RQF LEVEL 3

SWDPR301

SOFTWARE DEVELOPMENT

Project Requirements Analysis

TRAINEE'S MANUAL

October, 2024

PROJECT REQUIREMENTS ANALYSIS

KOICA Korea International Cooperation Agency

TQUM TVET Quality Management Project

2024

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ACRONYMS

CRM: Customer Relationship Management

EIS: Employee Information System

PMO: Project Management Office

ROI: Return On Investment

RTB: Rwanda TVET Board

TQUM Project: TVET Quality Management project

INTRODUCTION

This trainee's manual includes all the knowledge and skills required in software development specifically for the module of **"project requirements analysis".** Trainees enrolled in this module will engage in practical activities designed to develop and enhance their competencies. The development of this training manual followed the Competency-Based Training and Assessment (CBT/A) approach, offering ample practical opportunities that mirror real-life situations.

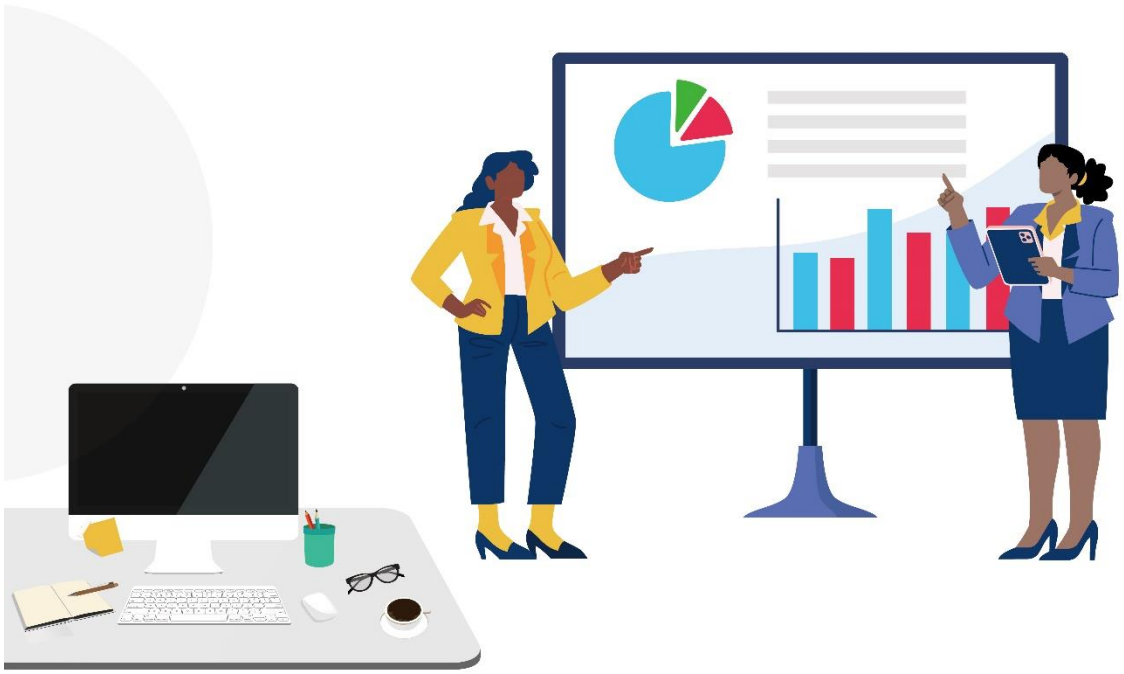
The trainee's manual is organized into Learning Outcomes, which is broken down into indicative content that includes both theoretical and practical activities. It provides detailed information on the key competencies required for each learning outcome, along with the objectives to be achieved.

As a trainee, you will start by addressing questions related to the activities, which are designed to foster critical thinking and guide you towards practical applications in the labor market. The manual also provides essential information, including learning hours, required materials, and key tasks to complete throughout the learning process.

All activities included in this training manual are designed to facilitate both individual and group work. After completing the activities, you will conduct a formative assessment, referred to as the end learning outcome assessment. Ensure that you thoroughly review the key readings and the 'Points to Remember' section.

MODULE CODE AND TITLE: SWDPR301 PROJECT REQUIREMENTS ANALYSIS

Learning Outcome 1: Identify customer needs
Learning Outcome 2: Gather project requirements
Learning Outcome 3: Determine user requirement



Indicative contents
1.1 Data gathering **1.2 Interpretation of data** **1.3 Organization of customer needs**

Key Competencies for Learning Outcome 1: Identify customer needs

Knowledge	Skills	Attitudes
• Description of key concepts used in data gathering • Description of work communication process • Description of data collection methods • Description of data interpretation • Description of customer needs organisation	• Preparing tools for data collection • Collecting raw data • Interpreting data • Organising data based on customer needs	• Being Teamwork when collecting data • Being a critical thinker in data analysis • Being Collaborative and good communicator when collaborating with customer

Duration: 10 hrs

Learning outcome 1 objectives:

By the end of the learning outcome, the trainees will be able to:

1. Describe correctly the key concepts used in project requirement
2. Describe correctly the work communication process as done in project requirement analysis
3. Gather accurately data based on customer needs
4. Interpret effectively data based on customer needs
5. Organise properly data based on customer needs

Resources

Equipment	Tools	Materials

• Computers • Tablets	• Web browsers • Online forms builder • Microsoft Office (Word, Excel, Power point)	• Internet • Papers • Pens • Pencils • Eraser

Indicative content 1.1: Data gathering

Duration: 5hrs

Theoretical Activity 1.1.1: Description of key concepts in project requirement

Tasks:

1: You are requested to answer the following questions:

I. Differentiate internal from external customers
II. Differentiate data from information
III. What do you understand by Pain point?
IV. What is the use of user story in project requirements?
V. What is a research project?

2: Present the findings to the whole class

3: Ask questions where necessary.

4: For more clarification, read the key readings 1.1.1.

Key readings 1.1.1.: Description of key concepts in project requirement

❖ **Customer**

The party that "orders" the product.

A customer, often also referred to as a client, can be a person or an organization that orders and buys products or services that a business offers.

In project management, the customer is the one defining the requirements of the project and often setting the parameters such as budget and deadlines. The customer, therefore, influences the constraints of a project heavily and plays an active part in the project's process.

Customers' role includes tasks such as: approving the project plan, requesting changes to the project, approving or declining the product or service at the end of a project.

You can distinguish between two types of customers:

· **Internal customer:** from the same organization

· **External customer:** belongs to another organization

❖ **Data**

Data refers to raw facts, figures, or information collected for reference, analysis, or calculation. It is a broad term that encompasses a wide range of information and can take various forms, including numbers, text, images, audio, and more.

❖ **Information**

Information is the processed or organized data that has meaning and relevance. While data consists of raw facts or observations, information is the result of processing, organizing, and interpreting that data to make it useful and meaningful. In other words, information provides context, understanding, and value to data.

Data Vs Information

❖ **Pain points**

Pain points refer to specific problems, challenges, or issues that individuals or entities (such as businesses or customers) encounter in a particular situation or context. These pain points represent areas of difficulty, frustration, or dissatisfaction that can hinder the smooth functioning or success of a process, product, or service.

Identifying pain points is crucial in various fields, including business, design, and customer service, as it helps address and improve upon areas that may be causing distress or inconvenience. By understanding and addressing pain points, businesses can enhance customer satisfaction, user experience, and overall efficiency.

For example:

- In the context of customer service, a long wait time on a helpline can be a pain point for customers.
- In product design, difficulty in navigating a website or using a particular feature could be a pain point for users.
- In business operations, inefficient processes that lead to delays or errors can be considered as pain points.

❖ **User story**

A user story is a concise, simple description of a feature or functionality from an end user's perspective. It is a way of expressing software or product requirements in a manner that is easily understandable by both technical and non-technical stakeholders. User stories are a fundamental component of Agile and Scrum methodologies, providing a user-centric approach to software development.

❖ **Research**

Research is a systematic process of investigating, studying, and analyzing a topic, issue, or phenomenon to gain new knowledge, insights, or understanding. It involves the collection

and interpretation of data and often follows a structured methodology to answer specific questions, test hypotheses, or explore a subject in depth.

- **Project**

A project is a temporary and unique endeavour with a defined beginning and end, undertaken to achieve a specific goal or outcome. Projects are typically constrained by factors such as time, cost, and scope. They involve a series of interrelated tasks, activities, and resources that are coordinated to produce a desired result.

Theoretical Activity 1.1.2: Description of work communication process

Tasks:

1: Answer the following questions related to the work communication process

I. What do you understand by work communication process?

II. Explain components of work communication process

III. Identify Types of Communication channels

2: Present the findings to the whole class

3: Ask questions where necessary.

4: For more clarification, read the key readings 1.1.2.

Key readings 1.1.2.: Description of work communication process

I. Work communication process

Work Communication process refers to the series of steps and elements involved in the successful exchange of information, ideas, or messages between a sender and a receiver at work. It involves the transmission, reception, and understanding of the message being conveyed.

II. Components of work communication process

- **Sender**

This is a person who formulates, encodes or transmits a message

In the communication process, the sender refers to the person or entity that initiates and encodes the message. The sender is responsible for formulating the information or idea they wish to convey and transforming it into a suitable form for transmission.

- **Encoding**

Encoding refers to the process of converting thoughts, ideas, or information into a format that can be effectively transmitted to a receiver. It involves selecting and arranging words, symbols, gestures, or other means of communication to convey the intended message. Encoding takes into account the sender's knowledge, language, culture, and communication skills to formulate the message in a way that can be understood by the receiver.

- **Message**

It is the content of the communicative act

a message refers to the information or ideas that are being conveyed from a sender to a receiver. It is the content of the communication and the primary purpose behind initiating the communication.

The message contains the actual content that the sender wishes to communicate. This could be in the form of words, images, symbols, data, or any combination of these elements.

The tone and style of the message contribute to its overall impact. The sender must consider the appropriate tone for the context and audience, whether formal, informal, persuasive, empathetic, or instructive.

- **Types of communication channel**

- **Verbal communication** involves the use of spoken words to convey information, ideas, thoughts, and emotions. It relies on the immediate interaction between individuals through face-to-face conversations, phone calls, video conferences, or any other medium that allows real-time audio communication. Verbal communication can be informal or formal, depending on the context and participants involved.

Verbal communication can be done through an interview, a meeting, a telephone

- **Written communication** involves the use of written or printed words to convey information, ideas, and thoughts. It includes various forms such as emails, letters, reports, memos, articles, and text messages. Written communication allows individuals to exchange information over time and space, enabling a more permanent record of the message.

Written communication can be done through a notice board, an internal mail service, a public postal service

- **Visual communication** refers to the transmission of information, ideas, or messages through visual aids or elements such as images, graphics, charts, diagrams, videos, and other visual representations. It involves using visual cues to convey meaning and enhance understanding.

Visual communication can be done through a computer, a printer, a fax machine

❖ **Receiver**

This is a person who decodes or interprets a message

A receiver is the individual, group, or entity that receives and interprets the message sent by the sender. The receiver plays a crucial role in the communication process as they are responsible for decoding the message and extracting meaning from it. The receiver's understanding of the message is influenced by their knowledge, experiences, attitudes, and cultural background. Effective communication relies on the receiver's ability to comprehend and interpret the message accurately.

❖ **Decoding**

The receiver interprets the message he or she has been given in order to obtain his or her own idea of the information it conveys. This may or may not be the same as the information which the sender wanted to convey.

If the sender encodes the idea wrongly or in terms that the receiver interprets according to his or her own experience rather than the senders, then distortion is likely to occur and the receiver will gain a different message from that intended.

❖ **Feedback**

It is where the receiver's first reaction to the message is made. A skilled communicator should look out for feedback when talking to an individual or group.

Feedback in the communication process refers to the response or reaction provided by the receiver or audience of a message. It is an essential component of effective communication as it allows the sender to gauge the understanding, interpretation, and impact of their message on the receiver. Feedback provides valuable information about the clarity, effectiveness, and relevance of the communication, enabling adjustments and improvements to be made if necessary.

Theoretical Activity 1.1.3: Description of data collection methods and their related tools

Tasks:

1: You are requested to answer the following questions related to the raw data collection methods and their related tools.

I. What do you understand by data collection?
II. Identify traditional data collection methods and their tools.
III. What is an online form?

2: Present the findings to the whole class

3: Ask questions where necessary.

4: For more clarification, read the key readings 1.1.3.

Key readings 1.1.3.: Description of data collection methods and their related tools

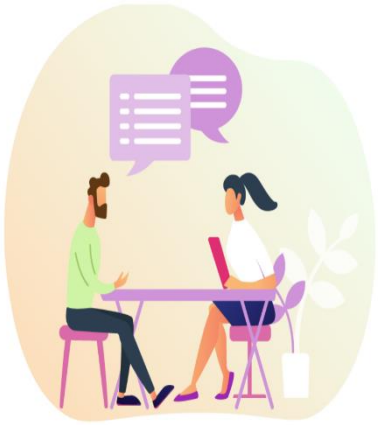
- **Raw data collection methods**

Data collection is the methodological process of gathering information about a specific subject. It's crucial to ensure your data is complete during the collection phase and that it's collected legally and ethically. If not, your analysis won't be accurate and could have far-reaching consequences.

Data collection methods are vital for gathering information, understanding stakeholders' needs, and defining project objectives. The methods used can vary depending on the specific project, its objectives, and the stakeholders involved.

Data collection methods

I. Traditional methods of collecting data



❖ **Interview**

An interview is a face-to-face conversation between Interviewer (someone who asks questions during an interview) and interviewee (someone who provides answers during an interview) with the sole purpose of collecting relevant information to satisfy a research purpose. An interview has different types based on the way an interviewer used to ask questions:

▪ **Types of interviews**

1. Structured interview

A structured interview is a type of quantitative interview that makes use of a standardized sequence of questioning in order to gather relevant information about a research subject.

2. Semi-structured interview

A semi-structured interview is a type of qualitative interview that has a set of premeditated questions, allowing the interviewer to explore new developments in the cause of the interview. In some way, it represents the midpoint between structured and unstructured interviews.

3. Unstructured interview

An unstructured interview is one in which there is no predefined pattern or set of questions. The interviewer asks questions based on interviewee's replies and may probe for further information.

▪ **Questions to avoid during an interview**

1. Double negation question

A double negation question is a type of question that includes two negative elements, resulting in a complex or contradictory statement. These questions can sometimes lead to confusion or misunderstandings because the use of double negatives can create ambiguity.

Examples:

1) Couldn't you not tell anyone about it?
2) Isn't it unlikely that you won't come?

2. Double-barrelled question

A double-barrelled question is a type of survey or interview question that combines multiple issues or topics into a single question. These questions can be problematic because they make it difficult for respondents to provide a clear and specific answer to each part of the question.

Examples:

1) "Do you enjoy your job and get along well with your colleagues?"

Issue: This question combines two separate topics, job satisfaction and relationships with colleagues. Respondents may have different experiences or feelings about each aspect, making it challenging to provide an accurate response.

2) "How frequently do you exercise and engage in outdoor activities?"

Issue: This question combines two different activities, exercise and outdoor activities. Respondents may have different levels of involvement in each area, making it difficult to provide a single, meaningful answer.

3. Ambiguous questions

1)"Are you satisfied with the product?"

This question lacks specificity and does not clarify what aspects of the product the respondent should consider when evaluating satisfaction. It could refer to various factors such as quality, price, features, or customer service.

2)"How often do you exercise regularly?"

The term "regularly" in this question is ambiguous and subjective. It does not provide a clear definition of what constitutes regular exercise, leaving room for different interpretations.

3)"Do you support the government's policies?"

This question does not specify which government's policies are being referred to, leaving it open to interpretation. It assumes that the respondent is familiar with all the government's policies and holds a singular opinion on them.

When conducting an interview there are some tools that are required.

- **Tools to be used during an interview**

When collecting data by using interview there are tools that are required depending on the way by which an interview will be conducted, like tools to record data, tools that will help when conducting an interview.

Here, let's focus on a questionnaire that will be guide an interviewer when asking questions.

List of questions

A list of questions that was prepared for a specific purpose

Characteristics of a questions used during an interview.

