

Application of MS-Project in Scientific Research Project Management

Li Yanjin

Department Science and Technology Development, Wuhan University of Technology, Wuhan,
P.R.China, 430070

(E-mail:372237961@qq.com)

Abstract: This paper introduces the basic concept of project management software and the importance of project management software in the practical work. Combined with the role of MS-Project in practical application of scientific research project management, analyzes common problems in the process of management. This paper also discusses how to make good use of MS-Project in management of specific scientific research project.

Keywords: Project management software; Project management; Scientific research Project

1 Introduction

Project management is a dynamic management control process. In the life circle of scientific research project, especially related to many units of large-scale scientific research project, there are often a lot of charts and data needed to be summary analysis and processing. Therefore, in order to realize efficient allocation of resources, we need to make advance planning, prepare scientific research plan, and get constantly real-time feedback in the implementation process of project to adjust, balance and control the plan. The implementation process of these specific tasks is also the process of project management at the same time, and it is also the process of application of project management software.

2 Project Management and Project Management Software

Project management is in a particular organization environment and conditions, in order to effectively achieve the goal and according to its internal logical rules, a series of organization principle, method and the auxiliary means are formulated. Project management is a comprehensively innovation in operation and thinking modes, it can fundamentally change management personnel's work process and improve work efficiency.

In the scientific research project that has long development circle, special coverage, and many research unit, with the complexity of the project is on the rise, whether in technology achieving or task workload, to monitor and evaluate the development process timely and effectively is more and more difficult. And big advantage of project management software in effectiveness and feasibility has made it become effective means that improving the traditional management methods without doubt.

In a broad sense, project management software is a kind of application software that goals as the core, schedule control as the starting point, by using the network technology in the concrete implementation process schedule, quality, cost of comprehensive program management and so on. The MS-Project by Microsoft is the most widely used project management software around the world so far. MS-Project can help project management personnel prepare the project plan, coordinate resources distribution, generate cost budget, draw business chart, form management report etc. With the help of MS-Project and other auxiliary tools, they can meet general project management needs.

3 Design of Scientific Research Project Management Pattern Based on Ms-Project

Project management is in particular framework and environment, and scientific research project is not exception. In the life circle of scientific research project, project management software can provide scientific method to control and change the deployment of resources, document and report specific working condition, provide the complete tracking trajectory of implement process, evaluate the integrity and consistency of the research results, improve the efficiency of management, and ensure that research and development work is orderly, and high quality. We can divide the life circle of scientific research project into four stages: Start, planning, implementation and control, and analyze the key problems that should be pay attention to in each stage.

Start

The primary task of scientific research project management is to project. From the view of life cycle, start-up phase is definition, choices and decisions to project, also is to make sure the specific process of project's purposes, organization structure, team building and so on.

In this stage, managers should combine with the background of the project, come up with the initial scope of the project, giving explanations of needs, plan, design, and plan selection of human resource. It is procedure formally decided on a project started, and will be responsible for providing them with the resources.

Plan

The main task of planning stage is to formulate the development plan. The primary task of this stage is to confirm the scope of project, make clear of function modules that should be achieved, decompose and distribute the task, work out schedule plan, and make the budget of the cost of resources and so on. In the condition that project scope relatively certain, the three goals of quality, schedule and cost are usually contradicted and check with each other. So with the attention shall be paid to the big to small, from small to large cycle to balance and management.

(1) Management team construction. Team-work is the guarantee of project management success, and staffing is the foundation for the development of the team. Personnel arrangement can be used for the definition of personal power and group ability. Let all the members actively participate to specific work, and make team management ability to obtain the biggest development is the key to this work.

(2) Description of object and function. The project research scope and content will undoubtedly play a decisive role to progress, so lock project scope is to take corresponding measures for the administration of the prerequisites. Based on the general goal, you can concrete the project into several component tasks, change target needs into function needs, and add the corresponding function description, extract and sort the key targets to judge the urgent and necessity of each component task.

(3) Task decomposition and distribution of the work. In order to make progress and cost of the expected more reasonable, WBS(Work Breakdown Structure) is usually used to divide the work, and unload the goal into several specific work unit that need to be finished. And estimates of their time and resource requirements, collect each unit's schedule through the reverse-plan, and combined with project key objectives sort, use the network diagram calculate the critical path, to ensure that the plan time points are in agreement.

(4) Plans and review. When the schedule was settled, according to the work parallel degree, make independent plan of project cost, quality management etc. Combined with the overall scheme, we shall make management system of risk, communication and document management and conduct the overall plan review.

Implementation and Control

The aim of implementation and control is to discover deviation and take corrective measures in the formulated plan and take corresponding adjustment and refined through the completion of the actual inspection plan, and promote the management level. To guarantee the implementation of the project can be set to route, the specific operation must be continuously tracking monitoring, collecting information for analysis and compare to benchmark plan. Close monitoring of the plan make it constantly clear and accord with the actual needs, and to ensure project according to the benchmark as much as possible.

Project control shall take reverse control. The senate grinds personnel shall review inspect task of specific in the beginning of each working day. The project manager shall organize regular meeting according to synchronous implementation, and take control of the execution situation of each molecules task. The management of the company and project director shall organize regular review meeting to track whether the program is in the original target to examine the whole project implementation, in order to ensure that the program flow of rationality.

