A:

1. From your project, explain the 4 stages of a project. Show how each of them led to the project success?
   4 stages of a project include the concept stage, planning stage, execution stage and finalization stage with their detailed explanation listed below.

   Concept stage is the idea stage where the project is conceived. The discussion of preliminary goals, deliverables, strategic vision alignment, problems are raised in this stage. With impact assessed in terms of TBL and life cycle, potential benefits identified, alternative approaches researched, and provisional costing determined. In the Managing Coastal Vulnerability project, twenty new and/or improved datasets were generated and discussed with key stakeholders. Those datasets are important new source of information for assessing coastal developments, and has been accessed and used widely by the coastal and marine management community.

   Planning stage is followed concept stage. During this stage, all work required is planned and scheduled. The project team should have the objectives finalized, resources assigned, quality signed off, final costing approved, the timing agreed, and all other administrative matters determined. During the planning stage of MCV project, a detailed account of how the objectives of the project were addressed, progress towards the realization of the expected benefits of the project, and lessons learned to assist any future effort and investment in this area.

   The project has commenced during the **execution stage** and the emphasis is moved to tracking actual progress using the schedules developed in planning stage as the comparison point of reference. All work commenced should be monitored, controlled, and corrected where necessary with schedules being reviewed revised and amended regularly as required. Throughout the MCV project, quarterly returns and annual reports were submitted as per the requirements of the MoU and provided information on on-going progress with the major expenditure items.

   Finalization stage is initiated after the project is completed and all deliverable handed over to the client. All resources are disposed o or reassigned, the project is evaluated, reports are written, presented and the administration arm of the project is closed. During the MCV project, as about 20 datasets were generated or improved, a number of opportunities were identified for improvement of data that would likely have significant value to regional WA. However, some opportunities could not be addressed within the scope and timeframe of the MCV project. Those opportunities have been summarized in this report for potential consideration in the future.

2. Explain how a sustainable approach is consistent with the Triple Bottom Line. Explain how it could improve the project when applied to every stage of the project.
Sustainability means meeting the needs of people today without compromising the ability of future generations to meet their own needs.

This can be done by adopting the triple bottom line (TBL) approach which is a company's ability to achieve its business goals and increasing long-term shareholder value by integrating economic, environmental and social opportunities into its business strategies. It can also be expected that triple bottom line sustainable project management can lead to the management of all resources in such a way that economic, social and environmental needs can be fulfilled while maintaining cultural integrity，biological diversity, essential ecological processes and life support systems. It is important to recognize that economic benefits can be achieved through adoption of positive social and environmental measures.

For the Managing Coastal Vulnerability project, it is very important to consider the relationship between the economic benefit and environment. Sustainability means the impact to the environment need to be minimized during the economic development. Therefore, in the concept stage, coastal protection needs to be a part of the discussion of preliminary goals, deliverables, strategic vision alignment and problems. In the planning stage, in order to meet the requirements of sustainable development, all the objectives of this project and expected benefits of the project should be achieved through adoption of positive environmental measures. During the execution stage, all work should be controlled to minimize the impact to the environment. Throughout the MCV project, quarterly returns and annual reports were submitted to summarize what have been done in the past period and also discuss what can be improved to meet the requirement of sustainably development in the next period. Finally, in the result of MCV project, Coastal Planning Datasets can be used for the long term sustainability of Western Australia's coast. This dataset provides a valuable source of information for coastal managers throughout the state. Release of the data will significantly reduce the amount of time that it takes to find reports relating to management and conditions for any one part of the coastline.

