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A study of supply chain management in civil engineering

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ABSTRACT

Supply Chain Management (SCM) is a concept that has flourished in manufacturing, originating from Just-In-Time production and logistics. Today, SCM represents an autonomous managerial concept, although still largely dominated by logistics. SCM endeavours to observe the entire scope of the supply chain. This Project is aimed to focus on the adoption and implementation of Microsoft Primavera in Construction work. The theoretical findings are based on the literature review of the existing papers. In This Project MS Primavera is used to analyse the effective time in which the internal plaster should be ideally completed. The Internal Plastering of a Residential Building (G+4) is taken for analysing. The time taken for the plastering work on site is compared with the analytical result of the software. The difference between the time taken on site and result obtained shows the effective time in which the plastering work should be completed. The readings obtained from the site have been used for the calculation of effective time. Analysis of time used along the process in order to get insight into the time build up. The methodology used in the project includes the use of MS Primavera Software for calculation. The basic objective of the project is to study the use of Supply Chain Management in Civil Engineering. The Scheduling of time using Primavera to get greater efficiency and to enhance flexibility. Optimizing value chain and improving customer service is the key objective of the project. The Supply Chain Performance is measured on Delivery, Quality, Time and Cost.

Keywords— Management, Optimizing, Delivery, Flexibility

1. INTRODUCTION

1.1 General

Supply Chain is a system of organization, people, activities information and resource involved in moving a product or services from supplier to customer . Supply Chain activities involves the transformation of natural resource, raw material and components into a finished product that is delivered to the end customer. Supply Chain Management (SCM) is a well-established concept within the manufacturing industry although the terminology has changed over the years (McCaffer and Root, 2000). Ganeshan and Harrison (1995) defined supply chain as a network of facilities and distribution option that performs the function of procurement of materials, the transformation of materials into intermediate and finished products, and the distribution of these finished products to the customers. Supply chain exists both service and manufacturing organisations, although the complexity of the chain may vary greatly from industry to industry and firm to firm. The effectiveness of Supply Chain Management has been evaluated using MS Primavera Software.

1.2 Necessity

The use of Construction Management in Civil Engineering is growing rapidly. India being a developing country, the construction process is taking place rapidly. The completion of mega projects as per schedule is a key thing. The scheduling of the project helps in minimizing time as well as maintaining quality. The materials required are already been determined which also saves the wastage of material.



Fig. 1: Flow chart of supply chain

1.3 objectives

- To Study the use of Supply Chain Management in Civil Engineering.
- To analyse Time Scheduling by using MS Primavera.
- Greater Efficiency.
- Enhance Flexibility and Agility.
- By using Primavera for minimising economy.
- Improve Customer Services.
- Optimize Value Chain.

2. LITERATURE REVIEW

Supply Chain Management in Construction Scope, Benefits and Barriers Volume 3 No. 1 June 2002 Syed Mahmood Ahmed, Salman Azhar, Irtishad Ahmad in their literature figured out the problems at operational level and have described various factors like bank rates political situations, material delivery, labour strikes, site accidents, design changes etc which makes it difficult for a chain to work efficiently. Supply Chain Management is a great opportunity for the construction industry to primarily reduce cost and time and thus improve profitability. SCM principles seem to have much strength to smoothen and integrate the construction process. The supply chain in construction could be divided into two major groups as material chain and construction chain, which would help to separate the procurement and management operations.

Supply Chain Management in Construction: Diagnosis and Application issues. Alfredo Serpell and Boris Heredia had their research project carried out with the general objective of proposing a generic application methodology of Supply Chain Management to the construction sector by adopting the manufacturing SCM experience and development to the particular characteristics of construction. As part of this research, a survey was carried out to more than 50 companies that participate in the construction sector. The purpose of this survey was to obtain a diagnosis of the current situation of the supply chain in the construction industry. The paper presented the main results of the survey and highlights the problems and restrictions that exist in the local construction supply chains as well as their main causes.

