
A Survey on Efficient Project Management and Scheduling in Software Testing

K.Vinitha, Dr. S.Preetha

^[1]MPhil Scholar, Department of Computer Science, Sri Ramakrishna College for Women, Coimbatore, India

^[2]Associate Professor, Department of Computer Science, Sri Ramakrishna College for Women, Coimbatore, India.

Abstract: Project scheduling plays an important role in research field. Project scheduling has raised noticeable attention within the last decades as a widely used discipline, applicable to many different real world areas. Software project scheduling is one of the most important scheduling areas faced by software project management team. Both software engineering and software management are very necessary for a successful project. To complete the software project within a listed time limit, allocate a start and end date that determine the milestones and outcomes of the tasks, determine which tasks are depend on another task to complete its operation, save time, build consistency, enhance visibility scheduling is very essential. Several software project management resources and schedule estimation methods have been developed. In this paper, we will make a review of some of these software project scheduling techniques which are used recently and are helpful in handling the various type of scheduling used in software projects and the project management.

Keywords: Project Scheduling, Planning, Controlling, Project management, Software project.

I. Introduction

Project scheduling has higher perceptible attention within the last decades as a widely used discipline, applicable to many different real world areas. The resource scarceness to carry out a project yielded to the resource constrained project scheduling problem advent, taken into account as an interesting research topic [3]. Project scheduling in the project it refers to the roadmap of all the activities to be done with the specified order and within time slot allotted to each activity. Project managers tend to define the various tasks and project milestones and they arrange the keeping various factors in mind. They look for the tasks lie in the critical path in the schedule, which are necessary to complete in specific manner and strictly within the time allocated. Arrangement of the task which lies out of critical path are less likely to impact over all schedule of the project.

II. Project Scheduling Process

Project scheduling involves splitting the total work involved in a project into separating activities and judging the time required to complete these activities. Managers must also estimate the resources needed to complete each task. Software project scheduling consists of many benefits like: Uncover problems, save time, build consistency, enhance visibility, fix problem etc. The project scheduling is usually represented as a set of charts showing the work breakdown structure, activities dependencies and staff allocation. There are many software project scheduling techniques which are given below[2]:

- Work Breakdown Structure
- Activity Charts
- Project Evaluation Review Technique (PERT)
- Gantt Chart
- Critical Path method (CPM)

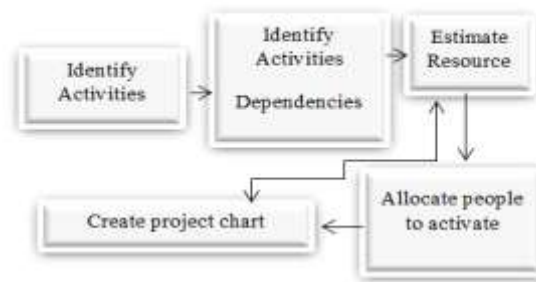


Figure 1. Project Scheduling Process [2]

A. Identify Activity

Identifying the specific activities that must be performed to produce the various project deliverables

B. Identify Activity Dependencies

Identifying and documenting interactivity dependencies.

C. Allocate Resources

Resources are allocated and estimating the number of work periods which will be needed to complete individual activities.

D. Create Project Charts

Project activity charts are created to analyzing activity sequences, activity durations, and resource requirements to create the project schedule.

E. Allocate People To Activities

According to different activities people are allocated to those activities.

RUDIMENTARY IDEA OF PROJECT SCHEDULING

- An unrealistic deadline established by someone outside the software development group and forced on managers and practitioners within the group.
- Changing customer requirements that are not reflected in schedule changes.
- An honest underestimate of the amount of effort and/or the number of resources that will be required to do the job.
- Predictable and/or unpredictable risks that were not considered when the project commenced.
- Technical difficulties that could not have been foreseen in advance
- Human difficulties that could not have been foreseen in advance.
- Miscommunication among project staff that results in delays
- A failure by project management to recognize that the project is falling behind schedule and a lack of action to correct the problem.

PRINCIPLES OF SOFTWARE PROJECT SCHEDULING

Software project scheduling has several principals and the principals are categorized as follows [11]:

A. Compartmentalization

The project must be decomposed into manageable activities and tasks.

B. Interdependency

The relationships between the tasks have to be established because some activities will depend on other, while other activities may occur independently.

C. Time allocation

Each task must be allocated a number of time units, also possibly a start date and a completion date.

D. Effort validation

Every project has a defined number of staff.

E. Responsibilities

Every task should be given to a specific member.

F. Outcomes

Every task should have a defined result.

G. Milestones

Every task should be associated with a milestone.

SOFTWARE PROJECT MANAGEMENT

Software project management is “The process of planning, staffing, monitoring, organizing, controlling and leading a software project”. Software project managers are responsible for planning and scheduling of software project development.

The software project manager’s job is to ensure that the software project its constraints and delivers software in time. Software project manager leads the development team and is the interface with initiator, suppliers and senior management.

Software project management is a method of organizing all activities related to a project and its parts. According to project management institute, it consists of five stages: Proposal writing, project planning, project scheduling, project tracking, personal selection and evaluation and project report writing.

Project management can be applied to all types of project but it is widely used to control the complex processes of software developments projects. It is an application of knowledge, skills and techniques to execute projects effectively and efficiently. We need software project management because professional software engineering is always subject to organizational budget and schedule constraints. The following are the major activities in software project management.