Part B:

What key information should be included in the project charter and why? Discuss

A project charter should include:

- **Project title**
- **Project start date**
- **Project finish date**
- **Key stakeholders**
- **Business case supporting the project**
- **Project goals**
- **Budget information**
- **Foreseeable risks**
- **TBL and life cycle thinking**

The project charter provides the following benefits:

- **Formally establishes the project (a project does not exist without a project charter)**
- **Designates the parameters within which the project manager has the authority to operate**
- **Gives the project manager authority to spend money and commit resources**
- **Provides the high-level requirements for the project**
- **Links the project to the ongoing work of the organization**

The project charter is needed because:

- **ensures the project manager understands the sponsor's needs**
- **provides key information needed to get started**
- **provides a reference document to make sure everyone is on the same page later in the project**
- **provides the basis to plan the project**
- **empowers and protects the project manager by describing what he or she is being asked to accomplish**

What scheduling tools are available to the project manager and team to plan the project activities? Discuss

The project schedule is the time-based-sequenced description of all of the project activities.

There are 4 main tools in capturing and/or communicating the schedule to the stakeholders:

- **work breakdown structure (WBS)**
- **program evaluation review technique (PERT) or network diagram**
- **critical path analysis (CPA)**
- **Gantt Chart**

Work Breakdown Structure is essential as part of a project's lifecycle and timeline. An important part of project planning, the WBS begins with a hierarchy of tasks and levels that help to identify how the

project will flow within a designed timeline set by the project manager. Also, it helps to define the specifics of the project outlined in the project scope.

Network Diagram is essentially a flowchart of the project tasks. The network is created by determining predecessor and successor relationships and connecting the tasks based upon those relationships. In a complex project with many organizations/individuals involved, this technique can provide guidance as to who is the internal customer for each task.

Critical path analysis is used to determine what the shortest time to complete the project. It offers a visual representation of the project activities, presents the time to complete the tasks and the overall project and tracks of critical activities.

Gantt chart is excellent for tracking progress or activity for tasks once they have been scheduled. It is used for daily/weekly tracking of project progress and it is easy to use and maintain. It creates focus for tracking progress because it is clear to see whether a task should be completed, underway, or pending at any given time.

What is the difference between a schedule drawn 'in series' and one drawn 'in parallel'? Discuss and provide examples to substantiate your answer.

The network can be drawn either 'in series', which is a straight line or linear network with one activity following directly on after its linked predecessor, or 'in parallel' where there are two or more paths of linked activities through the network from start to finish.

For example, there are 4 tasks in this project.

- **Task A takes 1 day to complete**
- **Task B takes 4 days to complete and can be executed in parallel with Task C which takes 11 days to complete**
- **when Tasks B and C are completed, Tasks D can be executed which will take 3 days to complete**

Transactional leaders

- Guide or motivate their followers to work towards established goal by exchanging rewards for their productivity
- Link job performance to rewards
- ensure resources allocation to get the job done

Transformational leaders

- Stimulate & inspire followers to exceed their own self-interests for the good of the organisation to achieve extraordinary outcomes
- Create a strategic vision which is the substance of transformational leadership
- Communicate the vision which is the process of transformational leadership
- Model the vision, "walk the talk"
- Build commitment toward the vision; transform the vision into reality

TBL & Sustainability

- Meeting the needs of people today without compromising the ability of future generations to meet their own needs
- Triple Bottom Line (TBL) approach – a company's ability to achieve its business goals & increase long-term shareholder value by integrating economic, environmental & social opportunities into its business strategies

Project life cycle + life cycle thinking

Societal business – occurs when governments, organizations and individuals design, develop and deliver needs satisfying goods and services that are equitable, sustainable and enhance the Quality of Life (QOL) for all, without prejudice

How design is important?