Construction Supply Chains: A Proposal to develop a new Conceptual Model Omer Bay bars presented the detailed method and procedure applying Supply Chain Management to the construction enterprises. The study was an attempt to prepare a framework with which a Construction Supply Chain model can be developed. The expected benefit of the proposed model is time and cost savings.

Role of Supply Chain Management in Construction Ruben Vrijhoef¹ and Lauri Koskela addressed that the actual practice in construction not only fails to address issues of the supply chain but rather follows principles that make supply chain performance worse. SCM can play major roles in construction.

3. METHODOLOGY

3.1 Steps followed for the project using MS Primavera.

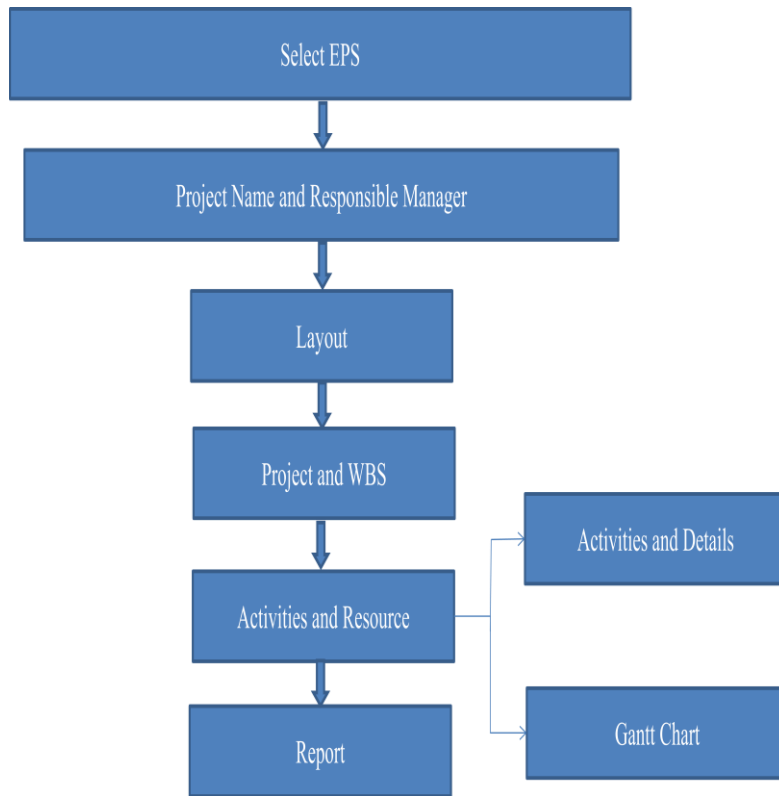


Fig. 2: Steps for supply chain

3.1.1 Select EPS: The EPS (Enterprise Project Structure) is a logical, meaningful hierarchal, arrangement of all the projects in an organization. EPS are hierarchal nodes where a project can be created and stored. EPS is useful to summarize the projects under it so that the summarized value can be seen. In an EPS hierarchy, Root EPS is top level and child EPS is low level.

3.1.2 Project name and responsible manager: The project is given a name by which it can be identified and also the project manager is assigned. The Project Manager depends on the work that is to be carried out. Project Manager is responsible for all the work ON- Site and OF- Site the below image gives an example of the following.

