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Q1.

(a)

(i) Project is a unique, innovative, non-routine, **one-time** effort limited by time, budget, resources, and performance specifications designed to meet **customer needs**.

(ii) Major Characteristics of a Project

- 1) Has an established **objective**.
- 2) Has a defined life span with a beginning and an end?
- 3) Has **specific time, cost, and performance** requirements.
- 4) Involves doing something never been done before. Non - Repetitive and non - routine tasks
- 5) Requires across-the-organizational participation.

(b) Non-Financial factors in choosing a Project

- 1) To fit corporate **objectives and strategy**. Strategic Fit
- 2) To capture **larger market share**
- 3) Entry into new customer market
- 4) To make it difficult for competitors to enter the market
- 5) **Competitive Advantage: existing player in the industry**
- 6) **To develop an enabler** product pioneers
- 7) To reduce **dependency on unreliable** suppliers
- 8) Availability of **Resources** as related
- 9) Availability of Technologies: To develop core technology for future products. Technical Feasibility
- 10) Safety Aspects
- 11) Legal aspects

- 12) Environmental Constraints, image
- 13) Community impacts: social impacts such bauxite mining impacting fisher man
- 14) Government Legislations / interferences: To prevent government intervention & regulation
- 15) Tax benefits (tax benefit in SG)

(c) What are some of the key environmental forces that have changed the way projects are managed

- 1) Compression of the product life cycle: competitive edge, speed is important, more cross-functional project schemes. Today is difficult to do without planning.
- 2) Corporate downsizing: management cuts cost. Automation and technology: AI do actual job. Now probably the company will reduce people to run the project, and if the project is without plan with limited and non-skillfully people, the management team will become fatigue and unproductive.
- 3) Global **competition**: monopolize in old days, now the things have changed. Every country participates in trade. So everyone want to do projects well.
- 4) Rapid development of **Third World economies**: Rapid development of 3rd world and closed economies: emerging economy. Expect you to be efficient to gain market share.
- 5) **Knowledge** explosion: Knowledge: available all over the world now. Everybody can have lifelong learning.
- 6) Small projects **that represent big problems**: failure of small project impact on big project and lead to big profit loss. Failure on delivering small spare parts may frustrate the whole mother projects.
- 7) Increase **customer focus**: now customers are special and customer has a lot of choices.
- 8) Triple Bottom Line (planet, people, profit)

The threat of global warming has brought sustainable business practices to the forefront. Businesses can no longer simply focus on maximizing profit to the detriment of the environment and society.

Q2

(a)

1. Functional Organization of Projects functional structure is the easiest
 - 1) Different **segments** of the project are **delegated** to **respective functional units**.
 - 2) **Coordination** is maintained through **normal management channels**.
 - 3) Used when
 - a) the **interest** of **one functional** area dominates the project or
 - b) one functional area has a dominant interest in the project's **success**.
 - 4) Advantages and disadvantages
 - a) Advantages
 - a. No Structural Change
 - b. Flexibility**
 - c. In-Depth **Expertise**
 - d. Easy Post-Project Transition
 - b) Disadvantages
 - a. Lack of Focus
 - b. Lack of Ownership
 - c. Poor Integration
 - d. Slow**
 - 5) What suit functional structure: event, best for standard and simple project.
2. Organizing Projects: Matrix Structure
 - 1) Hybrid organizational structure (matrix) is **overlaid** on the normal functional structure.
 - a) Two chains of **command** (functional and project)
 - b) Project participants report **simultaneously** to both functional and project managers.
 - 2) Matrix structure **optimizes the use of resources**.