Extend product life cycle through appropriate design to enhance product:

- reliability & robustness
- repairability
- upgradeability
- variability
- attachment

Potential benefits of life cycle thinking

- 70% of total product costs can be saved during design stage
- shortened lead-times for production
- design decisions have significant impact on quantity of resource used & of waste produced during life-cycle
- savings in labour, resources & energy
- positive image

5 approaches to managing conflict

- avoiding – low assertion low cooperation
  - no attempt is addressed the conflict at all
  - may be effective when
    - cannot possible win
    - the issue is relatively minor
    - there is an inequitable balance of power
- competing/forcing – high assertion low cooperation
  - power & dominance are used to gain compliance to one's own perspective
  - may be effective when
    - you know you are right
    - the stakes are too high if you lose
    - quick & decision action is required
    - unpopular decisions have to be made
    - a show of force is required

- accommodating – low assertion high cooperation
    - other person's point of view is considered more important to one's own
    - may be effective when
        - other person's evidence is more compelling
        - peace, goodwill and harmony are more important to the valued relationship
        - create a tactical advantage by offering a concession
        - wish to avoid further damaging the relationship
- collaborating – high assertion high cooperation
    - mutual and optimal outcomes are sought by both parties
    - may be effective when
        - want to build an alliance & relationship
        - need the enduring commitment from the other party
        - want to encourage, investigate & consolidate different perspectives
        - need an optimal outcome without sacrificing one's own
- compromising – mid assertion mid cooperation
    - mutual acceptable outcomes is reached
    - may be effective when
        - the outcomes are only moderately important to each party
        - no other option is working
        - evenly balanced power
        - a decision is required

Working with project teams

Stage of team development

- forming – meeting together 1st time
- storming – conflict appears by personality clashes, team role, leadership issues
- norming – the 'unwritten rule', code of conduct, and acceptable behaviours are developed, shared and agreed
- performing – ready to perform the work they have been assigned in a united, cohesive and productive manner
- adjourning – project is ceased and the team disbands

Criteria to be a team

- clear, communicated & recognised long-term goals
- mutual appreciation of members' individual & broad skills
- open, honest, continuous communication & constructive feedback
- supported leadership
- trust & support each other

What effective team members need

- the technical competence required to perform the assigned work
- commitment to the project's goal
- demonstrated communication skills
- the ability to identify key issues, solve problems & implement the solution

- the ability to work without ongoing supervision
- experience & knowledge of project methodology

Risk Management (life cycle of the project)

- identification – all internal & external sources of risk having the potential to impact the project
  - SWOT analysis
  - PESTELG framework
  - Simulations
  - Feasibility studies
- assessment – determine both the probability & impact arising from the risk source to calculate the priority
  - risk matrix
- analysis – clearly determine how each risk will impact the project's success
  - PERT analysis
  - critical path
  - networks
- management – plan the appropriate response strategies to accept, reject, and manage the risk
  - reject – modify plan to eliminate risk
  - accept – addressed as they arise
  - mitigate – proactive action to minimize the impact
  - share – partnership with 3rd party
  - transfer – outsourced to 3rd party
- evaluation – review the risk process and provide relevant strategies post project

Budgeting

- a formal written financial statement of management's plans for the future expressed in financial terms
- approaches to budgets
  - traditional – previous year's level of performance is the foundation for next year's figures
  - zero based – ignores previous results, each activity is recorded with zero spending to begin with
  - top down – based on the knowledge of senior managers & past results, project cost is estimated then passed to lower-level managers who continue the breakdown into further estimates
  - bottom up – individual tasks budgets are estimated in details

Key project stakeholders and their moral responsibilities

- A corporation has the same **ethical obligations** to its shareholders, employees, customers, suppliers and the community, as well as the environment
  - do not harm
  - have the moral obligation not to damage the freedom and the values of the free-enterprise system
  - be fair in the transactions in which it engages
  - live up to the contracts into which one enters freely

Lifecycle impact assessment

- an impact is a positive or negative result of an effect of a product, process, and activity, including all the social, economic, and environmental consequences and implications
- negative impacts can affect:
    - the ecosystem and natural resources
    - human health
    - safety
    - quality of life
    - economics
    - society as a whole

Key project management principles

- identified business need/opportunity
- defined benefits
- identified key stakeholders (agreed deliverables, accountability)
- leadership (cohesive teamwork, open communication, proactive decision making)
- consistent with a TBL and lifecycle approach
- project management as a strategy (not simply as planning & execution)
    - recognize & manage proactively project complexity
    - decision making based on strategic approaches
    - project lifecycle thinking
    - include variables in line with TBL

