2001ICT / 7621ICT - Project Management

Workshop 7

You have now looked at your Stakeholders, their communication needs, and the scope for the new Griffith University Car Park Monitoring system, and you have drawn up a high level estimation to work out the duration of your tasks. Your team has drawn up a WBS table showing the dependencies between the phases and tasks in the WBS, and included the duration of some of these tasks. These are shown in the Table.

| **ID** | **Task Name** | **Duration** | **Predecessors** |
| --- | --- | --- | --- |
| 1.0 | **Initiation & Planning** |  |  |
| 1.1 | Prepare project charter |  |  |
| 1.2 | Prepare project plan |  | 1.1 |
| 2.0 | **Analysis** |  | 1.0 |
| 2.1 | Prepare Survey Report |  |  |
| 2.2 | Prepare Initial Statement of User Requirements (SUR) |  |  |
| 2.3 | Gather Content |  |  |
| 2.4 | Prepare SUR & Acceptance Criteria |  |  |
| 3.0 | **Design** |  | 2.0 |
| 3.1 | Software Requirements Specification |  |  |
| 3.1.1 | Review inputs | 2 days | 2.3, 2.4 |
| 3.1.2 | Analyse requirements | 4 days | 3.1.1 |
| 3.1.3 | Produce SRS | 2 days | 3.1.2 |
| 3.2 | Site Design Document |  |  |
| 3.2.1 | Review inputs | 1 days | 3.1.3 |
| 3.2.2 | Analyse requirements | 1 days | 3.2.1 |
| 3.2.3 | Design intranet site | 4 days | 3.2.2 |
| 3.2.4 | Produce Site Design Document | 2 days | 3.2.3 |
| 3.3 | Content Design Document |  |  |
| 3.3.1 | Review inputs | 2 days | 3.1.3, 2.3 |
| 3.3.2 | Analyse content | 1 days | 3.3.1 |
| 3.3.3 | Design Content Management System | 4 days | 3.3.2 |
| 3.3.4 | Produce Content Design Document | 2 days | 3.3.3 |
| 3.4 | Test Plan |  |  |
| 3.4.1 | Review inputs | 1 days | 1.2, 2.4, 3.2.4, 3.3.4 |
| 3.4.2 | Develop test strategy | 2 days | 3.4.1 |
| 3.4.3 | Develop test cases | 2 days | 3.4.2 |
| 3.4.4 | Produce Test Plan | 2 days | 3.4.3 |
| 3.5 | Benefit Measurement Plan |  |  |
| 3.5.1 | Review inputs | 1 days | 1.2, 3.1.3, 3.2.4, 3.3.4 |
| 3.5.2 | Develop measures | 3 days | 3.5.1 |
| 3.5.3 | Develop measurement strategy | 2 days | 3.5.1 |
| 3.5.4 | Produce Benefit Measurement Plan | 2 days | 3.5.2 |

| **ID** | **Task Name** | **Duration** | **Predecessors** |
| --- | --- | --- | --- |
| 4.0 | **Implementation** |  | 3.0 |
| 4.1 | Car Park Monitoring Sensor Network installation |  |  |
| 4.2 | Car Park Monitoring Information System |  |  |
| 4.3 | Integration Testing |  |  |
| 4.4 | Test Report |  |  |
| 4.4 | Integration Report |  |  |
| 4.5 | Acceptance Report |  |  |
| 4.6 | Roll-out Report |  |  |
| 5.0 | **Planning and Management** |  | 1.0 |
| 5.1 | Promotion |  |  |
| 5.2 | Project Management |  |  |
| 5.3 | Configuration Management |  |  |
| 5.4 | Verification & Validation |  |  |
| 5.5 | Risk Management |  |  |
| 5.6 | Quality Assurance |  |  |
| 5.7 | Documentation Management |  |  |

You have to develop a Network Diagram for the **Design** phase of the project.