- a) Allows for participation on multiple projects while performing normal functional duties.
 - b) Achieves a greater **integration of expertise** and **project requirements**.
- 3) Different Matrix Forms
- a) Functional (also Weak or Lightweight) Form: Matrices in which the **authority** of the functional manager **predominates**, and the project manager has **indirect authority**.
 - b) Balance (or Middleweight) Form: The **traditional** matrix form in which the project manager **sets the overall plan** and the functional manager **determines how work to be done**.
 - c) Strong (Heavyweight or project matrix) Form: **Resembles 相似 a project team** in which the **project manager has broader control** and functional departments act as **subcontractors** to the project.
- 4) Project Organization: Advantages and disadvantages
- a) Advantages
 - a. Strong Project **Focus**
 - b. Flexible**
 - c. **Efficient**
 - d. Easier Post-Project Transition**
 - b) Disadvantages
 - a. Dysfunctional Conflict
 - b. Infighting
 - c. Stressful**
 - d. Slow

3. Organizing Projects: Dedicated Teams

1) Teams operate as **separate units** under the **leadership** of a full-time project **manager**.

2) In a **projectized** organization where projects are the **dominant form of business**, functional departments are **responsible** for providing **support** for its teams.

a) Advantages

a. Simple

b. Cohesive

c. **Cross-Functional**

d. Fast: dedicated located, 7/24.

b) Disadvantages

a. Expensive

b. Internal Strife. Conflicts most are between the project team and functional team, project manager and the functional manager.

c. Limited Technological Expertise single people cannot out-perform than the group, 1-2, limited by number, quality.

d. Difficult Post-Project Transition sometimes other company will come to take the people out. What to do with the people as they leave so long?

3) What suits this structure best:

a) One-time project like laying of oil rigs.

b) **Urgent** project

c) Very important, cannot-fail project

d) Culture: if company culture is very good, do not need to use project team because everyone is so helpful to each other and take the initiative to do and help. When

teamwork is hostile and **inter-functional collaboration** is bad, should develop an entity to develop own culture and so task, so the poor culture of the organization will not affect the team work.

(b)

1. Characteristics of a Strong PM Culture

- 1) Excited that PM is a way to deal with **changes** in enterprise
- 2) PM is so pervasive that it is recognized as “the way we do here!”
- 3) Products & services widely used by customers who are highly satisfied
- 4) Organizational strategies, policies, procedures and design understood
- 5) Extraordinary efforts to clarify authority, responsibility & accountability
- 6) Top managers recognize value of project teams in seizing opportunities
- 7) All personnel free to express ideas and concerns involving the projects
- 8) Proactive **training program** to upgrade knowledge, skills and attitudes of people on PM
- 9) Appropriate evaluation systems in place to recognize & reward individual & team performance
- 10) Excellent PM performance and experience vital for advancement to senior management rank

2. Mechanisms for Sustaining Organizational Culture

(1) Methods of maintaining organizational culture:

- a) Formal statement of principles
- b) Top management behavior
- c) Reactions to organizational crisis
- d) Allocation of **rewards and status**

e) Rituals, stories, and symbols

(2) Actions:

a) Recruitment of employees who fit the culture

b) Removal of employees who deviated from the culture

3. Suggestions on How to Strengthen a Project Team's Culture

1) Make full use of top management's visit to team and brief them on work done

2) Team leader to advise, coach, mentor, prompt and facilitate as much as possible a team environment

3) Keep team members regularly informed on project status

4) Keep members informed of what competitors are doing, their competitive threat impacting on project team

5) Create a sense of importance & urgency to project & work

6) Instill a sense of pride and purpose to team members on their roles and contribution to the project and organization success: speak out your culture and mission to member

7) Reward them with tangible and intangible benefits for individual and group performance: Reward group first and then individually.