1) **Clear and concise:** The questionnaire should use clear and concise language to ensure that the questions are easily understood by both the interviewer and the interviewee. Ambiguity or confusion in the questions can lead to inaccurate or incomplete responses.
2) **Relevant and focused:** The questions should be directly related to the topic or purpose of the interview. They should address the specific information or insights that need to be obtained. Irrelevant or off-topic questions may waste time and reduce the quality of the interview.
3) **Open-ended and specific:** Open-ended questions allow the interviewee to provide detailed responses and share their thoughts and experiences. However, the questions should also be specific enough to guide the interviewee towards relevant information, avoiding vague or overly broad inquiries.
4) **Logical flow and sequencing:** The questions should follow a logical flow that progresses from general to specific or from introductory to more in-depth. A well-structured questionnaire maintains a coherent sequence to ensure a smooth flow of the interview and helps the interviewee provide meaningful responses.
5) **Unbiased and neutral:** The questions should be framed in a neutral and unbiased manner to avoid influencing the interviewee's responses. Biassed or leading questions can introduce a bias into the interview process and may result in inaccurate or unreliable data.
6) **Avoid jargon and technical language:** The questionnaire should use language that is easily understood by the interviewee, avoiding jargon or technical terms that might confuse or alienate them. Using plain and accessible language ensures that the interviewee can provide accurate and relevant responses.
7) **Considerate interviewee's time:** It is essential to be considerate of the interviewee's time and ensure that the questionnaire is of an appropriate length. Long and complex questionnaires can be exhausting for the interviewee, leading to incomplete or rushed responses. Keeping the questionnaire concise while still gathering the necessary information is crucial.

❖ **Questionnaire**

A questionnaire is a data collection tool that consists of a set of structured questions designed to gather information from individuals or a group of respondents. It is a popular method used in research, surveys, and data collection processes to systematically gather data and insights from a target population

- **Type of Questionnaire**

1) **Closed-ended Questionnaire:** This type of questionnaire includes questions with predetermined response options(Closed-ended questions). Respondents select their answers from a list of provided choices. Examples of closed-ended questions include multiple-choice questions, rating scales (such as Likert scales), and yes/no questions. Closed-ended questionnaires are useful for quantitative analysis as responses can be easily categorized and analysed.

Example of closed-ended questions

1.What is your gender?
   a) Male
   b) Female
2.Have you travelled abroad in the past year?
   a) Yes
   b) No
3. How old are you?
4. What is your name?

2) **Open-ended Questionnaire:** In contrast to closed-ended questionnaires, open-ended questionnaires include questions that allow respondents to provide detailed, free-form responses (open-ended questions). These questions typically begin with prompts such as "Why?" or "Explain." Open-ended questions enable respondents to express their thoughts, opinions, and experiences in their own words. Analyzing open-ended responses can be more time-consuming and subjective, but it allows for richer qualitative insights and in-depth understanding.

Example of open-ended questions

1. Describe your school.
2. Explain the term customer
3. What is an interview?

- **Tools to be used during Questionnaire**

  - **Questionnaire**

Characteristics of questions to be used during questionnaire data collection method

1. Clarity

- **Simple and direct:** Questions should be easy to understand, without ambiguity. Avoid jargon or complex language that respondents may find confusing.
- **Avoid double-barreled questions:** Don't ask two things at once. Each question should focus on one issue or concept.

2. Relevance

- **Aligned with objectives:** Questions should be directly related to the purpose of the research and help gather information to meet the study's objectives.
- **Respondent-centric:** Ensure the questions are relevant to the respondents' experiences or knowledge.

3. Brevity

- **Concise:** Short questions reduce cognitive load and make it easier for respondents to answer without feeling overwhelmed.
- **Focused:** Avoid unnecessary details that could distract from the primary intent of the question.

4. Neutrality

- **No leading questions:** Avoid framing questions in a way that influences or suggests a particular answer.
- **Balanced wording:** Use neutral language that allows respondents to answer honestly without feeling biased toward a certain response.

5. Scalability (for closed-ended questions)

- **Balanced response options:** In closed-ended questions, provide balanced options to capture a full range of responses (e.g., strongly agree to strongly disagree).
- **Non-overlapping options:** Ensure response options do not overlap and that all possible answers are included.
- **Even or odd scale:** Choose whether to use an even scale (forcing a choice) or odd scale (allowing a neutral/middle option), depending on research goals.

6. Validity

- **Measures what it intends:** Ensure that the question is designed to capture the specific information needed to answer the research problem.
- **Appropriate context:** The wording should be consistent with the respondent's background and situation.

7. Reliability

- **Consistency in responses:** Questions should yield similar responses when posed to the same respondents over time under similar conditions.

8. Types of Questions

- **Open-ended:** Allow respondents to express opinions in their own words, useful for qualitative insights.
- **Closed-ended:** Provide fixed response options, useful for quantitative analysis and easier to analyze.
- **Multiple choice:** Offer a list of options for respondents to choose from.
- **Likert scale:** Measures attitudes or feelings across a scale, often ranging from strongly agree to strongly disagree.

9. Logical flow

- **Organized structure:** Arrange questions in a logical sequence that flows naturally, typically starting with general questions and progressing to more specific ones.
- **Filter questions:** Use screening questions to ensure respondents answer only those questions relevant to them.

10. Ethical considerations

- **Confidentiality:** Ensure questions do not ask for sensitive information unless necessary, and inform respondents about how their data will be used.
- **Voluntary participation:** Questions should not make respondents feel forced to provide information they are uncomfortable sharing.

❖ **Observation**

A way to gather data by watching people, events, or noting physical characteristics in their natural setting.

- **Types of observation**

1. **Participant Observation:** The observer actively participates in the activities or lives of the subjects being observed.
   is Used in ethnographic studies, sociological research, and qualitative research where understanding social interactions, behaviours, and cultural norms from an insider's perspective is crucial.

2. **Non-participant Observation**: The observer remains separate from the activities or lives of the subjects being observed and does not actively participate.
   It is useful when objectivity is critical, such as in psychological studies or scientific observations where the goal is to minimize observer influence on the subjects' behaviour.

3. **Structured Observation:** The observer uses a predetermined set of criteria or behaviours to systematically record observations.

It is used Common in quantitative research where specific behaviours or events are to be measured consistently across different observations, such as in educational assessments or behavioural studies.

4. **Unstructured Observation:** The observer does not use a predetermined checklist or categories but instead records observations as they naturally occur.
   It allows for flexibility and exploration of unexpected behaviours or phenomena, common in qualitative research where the focus is on generating insights and understanding complex social dynamics.

To collect data by using observation a checklist should be prepared before; to identify what to observe during an observation

- **Tool for observation: A checklist**

A checklist is a structured tool or document that contains a list of predefined items, criteria, or tasks to be observed, monitored, or verified during an observation process. The checklist serves as a systematic guide for individuals or observers to ensure that specific details or actions are documented accurately and consistently.

Checklist used during observation must be:

1) **Clear and specific:** The checklist should have clear and specific items or behaviours to be observed. Each item should be easily understandable and measurable to ensure consistency and accuracy in data collection.
2) **Organized and structured:** The checklist should be organized in a logical manner, grouping related items together. It should follow a structured format, making it easy for the observer to navigate and record observations systematically.
3) **Comprehensive coverage:** The checklist should cover all relevant aspects or behaviors that need to be observed. It should capture a comprehensive range of items to ensure that no important information or behavior is overlooked during the observation process.
4) **Objective and unbiased:** The checklist should be designed to promote objectivity and minimize bias in the observation. The items on the checklist should be neutral and free from subjective interpretations or opinions.
5) **Measurable or observable:** Each item on the checklist should be observable and measurable. It should describe behaviors or events that can be directly observed or recorded without subjective inference.
6) **User-friendly:** The checklist should be user-friendly, easy to understand, and straightforward to use. It should have clear instructions or guidelines to assist the observer in correctly interpreting and recording the observations.

7) **Adaptable:** The checklist should be adaptable to different observation contexts or settings. It should allow for customization or modification to suit specific research objectives or situations, while still maintaining the integrity of the observation process.

❖ **Documentation**

Sometimes you can collect a considerable amount of data without asking anyone anything. Document- and records-based research uses existing data for a study. Attendance records, meeting minutes, and financial records are just a few examples of this type of research.
Using documents and records can be efficient and inexpensive because you're predominantly using research that has already been completed. However, since the researcher has less control over the results, documents and records can be an incomplete data source.

- **Tool for documentation: A checklist**

A checklist is a structured tool or document that contains a list of predefined items, criteria, or tasks to be observed, monitored, or verified during an observation process. The checklist serves as a systematic guide for individuals or observers to ensure that specific details or actions are documented accurately and consistently.

II. Online form

An online form is a digital version of a traditional paper form that is accessed and filled out electronically through the internet. It is a web-based tool that allows users to input and submit information online, eliminating the need for physical paperwork

Online forms are beneficial for gathering qualitative data about users, specifically demographic data or contact information.

- **Instructions for designing online forms to be used in data collection**

To design an online form for data collection, follow these instructions:

1. **Define the Purpose**: Clearly define the purpose of the form and the specific data you want to collect. Understand the objectives and how the collected data will be used. This clarity will help you structure the form effectively.
2. **Choose an Online Form Builder:** Select a user-friendly online form builder platform or tool that suits your needs. Examples include Google Forms, Type form, JotForm, or Wufoo. These platforms provide pre-built templates and drag-and-drop functionality, making form creation easier.
3. **Start with Basic Information:** Begin the form with a section for basic information such as the respondent's name, email address, or any other relevant identifying details. Ensure you clearly communicate the purpose of collecting personal information and how it will be used.

4. **Organize Questions Logically:** Group related questions together and organize them in a logical flow. Start with simple, non-sensitive questions to engage respondents and build rapport. Progress to more complex or personal questions as the form advances. Ensure the form maintains a smooth and coherent structure.
5. **Use Clear and Concise Language:** Write clear and concise instructions for each question. Avoid jargon or technical terms that may confuse respondents. Provide examples or clarifications when necessary. Use plain language to make the form accessible to a wide audience.
6. **Provide Different Question Types:** Utilize a variety of question types to collect different types of data. Use multiple-choice, checkbox, dropdown, rating scales, text boxes, or file upload options, depending on the nature of the information you are seeking. Mix and match question types to keep the form engaging.
7. **Include Validation and Error Messages:** Implement form validation to ensure data accuracy. Add error messages for incorrectly filled or missing fields. This helps respondents provide accurate data and avoids frustration due to form submission errors.
8. **Consider Conditional Logic:** Use conditional logic to tailor the form based on respondents' answers. This allows you to skip irrelevant questions or sections, making the form shorter and more personalized. Conditional logic enhances the user experience by presenting only relevant questions.
9. **Test and Review:** Test the online form thoroughly before deploying it for data collection. Ensure all questions and functionalities work as intended. Check the form's appearance on different devices and browsers to ensure responsiveness. Review the form from the respondent's perspective to identify any potential issues or improvements.
10. **Provide Clear Submission and Confirmation Instructions**: Clearly communicate how respondents should submit the form and what will happen after submission. Consider providing a confirmation message or email to acknowledge their participation and inform them of any follow-up steps.
11. **Privacy and Data Security:** Pay attention to privacy and data security measures. Clearly state how the data will be stored, protected, and used. Comply with relevant data protection regulations and obtain necessary consent if required.
12. **Pilot Testing and Feedback**: Conduct a pilot test of the form with a small group of participants. Gather feedback on the form's clarity, ease of use, and any potential improvements. Make necessary adjustments based on the feedback before launching the form for wider data collection.

Practical Activity 1.1.4: Preparing tools to be used in data collection

Task:

1: Read key reading 1.1.4.

2: You are requested to read the task described below:

A **Bright Future Secondary School,** has requested the development of a website to make school information easily accessible to students, parents, and other stakeholders. The website will serve as a hub where users can access essential information about the school, such as available trades, school fees, location, contact details, and other relevant school details. This platform will enhance communication between the school and the community, offering an easier way for students and parents to stay informed.

To ensure the website fulfills the school's needs, the project requirements analyst is tasked with preparing tools to be used to collect detailed data from the school; those are: **Questions for interview, questionnaire, observation check list, documentation checklist and online form**. The analyst will need to gather the following information:

1. **School Profile:**
   - Full name of the school and its history.
   - Mission and vision statements.
   - School logo and branding materials.
2. **School Trades and Programs:**
   - List of available trades (e.g., technical, academic, vocational programs).
   - Detailed descriptions of each trade or program.
   - Admission requirements and prerequisites for different programs.
3. **School Fees:**
   - Breakdown of school fees by program, grade, or level.
   - Available payment options and schedules (e.g., installments, online payments).
   - Any fee-related policies, such as late fee penalties or scholarships.
4. **Location:**
   - The physical address of the school.
   - Directions to the school (public transport routes, nearby landmarks).
   - Interactive map integration details (if required).
5. **School Authority and Contact Information:**
   - List of key school personnel (principal, vice principal, administrative heads).
   - Contact details (email addresses, phone numbers, office hours).

- Preferred channels of communication for parents and students (e.g., email, phone, social media).

6. **Additional Information:**
   - Policies regarding student conduct, attendance, and academic performance.
   - Academic calendar, including term dates, examination schedules, and holidays.
   - School-related announcements, such as upcoming events, parent-teacher meetings, and extracurricular activities.
7. **Technical Preferences:**
   - Preferred website features (e.g., login for students, fee payment system).
   - Content management system (CMS) preferences (if any).
   - Any accessibility requirements for the website (e.g., language support, screen reader compatibility).

3: Prepare data collection tools.

4: Present your work to the trainer and whole class

Key readings 1.1.4

1. **Preparing tools to be used in data collection**

2. **Steps to Prepare interview questions**
3. **Identify key stakeholders:** Identify the individuals or groups who have a vested interest in the project and will be affected by its outcomes. These stakeholders can provide valuable insights into the requirements.
   Example: "Who are the primary stakeholders involved in this project? Please provide their names and roles."
4. **Determine the information needed:** Identify the specific information you need to gather from the stakeholders. This could include functional requirements, technical specifications, timelines, budget constraints, and any other relevant details.
   Example: "What are the functional requirements for the project? Please list the specific features or capabilities that the project should have."
5. **Design the interview questions:** Structure the questions in a logical and organised manner. Start with general questions and gradually move towards more specific ones. Use a mix of open-ended and closed-ended questions to gather both qualitative and quantitative data.
   Example: "Rate the importance of the following project requirements on a scale of 1 to 5:
   a. Timely completion of deliverables

b. Adherence to budget constraints
c. User-friendly interface
d. Integration with existing systems
e. Scalability for future growth"

6. **Keep it concise and clear:** Ensure that the questions is easy to understand and not too lengthy. Use simple language and avoid jargon or technical terms that may confuse the respondents.

   Example: "Please provide a brief description of any technical specifications or constraints that need to be considered for this project."

7. **Steps to prepare observation checklist**

When collecting data by using observation different tools may be used like: a checklist, a rating scale, or a narrative description, depending on the purpose of observation or depending on the events to be observed, in this activity lets deal with observation checklist.

8. **Determine the Purpose:** Identify the specific purpose of the data collection. For example, it could be to gather customer feedback, conduct a survey, or collect research data.
9. **Identify Key Components:** Determine the main categories or areas that need to be covered in the data collection process. For instance, if you're collecting data for a customer satisfaction survey, key components could include product quality, customer service, and overall experience.
10. **Define Checklist Items:** List specific items or questions that need to be addressed within each component. For example, under the customer service component, checklist items could include "Was the staff friendly and helpful?" or "Did the customer receive prompt responses to their inquiries?"
11. **Organize Checklist Items:** Arrange the checklist items in a logical order. You can group related questions together or organize them based on the flow of the data collection process.
12. **Include Descriptions or Instructions:** Provide clear instructions or descriptions for each checklist item. For instance, you could include guidelines on how to rate or respond to each question, or any additional information that data collectors need to know.
13. **Format the Checklist:** Structure the checklist in a user-friendly format. You can use checkboxes or rating scales to make it easy for data collectors to record their observations or responses. Additionally, consider using a digital data collection tool that allows for efficient data entry and analysis.