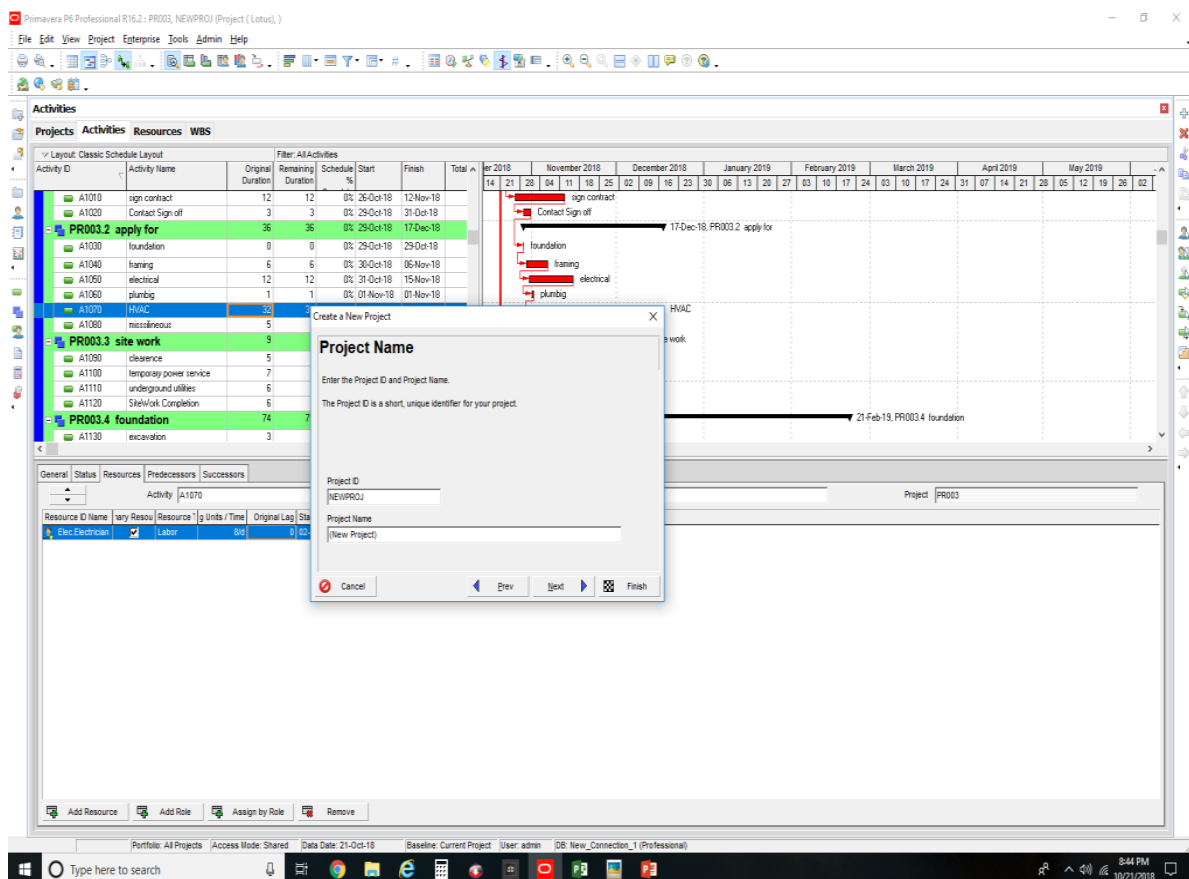


Fig. 3: Project name

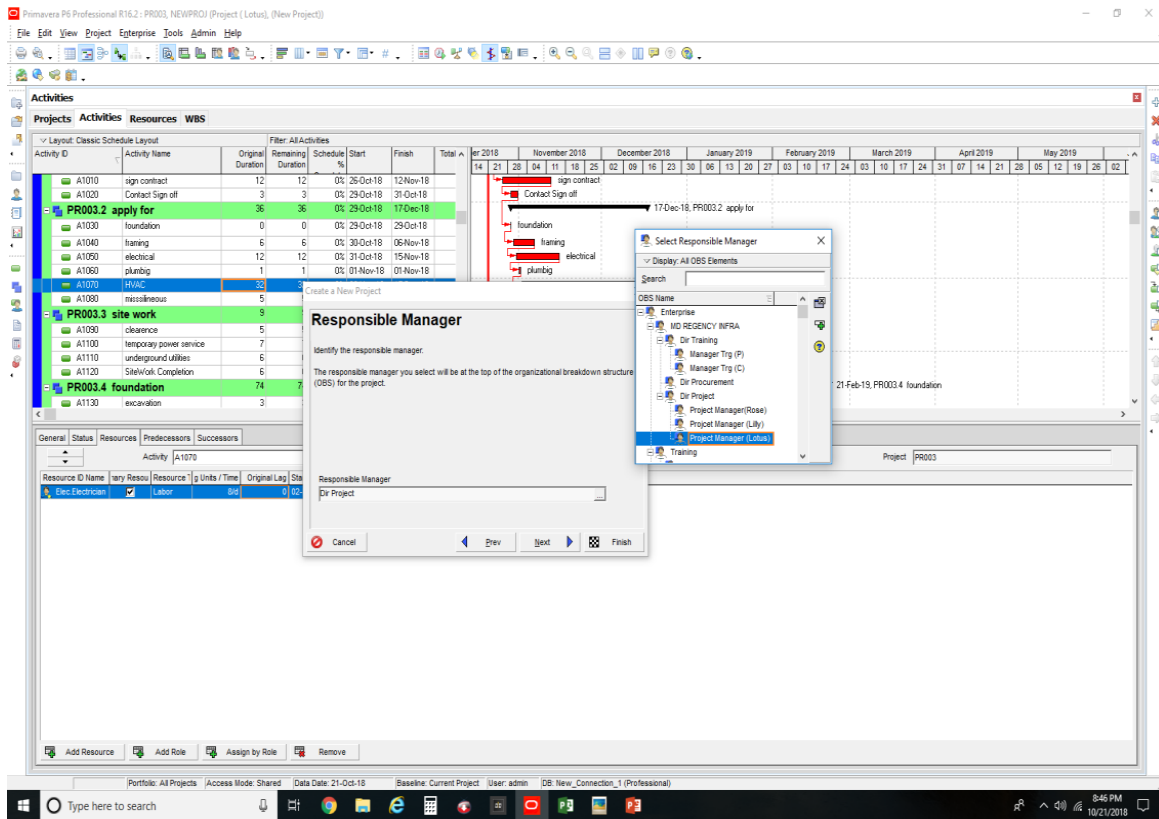


Fig. 4: Responsible manager

3.1.4 Layout: Layout is the division of the work. The layout is the sequence of the work which is to be carried out. With the help of layout, the responsible person for a specific work can be determined. The following shows the layout of the project.