8) Promote sharing of ideas, problems & interest among members

9) Have social activities for the team, both formal & informal: care for people's welfare

10) Cultivate the use of first names

11) Limit use of language that puts a hierarchical stamp on team

12) Reduce formality in dealing with team members

(c)

1. Work Breakdown Structure (WBS)

- 1) A complex project is made manageable by first breaking it down into individual components in a **hierarchical** structure, known as the **Work Breakdown Structure**, or the **WBS**.
- 2) Such a structure **defines tasks** that can be completed independently of other tasks, facilitating resource allocation, assignment of **responsibilities**, and measurement and control of the project.
- 3) A Work Breakdown Structure is a **hierarchical** chart used to **organize the tasks** of a project into related areas.
- 4) It often is completed as a tree diagram (normally) or as an outline.
- 5) In the WBS, milestones and tasks can be used for **budgeting and personnel selection** purposes as well as scheduling and network planning

2. The Project Network:

A flow chart that graphically depicts the sequence, **interdependencies**, and start and finish times of the project job plan of **activities** that is the **critical path** through the network.

- 1) Provides the basis for scheduling labor and equipment. (Resource allocation)
- 2) Provides a basis for budgeting cash flow.
- 3) Provides an estimate of the project's **duration**. (Show start and end)
- 4) Enhances communication among project participants. (Use the document to let everyone know what is going to do)
- 5) Identifies activities that are critical. Highlights activities that are “critical” and cannot be delayed. (In every project, have multiple critical activities)
- 6) Help managers get and stay on plan. (Need to figure out who contribute to the problem and delay)

3. Difference and linkage between WBS and Network:

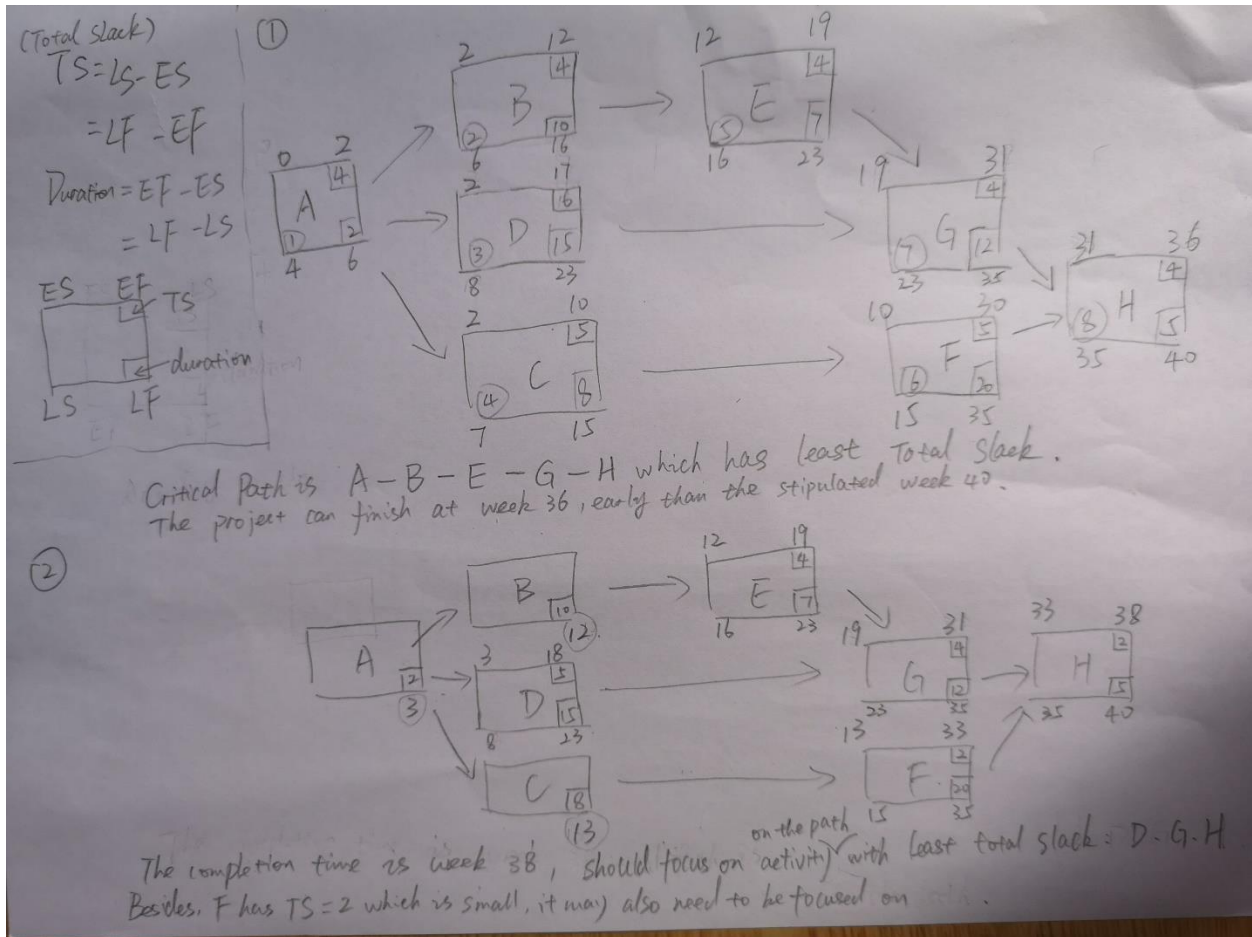
- 1) The WBS is the foundation of project planning. WBS is basis of network, and the result of WBS, network rises from WBS
- 2) It is developed before **dependencies** are identified and activity **durations** are estimated. At the WBS stage, not care about interdependent relationships; later stages at project network bring about cross-functions
- 3) The WBS can be used to **identify the tasks** in the CPM (**Critical Path Method**) and PERT (**Project Evaluation and Review Technique**) project planning models. **Critical Path Method is the process use in project network**
- 4) The network uses the time estimates found in the work packages of the WBS to develop the network. The time estimates, budgets, and resources required for a work package in the WBS are set in time frames, but without dates. The dates are computed after the network is developed

