

CO-ORDINATING MULTI-PLANS WITHIN A LARGE SCALE PROJECT

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Abstract

A large scale project requires several sub-level time plans to be managed effectively, in order to control costs and achieve delivery targets. Although various planning tools exist for project scheduling, there is still an opportunity to improve on the methods used for successful project plan co-ordination; particularly when there are many large independent execution team plans which report to the master schedule. In such instances, even where a project-wide work breakdown structure is used to roll-up and report progress, critical path analysis becomes inaccurate as the complicated logic in sub-level plans are not reflected within the Master schedule. The main effort of this work is to discuss issues relating to multi-plan management methods, in a view to improve project co-ordination. Methods of controlling deliverables between the master schedule, group plans and team execution plans are reported. The work here relates to practical issues which are being faced during the construction of the complex £200 million London Heathrow Airport Terminal 5 Baggage Handling System project.

Keywords: planning, co-ordination, multi-plan

1. Introduction

Large projects are increasingly using sub-level time plans to support the delivery of large quantities of work. These plans typically consist of level 2 and level 3 sub-plans, and contain logic and resources to achieve deliverable targets and milestones of the high-level level 1 programme. Demanding development projects which have large budgets, many milestones and complicated logic may use up to level 4, 5 or 6 detailed task team execution plans to support, co-ordinate and control the project. This type of detailed planning is becoming popular in projects with reimbursable contracts where customers demand detailed justification of actual costs and achievements, to monitor performance and project progress.

Although a good project wide work breakdown structure may be in place to capture costs, resources and progress, in instances where detailed level 4,5 and 6 sub-planning is used, the logic and critical path analysis becomes extremely difficult to manage [1]. The main reason, these plans are being maintained independently to the master schedule, to manage frequent changes to logic and resource allocations due to ongoing development of the system and processes, and the lack of resources to update detailed logic in the master programme. An additional drawback of having such detail independent plans include many problems in co-ordinating deliverables among the detail plans to achieve milestone in level 2 and 3 sub-level plans [2].

The objective of this paper is to discuss issues relating to multi-plan management methods and to provide a possible solution of using 'Integration' tasks throughout the project phases, in an attempt to assist project managers and engineers to manage their projects effectively.

2. Multi-plan Management

A detailed multi-plan consists of a series of logically linked activities to reach a milestone. These activities are controlled by a start milestone and finish milestone. They support a summary or a rolled-up deliverable of a sub-level 2 or 3 plan. The requirement for independent detail multi-plans, along with their drawbacks are outlined below in Table 1.

The requirement for independent multi-plans	Drawbacks of independent multi-plans
<ul style="list-style-type: none"> • Compared to sub-level plans which may be greater than 9 months duration; day-to-day and weekly activities can be easily managed by Task teams, to achieve intermediate milestones which form part of the deliverables. • Detail resources and progress can be measured accurately. • Due to changes in development and contractual based nature of the work phases, response to change in processes and systems is higher [3]. • Senior management can have a multitude of progress and performance summaries across one or many work phases which may consist of several multi-plans. 	<ul style="list-style-type: none"> • Frequent development changes to the baseline schedule and costs, causing difficulty in reporting and performance measurement. • Delays in communicating corrective actions and therefore changes among teams, causing inaccurate forecasts. • The requirement of 'Integration' tasks to co-ordinate multi-plan deliverables and intermediate milestones to achieve sub-level project milestones. • The requirement of a good ERP (Enterprise resources planning) system to cope the large amounts of financial budgets and work-packages.

Table 1 : Advantages and disadvantages of using multi-plans

The maintenance of multi-plans require many rules to be followed to report issues and monthly progress to higher level of planning. In addition, they also require stringent procedures and continuous monitoring of change to identify status with progress and revised completion dates. These problems, along with those identified as drawbacks in Table 1, may be resolved with the introduction of 'Integration' tasks. These integration activities not only manage the reporting to sub-level plans, but also provides intermediate integration milestones which are weighted to form part of a project deliverable or sub-level target. The milestones also provide an accurate method of measuring progress at detail level which then in turn can be rolled-up to reflect achievement within the master programme.

3. Introduction of Integration Teams to manage multi-plans

A proposed method for using multi-plans considers the master plan and independent plans managed as outlined in Figure 1. Here, the intermediate and deliverable milestones within the integration tasks of the plans bring together the logic behind the sub-plans of the master programme and independent detail plans. The integration plan provides a substantial importance in identified the critical path, as it regularly aligns deliverable milestones with sub-plan milestones. In addition, frequent changes to the baseline, mainly due to changes in customer requirements in levels 4,5 and 6, are accommodated with minimal consequences to the level 2 and 3 planning. This process not only retains the overall master programme's logic and baseline in the long term, but also reduces the complexity and effort to manage the project.