1. What is the minimum duration for this phase?

Based on the analysis using the network diagram (attached) that shows the early start date, early finish date, late start date and late finish date derived by forward and backward pass methods the analysis is as follows.

The total duration of this project is the completion time in days for task 2.3 or 2.4, whichever is latest, plus the total duration for the design tasks Software Requirements Specification(3.1), Site Design Document(3.2) and Test Plan(3.4), which the total duration for these is 23 days, plus the duration of the following tasks Implementation and Planning and Management. If we assume that Planning and Management proceeds Implementation, although Implementation has Design as its predecessor, and Planning & Management has Initiation and Planning as its predecessor. The duration of this project can be given by the rule.

Project Duration = [Completion of Task 2.3 or 2.4(whichever is latest)] + [23 days(inner critical path)] + [Completion of tasks 4.0 and 5.0]

1. What are the tasks on the critical path?

The tasks on the critical path are:

3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.4.1, 3.4.2, 3.4.3, 3.4.4

This is all the tasks for SRS(3.1), SDD(3.2) and TP(3.4)

The exact critical path would be determined by the duration to complete task 2.3 and 2.4 as well as the duration of tasks 4.0 and 5.0, that is if 5.0 is to be started after 4.0, this was not specified in the workshop sheet.

The critical path produced in this workshop can be thus referred to as the "inner critical path".

The critical path is the most impotent path project managers need to keep their eyes on, hence the name 'critical'. A delay of x amount of days in the critical path will result in a delay of that many days for the overall project.

**Advanced questions**

1. Can you identify any simple ways to reduce the overall duration of the project?

In order to reduce the overall time for project delivery, the strategies are as follows:

i. Complete both tasks 2.3 & 2.4 in the shortest possible time.

ii. Complete the 'inner critical path' within the 23 days.

iii. Complete tasks 4.0 & 5.0 in the shortest possible time.

The longest time of 2.3 or 2.4 in part (i) will determine when the inner critical path begins. Upon this duration the time to complete tasks 4.0 & 5.0 after (ii) will also be added. If possible it is recomended to complete tasks 5.0 or parts of after the completion of task 1.2 in parallel with the inner critical path.

So for instance is task 1.0 & 2.0 can be completed in 5 days, and tasks 4.0 & 5.0 completed in 3 days, that would mean the whole project would be complete in about at least a month (Overall duration = 5 + 23 + 3).

After completion of task 3.2.2. (Analyse Requirements for Site Design Document (SDD)), the team realises that task 3.2.3 will now take 7 days rather than the planned 4 days. To reduce the impact on the completion date for the design phases, the team decides to commence work on the test plan once the content design document is complete. Assume 50% completion of each of the activities of the Test Plan is possible without the SDD. What is the new overall minimum duration for the Design phase? What activities are on the critical path?

HINT: You can make use of dependencies other than simple Finish-Start, and of "lagged dependencies", to calculate this.

Up to task 3.2.2 the duration is 10 days from task 3.1.1. The total duration of the Test Plan is 7 days, let us say that with 50% completion of activities of Test Plan without the SSD will take 3.5 days, assuming a direct correlation between task completion progress and duration.

So we then establish the following:

(a) Up to task 3.2.2 the duration is 10 days

(b) Task 3.2.3 is now 7 days not 4, and task 3.2.4 is still 2 days so boths tasks now take 9 days

(c) Up to task 3.2.4 is is a duration of 19 days. (10 + 7 + 2)

So the overall duration for the Design phase is now (10 + 7 + 2 + 3.5) days = 22.5 days.

Although task 3.2.3 has become 7 days from 4 days and 50% of task 3.4 can be completed. So we made the assumption a period of 3.5 days for 50% of 3.4 which can be completed within the duration of 9 days while 3.2.3 and 3.2.4 is being completed. This brings the the total completion time to 22.5 days, say 23 days.

In conclusion, having 50% of 3.4 to be completed given the changes has made no effect on the task duration, unless I have made the wrongs assumption due to a lack of experience in project management.