❖ **Steps to prepare documentation checklist**

1. Define the Purpose of Data Collection

Identify the objective of the data collection.

Determine the type of information needed and how it will be used.
Example: Collecting product inventory data for analysis in an e-commerce app.

2. Identify the Sources of Documentation
Specify the documents you will use as data sources (e.g., reports, records, logs, transaction receipts).
Ensure the sources are reliable and relevant to the data collection objective.
Example: Sales reports, inventory logs, supplier invoices.

3. Break Down Data Requirements
List the specific data points or attributes to be collected.
Categorize these points for easier organization.
Example:

Product ID
Product name
Quantity in stock
Unit price
Supplier name

4. Create Checklist Items
Design each item as a question or statement to verify or extract specific information.
Use clear and unambiguous language.
Example:

Is the Product ID recorded correctly?
Is the product name consistent across documents?
Does the inventory log match the sales report for the same period?

5. Incorporate Validation Criteria
Include validation checks to ensure data accuracy and consistency.
Specify acceptable formats, ranges, or thresholds.
Example:

Product ID format: Alphanumeric, 6 characters.
Quantity in stock: Numeric, non-negative.

6. Organize the Checklist Logically
Group related items into sections for easier navigation.
Order items in a logical sequence (e.g., by document type, category, or priority).
Example:

Section 1: Product Details

Section 2: Inventory Details
Section 3: Pricing Details

7. Include Instructions for Use

Provide guidelines on how to fill out the checklist.
Clarify what to do in case of discrepancies or missing information.
Example: If an entry is missing in a document, note it and cross-check with alternative sources.

8. Pilot Test the Checklist

Test the checklist on a small dataset to identify issues.
Gather feedback from users involved in the data collection process.
9. Refine and Finalize
Modify the checklist based on feedback and test results.

❖ **Steps to prepare online form for data collection**

1. **Determine Data Collection Objectives:** Understand the purpose of the form and what specific information or data you need to collect.
   Example: If you're designing a form for a customer satisfaction survey, the objective could be to gather feedback on the quality of products and services.
2. **Select an Online Form Builder:** Choose a platform or tool that allows you to create and manage online forms. Examples include Google Forms, Typeform, SurveyMonkey, and Wufoo.
3. **Plan the Structure of the Form:** Decide how the form will be organized. This includes sections, pages, or categories to help respondents navigate smoothly.
   Example: For a customer satisfaction survey, you may decide to divide the form into sections such as "Product Quality", "Customer Service", and "Overall Experience".
4. **Identify Required and Optional Fields:** Determine which fields must be filled out (required) and which are optional. This ensures you gather essential information while respecting user preferences.
   Example: In a contact form, you might make the name and email address fields required, while the phone number field could be optional.
5. **Choose Appropriate Question Types:** Select the right question format for each data point. Common types include multiple choice, open-ended text, dropdown menus, radio buttons, checkboxes, and rating scales.
   Example: For a satisfaction rating, you could use a multiple-choice question with options ranging from "Very Satisfied" to "Very Dissatisfied".
6. **Write Clear and Concise Questions: Ensure** questions are phrased in a way that is easy to understand and doesn't lead respondents to a specific answer. Avoid jargon or overly technical language.

Example: Instead of asking, "How would you rate our services?", you could ask, "On a scale of 1 to 5, how would you rate the quality of our services?"

7. **Provide Instructions and Guidelines:** Offer clear instructions to guide respondents through the form. Explain any terms or concepts that might be unfamiliar to them.
   Example: If you're asking for specific information, you could include a note like, "Please provide details of any issues you encountered."
8. **Consider Data Validation and Formatting:** Implement checks to ensure data is entered in the correct format. For example, use email validation for email addresses or limit number fields to specific ranges.
   Example: If you're collecting email addresses, set up validation to ensure they are in the correct format (e.g., example@email.com).
9. **Customize the Form's Appearance:** Adjust the visual elements of the form to match your brand or make it visually appealing. This may include adding logos, choosing color schemes, and selecting fonts.
   Example: Choose a color scheme and add your company logo or branding elements to make the form visually appealing and consistent with your brand.

10. **Test the Form:** Before making the form live, thoroughly test it to make sure all elements work as intended. Check for functionality on different devices and browsers to ensure compatibility.
    Example: Submit the form yourself to ensure it works correctly. Test on different devices and browsers to ensure compatibility.

Practical Activity 1.1.5: Collecting raw data by using prepared data collection tools

Task:

1: Read key reading 1.1.5.

2: You are asked to read the below task that is requesting to collect data by using interview, Questionnaire, observation, and online form.

A **Bright Future Secondary School,** has requested the development of a website to make school information easily accessible to students, parents, and other stakeholders. The website will serve as a hub where users can access essential information about the school, such as available trades, school fees, location, contact details, and other relevant school details. This platform will enhance communication between the school and the community, offering an easier way for students and parents to stay informed.

To ensure the website fulfills the school's needs, the project requirements analyst is tasked with collecting detailed data from the school.

3: By using the data collection tools, collect data.

4: Present your work to the trainer

Key readings 1.1.5.: Collecting raw data by using prepared data collection tools

- **Collecting raw data by using an interview**

To collect raw data by using an interview pass throughout the below steps:

- ✓ **Preparation:**
- Review the research objectives and familiarize yourself with the interview guide or questions.
- Ensure that all necessary materials, such as consent forms and recording devices, are ready.
- Choose a suitable location for the interview, considering factors like privacy and minimal distractions.
- ✓ **Introduction:**
- Begin the interview by introducing yourself and thanking the interviewee for their time.
- Establish a friendly and comfortable atmosphere to make the interviewee feel at ease.
- ✓ **Build Rapport:**
- Establish a comfortable and friendly atmosphere to encourage open communication.
- Engage in small talk to help the participant feel at ease before delving into the main questions.
- ✓ **Consent and Permissions:**
- If required, obtain informed consent from the participant to use their responses for research purposes.
- Explain how the data will be used, stored, and anonymized, and address any concerns the participant may have.
- ✓ **Review Interview Process:**
- Briefly explain the structure of the interview, the approximate duration, and the types of questions you will be asking.
- ✓ **Follow the Interview Script:**
- Use the interview tool as a guide, following the questions and prompts in the predetermined order.

- Encourage participants to provide detailed responses, and use follow-up questions when necessary.

1. **Active Listening:**

- Practice active listening throughout the interview, demonstrating attentiveness to the participant's responses.
- Use non-verbal cues, such as nodding, to show understanding and engagement.

2. **Probing and Clarification:**

- When needed, use probing techniques to encourage participants to elaborate or clarify their responses.
- Seek additional information to ensure a comprehensive understanding of the participant's perspective.

3. **Record Responses:**

- Record the participant's responses accurately and consistently. This may involve taking notes, audio recording, or using digital tools for transcription.

4. **Handle Technical Issues:**

- If using technology for recording or note-taking, ensure that it is functioning properly. Be prepared to address any technical issues that may arise during the interview.

5. **Respect Participant's Pace:**

- Allow the participant to answer at their own pace. Avoid rushing or interrupting, and create a space for thoughtful responses.

6. **Address Participant Questions:**

- Be prepared to answer any questions the participant may have about the interview process or the research itself.

7. **Closing the Interview:**

- Thank the participant for their time and contribution.
- Reiterate the confidentiality of their responses and provide any relevant information about the next steps in the research process.

- **Collecting Raw data by using questionnaire**

To collect raw data by using questionnaire flow the below steps:

✓ **Prepare for Distribution:**

- If distributing online, use a reliable survey platform (e.g., Google Forms, SurveyMonkey) or prepare printed copies for in-person distribution.
- Ensure you have a plan for reaching your target audience, whether it's through email, social media, or other channels.

✓ **Distribution:**

- Distribute the questionnaires to your target audience.
- Clearly communicate instructions for completing the questionnaire.
- If using online platforms, share the survey link and consider using incentives to encourage participation.

1. **Monitor Responses:**

- Regularly check for incoming responses and monitor for any issues or incomplete submissions.
- Consider sending reminders to boost response rates if necessary.

✓ **Collecting raw data by using Documentation method**

To collect raw data by using documentation flow the below steps:

1. **Define Objectives**

— **Identify resources:** determine what documents are relevant.

2. **Collect Raw Data**

- **Gather Data:** Collect all relevant raw data from various sources.
- **Ensure Completeness:** Make sure you have all necessary data points for your analysis.

✓ **Collecting raw data by using observation method**

1. **Prepare for Data Collection:**

- Ensure that all necessary materials for data collection are ready. Check that observation tools are functioning properly and that observers are prepared.

2. **Start Observation:**

- Begin the observation according to your plan. Record observations systematically and consistently. Be attentive to details and record data promptly.

3. **Conduct the Observation:**

- Carry out the observation according to your plan. Be adaptable to unexpected situations while staying focused on the objectives. Minimize interference with the natural flow of the observed activity.

4. **Maintain Objectivity and Limit Bias:**

- Remind observers to maintain objectivity and minimize bias. Objectivity ensures that the data collected accurately reflects the observed behavior or event.

✓ **Steps to collect data by using online form:**

1. **Deploy the Form**

- **Distribution Channels**: Decide how you will distribute the form (e.g., email, social media, website, mobile app).
- **Embed or Link**: Embed the form on your website or share a link via email or social media.
- **Target Audience**: Ensure the form reaches the intended audience through targeted distribution.

2. **Collect Data**

- **Monitor Submissions**: Regularly check the form submissions to ensure data is being collected as expected.
- **Data Storage**: Ensure that data is stored securely, complying with data protection regulations.
- **Backup**: Regularly back up collected data to prevent loss.

3. **Analyze and Act**

- **Data Cleaning**: Clean the data to remove duplicates, correct errors, and handle missing values.
- **Data Analysis**: Use tools like spreadsheets, statistical software, or business intelligence tools to analyze the data.
- **Reporting**: Generate reports and visualizations to present the findings.
- **Actionable Insights**: Use the insights gained from the data to make informed decisions and take action.

4. **Follow-Up**

- **Thank You Message**: Send a thank-you message or confirmation to respondents upon form submission.
- **Follow-Up Communication**: Based on the data collected, send follow-up communications (e.g., additional surveys, promotions, updates).
- **Feedback Loop**: If applicable, share the outcomes or actions taken based on the collected data with respondents.

Theoretical Activity 1.1.6: Description of interaction with customer

Tasks:

1: You are requested to answer the following questions related to interaction with customer

I. Explain the way by which you can use to get to know customer
II. How can you predicate customer needs?
III. What do you have to care about when preparing to meet with customer?

2: Present the findings to the whole class

3: Ask questions where necessary.

4: For more clarification, read the key readings 1.1.6.

Key readings 1.1.6.: Description of interaction with customer

An interaction with a customer refers to any communication or engagement between a business or its representative and a customer. It can occur through various channels, such as in-person, over the phone, via email, through live chat, or on social media platforms. Interacting with customers is essential for building relationships, addressing inquiries or concerns, providing support, and ensuring customer satisfaction.

I. Get to know the customer

Refers to the process of gathering information and understanding the preferences, needs, and characteristics of an individual or a group of customers

To know the customer the below ways may be used:

1. **Conduct interviews**: Conduct interviews with the customer to understand their perspective and gather information about their requirements. Prepare a list of open-ended questions to encourage the customer to share their thoughts and opinions.
2. **Analyze customer data:** Analyze customer data such as purchase history, customer feedback, and customer support requests. This can provide insights into their behavior and preferences.
3. **Use personas:** Develop customer personas to represent different customer segments based on their needs, preferences, and behavior. This can help to create a more customer-centric approach to the project.
4. **Visit customer sites:** Visit the customer's site to get a better understanding of their business operations, environment, and culture. This can help to identify any unique requirements or constraints that need to be considered in the project.
5. **Attend industry events:** Attend industry events or conferences where the customer is likely to be present. This can provide an opportunity to network with the customer and gain insights into their industry trends and challenges.

II. Predict customer needs

Customer needs prediction refers to the process of forecasting or anticipating the needs, desires, and expectations of customers in the future. It involves using various data analysis techniques, market research, and customer insights to make educated predictions about what customers will require or seek in terms of products, services, or experiences.

To predict the customer needs the below ways may be used:

1. **Analyse customer behaviour**: Analyse customer data to identify patterns in their behaviour and preferences. Look for trends such as purchase history, browsing behaviour, and engagement with marketing campaigns. This can help to identify potential customer needs and preferences.

2. **Monitor social media:** Monitor social media platforms to understand what customers are saying about your brand and your industry. Look for trends in customer sentiment and identify any areas where customers are expressing dissatisfaction or frustration. This can help to identify potential areas of improvement.

3. **Use predictive analytics:** Use predictive analytics to analyze customer data and identify potential customer needs. This involves using machine learning algorithms to analyze data such as customer demographics, behavior, and purchase history to predict future behavior and preferences.

4. **Conduct surveys:** Conduct surveys to gather feedback from customers about their needs and preferences. This can help to identify potential areas of improvement or areas where customers may have unmet needs.

5. **Use customer personas:** Develop customer personas to represent different customer segments based on their needs, preferences, and behavior. This can help to anticipate customer needs and create more personalized experiences.
6. **Stay up-to-date with industry trends:** Stay informed about industry trends and developments to understand how customer needs may be changing. This can help businesses to stay ahead of the competition and anticipate future customer needs.

III. Meet the customer

Meeting customer needs involves understanding their requirements, preferences, and expectations and taking actions to fulfill them`

When planning to meet the customer remember that you have to:

1. **Prepare for the meeting:** Before the meeting, make sure to do your research on the customer's business, industry, and any relevant background information. Prepare a list of questions to ask the customer to gather requirements and understand their needs.
2. **Set an agenda:** Set an agenda for the meeting to ensure that you cover all the topics you need to discuss. Share the agenda with the customer beforehand, so they are aware of what to expect.
3. **Be on time:** Arrive on time for the meeting, or if it's a virtual meeting, log in promptly. Respect the customer's time and be mindful of any time constraints.
4. **Listen actively:** Listen carefully to what the customer is saying and try to understand their perspective. Pay attention to their words, tone, and body language to gather more information about their needs and preferences.
5. **Communicate clearly:** Use simple and easy-to-understand language to explain technical concepts and project details. Avoid using technical jargon that the customer may not be familiar with.
6. **Be respectful:** Be courteous, respectful, and professional in your interactions with the customer. Show empathy and understanding for their business needs and objectives.
7. **Follow up:** Follow up with the customer after the meeting to confirm any decisions made and provide any additional information or clarifications. This shows that you value their time and are committed to meeting their needs.

Practical Activity 1.1.7: Interacting with customer

Task:

1: Read key reading 1.1.7.

2: Perform the below task:

After collecting data from Bright Future Secondary School, the project requirements analyst has identified various needs for the website. However, to ensure that the requirements are fully understood and meet the school's expectations, the analyst need to interact directly with the school's management entity. This interaction will help to clarify the data gathered, address any ambiguities, and refine the website features based on the school's priorities.

As requirements analyst, you are requested to schedule and conduct a meeting with Bright Future Secondary School's management to clarify and refine the website's requirements.

3: Interact with customer

4: Ask for clarification if any

Key readings 1.1.7:

Here are some steps to effectively meet and engage with customers:

1. **Greeting and Introduction:**
   - Begin with a warm greeting and a friendly smile.
   - Introduce yourself and your role in the company.
   - If it's the first meeting, exchange business cards and establish the context for the interaction.
2. **Building Rapport:**
   - Engage in small talk to make the customer comfortable. Discuss neutral topics such as the weather or recent events.
   - Show genuine interest in the customer as a person to build a connection.
3. **Setting the Agenda:**
   - Clearly state the purpose of the meeting and what you hope to achieve.
   - Ask if the customer has any specific topics they would like to address.

- Confirm the agenda to ensure mutual understanding and alignment.

4. **Active Listening:**

- Listen attentively to the customer's concerns, needs, and feedback.
- Maintain eye contact, nod, and use verbal affirmations like "I see" or "That makes sense" to show you're engaged.
- Avoid interrupting; let the customer finish their thoughts.

