**Week 3 Intro to Project Management**

**What is a project?**

A temporary endeavour to create or develop a unique product or service.

**Attributes**

* Unique purpose
* Temporary
* Requires resources from various areas
* Primary sponsor and/or customer
* Involves uncertainties

**What is project management?**

Project management is the application of knowledge, skills, tools and techniques in order to meet the requirements of a project through project ‘activities’.

The process goes by:

Initiating -> planning -> executing - > controlling -> closing

**Advantages**

Project management tasks allow for better control of financial, physical, and human resource aspects of project development. It allows for shorter development time by grouping tasks and laying schedules. Lowers costs which in turn heightens profits. Project management and planning leads to higher quality project outcomes and increased reliability of the project development process. It also helps to improve productivity and better internal coordination and team cooperation for team learning and growth. Provides assurance and reduces risks. Brings forth tools for planning, monitoring, tracking, schedule management, cost reduction and quality control. Allows for history or metrics based future planning and good project documentation.

**Triple constraint**

Combination of the limitations of scope, time and cost goals which constrain every project. Project manager balances the competing goals.

* Scope goals: the projects accomplishment, the unique product or service the project will create
* Time goals: completion time estimation, project scheduling
* Cost goals: financing and completion costs

**Project Management Body of Knowledge (PMBOK)**

PMBOK provides a common language within a profession and provides basic reference for project management for project managers, team members, customers, stakeholders, functional managers, employees of project teams, educators and consultants.

**The 9 knowledge areas of success**

* Four core knowledge areas lead to specific objectives
  + **Scope:** scope statement and work breakdown structure. refers to all the work involved in creating the products of the project and the processes used to create them. Scope management includes the processes involved in defining and controlling what is or is not included in a project.
    - Deliverables: hardware, software, planning documents.
  + **Time:** Gantt charts: scheduling activities in a calendar format, network diagrams: schematic display of logical relationships amongst project activities, critical path analysis: prediction of total project duration, critical chain scheduling. These documents involve the processes required to ensure timely completion of a project.
    - **Activity definitions:** identifying the specific activities to be performed for the deliverables.
    - **Activity sequencing:** identifying and documenting the relationships between activities. Review activities and determine dependencies.
    - **Resources estimation:** how many resources are required for activities.
    - **Time duration estimation:** effort- hours required for completion, duration- actual amount of time worked on the activity.
    - **Schedule development:** analysing activity sequences, resources and duration to create project schedule. (Gantt charts & critical path analysis.)
    - **Milestones:** activities and steps that makeup a specific portion of project development. Useful for goal scheduling and process monitoring.
  + **Cost:** cost estimates and earnt value management.
    - **Project costs management:** includes the processes required to ensure a project is completed within budget.
    - **Cost estimating:** estimate of the costs of resources for project completion.
    - **Tools and techniques:**
      * Top-down estimates: actual costs of previous projects as the basis for estimation
      * Bottom-up estimates: estimating individual activities and summing for a total
      * Parametric modelling: uses project parameters in a mathematical model
    - **Issues in cost estimation:** 
      * Complex task, requires significant effort
      * Human under-estimation bias
      * Management desires accuracy
  + **Quality:** audits, Pareto analysis (technique useful where many possible courses of action are competing for attention. 80% of problems are due to 20% of causes.)
    - **Purpose:** ensure project will satisfy the project needs
    - **Process:** planning -> assurance -> control
      * **Planning:** identifying relevant standards and how to satisfy them
      * **Assurance:** Functionality, features, system outputs, performance, reliability, maintainability
      * **Quality control:** Pareto analysis, statistical sampling, six sigma, QC charts.
* Four facilitating knowledge areas are processes supporting the achievement of objectives
  + **Human resources:** includes the processes requires to make the most effective use of people involved in the project process.
    - **HR planning:** identifying, assigning, and documenting project roles, responsibilities and reporting relationships
      * **Project organizational charts**
      * **Responsibility assignment matrix (RAM)**
      * **Resource histograms**
    - **Acquiring project team:** getting the needed personal assigned to and working on the project
      * **Resource assignment**
      * **Resource loading:** amount of resources required
      * **Resource levelling:** resolving resource conflicts by delaying tasks. Creates smoth distribution of resource usage.
    - **Team development:** building individual and group skills to enhance project performance.
      * **Motivation, influence, effectiveness**
      * **Focus on meeting project objectives**
      * **Fix problems**
      * **Care for team members and encourage each other**
      * **Acknowledge group and individual activities**
  + **Communication**
  + **Risks:** An uncertain event or condition that, if it occurs, has a positive or negative effect of the project objectives.
    - **Risk management:** is identifying, analysing and responding to risks throughout the life of a project.
      * **Planning:** decide how to approach and plan risk management activities
      * **Identification:** determining which risks are likely to affect a project
      * **Analysis:** characterising and analysing risks, and giving priority to their effects on project objectives.
        + **Decision trees and EMV**

**Decision tree:** diagram to help select the best course of action in situations where outcomes are uncertain.

**Expected monetary value:** calculate the expected monetary value of a decision based on its risk event probability and value.

* + - * **Control:** monitoring, identifying and evaluation risk reduction effectiveness.
      * **Tools and techniques:**
        + Brainstorming
        + Interviewing
        + SWOT (strengths, weaknesses, opportunities and threats)
    - **Improve success:** selecting good projects, determine project scope and develop realistic estimates
  + **Procurement**
* The ninth knowledge area ensures the various area of the project are properly coordinated.
  + Project integration management

**Work Breakdown Structure (WBS)**

A structural grouping of the work involved in a project that defines the total project scope. It is the foundation document used for planning and managing project schedules, costs, resources and changes. Created by decomposing processes of subdividing project deliverables into smaller tasks.

**WBS development approaches**

* Top-down: Start with the largest items of the project and break them down.
* Bottom-up: start with the specific tasks and roll them up.
* Mind-mapping: write tasks in a non-linear branching format and create the WBS from this.

**WBS Dictionary**

* A documents that describes the detailed information about each WBS item
* Enables estimates of tasks, time and costs
* WBS and WBS dictionary along with the scope statement, form the scope baseline, used to measure performance in meeting project scope goals

**Risks**

Categories:

* **Market risk:** will the new product be useful to the organization or be marketable to others? Will it be accepted by users?
* **Financial risk:** can the organization afford to undertake the project? Is this the best way to use the company’s financial resources?
* **Technology risk**: is it technologically feasible? Could the technology be outdated before completion?
* **People risk:** does the organization have the people with appropriate skills? Do they have enough people? Do they have enough experience?
* **Structure/process**: what is the degree of change the project will introduce? Which user groups must be satisfied?

Response strategies

* **Risk avoidance:** elimination of threats or risks by elimination the causes
* **Risk acceptance:** accepting risk consequences if the risk was to occur.
* **Risk transference:** shifting the risk impact to a third party
* **Risk mitigation:** reduction risk impact by reducing probability of its occurrence
* **Monitoring:** knowing risk status
* **Controlling:** carrying out risk management plans as risks occur
* **Workarounds:** unplanned responses to risk events that must be don’t when there is no contingency.