 10:00	1.25
RB50	1.00	1.00	7-Day Workweek	0		Final Control	17-Mar-10 15:00	18-Mar-10 15:00	19-Mar-10 08:00	19-Mar-10 17:00	1.25
RC10	1.00	1.00	7-Day Workweek	0		Turning 1	12-Mar-10 08:00	12-Mar-10 17:00	12-Mar-10 11:36	17-Mar-10 11:36	4.45
RC20	0.50	0.50	7-Day Workweek	0		Turning 2	13-Mar-10 08:00	13-Mar-10 12:00	17-Mar-10 10:48	17-Mar-10 15:48	4.45
RC30	0.50	0.50	7-Day Workweek	0		Drilling	14-Mar-10 08:00	14-Mar-10 12:00	17-Mar-10 15:48	18-Mar-10 10:48	4.45
RC40	0.25	0.25	7-Day Workweek	0		Milling	14-Mar-10 11:12	14-Mar-10 14:12	18-Mar-10 10:00	18-Mar-10 12:00	4.45
RC50	0.50	0.50	7-Day Workweek	0		Grinding	14-Mar-10 14:12	15-Mar-10 09:12	18-Mar-10 13:00	18-Mar-10 17:00	4.45
RC60	1.00	1.00	7-Day Workweek	0		Final Control	15-Mar-10 09:12	16-Mar-10 09:12	19-Mar-10 08:00	19-Mar-10 17:00	4.45
Total	29.88	29.88					12-Mar-10 00:00	21-Mar-10 23:00	12-Mar-10 08:00	19-Mar-10 21:00	0.00

Figure 12. The Report - Sorted by Total Float for project

4. CONCLUSIONS

Primavera software products management needs of organizations that manage large numbers of project at one time. These integrated applications use project management to support the management needs of project teams in different locations and at varying levels of the organization.

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