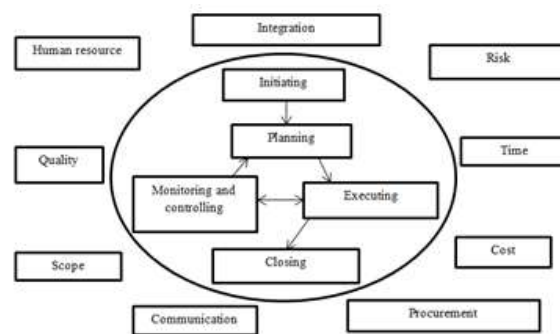


Figure 2. Software Project Management Activities [2].

Software project scheduling is one of the most demanding tasks for software managers. It is an activity that distributes estimated effort across the planned project duration by allocating the effort to specific engineering tasks

PROJECT MANAGEMENT COMPONENTS

In this section discuss about project management components so it will be helpful to work further in the interested area. There are given below [1]

A. Resources Each activity requires some resources for its processing. Examples : machines and tools, human and their skills, raw materials and semi-finished products, natural resources (water, land, etc.), information, money etc.

B. Activities typically each activity is characterized by: resource requirements, processing model, and precedence constraints with other activities, but other parameters can occur in the problem formulation as well.

C. Objectives Motivated by real-world situations, a wide variety of objectives for project scheduling have been studied in the literature. Some objectives may be related to time, as they concern temporary usage of renewable and doubly constrained resources, whereas others – to cost, as they deal with consumption of nonrenewable and doubly constrained resources. Two kinds usually characterize conflicting objectives, then shortening the processing time results in increasing the resource consumption, and vice versa – decreasing the execution cost lengthens the project duration.

D. Schedules a schedule is defined by a sequence of activity start times, but it is insufficient for problems where activities can be executed in multiple modes. Thus, in these cases additional information about processing modes is necessary. A schedule is time-feasible if it satisfies all precedence and time constraints defined for the project, and resource-feasible if all resource constraints are met. A schedule is said to be feasible if it is both time- and resource-feasible. An optimal schedule is a feasible schedule for which a given performance measure is optimized.

E. Stake holders every project has stakeholders. Stakeholders are people who have an interest in the successful completion of the project. There are many different types of stakeholders, and the stakeholders vary by project, the stakeholders should have some part in defining the project objectives, since they are the people who will be affected by the outcome. When defining project stakeholders, the project manager and members of her or his team should carefully think through who will be the end users of the product, whether it be services or goods,

and whether the product will have a positive effect, and how it is likely to be received. Some of the stake holders are Customers/clients, Sponsors, Company, Team members and the Project Manager.

III. Software Project Scheduling Problem

Software project scheduling problems (SPSP) is a problem of finding an optimal schedule for a software project so that the precedence and resource constraints are satisfied and the final project cost consisting of personal salaries and project duration is minimized. In addition to considering the salaries and skills of employees, SPSP also takes workload and required skills of each task into account, so SPSP is suitable and capable to describe the real software project scheduling.

SPSP is close to RCPSP, there are a few differences between SPSP and RCPSP. First, there is one more objective to be optimized in SPSP in addition to the project duration minimization objective in RCPSP. Second, employees with several possible skills are the major resource in SPSP while there are several kinds of resources in RCPSP.

SPSP is related to the resource-constrained project scheduling problem (RCPSP) which aims to find an optimal schedule that meets the precedence and resource requirements while minimizing the project duration [1]

IV. Conclusion

In this article we have given the brief introduction for the project scheduling and project management. Project scheduling and project management is a very important part of implementing project within an organization. We have provided the overview of the process, principals and components of the project. Overview of the current progresses in the field of project is provided.

References

- [1]. Survey paper for Software Project Scheduling and Staffing Problem NANDKISHOR PATIL1, KEDAR SAWANT2, PRATIK WARADE3, YOGESH SHINDE4 BE IT, SAE, Pune, India1, 2, 3,
- [2]. A Review of various Software Project Scheduling techniques Ramandeep Kaur M-Phil Student, Guru Kashi University, Talwandi Sabo(Punjab) Gillraman532
- [3]. A Brief Review on Integrated Planning of the Project Scheduling and Material Procurement Problem Babak H Tabrizi* Department of Industrial Engineering, University of Tehran, Iran
- [4]. Software Engineering "Software Reliability, Testing and quality assurance" Nasib Singh Gill
- [5]. Lavagnon A. Ika Amadou Diallo and Denis Thuillier, "Project management in the international development industry" (2009)
- [6]. Barnard, A, Eloff , M.M. and Van der Poll, J.A, " A Survey of project management tools, techniques and methodologies used in Mauritius" (2004)
- [7]. Vahid Khodakarami, Norman Fenton, Martin Neil, "Project Scheduling: Imposed Approach to Incorporate Uncertainty using Bayesian Networks" (2007)
- [8]. Carl K.Chang,Hsin-Yi Jiang,Yu Di,Dan Zhu,Yujia Ge, "Time-line based model for software project scheduling with genetic algorithms"(2008) [
- [9]. Pich, M. T., Loch, C. H., and De Meyer, A. (2002). "On uncertainty, ambiguity, and complexity in project management. Management Science ", vol. 48(8), pp.1008-1023
- [10]. Attarzadeh, I, Ow, S. (2008). "Project Management Practices: The Criteria for Success or Failure ". Communications of the IBIMA, vol. 1, pp.234-241.