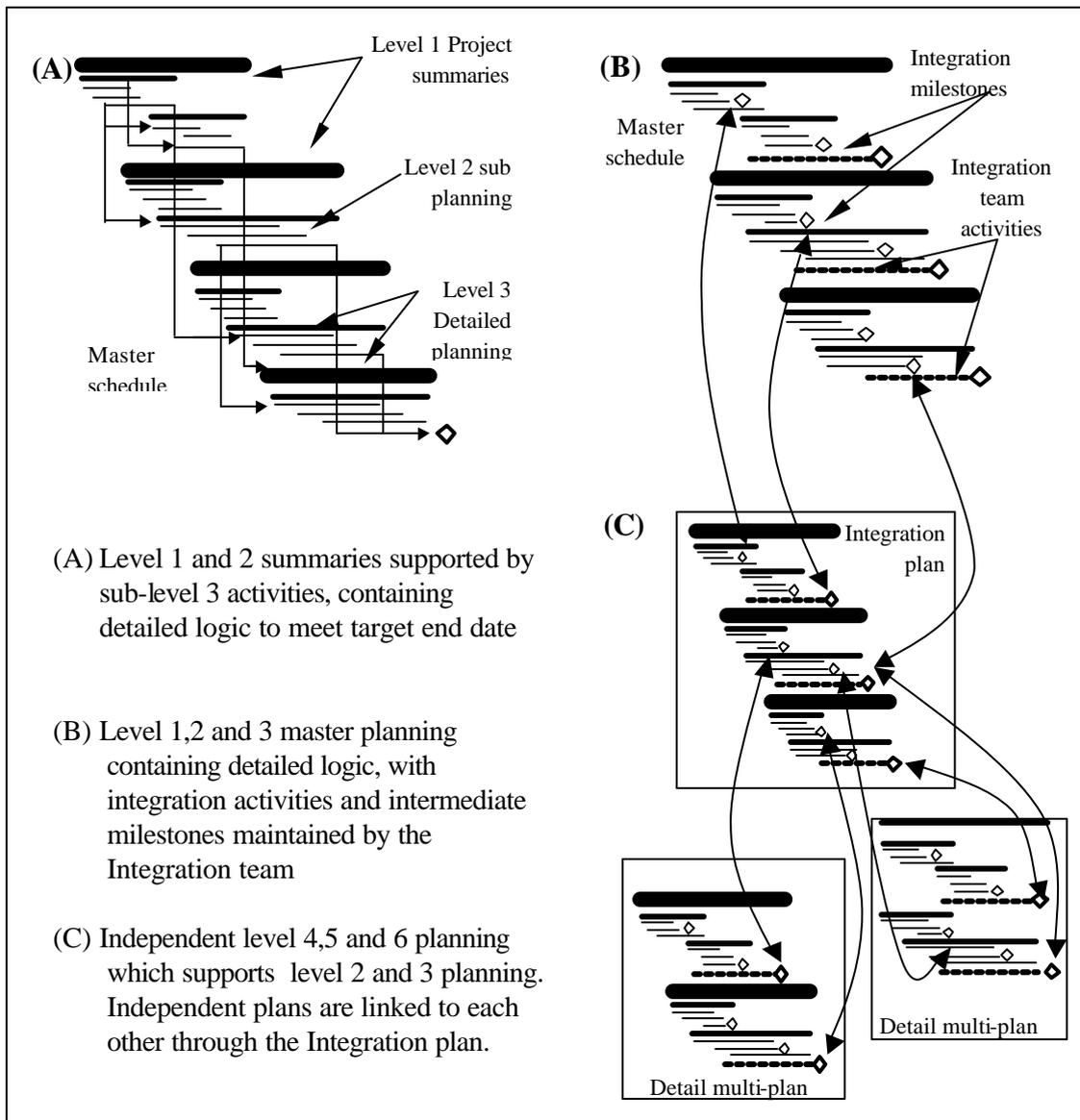


Figure 1 : Managing multi-plan schedules

Managers and team-leaders responsible for maintaining detail multi-plans also form part of the integration team. They represent their work package among the deliverable teams. Once status is obtained, the progress is reported to the master schedule by weighting each integration milestone. Forecasted completion dates are also reported to ensure level 2 or 3 sub-plans are not affected. At this stage they also analyse the critical path and monthly performance and identifies necessary actions to manage resources to achieve targets.

4. Multi-plan Resources

It is important to have a robust cost based resources planning system to manage the budgets and resources of multi-plans and the master programme. The initial set-up of this system should consider breakdown structure, cost capture, progress monitoring and reporting criteria. Allocation of financial budgets and man-hour resources to multi-plans should be similar to that of standard projects. However, the total number of hours and budgets of multi-plan work packages at deliverable level should be identical to the allocated resource of the summary bar of the level 2 or 3 sub-level planning. Forecasting of completion dates of level 2 and 3 summary plans should also cover the completion dates of the detail plans. This ensures detail plan budgets are open to handle re-work or re-development until the completion of the work phase. Due to this reason, schedule performance calculations of detail multi-plans compared with master programme will be inaccurate; and thus should only be carried out at master programme level. However, the cost performance calculations throughout all plans and the master programme will be correct.

5. Implementing multi-plans in large projects

Multi-plans are mainly used to administer a large volume of work needing careful management. These plans must be introduced in conjunction with standard project management techniques [4]. Project managers, co-ordinators, planners and engineers should decide on the feasibility of implementing multi-plans. A thorough study must be undertaken to prioritise requirements and assess compatibility with in-house and client based systems. Accurate change control procedures should also be in place to ensure movement of budgets and resources are reflected in baseline activities.

Due to the nature of these multi-plans, gradual implementation is possible. Thus, introduction of detail-multi plans should consider those work packages requiring stringent management due to high risks. The gradual approach of detailing a level 2 or 3 sub-level summary plan with a multi-plan would benefit the project team with an opportunity to progressively move to full implementation. Particular consideration must also be given for budget and human resource organising, to update and keep alignment while introducing multi-plans, to prevent misinterpretation of project progress and performance.

6. Conclusion

This paper encourages senior engineers and managers to use multi-plans to improve the management of large projects. Multi-plans are ideal for work packages with many development based detailed activities. Even though there are many advantages of using multi-plans to manage the volume of deliverables, there is a considerable amount of risk involved in employing such a system for live projects. A gradual phased approach has to be employed for successful implementation. However, the use of Integration tasks not only eases the complexity of managing many deliverables, but also provides a good reporting and progress measuring methodology to satisfy customers to meet their targets. Further studies of using Integration tasks with multi-plans have to be conducted to develop a standard method which could be used to manage large complicated projects.

7. References

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