5. **Asking Open-Ended Questions:**

- Use open-ended questions to encourage the customer to elaborate on their needs and experiences.
- Examples include, "Can you tell me more about that?" or "What are the challenges you're facing?"

6. **Clarifying and Summarizing:**

- Repeat back key points to confirm understanding: "So what I'm hearing is…"
- Ask clarifying questions if something is not clear.

7. **Providing Solutions:**

- Based on the information gathered, suggest possible solutions or recommendations.
- Demonstrate how your product or service can meet their needs.
- Use examples, case studies, or live demos to illustrate your points.

8. **Handling Objections:**

- Listen to any concerns or objections the customer may have.
- Address them calmly and confidently, providing evidence or reassurance where necessary.
- Empathize with their concerns and offer practical solutions.

9. **Summarizing the Conversation:**

- Recap the main points discussed and the agreed-upon next steps.
- Ensure there is mutual agreement on any actions to be taken.

10. **Action Plan and Follow-Up:**

- Outline the next steps clearly, including any follow-up actions.
- Agree on deadlines and responsibilities.
- Reassure the customer that you will follow through and provide any necessary support.

11. **Closing the Meeting:**

- Thank the customer for their time and input.
- Confirm your availability for any future questions or discussions.
- End on a positive note, reinforcing your commitment to helping them.

Points to Remember

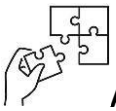
- **Internal customer:** is a customer from the same organization while **External customer:** is a customer who belongs to another organization
- **Data** refers to raw facts materials that need to be processed in order to have meaning while **information** is data after being processed.
- **Pain points** refer to specific problems, challenges, or issues that individuals or entities encounter in a particular situation or context.
- **User story** is used to express software or product requirements in a manner that is easily understandable by both technical and non-technical stakeholders.
- **A research project** is an academic, scientific, or professional undertaking to answer a research question.
- The communication process includes the following components: sender, encoding, message, decoding, Receiver, and feedback
- Types of communication channels are:
    - ✓ Verbal communication
    - ✓ Written communication
    - ✓ Visual communication
- Data collection is the methodological process of gathering information about a specific subject
- The traditional data collection methods are:
    - ✓ Interview
    - ✓ Questionnaire
    - ✓ Observation
    - ✓ Documentation
- Online form is a digital version of a traditional paper form that is accessed and filled out electronically through the internet. It is a web-based tool that allows users to input and submit information online, eliminating the need for physical paperwork
    - **Steps to prepare a questionnaire**
        - ✓ Identify key stakeholders
        - ✓ Determine the information needed
        - ✓ Design the questionnaire
        - ✓ Keep it concise and clear
    - **Steps to prepare observation checklist**
        - ✓ Determine the Purpose
        - ✓ Identify Key Components
        - ✓ Define Checklist Items
        - ✓ Organize Checklist Items
        - ✓ Include Instructions
        - ✓ Format the Checklist
    - **Steps to Design online form for data collection**

- ✓ Determine Data Collection Objectives
- ✓ Identify Required and Optional Fields:
- ✓ Write Clear and Concise Questions
- ✓ Provide Instructions and Guidelines
- ✓ Customize the Form's Appearance
- ✓ Test the Form

- Collecting data using interview the below steps are used:
  - ✓ Introduce
  - ✓ Follow the Interview Script
  - ✓ Ask questions
  - ✓ Probing and Clarification
  - ✓ Record Responses
  - ✓ Address Participant Questions
  - ✓ Closing the Interview
- To collect data by using questionnaire follow the below steps:
  - ✓ Prepare for Distribution
  - ✓ Distribution
  - ✓ Monitor Responses
- To collect data by using observation the below steps are used:
  - ✓ Conduct the Observation
  - ✓ Maintain Objectivity
  - ✓ Record data
- To collect data by using online form follow the below steps:
  - ✓ Deploy the Form
  - ✓ Collect Data
  - ✓ Analyze and Act
  - ✓ Follow-Up
- To get to know customer you may use the bellow ways:
  - ✓ Conduct interviews
  - ✓ Analyze customer data
  - ✓ Use personas
  - ✓ Visit customer sites
  - ✓ Attend industry events
- To predict customer needs, use the below ways
  - ✓ Analyse customer behaviour
  - ✓ Monitor social media
  - ✓ Use predictive analytics
  - ✓ Conduct surveys
  - ✓ Use customer personas
  - ✓ Stay up-to-date with industry trends
- When preparing to meet customer remember to:

- ✓ Prepare Questions for meeting
- ✓ Set Agenda
- ✓ Be on time
- ✓ communicate clearly
- ✓ Be respectful
- ✓ Follow up

- To interact with customer, follow the below steps:
  - ✓ Greeting and Introduction
  - ✓ Setting the Agenda
  - ✓ Asking Open-Ended Questions
  - ✓ Summarizing the Conversation
  - ✓ Action Plan and Follow-Up
  - ✓ Closing the Meeting



Application of learning 1.1.

As a requirement analyst, you have been assigned to a new project aimed at developing a customer relationship management (CRM) system for a mid-sized retail company. The client has expressed concerns about inefficiencies in their current system, which they feel is leading to lost sales opportunities and poor customer satisfaction. Your task is to prepare appropriate data collection tools, such as interviews, questionnaire, checklist for documentation, online formand observation checklists, to gather detailed information from the company's employees, management, and customers. You are expected to use these tools to collect data on the current system's functionality. After collecting and analyzing the data, you will need to meet with the client to present your findings, discuss potential solutions, and organise the data to ensure that the final product meets their needs and expectations.

Indicative content 1.2: Interpretation of data

Duration: 2 hrs

Theoretical Activity 1.2.1: Description of data interpretation

Tasks:

1: Answer the following questions related to data interpretation

I. What do you understand by data interpretation?
II. Differentiate data visualisation from data manipulation methods of data interpretation

2: Present the findings

3: Ask questions where necessary.

4: For more clarification, read the key readings 1.2.1.

Key readings 1.2.1.: Description of data interpretation.

I. **Data interpretation**

Data interpretation refers to the process of making sense of data by analysing and drawing conclusions from it. It involves examining data in order to identify patterns, relationships, and trends that can help explain the underlying phenomena being studied. Data interpretation can be used to make informed decisions and solve problems across a wide range of fields, including business, science, and social sciences.

II. **Methods of Data Interpretation**

There are various methods for data interpretation that can be used to analyze and make sense of data. Here are some of the most common methods:

a) Data manipulation

Data manipulation refers to the process of analyzing non-numerical data, such as text, images, and audio. This data type is often used to gain a deeper understanding of customer attitudes and opinions and to identify patterns and trends. This method is used for **Qualitative data.**

- **Techniques for Data Manipulation**

1. Thematic Analysis

By identifying recurring themes or ideas from the qualitative data, we can group related concepts together.

2. Categorization

Categorization is used to organize qualitative data into predefined categories.

3. Keyword Analysis

Keyword analysis helps identify the most frequently mentioned terms in qualitative feedback. This can highlight important priorities or concerns.

4. Content Analysis

Content analysis focuses on quantifying the presence of certain words, themes, or concepts in the qualitative data.

5. Summarization

Qualitative data can be summarized into concise statements that reflect the major concerns or desires of the stakeholders.

b) Data Visualization

Data Visualization is a graphic representation of data that aims to communicate numerous heavy data in an efficient way that is easier to grasp and understand. In a way, data visualization is the mapping between the original data and graphic elements that determine how the attributes of these elements vary. The visualization is usually made by the use of charts, lines, or points, bars, and maps

This method is used for **Quantitative data.** This type of data is often used to measure and quantify specific characteristics, such as sales figures, customer satisfaction ratings, and employee productivity.

- **Types of Data Visualization**

1. **Maps**

Map visualization is a great method to analyze and display geographically related information and present it accurately via maps. This intuitive way aims to distribute data by region. Include: **Line Maps, Regional Maps, Point Maps, Heat Maps**

2. **Charts**

Charts present data in the form of graphs, diagrams, and tables. They are often confused with graphs since graphs are indeed a subcategory of charts. However, there is a small difference: graphs show the mathematical relationship between groups of data and is only

one of the chart methods to represent data. Include: **Bar Graph, Pie Charts, Line Graph, Scatter Plot,**

3. Tables

Unlike the charts we just discussed, tables show data in almost a raw format. They are ideal when your data is hard to present visually and aim to show specific numerical data that one is supposed to read rather than visualize.

c) Mixed Methods Data Interpretation

Mixed methods data interpretation combines both quantitative and qualitative data to provide a more comprehensive understanding of a particular subject. This approach is particularly useful when analyzing data that has both numerical and non-numerical components, such as customer feedback data.

Practical Activity 1.2.2: Interpreting data using data manipulation method

Task:

1: Read key reading 1.2.2.

2: Read the task described below:

Here is a set of sample qualitative data collected from interviews and surveys conducted at Bright Future Secondary School. This data can be interpreted using various data manipulation methods like coding, categorization, thematic analysis, and keyword analysis.

Sample Qualitative Data

1. Feedback from Interviews with School Staff

- **Head teacher:**
  "The website should emphasize our commitment to excellence and highlight the success stories of our students. We want it to be visually engaging, with a strong focus on our mission and the trades we offer. Students and parents should easily find information about school policies and upcoming events."
- **Head of Department of ICT:**
  "The website needs to offer clear guidance on the Computer Science trade, including prerequisites and enrollment details. We also need to provide online resources for students to access course materials and coding tools. A login feature would be beneficial for restricted content access."
- **Head of Electrical Engineering:**
  "Parents and students often ask about school fees and available payment options.

This information needs to be transparent and accessible. The website should also feature a section on scholarship opportunities, especially for technical programs like Electrical Engineering.”

1. **Survey Responses from Parents**

- "We want to see real-time updates about upcoming events, like parent-teacher meetings and exams. This helps us plan ahead. A notifications feature would be helpful."
- "It would be great if the website offered details on extracurricular activities and how students can join."
- "I often find it difficult to understand the breakdown of school fees. A visual representation or simple table would be more helpful."
- "We appreciate email communication, but having access to contact details for all departments on the website would make things easier."

3. Questionnaire with Students

- “We need more information about the various technical programs offered. I wasn’t sure about the difference between ICT and Electrical Engineering until I spoke with someone.”
- “An online fee payment system would make things so much easier, especially for students who can’t always come to school in person.”
- “It would be helpful if the website had a section for students to see their academic progress or any assignments we missed.”

3: Interpret data using data manipulation

4: Present your work to the trainer and whole class

Key readings 1.2.2.: Interpreting data using data manipulation method

❖ **To manipulate data, follow the below steps**

1. **Data cleaning:** This involves identifying and correcting errors, inconsistencies, and missing values in the data. This can include removing duplicates, filling in missing values, and standardizing formats.
2. **Data transformation:** This involves converting the data into a different format or structure to make it easier to analyze. This can include splitting or merging columns, aggregating data into categories, and normalizing the data.
3. **Data filtering:** This involves selecting a subset of the data based on specific criteria. This can include filtering data by date, location, or other variables.
4. **Data merging:** This involves combining data from multiple sources into a single dataset. This can be useful for analyzing relationships and trends across different

datasets.

5. **Data sorting:** This involves organizing the data in a particular order, such as by date, alphabetical order, or numerical order.
6. **Data summarization:** This involves calculating summary statistics, such as means, medians, and standard deviations, to gain insight into the overall distribution of the data.
7. **Data aggregation:** This involves grouping data into larger categories or bins to identify patterns and trends in the data.

Practical Activity 1.2.3: Interpreting data by using data visualisation method

Task:

1: Read key reading 1.2.3.

2: Read the below task.

Here's a sample of quantitative data that was collected based on the tools (interviews, questionnaires, observation checklists, and online forms) for the Bright Future Secondary School website development project as a project requirement analyst you are asked to interpret them by using data visualization:

1. School Profile (Interview & Questionnaire Data):

a) **Years of operation**: 30 years

b) **Number of students enrolled annually**:

- 2020: 470 students
- 2021: 500 students
- 2022: 530 students
- 2023: 560 students

c) **Total staff members: 80**

- Teaching staff: 55
- Administrative staff: 15
- Support staff: 10

2. School Trades and Programs (Interview & Questionnaire Data):

a) **Available Programs:**

- Technical Programs: 6
- Academic Programs: 5

- Vocational Programs: 4

b) **Student distribution by program:**

- Technical: 210 students
- Academic: 220 students
- Vocational: 130 students

c) **Admission Requirements Satisfaction:**

- Yes: 80% of interviewees
- No: 20% of interviewees

3. School Fees (Interview & Questionnaire Data):

a) **Average fee structure by grade:**

- Grades 7-8: $550/year
- Grades 9-10: $650/year
- Grades 11-12: $750/year

b) **Preferred fee payment options:**

- Installments: 55%
- Full payment upfront: 35%
- Online payment: 10%

c) **Number of students benefiting from scholarships: 80 students (14% of the student population)**

4. Location (Observation Checklist Data):

a) **Distance from public transport stops**:

- Less than 1 km: 45% of students
- 1-3 km: 40% of students
- More than 3 km: 15% of students

b) **Modes of transport used by students:**

- Public transport: 50%
- Private vehicle: 30%
- Walking: 20%

5. School Authority and Contact Information (Interview & Online Form Data):

a) **Preferred contact methods for parents**:

- Email: 65%
- Phone: 25%
- Social media: 10%

b) **Response time satisfaction (from interviews):**

- Satisfied: 70%
- Dissatisfied: 30%

6. Additional Information (Interview, Observation Checklist & Online Form Data):

a) **Attendance rate**: 96%

b) **Events per year**:

- Parent-teacher meetings: 3
- Extracurricular activities: 12
- School events (e.g., graduation, sports day): 4

c) **Top 3 extracurricular activities (from questionnaire)**:

- Sports: 45% of students
- Music: 25%
- Drama: 15%

7. Technical Preferences (Interview & Online Form Data):

a) **Preferred website features**:

- Student login for progress tracking: 70%
- Online fee payment: 60%
- Event notifications: 80%

b) Preferred languages for website:

- English: 95%
- Other languages: 5%

c) Accessibility preferences:

- Mobile-friendly design: 85%
- Desktop-friendly design: 15%

3: Interpret data using data visualization method.

4: Present your work to the trainer and whole class

Key readings 1.2.3.: Interpreting data by using data visualisation method

❖ **Interpret data with visualisation**

Here are the key steps involved in the process:

1. **Identify the data to be represented:** Determine the relevant data that needs to be graphically represented to support the software project requirement analysis. This may include data related to user behaviors, system performance, business metrics, or any other relevant information.
2. **Understand the requirements:** Gain a clear understanding of the software project requirements and the specific objectives of the data representation. Identify the key questions or insights that need to be addressed through the graphical

representation. This understanding will guide the selection of appropriate visualization techniques.

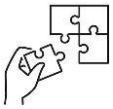
3. **Select suitable visualization techniques:** Choose the appropriate visualization techniques that best represent the data and address the requirements. Consider the type of data, its characteristics, and the insights you want to convey. Common visualization techniques include bar charts, line charts, scatter plots, pie charts, heatmaps, tree maps, and network diagrams.
4. **Clean and pre-process the data:** Clean and pre-process the data to ensure accuracy and consistency. Handle missing values, outliers, and any other data inconsistencies. Perform necessary data transformations, aggregations, or filtering to prepare the data for visualization.
5. **Design the visualizations:** Design the graphical representations with a focus on clarity and effectiveness. Consider visual elements such as colors, labels, legends, titles, and axes to enhance the understandability of the visualization. Choose appropriate visual encodings, such as position, length, angle, color, and size, to represent the data accurately.
6. **Implement the visualizations:** Utilize data visualization tools or libraries to implement the chosen visualization techniques. Popular tools include Tableau, Power BI, D3.js, matplotlib, ggplot, or custom-built solutions using programming languages like Python or JavaScript. Import the pre-processed data into the chosen tool and map the variables to the corresponding visual elements.
7. **Test and refine the visualizations:** Validate the visualizations by testing them with different data scenarios. Ensure that the visualizations accurately represent the data and convey the desired insights. Seek feedback from stakeholders, domain experts, or end-users and make necessary refinements to improve the visualizations' clarity and usability.