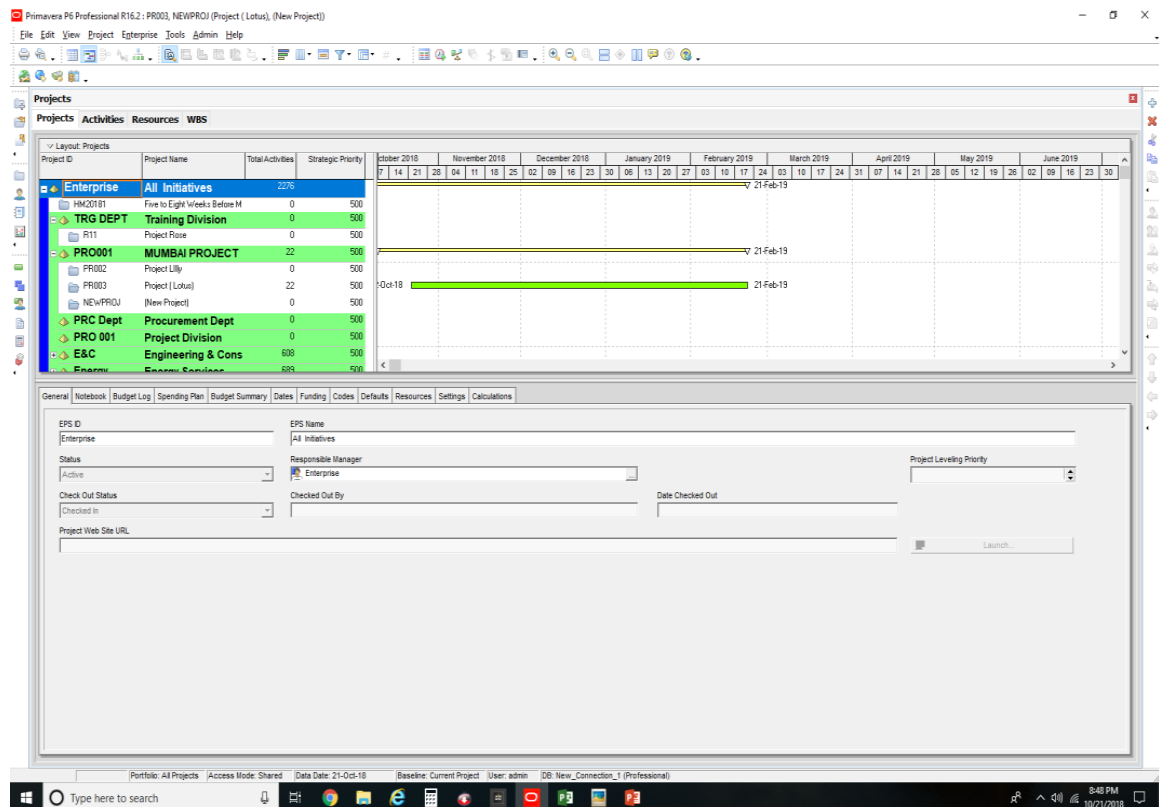


Fig. 5: Layout

3.5 WBS (Work Based System)

WBS is the key point of distribution and part of work.

For eg. In one floor four rooms are there in the plan, so the plastering work, brickwork etc can be carried out which can be grouped under WBS.