4. Simple example:

If there is project to construct a building. Then the individual works such as drawing out design, purchasing of material, lay the foundation of the building, set up the floors are WBS. There will be resources and time required by each WBS. After figuring out WBS, the relationships, interdependencies and sequences will be found in the project network. Such as the foundation of the building must be built first before building up to different floors.

Q3:

(a)



(b) Quality of Estimates

- 1) Planning Horizon: how deep, scoping.
- 2) Project Duration: how long. Short ones have less uncertainties and estimation is more accurate in terms of fund, interest rate etc. If duration is long, it is hard to keep accurate i.e. Task Definition (Planning Horizon & Project Duration)- The completeness of your project definition will determine if all tasks have been taken into account.
- 3) Project Structure and Organization: A dedicated project team will be able to focus its effort on completing the project effectively. This is about the sense of ownership.
- 4) People Productivity: People do not focus on a task with 100% efficiency. The difference between “calendar time” and effort must be considered.

- 5) Padding: People may increase estimates to take into account unknown risks and this may force an unnecessary trade-off.
- 6) Organization Culture: What is deemed acceptable behavior by the organization (e.g. padding vs. accuracy) will affect estimates. This is about attitude. If the boss is very authoritative, staff is very likely to be padding. If culture is tolerant, staff are keen to get closer to the factual estimate.
- 7) Other Factors/Downtime (Non-project factors)- Equipment repairs, holidays, vacations, exam schedules can all affect the time estimate. Some can be predicted some cannot. Accidents can be minimized by training. Machine can be maintained properly.

(c)

(i) Why:

- 1) You did not perform well due to your own fault;
- 2) 'Good to have things', cannot always widen the scope for those good to have things.
- 3) When you slightly behind, you want to ask your boss for more resources, which is not allowed. You need to be more stringent on your performance and exercise more control.

(ii) Allowed:

- 1) Government regulation, compliance situation, without which, you cannot carry out the project; some new regulation come out during the project progress.
- 2) Customer request, eg. Request for widen the scope or reduce the scope, since customer pay, so it is not a big issue.
- 3) Disasters jeopardize the safety;
- 4) Change of management, the new management may not want to proceed or prefer change of the budget.