Points to Remember

- Data manipulation may be utilized in data science in a variety of ways. It is used to make data more understandable or more structured.
  - Methods of data interpretation are:
    - ✓ Data manipulation
    - ✓ Data Visualization
  - To manipulate data, follow the below steps
    - ✓ Data cleaning
    - ✓ Data transformation

- ✓ Data filtering
- ✓ Data merging
- ✓ Data sorting
- ✓ Data summarization

- Interpret data with visualisation
  - ✓ Clean and pre-process the data
  - ✓ Design the visualizations
  - ✓ Implement the visualizations
  - ✓ Test and refine the visualizations



Application of learning 1.2.

As a project requirement analyst, you are hired by KCI Ltd for the development of a new educational website, your task is to ensure that the platform is designed based on comprehensive insights derived from user data. The website aims to offer a variety of online courses, interactive tutorials, user forums, and a personalized dashboard for tracking progress. To effectively capture and address all project requirements, you need to interpret existing data on user preferences, engagement patterns, and feedback from similar educational platforms. This involves using data visualization and manipulation techniques to uncover trends, identify key features, and prioritize functionalities that will enhance the user experience.

Indicative content 1.3: Organisation of customer needs

Duration: 3 hrs

Theoretical Activity 1.3.1: Description of customer needs organisation

Tasks:

1: Participate in group formation

2: You are requested to answer the following questions related to customer needs organisation

I. What are the data categories?
II. What is data cleansing process?
III. What are the parts of data report?

2: Present your findings to your classmates and trainer

Key readings 1.3.1.: Description of customer needs organisation

Categorization of data involves grouping data into different categories based on specific criteria.

I. Data categories:

1. **Numerical data:** This is data that can be measured on a numerical scale, such as height, weight, temperature, and time. Numerical data can be further categorized into discrete or continuous data.
2. **Categorical data:** This is data that can be divided into categories or groups, such as gender, race, education level, or occupation. Categorical data can be further categorized as nominal or ordinal data.
3. **Time-series data:** This is data that is collected over a period of time, such as sales data or stock prices. Time-series data can be used to identify trends and patterns over time.
4. **Text data:** This is data that is in the form of text, such as customer feedback, social media posts, or email messages. Text data can be categorized using natural language processing techniques, such as sentiment analysis.

5. **Image data:** This is data that is in the form of images, such as photographs or diagrams. Image data can be categorized based on the visual features of the images, such as color, texture, or shape.

II. Data cleansing

Data cleansing is the process of finding and removing errors, inconsistencies, duplications, and missing entries from data to increase data consistency and quality—also known as data scrubbing or cleaning.

— **Phases of data cleansing**

1. **Data Duplication**

- Ensures that project data, such as customer requirements or feedback, is not duplicated, leading to inaccurate analysis and planning.
- Prevents redundant information from inflating project scope or skewing requirements prioritization.

2. **Data Analysis**

- Helps in identifying the most critical requirements by analyzing trends and patterns in stakeholder needs and feedback.
- Supports the identification of gaps or inconsistencies in the collected requirements, ensuring a comprehensive analysis.

3. **Data Standardization**

- Ensures that all requirements are recorded in a consistent format, making it easier to analyze and compare them.
- Facilitates clear communication and understanding among stakeholders by using standardized terminology.

4. **Data Normalization**

- Allows for the comparison of requirements by normalizing priority scores, effort estimates, and other numerical attributes.
- Ensures that different types of requirements (functional, non-functional, technical) can be analyzed together coherently.

5. **Quality Check**

- Ensures that the requirements data is accurate and reliable, providing a solid foundation for project planning and execution.
- Helps in identifying and correcting any inconsistencies or errors in the requirements, leading to a more robust and reliable project plan.

III. Data reporting

A report is a structured document that presents information as clearly and succinctly as possible. It's typically written for a specific purpose and audience, and it often outlines findings, events, or analyses of particular situations or data.

Data reporting involves the presentation and analysis of data in a format that is easy to understand and interpret. The goal of data reporting is to provide insights into business operations, identify trends and patterns, and inform decision-making.

A data report is a document that collects and organizes data to analyze, interpret, and present findings in a structured format. It typically includes visual elements such as charts, graphs, and tables to help convey the information in a clear and accessible way. The purpose of a data report is to provide insights, support decision-making, and communicate the results of data analysis to stakeholders.

— **Parts of data report:**

1. **Title Page:** Contains the title of the report, the name of the author(s), the organization, and the date of publication.
2. **Executive Summary or Abstract:** This section provides a brief overview of the report, summarizing the main points, findings, and conclusions. It's designed to give readers a quick preview of what the report contains.
3. **Introduction:** Sets the context for the report, outlines the objectives, and may include the background or the rationale behind the data analysis.
4. **Methodology:** Describes the methods used to collect and analyze the data, including the sources of data, data collection techniques, and analytical tools or software used.
5. **Results or Findings:** Presents the data in an organized manner, often using visual aids like charts, graphs, and tables. This section highlights the key findings from the data without providing interpretation or recommendations.
6. **Analysis or Discussion:** Interprets the data presented in the results section. It explains what the data means, explores trends, patterns, and correlations, and may discuss the implications of the findings.
7. **Conclusion:** Summarizes the main points of the report, restates the significance of the findings, and may suggest next steps or actions based on the report's analysis.
8. **Recommendations:** If applicable, this section provides suggestions for action or changes based on the report's findings.

9. **Appendices:** Includes additional materials that are relevant to the report but not essential to its main content, such as raw data, detailed tables, technical notes, or questionnaires.
10. **References or Bibliography:** Lists the sources cited in the report, formatted according to a specific citation style.

Format of Data reporting

The format of data reporting in project requirements analysis can vary depending on the specific needs and preferences of stakeholders. However, here is a suggested format that can be used as a starting point:

1. **Write a Title and Introduction:**

- Include a clear and concise title that reflects the purpose of the report.
- Provide a brief introduction that outlines the objectives of the report and provides context for the data being presented.

2. **Write an Executive Summary:**

- Summarize the key findings, insights, and recommendations from the analysis.
- Highlight the most important data points and trends.
- Keep this section concise and focused on the main takeaways for stakeholders who need a quick overview.

3. **Describe Methodology:**

- Describe the approach and methodology used to collect, clean, analyze, and report the data.
- Explain any assumptions or limitations associated with the data analysis.

4. **List Data Sources:**

- List the sources of the data used in the analysis.
- Provide details about the data collection process, including data collection methods, timeframes, and any relevant considerations.

5. **Analysis Data and Findings:**

- Present the analyzed data and findings in a structured and organized manner.
- Use appropriate visualizations (e.g., charts, graphs, tables) to effectively communicate the data.
- Break down the analysis by relevant categories, metrics, or variables.
- Explain the significance of the findings and how they relate to the project requirements.

6. **Provide Recommendations:**

- Provide actionable recommendations based on the data analysis and insights.
- Link the recommendations to the project requirements and objectives.
- Clearly articulate how implementing these recommendations can address identified challenges or improve project outcomes.

7. **Conclude:**

- Recap the main points discussed in the report.
- Reinforce the key findings and recommendations.
- Highlight any next steps or future considerations for the project.

8. **Add References:**

List any references, sources, or citations used in the report.

Practical Activity 1.3.2: Organising data based on customer needs

Task:

1: Read key reading 1.3.2.
2: You are requested to go in computer lab to categorise data, perform data cleansing, and make data report.
3: Organise data based on customer needs.

4: Present your work to the trainer and whole class

Key readings 1.3.2.: Organising data based on customer needs

When performing raw data categorization during project requirements analysis, you can follow these steps:

1. **Identify the Raw Data:** Begin by identifying the raw data sources relevant to the project.
2. **Understand the Project Requirements:** Gain a clear understanding of the project requirements and objectives. This will help you determine the categories or groups into which the raw data should be organized.
3. **Define Categorization Criteria:** Establish the criteria for categorizing the raw data. This can be based on data types, attributes, content, or any other relevant factors. The criteria should align with the project's goals and requirements.
4. **Assess Data Quality**: Evaluate the quality of the raw data. Identify any data quality issues that need to be addressed before categorization.
5. **Determine Categories:** Based on the project requirements and the identified criteria, determine the categories or groups in which the raw data will be classified. This can be done by analyzing common attributes, relationships, or patterns in the data.

6. **Categorize the Raw Data:** Apply the categorization framework to the raw data. Evaluate each data item and assign it to the appropriate category based on the established criteria.

Mainly, data cleansing involves:

1. **Identify Data Quality Issues:** Review the raw data and identify potential data quality issues such as missing values, duplicates, inconsistencies, outliers, formatting errors, or inaccuracies
2. **Define Data Cleansing Rules:** Establish rules and criteria for identifying and addressing data quality issues.
3. **Handle Missing Values:** Determine how to handle missing values in the data. Depending on the context, you may choose to delete rows or columns with missing values
4. **Remove Duplicate Entries:** Identify and remove duplicate entries from the data. This can be done by comparing data records based on key fields or a combination of fields to determine duplicates.
5. **Correct Inaccurate or Inconsistent Data**: Identify and correct inaccuracies or inconsistencies in the data. This can involve verifying data against trusted sources, cross-referencing with external datasets, or manually reviewing and making corrections based on domain knowledge
6. **Standardize and Format Data:** Ensure consistent formatting and standardization of data across different fields. This step may involve converting data types, standardizing units of measurement, applying naming conventions, and formatting dates, addresses, or other data elements consistently.

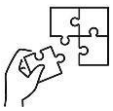
Mainly, data reporting involves:

1. **Define the report objective:** The first step in data reporting is to define the objective of the report. This involves identifying the questions that the report should answer, the audience that the report is intended for, and the format that the report should take.
2. **Organize data:** The next step is to organize the data that will be used in the report. This may involve gathering data from multiple sources and consolidating it into a single dataset.
3. **Analyse the data:** Once the data has been collected and organized, it is important to analyse it to identify trends and patterns. This may involve creating charts, graphs, or other visualizations to help visualize the data.
4. **Design the report:** After analysing the data, the report should be designed in a way that is easy to understand and interpret. This may involve creating tables, charts, or other visualisations to present the data, and adding explanatory text to provide context and insights.

5. **Test and refine the report:** Before the report is finalized, it is important to test and refine it to ensure that it meets the report objective and is easy to understand. This may involve sharing the report with colleagues or stakeholders to gather feedback and making revisions based on the feedback received.

Points to Remember

- Data may be categorised as: Numerical data, Categorical data, Time-series data, Text data, Image data
- Data cleansing phases are: Data Duplication, Data Analysis, Data Standardization, Data Normalization, Quality Check
- Key elements of data report are: Title Page, Executive Summary or Abstract, Introduction, Methodology, Results or Findings, Analysis or Discussion, Conclusion, Recommendations, Appendices, References or Bibliography
- Steps to categorize data:
  - ✓ Define Categorization Criteria
  - ✓ Assess Data Quality
  - ✓ Determine Categories
  - ✓ Categorize the Raw Data
- To perform data cleansing involves:
  - ✓ Identify Data Quality Issues
  - ✓ Define Data Cleansing Rules
  - ✓ Handle Missing Values
  - ✓ Remove Duplicate Entries
  - ✓ Correct Inaccurate or Inconsistent Data
  - ✓ Standardize and Format Data
- Steps to make data report
  - ✓ Write a Title and Introduction
  - ✓ Write an Executive Summary
  - ✓ Describe Methodology
  - ✓ List Data Sources
  - ✓ Analysis Data and Findings
  - ✓ Provide Recommendations
  - ✓ Conclude
  - ✓ Add References



Application of learning 1.3.

A large organization is undergoing a digital transformation to enhance its human resources management processes. As part of this initiative, they have decided to implement an Employee Information System (EIS) to streamline employee data management, improve data quality, and enable efficient reporting for decision-making. You are one among the project team that is in the requirement analysis phase. The data was collected and interpreted during previous activities, now you are going to focus on data categorization, data cleansing, and data reporting aspects.

Learning outcome 1 end assessment

Theoretical assessment

Question 1: Match the key terms to their meaning from the below table by writing the correct number in the answer column corresponding to the letter provided in that column

Answer	Key term	Meaning
a) ……	a) Customer	1. Refers to the medium or pathway through which information is transmitted from a sender to a receiver.
b)……	b) User story	2. Is a shortcoming in a product or service that can make customers less likely to make a purchase.
c)…..	c) Communication channel	3. Referred to as a client, can be a person or an organization that orders and buys products or services that a business offers.
d)….	d) Customer pain point	4. what the user wants to achieve with the product

Question 2: Answer by True or False to the following statements

a. During an interview the clients of an organisation for which you are developing a software for, must be involved in order to get the specific requirements.

b. Questionnaire is used only when analysts need information from a few people/persons.

c. During the communication between customer and analyst it is not allowed to use gestures.

d. When interpreting data, graphics may be used where it is possible.

Question 3: Why is it important to provide feedback after receiving a message? tick two that apply

- ☐ Confirmation of Receipt
- ☐ Reduce errors in typing
- ☐ Encourages Open Communication
- ☐ Encourage receiver encode a short message

Question 4: Answer by true or false for the below statements

a) Sending an e-mail to your customer is a verbal communication
b) Chatting with the customer on what's app through voice chat is a form of verbal communication
c) Presenting data using a graphic to the customer is o form of visual communication
d) Sharing a printed report with your customer it a kind of written communication

Question 5: Match data interpretation terms to their meaning

Data interpretation terms	**Meaning**
1.Data Manipulation	**a.** refers to the process of analyzing numerical data.
2.Qualitative data	**b.** refers to the process of analyzing non-numerical data, such as text, images, and audio.
3.Data visualisation	**c.** refers to the process of analyzing non-numerical data, such as text, images, and audio.
4.Quantitative data	**d.** is a graphic representation of data that aims to communicate numerous heavy data in an efficient way that is easier to grasp and understand

Question 6. Below are the categories of data except:

a) Numerical data
b) Categorical data
c) Cloud data
d) Image data

Question 7**.**…… is the process of finding and removing errors, inconsistencies, duplications, and missing entries from data

a. Data cleansing
b. Data analysis
c. Data organization

Question 8. Below are elements of data reporting except:

a) Introduction
b) Acknowledgement
c) Objective
d) Data collection methods

Practical assessment

KGD innovation is a pet food trading company located in your village. This company faces the problem of a small number of customers because farmers who do not live with the company do not know that it sells pet food. KGD innovation has decided to develop a website that will be used to advertise its activities so that the customer, wherever he is, can find out the services provided by KGD. As a project requirement analyst, you are hired by KGD Innovation to:

1. Collecting data about KGD Innovation
2. Interpret collected data
3. Organise Data and report findings to the company for approval.

THIS TASK WILL BE PERFORMED IN 4 HOURS

References

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Indicative contents
2.1 Identification of project requirements
2.2 Research methodology
2.3 Conduct research
2.4 Analyse results
2.5 Report findings

Key Competencies for Learning Outcome 2: Gather Project Requirements

Knowledge	Skills	Attitudes
• Identification of Project management approach • Description of Project requirements • Description of Project's Scope • Description of research methodology	• Outlining project requirements • Defining project scope • Conducting research • Analysing research results • Reporting findings	• Having Critical thinking in outlining project requirements • Being Decision maker in defining project scope • Having collaboration skills in conducting research • Having communication skills in conducting research

Duration: 20hrs

Learning outcome 2 objectives:

By the end of the learning outcome, the trainees will be able to:

1. Identify properly project management approach as used in project management
2. Identify properly project requirements in accordance with customer needs
3. Determine correctly research methodology and tools in accordance with projects goals
4. Describe correctly project scope in accordance with projects goals
5. Outline correctly project requirements in accordance with customer needs
6. Conduct properly research in line with project goals
7. Analyse properly collected data in accordance with research conducted
8. Report properly research findings in accordance with project requirements

Resources

Equipment	Tools	Materials
• Computer	• Web browser • Microsoft office	• Internet • Papers • Pens

Indicative content 2.1: Identification of project requirements

Duration: 4 hrs

Theoretical Activity 2.1.1: Description of project management approach

Tasks:

1: You are requested to answer the following questions related to Project management approaches

I. What do you understand by project management approach?

II. Identify project requirements approaches

2: Present the answers for the asked questions

3: Ask questions where necessary.