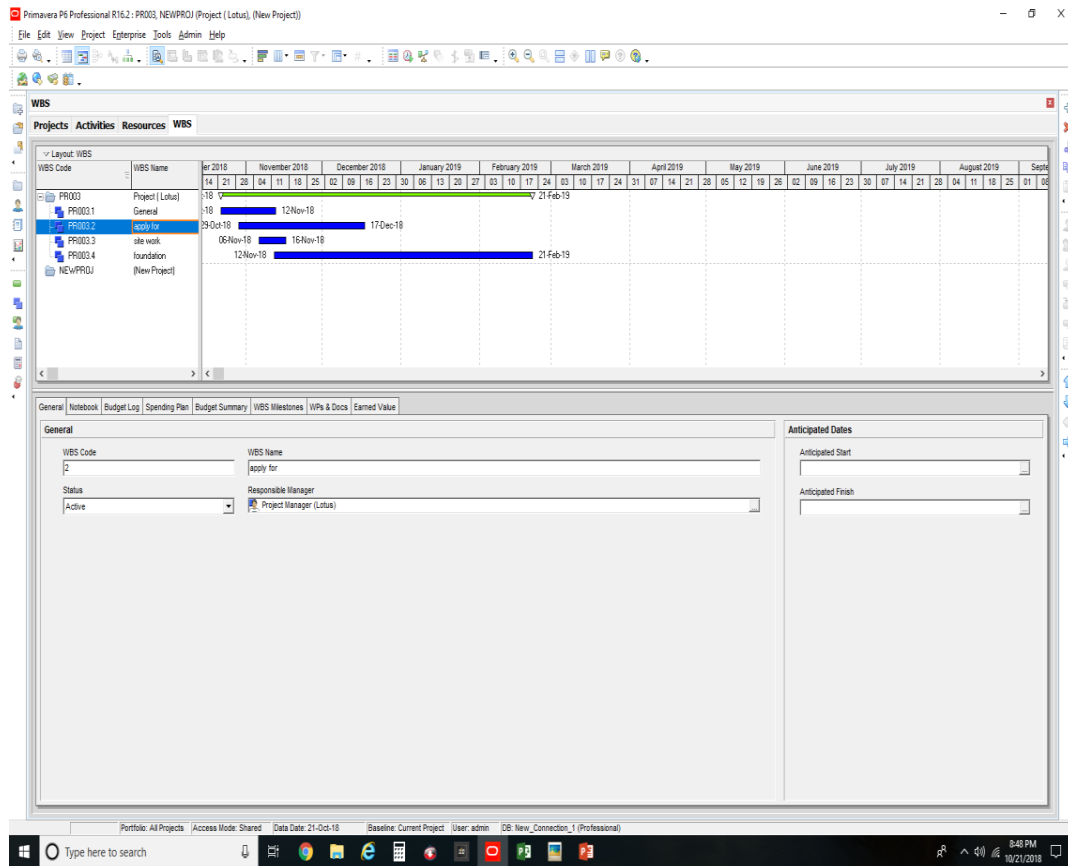


Fig. 6: WBS (Work Based System)

3.1.6 Activities and resource: Activities and Resource include all the activities and resources which are to be used in the Project. All the activities under WBS are under this Title. The amount of resources which are required to complete the project is also under the Title. The following figure shows the activities and resources TAB:

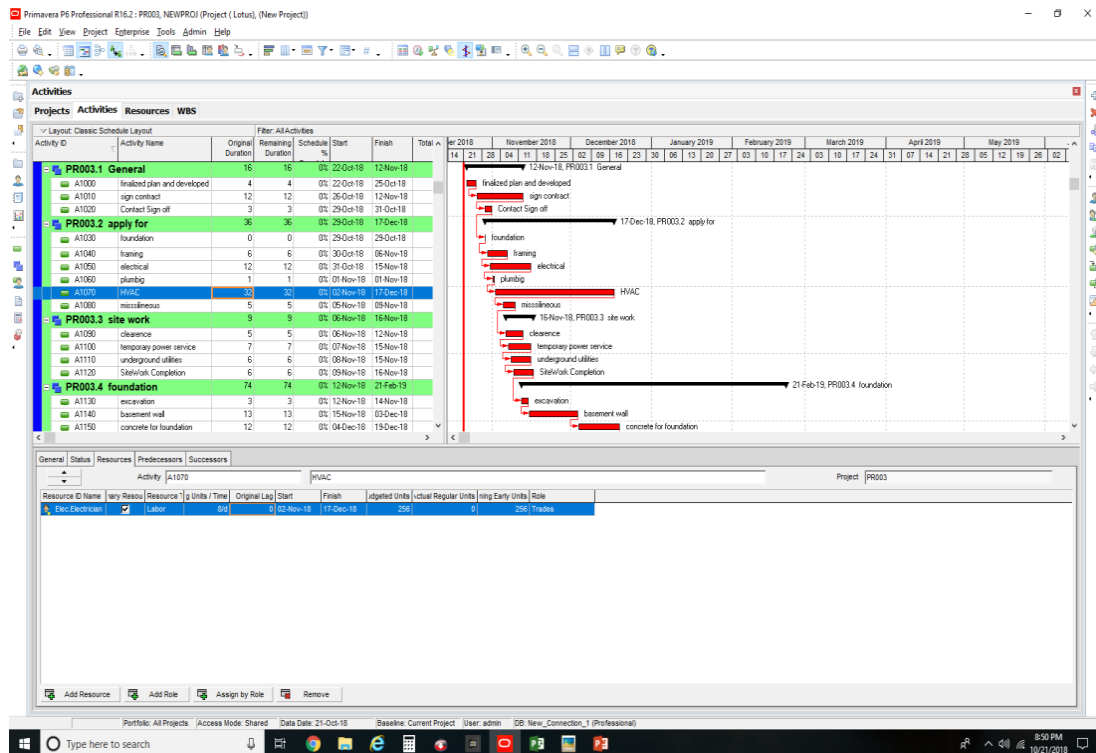


Fig. 7: Activities and resource

Gantt Chart

The basic use of a Gantt chart is to

- Add Relationships.
- Edit Relationships.
- Delete Relationships.
- The Scheduled activities are shown on the Gantt chart.