Ending

When scientific research project is concluding, the project management team needs to finish the work. The success of scientific research project ending still need to carry out the liquidation, summary, post-project meeting and so on besides of the acceptance, submitted of results.

4 Implementing Case of MS-Project in Scientific Research Project Management

For project of a comprehensive ship bridge system development, the development of the task is extremely complex. It includes not only the coordination of many interdisciplinary units, but also how to make research results meet market, to realize the industrialization of final application, etc. In the process, senate grinds units are a complex association. Using artificial means to make out the feasible research and development program need to spend a lot of time in analysis, calculation, draw Gantt chart and network chart. It can't adapt to the characteristics of time tight, heavy task of project. With the application of Project management software, the problem solved.

Establishment of the Plan

The sort of activities refers to work package of WBS, unit up all the work in the project that needs to be done in the logical, and determine the order of the task. Project provides four type of lead tasks, they are complete-began, began-began, complete-complete, began-complete. To choose the appropriate lead task types according to the different forms of cohesion of the project.

In the developing process of the comprehensive ship bridge system, first of all, the senate grinds units according to the overall requirements of the project scope, build their own schedules. Management personnel summary them and set up the logical relationship in every mandatory subtasks according to the general function design and project achievement requirements. Input task name into Project and according to the relationship between the project and the sub project will upgrade or relegate the task. Further calculated period according to plan completion time submitted by each unit of senate grinds, and set lead task according to the scheduled project plan. And control the actual working schedule of each senate grinds unit.

In this way, through optimization of the plan will be after as the benchmark plan and the current progress and resource consumption compared, can always find which tasks in advance and which fall behind, have any effect on the whole the schedule of the project. And it provides great convenience with the control of progress.

Changes of Plan

Making plan is a complex work. In addition to using the system engineering theory to combine it into complete schedule, calendar period, project cost, resources balance, risk assessment are needed to be considered. In the actual operation, only will these factors into consideration and analysis of the influence of the project is credible, can control the benchmark for the final plan.

After the completion set of lead task, making schedule combined with Project. If the project schedule begins from the start of the scheduled date, completion time latter or earlier than specified schedule, or some key time nodes have changes, need to adjust to the project plan. The adjustment methods could be divided into two: One is to adjust the time limit, that is, through shorten or extend the main construction project of time to meet the time limit. The other is to adjust the lead task and time delay. If the original plan use type of complete-began, conducting project B after completing project A, under the premise of task reasonable cohesion, it can be changed into began-began according to the actual needs. That is project B began at the same time when project A started, to ensure the implementation of the project progress.

Resource Allocation

The project plan that is set up according to the above steps still needs subject to time compression and resources balance. And it should have risk analysis, and no plan can be used as the true sense of the management basis without configuration of resources conditions. The precondition of the balance resources is the specific content of the task, mastered resources, restricting factors, etc. Its expression form in addition to the commonly used outside time limit, many descriptions such as human resources, equipment and machines, error range or risk probability and premise of need hypothetical should also be additional. Pure digital date or bar graph has not any real significance actually, and against the effective control of the task.

Plan adjustment will begin after the completion of the allocated resources, abstracting personnel, equipment and materials, capital and workload into "resources". Project will calculate the whole project resources demand curve according to the resource usage for each task, take up proportion being undertaken schedule, cost and effort, the resources of the table by each specific work units, conduct automatic balance resources. And thus easy compute out the purpose and the sub task flow working strength, adjusting time scale in "resources use situation", configuring personnel and cost according to the mission independently.

Use of Progress Management Tools

The commonly used tools in project management are Milestone charts, Gantt charts and resource balance configuration diagram, etc, and its essence is from macroscopic to microcosmic to adapt to different specific needs. In order to carry on the comprehensive effective management, you can blend part of Milestone charts and resource balance configuration diagram on basis of Gantt charts. Then it can reflect the practical implementation of the project comprehensively and do more help to the control of the project. After the set up of lead task in plan in Project, Gantt chart will automatic generate into bar chart and can show the relationship line between work units according to the set time scale. Project combines Gantt chart with data tables, we can not only check task information in the way of image, but also analyze and understand it through the concrete data. Take comprehensive ship bridge system development project

as an example, Gantt chart reflecting the whole progress can be made out according to the molecular plan of senate grinds unit. Then set up several important nodes as milestones according to the characteristics of the project, and describe the functional requirements of the project and standard conditions in detail. This helps to track the progress of the overall situation, and can detect the factors impact on the project schedule early. It can also increase the resources allocation for the specific conditions of better balance overall control. Project provides eight types of graphics to do resource analysis and track, such as the investment, adjustment and withdraw of resources. Therefore, it is very intuitive to judge whether can complete the required as planned during the project process, and take early action to correct the process. The purpose is making it more suitable for decision-making, management and the actual operation platform to have intuitive communication.

5 Conclusion

Experience is very important in project management, but it is only part of the resource requirements. Large-scale scientific research projects often have lots of senate grinds unit, time is special tight. To work out the plan and repeated calculation only by personal experience will often spend a lot of time and usually isn't easy to achieve objectives. Use the project management technology can do comprehensive management when managing a project. And it has characteristics of timely, rapid, accurate and convenient etc. Whatever, manual work only can't match it at all. For this reason, Depending on its significant role in project management, and its characteristics of simple operation, easy to tracking and adjust, Project must will be widely used.

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