4: Read the key readings 2.1.1. For more clarification.

Key readings 2.1.1.: Description of project management approach

- **Project management approach**

A project management approach is a set of principles, practices, and methodologies used to plan, execute, and control projects. The choice of a project management approach depends on the nature of the project, organizational culture, and other contextual factors. Here are some common project management approaches Here are some common project management approaches:

✓ **Project requirement approaches are:**

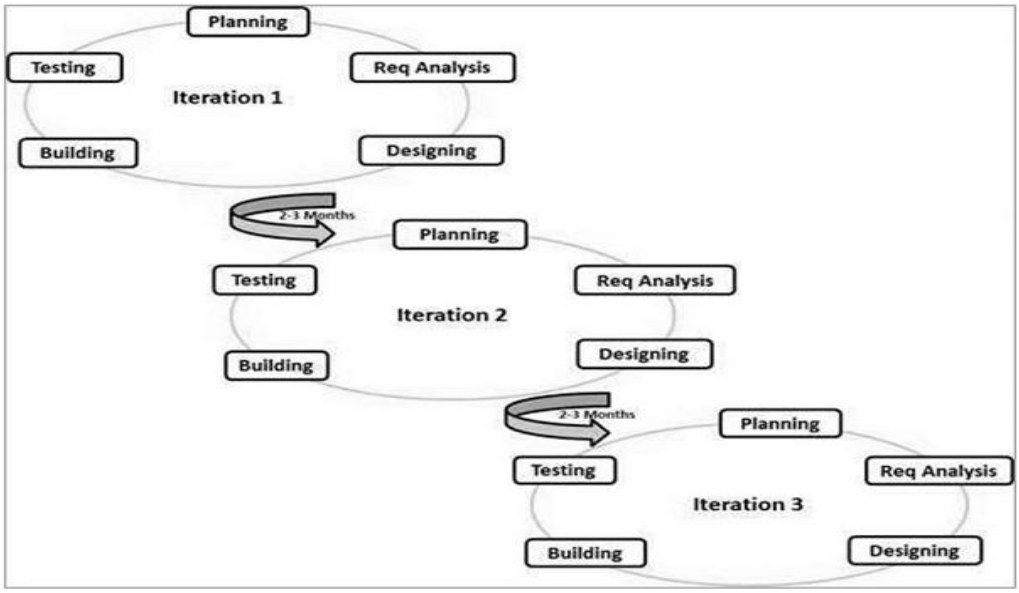
Agile

The Agile model believes that every project needs to be handled differently and the existing methods need to be tailored to best suit the project requirements. In Agile, the tasks are divided into time boxes (small time frames) to deliver specific features for a release.
Iterative approach is taken and working software build is delivered after each iteration. Each build is incremental in terms of features; the final build holds all the features required by the customer.

- **Key Characteristics**

1. Iterative development with frequent releases.
2. Embraces change and adapts to evolving requirements.
3. Continuous customer collaboration and feedback.

- **Figure**



- **Advantages of agile model**

The Agile model is an iterative and incremental software development approach that focuses on collaboration, flexibility, and customer feedback.

1. It is a very realistic approach to software development
2. Promotes teamwork and cross training.
3. Functionality can be developed rapidly and demonstrated.
4. Resource requirements are minimum.
5. Suitable for fixed or changing requirements
6. Delivers early partial working solutions.
7. Good model for environments that change steadily.
8. Minimal rules, documentation easily employed.
9. Enables concurrent development and delivery within an overall planned context.
10. Little or no planning required.
11. Easy to manage.
12. Gives flexibility to developers.

- **Disadvantages of agile model**

1. Not suitable for handling complex dependencies.
2. More risk of sustainability, maintainability and extensibility.
3. An overall plan, an agile leader and agile PM practice is a must without which it will not work.
4. Strict delivery management dictates the scope, functionality to be delivered, and adjustments to meet the deadlines.
5. Depends heavily on customer interaction, so if the customer is not clear, the team can be driven in the wrong direction.

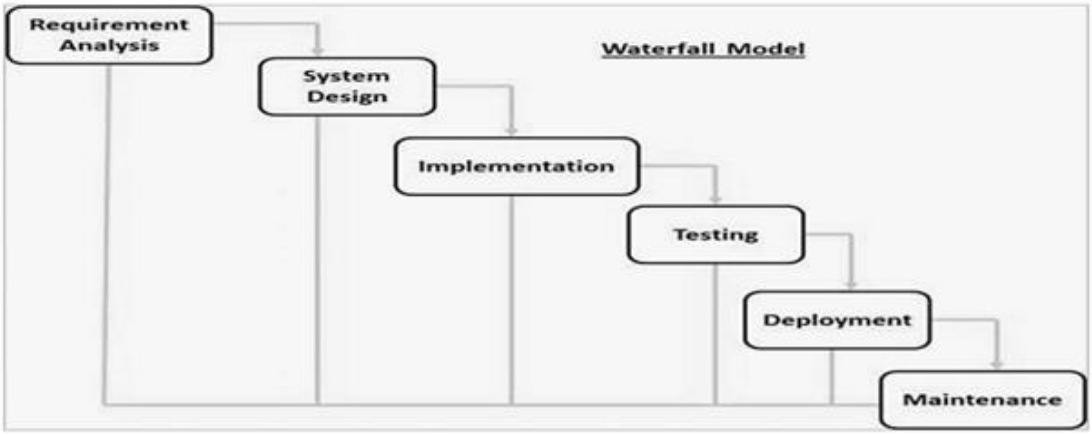
6. There is a very high individual dependency, since there is minimum documentation generated.
7. Due to lack of documentation.

✓ **Waterfall**

The Waterfall approach was the first SDLC Model to be used widely in Software Engineering to ensure success of the project. In "The Waterfall" approach, the whole process of software development is divided into separate phases. In this Waterfall model, typically, the outcome of one phase acts as the input for the next phase sequentially.

The waterfall method does not allow for changes or modifications to be easily included during a project process and instead sets out everything before the project's beginning, hoping that everything will go according to plan and that there won't be a need for change. It is mainly useful for projects that are not complicated and involve few coordination requirements.

- **Figure**



The sequential phases in Waterfall model are:

1. **Requirement Gathering and analysis –** All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document.
2. **System Design** – The requirement specifications from the first phase are studied in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture.
3. **Implementation** – With inputs from the system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality, which is referred to as Unit Testing.

4. **Integration and Testing** − All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.
5. **Deployment of system –** Once the functional and non-functional testing is done; the product is deployed in the customer environment or released into the market.
6. **Maintenance –** There are some issues which come up in the client environment. To fix those issues, patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

- **Advantages of the Waterfall model**

The advantages of waterfall development are that it allows for departmentalization and control. A schedule can be set with deadlines for each stage of development and a product can proceed through the development process model phases one by one.

1. Simple and easy to understand and use
2. Easy to manage due to the rigidity of the model. Each phase has specific deliverables and a review process.
3. Phases are processed and completed one at a time.
4. Works well for smaller projects where requirements are very well understood.
5. Clearly defined stages.
6. Well understood milestones.
7. Easy to arrange tasks.
8. Process and results are well documented.

- **Disadvantages of the waterfall model**

The disadvantage of waterfall development is that it does not allow much reflection or revision. Once an application is in the testing stage, it is very difficult to go back and change something that was not well-documented or thought upon in the concept stage.

1. No working software is produced until late during the life cycle.
2. High amounts of risk and uncertainty.
3. Not a good model for complex and object-oriented projects.
4. Poor model for long and ongoing projects.
5. Not suitable for the projects where requirements are at a moderate to high risk of changing. So, risk and uncertainty is high with this process model.
6. It is difficult to measure progress within stages.
7. Cannot accommodate changing requirements.
8. Adjusting scope during the life cycle can end a project.

9. Integration is done as a "big-bang. at the very end, which doesn't allow identifying any technological or business bottleneck or challenges early.

Difference between Waterfall vs Agile Development Model

Aspect	Agile	Waterfall
Life Cycle	It is a continuous iteration life cycle model to develop and test a software product.	It is a linear sequential model to develop and test a software product.
Process	In this; The entire process of development is divided into sprints	The software development process is broken down into different phases.
Flexibility	Agile development model is flexible to make changes at any point of time (or at any stage of development process) .	In Waterfall model to make changes after one phase is difficult and costly.
client involvement	Continuous client Interaction and feedback	There is very little client involvement and very little feedback is taken.
Delivery Time	Its delivery time is very short and functional software is available very quickly.	Its delivery time is very long, the entire project must be completed before delivery.

Theoretical Activity 2.1.2: Description of project requirements

Tasks:

1: You are requested to answer the following questions related to project requirements

I. What do you understand by project requirements?

II. Identify types of project requirement.

III. What are the types of non-functional requirement

2: Provide the answer for the asked questions and write them on papers

3: Present the findings to the whole class

4: Ask questions where necessary

5: For more clarification, read the key readings 2.1.2.

Theoretical Activity 2.1.3: Description of project scope

Tasks:

1: You are requested to answer the following question related the project scope

I. What do you understand by project scope?

2: Present your answers

3: Ask questions where necessary

4: Read the key readings 2.1.3. For more clarification.

Key readings 2.1.3.: Description of project scope

- **Project scope**

✓ **Definition**

Project scope refers to the specific boundaries, objectives, and deliverables of a project. It defines the work that needs to be accomplished to successfully complete the project and outlines what is included and excluded from the project's activities.

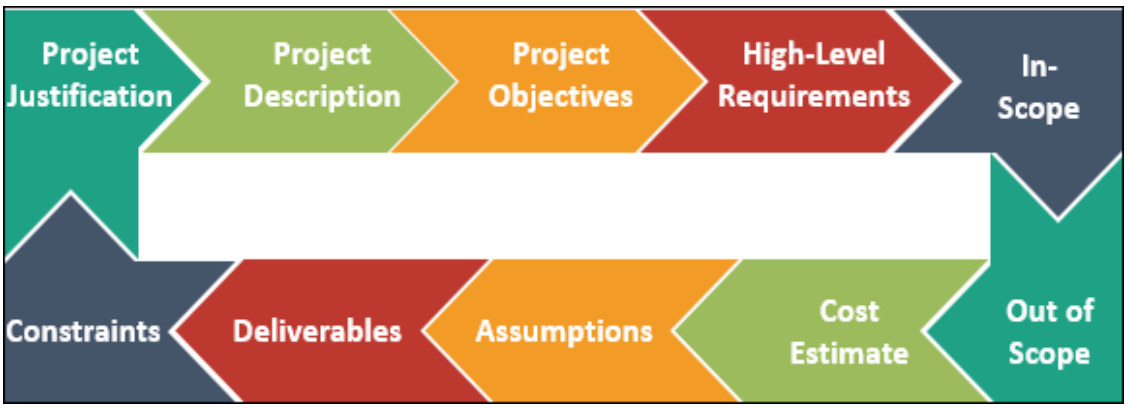
The scope of software refers to the detailed definition of the functionalities, features, and deliverables that a software product or system is intended to include. It encompasses the boundaries and constraints that define what the software will do and what it will not do. Clearly defining the scope is a crucial step in software development, as it helps manage expectations, guide the development process, and ensure successful project delivery.

In simple terms, the project scope is just a way of describing what you have agreed to work on. It demonstrates the project's limitations and restrictions.

✓ **Project scope management is comprised of a variety of related initiatives including:**

1. **Scope creep:** When a project grows beyond its original scope with additional deliverables, an extended timeline, or more costs than originally planned.
2. **Project management triangle:** The trifecta of project management—scope, budget, and timeline. When you properly coordinate all three of these, you complete your projects without needing additional resources.
3. **Project scope statement:** Guidelines to help your team determine what's in and out of scope.

Key Elements of a Project Scope Statement:



1. **Project Objectives:**
   Clearly articulate the overarching goals and objectives of the project. Ensure that these objectives align with the broader mission or strategy of the organization.
2. **Deliverables:** Specify the tangible and intangible outcomes that the project is expected to produce. This provides a concrete understanding of what success looks like and helps in setting measurable targets.
3. **Boundaries:** Define the project's boundaries by outlining what is included and excluded. This helps manage expectations and prevents scope creep, ensuring that the project team and stakeholders have a shared understanding of the project's scope.
4. **Assumptions:** Document any assumptions made about the project scope. Acknowledging assumptions is crucial for risk management, as it helps identify potential areas of uncertainty that may impact the project's success.
5. **Stakeholders:** Identify and engage key stakeholders, understanding their roles, responsibilities, and expectations. Stakeholder input is essential for defining a scope that meets the needs of all relevant parties.
6. **Exclusions:** Explicitly state what is not included in the project scope. This helps prevent misunderstandings and sets realistic expectations about the project's limitations.
7. **Change Control:** Establish a formal process for managing changes to the project scope. Clearly define how changes will be requested, evaluated, approved, and implemented. This helps maintain control over project scope and prevents uncontrolled changes.
8. Review and Approval: Share the project scope description with key stakeholders for review and approval. Seek feedback to ensure that all perspectives are considered and that the scope accurately reflects the project's objectives and constraints.
   - **Template**

SIMPLE PROJECT SCOPE STATEMENT

PROJECT NO.	**DATE SUBMITTED**
	00/00/0000
PROJECT OBJECTIVES Describe the high-level goals of the project and how they relate to overall business objectives.	

1. Project Deliverables

DELIVERABLE NO.	**DESCRIPTION**
1	
2	
3	

2. List of Project Tasks

TASK NO.	**DESCRIPTION**	**FOR DELIVERABLE NO. …** **ENTER TASK #**
1		
2		
3		

3. Out of Scope

This project **will NOT accomplish or include** the following:	

4. Project Assumptions

NO.	ASSUMPTION
1	
2	
3	

5. Project Constraints

PROJECT START DATE	
LAUNCH / GO-LIVE DATE	
PROJECT END DATE	
LIST ANY HARD DEADLINE(S)	
LIST OTHER DATES / DESCRIPTIONS OF KEY MILESTONES	
BUDGET CONSTRAINTS Enter information about project budget limitations (total project budget, maximum budget for key project deliverables).	
QUALITY OR PERFORMANCE CONSTRAINTS Enter any other requirements for the functionality, performance, or quality of the project.	

EQUIPMENT / PERSONNEL CONSTRAINTS Enter any constraints regarding equipment or people that will impact the project.	
REGULATORY CONSTRAINTS Enter any legal, policy, or other regulatory constraints.	

6. Updated Estimates

Estimate the hours required to complete the project. *Enter total # of hours.*	

7. Approvals

STAKEHOLDER NAME & TITLE	ROLE OF STAKEHOLDER / APPROVER	DATE SUBMITTED FOR APPROVAL

- **Scope of Work Tools**

1. Google drive through google docs, google sheet, google slides, …
2. Balsamiq-Wireframing made simple

Practical Activity 2.1.4: Preparing project scope statement

Task:

1: Read key reading 2.1.4.

2: Read the below task:

This is a sample customer needs from Bright Future Secondary School

1. School Profile:

a. **Full Name**: Bright Future Secondary School
b. **History**: Established in 1995, the school has served the local community for over 25 years, with a strong focus on both academic excellence and vocational training.
c. **Mission Statement**: To provide holistic education that empowers students to achieve academic and vocational success while fostering personal growth and community engagement.
d. **Vision Statement**: To be a leading institution that prepares students for future challenges through innovative education and skill development.
e. **School Logo and Branding**: School logo features an open book with a shining light representing knowledge, and the colors are blue and gold.

2. School Trades and Programs:

a. **Available Trades**:
   - **Technical Programs**: Electrical Engineering, Computer Science
   - **Academic Programs**: Science, Arts, Commerce
   - **Vocational Programs**: Carpentry, Fashion Design, Catering

b. Program Descriptions:
   - Electrical Engineering: Focuses on the basics of electrical systems, circuits, and power distribution.
   - Carpentry: Provides hands-on training in woodworking and furniture design.

c. Admission Requirements: Minimum of a primary school certificate for vocational programs; junior secondary certificate for academic programs.

d. Prerequisites: Basic mathematics for technical programs; no prerequisites for vocational programs.