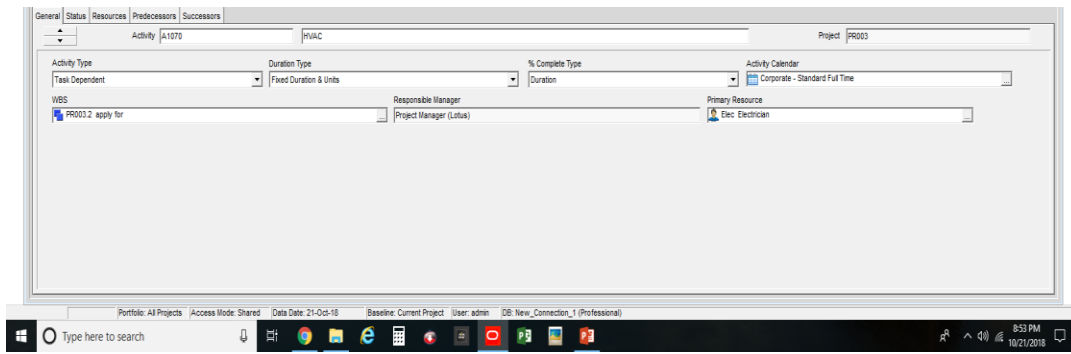


Fig. 8: Gantt chart activities

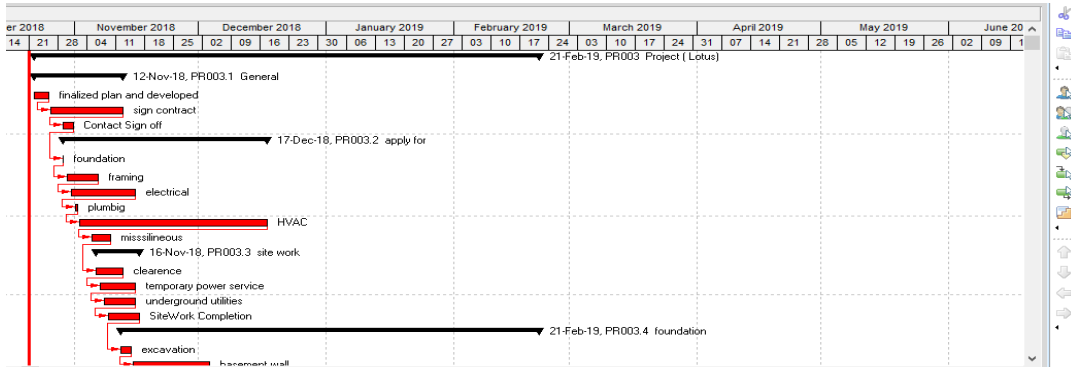


Fig. 9: Gantt chart activities and resources

4. CONCLUSION

Construction using Supply Chain Management is intended to make savings by linking the supply chain more closely, making manufacturers more responsive. Due to its recurring character, the SCM Methodology implies a continuous improvement process of which the scope can be enlarged over time, involving an increasing number of areas of application. Primavera solutions for Architecture, Engineering and Construction firms enable them to successfully plan, manage, control, and deliver projects. The result is improved client service without sacrificing project profitability.

5. REFERENCES

- [1] Supply Chain Management in Construction Scope, Benefits and Barriers. Syed Mahmood Ahmed, Salman Azhar, Irtishad Ahmad.
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- [3] Roles of supply chain management in construction. Ruben Vrijhoef and Lauri Koskela.