Project management lifecycle

- concept stage, discussion on
    - preliminary goals
    - deliverables & strategic vision alignment
    - problem raised
    - impact assessment in terms of TBL
    - potential benefits identifies
    - cost estimation
- planning stage
    - all work required, planned, scheduled
    - objective are finalized
    - resources are assigned
    - quality is signed off (including TBL and life cycle guidelines & standards)
    - final costs are approved
    - timing agreed
    - all others administrative matters are determined
- execution stage
    - tracking actual progress
    - work is monitored, controlled, corrected where necessary with schedules being reviewed, revised, updated as required
- finalization stage
    - project is completed & deliverable handed over to the client
    - resources are disposed or reassigned

- project is evaluated
- reports are written & presented
- administration arm of the project is closed

Project management competencies

- integration - all aspects of the project are effectively coordinated & managed
- scope – all the work required by the project, & only this work is included
- time – project is completed in a timely manner
- cost – project is completed within the approved budget
- quality – project will satisfy the needs (standards, definitions, specifications, uses) for which it was undertaken
- human resource – effective use
- communications – all communication is completed, timely, appropriate & targeted
- risk – clearly identified, comprehensively analysed & responded to proactively
- procurement – processes required to acquire all external goods & services from the project

Key project management lifecycle benefits

- communications graphical framework of the total project
- guides all activity
- details responsibility
- recommend manageable portions
- identify control gates
  - concept – project charter
  - schedule – project plan
  - progress – project report
  - complete – project audit

Benefits of successful project management

- improved accountability – responsibility, visibility & authority assigned
- improved scope definition – clear to project & stakeholders
- improved efficiency & effectiveness – effective planning & use of resources, systems & processes
- improved performance management – measuring achievements against plan
- improved consistency
- improved transparency of process
- improved client/stakeholder satisfaction

Identifying the project variables/constraints

- time – timeframe including start, finish & deadline dates
- cost – budget & associated funding requirement & approvals
- specification – initial description of output as to enable measurement
- resources – nominated assignment & commitment of people, materials, equipment & finance
- TBL & life cycle steps

Adding value to the bottom line

Project vision

- understood
- credible
- motivational
- demanding & challenging

Non-numeric Project selection models

- scared cow - project chosen by senior executive
- operating necessity – maintain operational functionality, fast-tracked decision making, limit budget provision and reduced planning time
- Competitive necessity – maintain a competitive advantage in the marketplace, ability to match competitors
- Comparative benefit – seek multiple projects with differing benefits, highly subjective choice
- Product line extension – the product service is repositioned favourably with customers

Numeric Project selection models

- Payback period = the time it takes to earn back the money invested in a project
- Return on investment (ROI) = the overall profit on an investment calculated as percentage of the total amount invested
- Net present value (NPV) = the projected profitability of an investment, based on future cash-flows & discounted (from 2nd year) at a stated interest rate

Project governance (control)

- define the roles and responsibilities of all project stakeholders
- determine the decision making structure for the project
- assign the decision rights and accountability framework to encourage desirable behaviour in the project
- transparent accountability with detailed project plans based on defined success factors, critical path analysis, performance milestones and decision gate
- internal audit capability and accountability to provide regular, timely, clearly reports on performance, deliverables and outcomes

Benefits of project governance

- clear assignment of roles & responsibilities
- develops organization's project delivery capability
- accountability & transparency in decision making
- standardizes processes & procedures
- identification, communication & management of all stakeholders
- process to review & evaluation documents & deliverables
- maximize the return on project investment

- ensure consistency with TBL and project life cycle

Key stakeholders and accountabilities

Sponsor & clients

- ensures strategic alignment
- determines overall project goal, hopefully in line with TBL & life cycle thinking
- approves changes to scope
- funding