3. School Fees:

a. **Fee Structure**:

- Technical Programs: $500 per term
- Academic Programs: $300 per term
- Vocational Programs: $200 per term

b. Payment Options: Bank transfer, mobile payment, and online payment portal.

c. Fee Policies: Late payment incurs a penalty of $20 per week. Scholarships are available for top-performing students.

4. Location:

a. **Physical Address**: 123 Knowledge Avenue, Future City, State XYZ

b. Directions: Located near the central bus terminal, 10 minutes' walk from Future City Mall.

c. **Interactive Map: Google Maps integration preferred.**

5. School Authority and Contact Information:

a. **Key Personnel**:
   - **Principal**: Dr. Emily Johnson (emily.j@brightfuture.edu)
   - **Vice Principal**: Mr. David Parker (david.p@brightfuture.edu)
   - **Head of Administration**: Mrs. Sarah Mills (sarah.m@brightfuture.edu)

b. Office Hours: 8:00 AM - 4:00 PM, Monday to Friday.

c. Preferred Communication Channels: Email for formal communication, phone and WhatsApp for urgent matters.

6. Additional Information:

a. **Policies**:
   - Attendance is mandatory, and students must maintain a 75% attendance rate.
   - Strict code of conduct regarding discipline, uniform, and punctuality.

b. Academic Calendar:
   - Term 1: January - March
   - Term 2: May - July
   - Term 3: September - November
   - **Examination Schedules**: Mid-term exams in the second month of each term; final exams in the third month.

c. **Announcements**: Upcoming Parent-Teacher Conference in October, annual sports day in November.

7. Technical Preferences:

a. **Website Features**:
   a. Student and parent login portal
   b. Online fee payment system
   c. Event calendar and news updates

b. **Content Management System (CMS)**: Open to recommendations; prefers WordPress or Joomla.

c. **Accessibility Requirements**: Must be mobile-friendly, include support for multiple languages (English, Kinyarwanda), and be compatible with screen readers for visually impaired users.

As a project requirement analyst, you are requested to prepare a project scope statement of Bright Future Secondary School's website based on the above provided customer needs.

3: Prepare a project scope statement.

4: Present your work to the trainer and whole class

Key readings 2.1.4.: Preparing project scope statement

Defining project scope involves a series of steps to provide more detailed information and clarification about various aspects of the project.

Consider the following steps to prepare statement of Project scope:

Step 1. Project Deliverables

Please list all project deliverables and briefly describe each. Do not list dates. Add more rows as necessary.

Step 2. List of Project Tasks

Please list all project tasks to be completed, based on the deliverables listed in the previous section. Do not list dates. Add more rows as necessary.

Step 3. Out of Scope

Please list the deliverables or tasks that you will not complete or provide as outputs of this project.

Step 4. Project Assumptions

Please list any project factors that you consider to be true, real, or certain. Assumptions generally involve a certain degree of risk.

Step 5. Project Constraints

Step 6. Updated Estimates

Step 7. Approvals

Practical Activity 2.1.5: Outlining project requirements

Task:

1: Read key reading 2.1.5.

2: Outline the project requirements based on statement of project scope.

Project Scope Statement for Bright Future Secondary School Website Development

1. Project Deliverables

a. Responsive School Website: A fully functional, mobile-friendly website that reflects the school's branding.

b. Content Management System (CMS): Integration of a CMS (e.g., WordPress or Joomla) to allow easy content updates by school staff.

c. User Portal: Login functionality for students, parents, and staff, allowing access to personalized content.

d. Online Fee Payment System: Secure, user-friendly system for processing school fee payments with options for installment payments.

e. School Information Hub: Pages detailing school profile, trades, programs, school fees, location, and key personnel contacts.

f. Interactive Map Integration: Google Maps embedded for easy navigation to the school.

g. Event and Announcement Calendar: Feature to post and update school events, announcements, and academic schedules.

h. Multilingual Support: Language options (English and Spanish) for accessibility.

i. Accessibility Features: Compatibility with screen readers and adherence to web accessibility standards.

2. List of Project Tasks

Task 1: Requirements gathering through interviews, questionnaires, and observation checklists.

Task 2: Finalizing website design (branding, structure, color scheme, logo integration).

Task 3: Developing user-friendly navigation and responsive design for mobile and desktop.

Task 4: Building and integrating the CMS for school staff to manage content.

Task 5: Creating user portals with login functionality and secure access for students, parents, and staff.

Task 6: Developing and testing the online payment system, including multiple payment options.

Task 7: Content creation and uploading (school profile, trades and programs, fees, policies).

Task 8: Integration of Google Maps and school location details.

Task 9: Developing an event calendar and announcements section.

Task 10: Implementing multilingual support and accessibility features.

Task 11: Website testing for functionality, performance, and accessibility.

Task 12: Training school staff on using the CMS and managing the website.

Task 13: Final website deployment and post-launch support.

3. Out of Scope

a. Social Media Management: Integration with the website is within scope, but managing social media accounts is out of scope.

b. Third-party Systems Integration: Any integrations with external systems outside of the online payment system are out of scope (e.g., learning management systems).

c. Long-term Website Maintenance: Ongoing maintenance and updates after project completion are excluded, unless covered under a separate agreement.

d. Custom Software Development: No custom software beyond the CMS and payment system will be developed.

4. Project Assumptions

a. Timely Access to Information: The school will provide all necessary content, including logos, program descriptions, fee details, and contact information, in a timely manner.

b. Stakeholder Engagement: Key stakeholders (administrators, teachers, IT staff) will be available for interviews, feedback, and testing throughout the project.

c. Stable Internet Connection: The school has a reliable internet connection to support website hosting, online payments, and CMS functionality.

d. Payment System Compliance: The payment system will comply with local financial regulations and secure online transaction protocols.

e. Staff Training Readiness: School staff will be available and ready to be trained on managing the website and CMS.

5. Project Constraints

a. Budget Limitations: The project budget is fixed and must cover all development, testing, and training activities without exceeding the agreed amount.

b. Timeframe: The website must be fully operational and launched within 6 months of the project start date.

c. Technology Restrictions: The website must use a CMS platform like WordPress or Joomla, as requested by the client, limiting custom software options.

d. Compliance with Accessibility Standards: The website must adhere to international web accessibility guidelines (e.g., WCAG) to ensure usability for people with disabilities.

6. Updated Estimates

a. Estimated Time for Completion: 6 months from the project start date.

b. Estimated Cost: $20,000 for design, development, CMS integration, payment system, testing, and training.

c. Resource Requirements: 3 full-time developers, 1 designer, 1 project manager, 1 tester, and support from the school's IT department for content and feedback.

AS a project requirement analyst use **Project Scope Statement for Bright Future Secondary School Website Development** to outline project requirements

3: Present your work to the trainer and whole class

4: Read key reading 2.1.5 and ask clarification where necessary

5: Perform the task provided in application of learning 2.1.

Key readings 2.1.5.: Outlining project requirements

- **Steps to outline project requirements**

✓ **Review the Scope Document:** Understand the scope thoroughly. Identify the key objectives, deliverables, constraints, and assumptions already defined.

✓ **Identify Stakeholders:** Determine who the key stakeholders are for the project. This includes decision-makers, end-users, subject matter experts, etc.

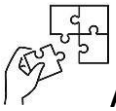
✓ **Define Project Goals:** Based on the scope, articulate clear and measurable goals for the project. These should align with the overall objectives outlined in the scope document.

- ✓ **Gather Initial Requirements: Even without detailed research, gather initial requirements based on the scope and goals. This can include functionalities, performance expectations, regulatory requirements, etc.**
- ✓ **Create a Requirements Document: Begin** drafting a requirements document. This should include sections such as:
  - **Introduction:** Overview of the project and its objectives.
  - **Scope:** Detailed description of what is included and excluded from the project.
  - **Functional Requirements:** What the system/product must do.
  - **Non-Functional Requirements:** Constraints, performance requirements, usability criteria, etc.
  - **Constraints and Assumptions:** Factors that might limit the project or decisions made without full information.
  - **Dependencies:** External factors or resources needed for the project.
- ✓ **Prioritize Requirements: Work with stakeholders to prioritize requirements based on importance and feasibility. This helps in case of trade-offs or resource constraints later.**
- ✓ **Document Assumptions and Risks: Note down any assumptions you're making due to lack of research and potential risks associated with these assumptions.**

Points to Remember

- A project management approach is a set of principles, practices, and methodologies used to plan, execute, and control projects.
- Project management approaches are: **Agile and Water fall model**
- A project requirement is a detailed description of what a project must accomplish, including specific criteria, features, functionalities, and constraints.
- A project should have two types of requirements: **functional requirements** and **non-functional requirements**.
- Types of non-functional requirement are:
  - ✓ Performance Requirement
  - ✓ Usability requirements
  - ✓ Recoverability requirements
  - ✓ Maintainability requirements
  - ✓ Accessibility requirements
- Project scope refers to the specific boundaries, objectives, and deliverables of a project.

- For better defining project scope, the project scope statement may be prepared to avoid gaps in the scope.
  - To prepare statement of project scope pass through the bellow steps:
    - ✓ Define Project Deliverables
    - ✓ List of Project Tasks
    - ✓ Provide tasks that are Out of Scope
    - ✓ Provide Project Assumptions
    - ✓ Provide Project Constraints
    - ✓ Reserve space for approvals
  - **To outline project requirements, use the below steps:**
    - ✓ Write an introduction
    - ✓ Define Scope
    - ✓ List Functional Requirements
    - ✓ List Non-Functional Requirements
    - ✓ Define Constraints and Assumptions
    - ✓ Define dependencies



Application of learning 2.1.

Green Tech Solutions is located in your sector, it needs a requirement analyst to improve customer engagement through a new mobile application focus on defining the project scope and outlining the project requirements. The context of this project is to develop an app that provides real-time updates on sustainability initiatives and personalized tips for reducing carbon footprints. To overcome the problem of current communication channels which is insufficient in engaging our environmentally-conscious audience effectively.

Indicative Content 2.2: Research Methodology

Duration: 1 hr

Theoretical Activity 2.2.1: Description of research methodology

Tasks:

1: Answer the following questions related the research methodology

I. What do you understand by research methodology?

II. Identify types of research methodology

2: Present the findings to the whole class

3: Ask questions where necessary.

4: For more clarification, read the key readings 2.2.1.

Key readings 2.2.1.: Description of research methodology

- **Research methodology**

Research methodology is a way of explaining how a researcher intends to carry out their research. It's a logical, systematic plan to resolve a research problem. A methodology details a researcher's approach to the research to ensure reliable, valid results that address their aims and objectives.

✓ **Types of research methodology**

Fundamental

Fundamental research, also known as basic research or pure research does not usually generate findings that have immediate applications in a practical level. Fundamental research is driven by curiosity and the desire to expand knowledge in specific research areas. This type of research makes a specific contribution to the academic body of knowledge in the research area.

Fundamental studies tend to make generalizations about the phenomenon, and the philosophy of this type of studies can be explained as 'gathering knowledge for the sake of knowledge'. Fundamental researches mainly aim to answer the questions of why, what or how and they tend to contribute to the pool of fundamental knowledge in the research area.

Exploratory

One common type of research design is exploratory design. The exploratory research design format is useful when you don't have a clearly defined problem to study. Often, this type of research design is less structured than other research design options, and you can use it as a guide for your initial research to uncover your research problem.
Theories and their explanation are the basis of Exploratory Research. Its goal is only to investigate the study questions, not to provide definitive and conclusive solutions to current problems.

Exploratory research seeks to increase our understanding of the issue rather than offering conclusive evidence. The structure is improper, and the methods offer a flexible and investigative approach. Therefore, one does not test the hypothesis, and the results do not help the outside world. The findings are usually a related topic, which helps improve the research.
Exploratory research is usually qualitative, but a large-sample exploratory study can also be quantitative. Due to its flexible and open-ended nature, it is often known as interpretive research or a grounded theory approach**.**

- **Survey**

Researchers also use the survey research design frequently. You can use surveys to gather information directly from your sample population**.**

Surveys play a prominent role in the research method. It helps collect a vast amount of real-time data and helps the research process. It is done cheaply and is usually faster than any other method. A researcher can conduct surveys in both quantitative and qualitative methods. The researcher usually prefers quantitative surveys over qualitative ones as they provide numerical outputs and accurate data.
Surveys are mainly used in the business to know the demand for a product in the market. It also helps to forecast the production based on the research results.
Questionnaires and interviews are two of the most common types of surveys. While interviews are conducted in person to reflect on feelings and experiences and explore issues with a greater emphasis, researchers use questionnaires to acquire information quickly.

- **Case studies**

Case study research is a qualitative research methodology that involves an in-depth and detailed examination of a specific individual, group, organization, or situation. It focuses on providing a comprehensive understanding of a particular case and its context, often by using multiple sources of data. Case studies aim to explore complex phenomena, generate rich descriptions, and gain insights into real-world situations.

A common technique for qualitative analysis is the case study method, which entails thorough observation of a social unit and focuses on the in-depth study. The case study emphasizes the detailed examination of a smaller set of circumstances and their interactions. Finding the elements that collectively account for the behavior patterns of the provided unit is the goal of the case study method.

In this method of research methodology, the researcher considers different cases, and the proper one for the research is selected. Case studies help to develop an idea of the research and help in the foundation of the research.

One considers various facts and theories from the case studies that help to form proper reviews about the research topic. Researchers can make the topic general or specific according to the literature reviews from the studies. The researcher can make an appropriate understanding of the research from the case study.

Also, we have focus groups and research interviews to understand the types of research methods in a well-defined manner. Various methods can follow structured and unstructured methods.

Summary Difference of Research Methodologies

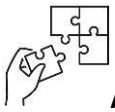
Research Methodology	**Description**	**When to Use**	**Data Collection Methods**	**Outcome**	**Advantages**
Fundamental Research (also known as Basic or Pure Research)	Research aimed at expanding knowledge by discovering new theories, principles, or phenomena without immediate practical application.	Use when seeking to understand basic principles or concepts and expanding theoretical frameworks without focusing on direct application. Common in scientific or academic settings.	Literature review, experiments, simulations, theoretical modelling	New theories, models, or principles that contribute to a body of knowledge.	Contributes to long-term knowledge development; lays the foundation for applied research.

Exploratory Research	Research conducted to explore a problem or situation where little prior information exists, often without a clear hypothesis.	Use in early stages of research when trying to understand a new topic, problem, or idea, or when seeking to clarify the scope of a problem.	Literature review, interviews, focus groups, qualitative methods	New insights, ideas, or hypothesis generation. Establishes groundwork for future, more structured research.	Flexible and open-ended, can lead to the identification of key variables for future research.
Survey Research	Research method involving the use of structured questionnaires or interviews to gather quantitative data from a predefined population.	Use when looking to collect large amounts of data from a broad audience, typically when measuring opinions, behaviors, or characteristics in a population.	Questionnaires, interviews, online or paper surveys	Quantitative data that provides a snapshot of trends, behaviors, opinions, or demographics.	Efficient for collecting data from large populations; provides quantitative data that can be statistically analyzed.
Case Study Research	In-depth, detailed examination of a specific subject (person, group, organization, or situation) to	Use when seeking to investigate a specific instance or small number of cases in detail, often for an in-	Interviews, observation, document review, archival records	Rich qualitative insights, detailed understanding of the specific case, often not generalizabl	Provides in-depth understanding of complex phenomena; useful for generating insights from real-

	explore complex issues within a real-life context.	depth understanding of a phenomenon. Useful when testing theories in real-world settings.		e but valuable for in-depth knowledge.	world contexts.

Points to Remember

- Research methodology is a way of explaining how a researcher intends to carry out their research.
- Types of research methodology are:
    - ✓ Fundamental The
    - ✓ Exploratory
    - ✓ Surveys
    - ✓ Case study



Application of learning 2.2.

Bright Future Secondary School is developing a new web-based platform to streamline communication with students, parents, and other stakeholders. The platform will include features such as online fee payment, real-time updates about school events, student performance tracking, and program enrolment information. However, the school administration is unsure about the specific requirements and functionalities that should be prioritized in the system. To ensure the website meets the school's needs, a Project Requirement Analyst has been tasked with selecting research methodologies to gather data and provide a comprehensive analysis.

