1 Introduction

- Schedule and deliverables mostly determined by methodology.

- e.g. Waterfall vs Agile. Waterfall will have few deliverables. Agile will have frequent deliverables.

- SDLC mostly determined by type of requirements. Complex and well defined requirements suggest Waterfall approach. While uncertain or incomplete quirements require iteration, suggesting Agile style approach.

- Once project is dividied into phases, need to define the activities/tasks (units-of-work), required for each deliverable.

- Units-of-work could be: interview stakeholder, write a program, test a feature, etc.

- When identifying tasks, need to consider sequence, resources, and time.

- Linear sequences are tasks that need to be completed one-after-the-other. There is some dependency from task-to-task.

- Parallel sequences are tasks that can be completed in parallel. Parallel tasks enable shortening the project timeline.

- Resources: Include facilities, technology, people.

- There's a cost to using resources. Costs can be tracked on per-use or prorated basis. For example, a consultant is paid $200k a year, and the task takes up 1 day of their time. The cost of that task is 200000/52/5, or about $800.

- The cost is an estimate. If it takes the consultant two days to complete the task, then the project is suddenly 1 day behind schedule, and is $800 over-budget.

- The behind-schedule part can often be mitigated by having other parallel tasks done at the same time—so the project is not really behind schedule, since other tasks need to be completed too.

- gantt charts

- activity on the node, critical path analysis

- PERT estimate (program evalution and review technique): activity estimate = (optimitic time + 4 * most-likely-time + pessimistic time) / 6

- precedence diagraming method (PDM): can be used to determine lead/lag times for tasks.

- finish-to-start: activity A ands and activity B can start.

- start-to-start: activity A and B can start at the same time, but may not finish at the same time.

- finish-to-start: activity A and B are planned to finish at the same time, though may not start at the same time.

- start-to-finish: task A cannot end until task B is starts.

- student syndrom: start as late as possible on a task

- Parkinson's law: work expands to fill the time available.

- critical chain project management (CCPM): similar to critical path, except instead of estimating completion time, we estimate probable completition time, and use saved-time to create buffers for critical pieces, and at the end.

- budget estimation: a function of tasks and resources used.

- use true-cost of resource. e.g. employee salaries include benefits, etc., can prorate to estimate hourly cost from an annual salary.

- Direct costs: salaries,

- Indirect costs: rent, utilities, insurance,

- sunk costs: costs prior to project start (e.g. prior attempt at solving the problem).

- learning-curve costs (build one to throw away).

- reserves: provide a cushion for unexpected situations.

- document assumptions regarding estimates. e.g. if can't use actual salaries, use surveys, and document methodology used.