Senior managers

- ensure strategic alignment
- approve appointment & responsibilities of project manager
- provide guidance & support
- authorize start/finish project phases
- support for project deliverables, hopefully in line with TBL & life cycle thinking

Project manager

- managing stakeholders expectations
- coaching, mentoring & supporting project team
- managing quality requirements
- project planning plus estimating, assigning, managing project resources, budgeting
- managing procurements & contracts
- taking corrective action where required
- setting project deliverables & promoting/supporting a TBL and life cycle approach

Project manager profile

- conceptual skills
- interpersonal skills
- technical skills
- managerial ability
- strategic expertise
- experience team player
- project management discipline
- delegate
- negotiate and conflict solving

Project scoping

Core output from the concept stage

- identifying key stakeholders
- assigning the project manager
- creating the project charter
- developing preliminary project scope statement

Project scope statement

- project title
- project start and finish date
- detailing key stakeholders
- detailed description of all objectives, characteristics & requirements
- project justification
- detailing milestones
- detailing risks
- detailing assumptions
- project success criteria
- TBL & life cycle thinking

Setting project objectives (SMART Framework)

- specific
- measure
- achieve
- realistic
- time frame

Purpose of the concept stage:

- document the key project stakeholders
- discuss project status on the idea/initiative/change
- describe what is to be accomplished
- document the project in all essential respects before final estimates are made (time, cost, quality, resources, TBL and life cycle)
- communicate the size, potential risks, TBL & life cycle & interdependencies of the project
- identify how much is to be achieved (& what will not be achieved)

Part C:

What are some of the key characteristics of a highly performing project team? Discuss and provide examples to support your answer.

Shared Vision – when each team member understands where the team is headed and how their specific role contribute to the goals and vision of the team; productivity skyrockets.

- Put the vision onto paper
- Develop a vision communication strategy to connect the vision to the team
- Allow the team to build on the vision and take ownership of it

Health Team Culture – allows the team to make decisions, not waste time on office politics, and accomplish more in less time.

- Set expectations for a team culture based on trust and healthy conflict
- Recognize individuals and the team for achievements and living out core values
- Create opportunities to connect outside of work

Clear Defined Roles and Expectation for Performance – team members know what they are supposed to do, how their work supports the team, and how they contribute to the overall success of the team.

- Identify the roles for the team based on market demands, leadership needs, and the vision
- Lay out job descriptions with performance expectations and success indicators
- Perform team assessment using strengths finder to identify the right person for each role
- Set up a communication strategy to introduce the new roles to the team

Everyone is Held Accountable – in a culture of accountability, the focus is on the personal development of your team and results

- Establish one-on-one coaching sessions with each team member
- Hold regular formal performance reviews
- Require team members to verbally report on specific projects, goals, and the action plans

The Leader is an Example

- Work from leader's strengths-zone and trust others to do the same
- Provide High Impact team building opportunities
- Get into the trenches with the team and show them the leader cares

What is a code of ethics? Discuss the limitations of a code of ethics and provide examples to substantiate your answer

Code of ethics is defined as value and principles that shape the decisions we make in engineering practice. Its functions as a commitment by the profession as a whole, that engineer will serve the public health, safety and welfare.

What they can do

- help to find answers
- protect against pressure to compromise privacy
- Tell what the professional standards of behaviour are

What they cannot do

- cannot force ethical behaviour
- cannot give the answers
- They are not a panacea

Limitations for code of ethics

- without proper guidance, different parts of the organisation may interpret the code differently, ultimately devaluing it
- introducing and implementing the code effectively will be demanding of senior management time

- the code may raise public and employee expectations to a level that the organisation is unable to live up to

What are the benefits of managing a project ethically? Discuss and provide examples to support your answer.