(iii)Not allowed:

- 1) Normal inflation or currency change should not make your baseline change.

Q4

(a) When Do You Conduct A Formal Teambuilding Session?

- 1) Whenever it is necessary to **enhance team performance**
- 2) To re-**energize** the **team** towards **higher performance**
- 3) Project manager to decide when to conduct teambuilding session.
- 4) At the beginning of the project to **develop a team identity** among strangers
- 5) To assimilate new members when project is underway
- 6) When project team experiences **problem working together**
- 7) To improve collaboration to prevent small problems escalating into big problems within the team.

(b)

(i) Developing a **Contingency Plan** to **tackle** the risk if it **materializes**

- 1) Contingency Plan
 - (1) An **alternative plan** that will be used if a **possible foreseen risk** event actually occurs.
 - (2) A plan of **actions** that will **reduce or mitigate** the **negative impact (consequences)** of a risk event. Reduce hurray plan
- 2) Contingency plans increase chance of project **completion** on time/within budget.
- 3) Risks of Not Having a Contingency Plan
 - (1) Having no plan may **slow managerial response**.
 - (2) Decisions made under **pressure** can be potentially **dangerous and costly**.

(ii) Four aspects of contingency plan and risk: contingency plan affect risk

(1) Technical Risks

- (a) Backup strategies if **chosen** technology fails.
- (b) Assessing whether technical **uncertainties** can be resolved.

(2) Schedule Risks

- (a) Use of **slack** increases the risk of a late project finish.
- (b) Imposed duration dates (absolute project finish date)
- (c) Compression of project **schedules** due to a shortened project duration date.

(3) Cost Risks

- (a) Time/cost dependency links: costs increase when **problems** take longer to solve than **expected**.
- (b) Price protection risks (a rise in input costs) increase if the duration of a project is increased.
- (c) Deciding to use the schedule to solve cash flow problems should be avoided. Do not use schedule to do cashflow

(4) Funding Risks: Changes in the supply of funds for the project can dramatically affect the **likelihood** of implementation or successful completion of a project.

(c)

(i)

1. Major Tasks of a Project Audit:

- 1) Evaluate if the project delivered the **expected benefits** to **all stakeholders**.
 - a) Was the project **managed** well?
 - b) Was the **customer** satisfied?

2) Assess what was done **wrong** and what contributed to **successes**. Audits should not be done only with failed projects.

3) Identify **changes** to **improve** the delivery of future projects.

2. Importance of different types of Project Audits

1) In-Process Project Audits: Allow for **corrective changes** if conditions have **changed** and for **concentration** on project **progress and performance**. Best time to do such audit is 20-30% to the completion

2) Post-Project Audits: Take a **broader and longer-term view** of the project's **role** in the organization and **emphasize improving** the management of **future** projects.

(ii)

1. Project Audit Components

1) A **review** of **why** the project was **selected**

2) A reassessment of the project's **role** in the organization's priorities

3) A check on the organizational culture to ensure it facilitates the type of project being implemented

4) An assessment of how well the project **team** is **functioning** and if it is appropriately staffed

5) A check on external factors that might **change** where the project is **heading** or its **importance**. Audit is always done by outsider

6) A **review** of all factors relevant to the project and to managing **future** projects

2. Audit Report Content Outline

1) Classification of project

(1) Strategic or support

- (2) Project type
 - (3) Size
 - (4) Staffing**
 - (5) Technology level
- 2) Analysis of **information** gathered
 - (1) Project **mission and objectives**
 - (2) Organization **resources** used
 - (3) **Procedures and systems** used
 - 3) Recommendations: Corrective actions: especially for in progress project audit
 - 4) **Lessons learned:** Reminders
 - 5) Appendix: **Backup data**
 - 6) Summary booklet: overview