- Cultivate strong teamwork and productivity – Ongoing attention and dialogue regarding values in a project builds openness and integrity. The team feels strong alignment between their values and other organization, with strong motivation and performance.
- Support the team growth and meaning – team members feel full confidence they can admit and deal with whatever comes their way.
- Help manage values associated with quality management, strategic planning and diversity management – Total quality management includes high priority on certain operating values, e.g., trust among stakeholders, performance, reliability, measurement, and feedback. Ethics management techniques are highly useful for managing strategic values, as well as in managing diversity which is acknowledged as different values and perspectives.
- Promote a strong public image - an organization regularly gives attention to its ethics can represent a strong positive to the public.

Ethical management and leadership – Loyalty & Integrity (code of ethics)

- Expected to maintain the highest levels of honesty and integrity, both inside and outside working hours
- Maintain confidentiality
- Devoting their best efforts and loyalty to the firm

Limits of loyalty and integrity

Loyalty – being faithful to

- self and family
- groups and associations one has chosen to join
- the employing organization
- society at large

Integrity – thinking honestly and soundly, and acting accordingly, in

- the personal and private arena
- the public arena
- the organization
- society at large

Ethical managers/project managers/leaders should provide a good role model by:

Being ethical & honest at all times (obeying to wide loyalty and integrity principles)

- telling the truth
- admitting failure

- communicating shared ethical values to employees
- rewarding employees who behave ethically & punish those who do not

Attributes of an ethical manager/project manger/leader

- Establish codes of ethics & decision rules
- Hire individuals with high ethical standards
- Have all levels of management continually maintain the code of ethics & the organization's commitment to the code
- Consistently discipline those who break the code
- provide ethics training
- conduct independent social audits
- provide support for individuals facing ethical dilemmas

Ethical decision making by consumer

- benefits of life cycle thinking
- evaluation of potential product harm
- key ethical drivers behind consumer's decision-making process
    - environmental issues
    - human rights
    - animal rights
- consider the product groups to have differential importance
    - food products being the most strongly associated with ethical issues
    - brown goods group (electric goods) being least associated with these issues

Engineering ethical issues

A two-dimension foundation

- a moral dimension of ethics
    - principles of right and wrong in human conduct
    - set of guidelines frameworks constructed by society that direct appropriate values and subsequent behaviour
    - often culturally determined
- a normative dimension of ethics
    - What is the right thing to do?
    - moral correctness based on personal values shaped by:
        - family
        - religion
        - experience
        - personal feelings on how we should treat people and the environment as a whole

Reasons of ethics

- moral awareness – recognising moral issues
- moral reasoning – assessing opposing arguments on moral issues
- moral coherence – forming consistent viewpoints based on facts

- moral imagination – look for alternative responses to moral issues
- moral communication – use of ethical language
- respect for people – genuine concern for the well-being of others and oneself
- tolerance of diversity – respect ethics and religious difference and acceptance of reasonable differences in moral perspectives
- integrity and honesty – maintaining moral integrity and honesty, and integrate the professional life and personal convictions
- ethics and sustainable development are strongly related with respect to
    - financial bottom line – make a profit while balancing the need for social, environmental and natural resource balance
    - social bottom line – focus on society as a whole
    - environmental bottom line – controlling pollution and toxic emissions, preserve biological diversity
    - natural resource – conservation to the extent possible and search for substitutes for non-renewal resources

Ethical theories

- consequences-based theory – an action is judged as ethical or unethical based on the consequences/outcome
    - maximise benefits /minimise costs
    - an action is right if it produces the best consequences overall
    - the greatest good for the greatest number
    - an act is right if it maximises overall utility
- duty-based theory – actions are judged as ethical standing alone & without regard to consequences
    - to do the right thing simply because it is the right thing to do; regardless of consequences
    - to do the right things that we would tolerate anyone else doing, and not to give ourselves excuses
    - always treat any human being as an end in himself/herself, never merely as a mean to an end
- virtue-based theory – focused on the individual not on the action; individuals should seek to live a virtuous life
    - concentrates on the person who performs the act
    - focuses on the character development of the person
    - development of a good character of the moral virtues will lead a person to do the right thing

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