Indicative content 2.3: Conduct research

Duration: 8hrs

Theoretical Activity 2.3.1: Identification of steps to conduct research

Tasks:

1: Answer the following questions related to the steps to conduct research

I. Briefly describe a research plan

II. Explain how to conduct research?

III. How can a researcher show the research results?

2: Provide the answers for the asked questions

3: Present the findings to the whole class

4: For more clarification, read the key readings 2.3.1.

Key readings 2.3.1.: Identification of steps to conduct research

- **Identification of steps to conduct research**

Conducting research involves systematically collecting and analysing information to answer a specific question or solve a problem.

❖ **Plan**

In project management, a plan is a comprehensive document that outlines the approach, processes, activities, resources, and timelines needed to achieve the project's objectives. The project plan serves as a roadmap for the entire project team, providing guidance on how the project will be executed, monitored, and controlled. It is a crucial tool for ensuring that everyone involved in the project understands their roles and responsibilities and that the project progresses smoothly from initiation to completion.

Key elements of a project plan typically include:

1. **Research methodology**

Selecting the appropriate research methodology depends on the nature of the research question and the type of data that needs to be collected. There are several research methodologies that can be used, each with its own strengths and weaknesses.

2. **Project Objectives**

Clearly defined and measurable goals that the project aims to achieve. These objectives serve as the foundation for the entire plan.

3. **Project Scope**

A detailed description of the project scope, including what is included and what is excluded from the project. This helps in setting boundaries and managing expectations.

4. **Work Breakdown Structure (WBS)**

A hierarchical decomposition of the project into smaller, more manageable tasks and deliverables. The WBS organizes the work into phases and provides a visual representation of the project's structure.

5. **Schedule**

A timeline that outlines the start and end dates for each task or phase of the project. This includes dependencies between tasks and identifies critical paths.

6. **Resource Allocation**

Identification and allocation of the resources (human, financial, equipment, etc.) required for each task or phase. This ensures that the project has the necessary resources to proceed as planned.

7. **Risk Management**

Identification, assessment, and mitigation strategies for potential risks that could impact the project. A risk management plan helps the team anticipate and address challenges proactively.

8. **Communication Plan**

A strategy for communication within the project team and with stakeholders. This includes defining the frequency, channels, and types of communication.

9. **Quality Management**

Procedures and standards for ensuring the quality of project deliverables. This may include testing plans, quality assurance processes, and acceptance criteria.

10. **Monitoring and Control**

Methods for tracking project progress, monitoring performance, and controlling changes. This involves setting up mechanisms to ensure that the project stays on track and deviations are addressed promptly.

11. **Stakeholder Management**

Identification of key stakeholders, their interests, and strategies for managing their expectations and involvement throughout the project.

12. **Budget**

An estimate of the project's overall cost, including details on how funds will be allocated to various tasks and phases.

13. Closure Criteria

Criteria for determining when the project is complete and successful. This includes final deliverables, acceptance criteria, and criteria for project closure.

14. Identify research tools.

Surveys: Surveys are a popular research tool that involve asking a series of questions to a sample of respondents. Surveys can be conducted in person, over the phone, by mail, or online.

1) **Interviews:** Interviews involve asking a set of questions to individuals or groups in a face-to-face or virtual setting. Interviews can be structured, semi-structured, or unstructured, depending on the research objectives.
2) **Focus groups**: Focus groups involve gathering a small group of individuals to discuss a specific topic or issue. They are often used to explore attitudes, beliefs, and perceptions.
3) **Observation:** Observation involves watching and recording the behavior of individuals or groups in a natural or controlled setting. Observational research can be used to study human behavior, organizational processes, or physical phenomena.
4) **Experiments:** Experiments involve manipulating one or more variables to observe the effect on an outcome. They are often used to test hypotheses and establish cause-and-effect relationships.
5) **Content analysis:** Content analysis involves analyzing written or recorded communication, such as books, articles, social media posts, or audio/video recordings. It can be used to identify patterns, themes, and trends in the data.
6) **Case studies:** Case studies involve in-depth analysis of a single case or a small number of cases. They are often used to explore complex phenomena and provide detailed descriptions of specific situations.
7) **Data mining:** Data mining involves analyzing large datasets to identify patterns, relationships, and trends. It can be used to identify hidden insights and generate new hypotheses.
8) **Secondary data analysis:** Secondary data analysis involves analyzing existing data collected by others, such as government agencies, non-profit organizations, or research institutions. This approach can save time and resources and can provide access to data that may not be easily accessible.

While each research project is different, it’s best to follow these seven general steps to create your research plan:

- **Research plan template**

1. Project Overview

- **Project Name**: [Project Title]
- **Project Sponsor**: [Name of the sponsor or key stakeholder]
- **Project Manager**: [Name of the project manager]
- **Start Date**: [Start date]
- **End Date**: [End date]
- **Purpose**: [Brief description of the project's purpose and objectives]
- **Scope**: [Summary of what is included in the project and what is excluded]

2. Objectives and Goals

- **Project Objectives**: [Specific objectives the project aims to achieve]
- **Success Criteria**: [How success will be measured]

3. Project Deliverables

- **Deliverable 1**: [Description of the first deliverable]
- **Deliverable 2**: [Description of the second deliverable]
- [Additional deliverables as needed]

4. Milestones and Timeline

- **Milestone 1**: [Description of the milestone, including date]
- **Milestone 2**: [Description of the milestone, including date]
- [Additional milestones as needed]

5. Project Scope

- **Inclusions**: [Details about what is included in the project scope]
- **Exclusions**: [Details about what is not included in the project scope]

6. Roles and Responsibilities

- **Role 1**: [Name and responsibilities]
- **Role 2**: [Name and responsibilities]
- [Additional roles as needed]

7. Resources

- **Human Resources**: [List of team members and their roles]
- **Budget**: [Estimated budget and cost breakdown]
- **Equipment and Materials**: [List of required equipment and materials]

8. Risk Management

- **Risk 1**: [Description of the risk and mitigation strategy]
- **Risk 2**: [Description of the risk and mitigation strategy]
- [Additional risks as needed]

9. Communication Plan

- **Stakeholders**: [List of stakeholders and their communication needs]
- **Communication Methods**: [How and when communication will occur]
- **Reporting**: [Frequency and format of project status reports]

10. Approval and Sign-off

- **Project Sponsor**: [Signature and date]
- **Project Manager**: [Signature and date]

❖ **Implement**

implementation refers to the phase where the research plan is put into action. It involves carrying out the designed research methods and procedures to collect data and achieve the objectives of the study. The implementation phase is a critical part of the research process, and its success is crucial for obtaining reliable and valid results. Here are key components of the implementation phase in research:

1. **Data collection:** Once the research design is in place and the research tools are selected, data collection can begin. Depending on the research question and methodology, data collection can take various forms, such as surveys, interviews, observations, experiments, or content analysis. It is important to follow the research plan and protocol to ensure the quality and validity of the data collected.

2. **Data management**: During the data collection process, it is important to keep accurate records of the data collected. This may include recording data on paper or electronically, ensuring data security, and maintaining data quality. Data cleaning and preparation may also be necessary before data analysis can begin.

3. **Data analysis:** Once the data is collected and prepared, it can be analyzed using statistical or qualitative analysis methods, depending on the research question and methodology. The analysis should be guided by the research objectives and hypotheses, and should be performed using appropriate statistical or qualitative software.

4. **Interpretation of results:** The results of the data analysis should be interpreted and presented in a way that addresses the research question and hypotheses. The interpretation should also consider the limitations of the research design and methodology, and should be supported by the data collected.

❖ **Show the results**

The "Show Results" step in conducting research refers to the phase where the researcher presents and communicates the findings of the study to the intended audience. This step is crucial for disseminating the research outcomes, contributing to the body of knowledge in the field, and informing relevant stakeholders about the implications of the study

1. **Reporting and dissemination of results**: The results of the research should be reported and disseminated in a way that is appropriate for the audience and purpose. This may include writing research reports, presenting findings at conferences, or publishing articles in academic journals. It is important to acknowledge any limitations or areas for future research in the reporting of results.

2. **Evaluation of research process: Finally**, it is important to evaluate the research process and reflect on what went well and what could be improved in future research projects. This can help to improve the quality and validity of future research projects and ensure that research is conducted in an ethical and responsible manner.

Practical Activity 2.3.2: Preparing research plan

Task:

1: Read key reading 2.3.2

2: Prepare research plan to be used to conduct research.

3: Present your work to the trainer and whole class

Key readings 2.3.2.: Preparing research plan

To write your own plan for your research project, consider the following seven steps:

1. Define the project purpose

The first step to creating a research plan for your project is to define why and what you're researching. Regardless of whether you're working with a team or alone, understanding the project's purpose can help you better define project goals. If you're researching as a group, defining the project's purpose can help you divide tasks into sections to make work more manageable. For example, if you define your task as researching the history of a country, you can give some members the responsibility of researching cultural history, while another researches conflict history and so on.

2. Identify individual objectives

Once you've defined your overall goal for a project, identify individual objectives or steps you need to accomplish that goal. Learning what individual steps you need to take to reach your goal can help you simplify and better understand your process. Large groups in a research project may benefit from identifying individual goals so that they can divide and allocate tasks according to who they have available to help. Even when working alone, dividing this period into several smaller steps can help you identify immediate goals that need attention right away and eventual goals that can wait.

3. Select a research method

After defining your goal and individual steps, the next step toward creating a research plan is to choose the method for your research. Establishing what methods of research, you want to use can help you establish your processes before beginning the research period. You don't need to use a single research type for your project, but determining what kinds you need can help a team work together more efficiently. For example, some people may be better at researching through interviews than others. Knowing what research methods are available and who is best prepared for each can make task allocation easier.

4. Recruit participants and allocate tasks

If you can, try to recruit participants for your research project. This can make your work not only take less time, but may simplify your research tasks. If you divide your work among a group of people, you can also divide work by individual proficiencies. Recruiting participants for your research project may enable you to focus on more managerial matters of the plan, such as how to display results, allocate tasks or document changes. Allocating tasks in a team effort research plan can help you divide work appropriately. Consider allocating tasks as soon as you understand how many are necessary to complete a project. The more quickly

and effectively you allocate tasks, the faster your team can work individually on parts of a project.

5. Prepare a project summary

A project summary or brief is a guide to your research project that you can use during recruitment interviews, meetings and field studies. A brief can help remind you which questions you may want to ask your potential recruits, what elements of the research project you want to discuss and how to keep meetings on topic. Project summaries may be separate from the research project itself and typically include an introduction and possibly even interview questions for recruits.

6. Create a realistic timeline

Once you've recruited everyone and determined the tasks for your project, consider placing every objective on a tentative timeline. If you're working with multiple people, this may take more than one meeting to establish a workable timeline. When creating your timeline, consider placing each goal on dates that allow for a little extra time if team members don't meet the deadline. This can help compensate for any unexpected developments or interruptions that may happen during the research. It might also be beneficial to create a physical timeline in the form of a whiteboard display, paper sheet or digital presentation. This can help members visualize when tasks need to be accomplished. If possible, consider labelling tasks with their owners. Even if you're working alone on this project, creating your own timeline for tasks can help you view the full expanse of your research project with awareness.

7. Determine how to present your results

Before beginning your project, another step you can take is to determine how you want to display or present your research. Depending on the context and purpose of your research, there may be many ways you can display your research results. For example, if you're doing this for a company as a commission employee, you may want to present your research professionally, such as through a presentation, pamphlet or booklet. If you're doing this research by yourself or for your own needs, you may not need to have professional presentation methods unless you prefer to do so for organizational reasons.

Practical Activity 2.3.3: Implementing research plan

Task:

1: Read key reading 2.3.3.

2: Conduct research based on research plan

3: Present your work to the trainer and a whole class

Key readings 2.3.3.: **Implementing research plan**

- **To Implement the research plan, follow the below steps:**

✓ **Collect data**: Execute your research plan by gathering the necessary data through surveys, interviews, experiments, observations, or any other appropriate means.

✓ **Organize and analyze data**: Clean and organize the collected data, ensuring its accuracy and consistency. Apply appropriate statistical or qualitative analysis techniques to extract meaningful insights from the data.

Practical Activity 2.3.4: Showing research result

Task:

1: Read key reading 2.3.4

2: Read the below task:

As a project requirement analyst, you are asked to show results from the conducted research

3: Present research result to the trainer and whole class

Key readings 2.3.4.: **Showing research result**

- **Steps to show research result**

✓ **Interpret the findings:** Analyze the results of your research and interpret the data in the context of your research objective or question. Identify patterns, trends, or relationships that emerge from the data.

✓ **Draw conclusions:** Based on your analysis, draw conclusions that address your research objective or question. Discuss the implications of your findings and their significance in the broader context of the research field.

✓ **Communicate your results**: Present your findings in a clear and concise manner through a research report, presentation, or any other appropriate format. Use visual aids, such as graphs or charts, to enhance the understanding of your results.

✓ **Seek feedback and peer review:** Share your research findings with colleagues, mentors, or experts in the field to receive constructive feedback and validate the credibility of your research.

Points to Remember

- Plan is a comprehensive document that outlines the approach, processes, activities, resources, and timelines needed to achieve the project's objectives.

  -The plan will model the activities needed at each phase of the research project.

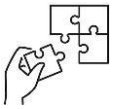
  - Serves as a valuable tool providing direction for those involved in the project both internally and externally.

  - Most official research plan documents will include the core elements below:

  - Depending on the research project's size and scope, your research plan could be brief perhaps only a few pages of documented plans. Alternatively, it could be a fully comprehensive report**.**

- The research is conducted by implementing the elaborated research plan.
- To show research result, a written report or interactive presentation may be used

- To elaborate research result, use the bellow steps:
  - ✓ Define the project purpose
  - ✓ Identify individual objectives
  - ✓ Select a research method
  - ✓ Recruit participants and allocate tasks
  - ✓ Prepare a project summary
  - ✓ Create a realistic timeline
  - ✓ Determine how to present your results
- After selected research methodology next is to conduct research starting by collecting data then analyse them
- **Those are steps to present the result of research**
  - ✓ Interpret the findings
  - ✓ Draw conclusions
  - ✓ Communicate your results
  - ✓ Seek feedback and peer review



Application of learning 2.3.

EcoClean company ltd, is planning to develop a new eco-friendly cleaning product line. We need a project requirement analyst to conduct research on market trends, competitor products, and consumer preferences to identify key features and sustainable ingredients that will differentiate our offerings. Your findings will be essential in defining the product requirements and ensuring market success.

Indicative content 2.4: Analyse results

Duration: 4hrs

Theoretical Activity 2.4.1: Description of result analysis

Tasks:

1: You are requested to answer the following questions related the research result analysis

I. Give feasibility types that may be used to analyse research results?

II. Which resources to be analysed during results analysis?

III. what analyst do in competency analysis?

2: Present the answers to the whole class

3: Ask for clarification where necessary.

4: For more clarification, read the key readings 2.4.1.

Key readings 2.4.1.: Description of result analysis

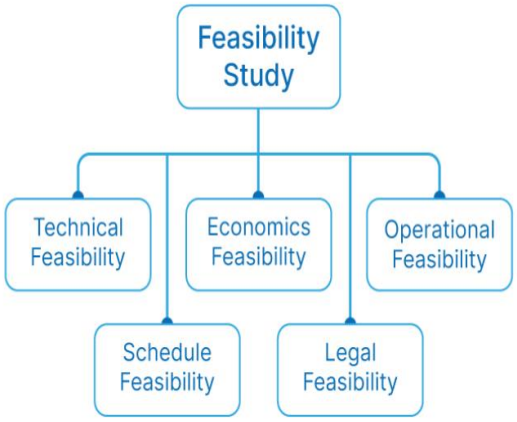
- **Description of result analysis**

When analyzing the results of a project in project management, there are several critical areas to consider, which include Feasibility, Resources, and Competency. Let's explore each of these areas and then summarize the steps typically involved in result analysis:

❖ **Feasibility**

Feasibility in the context of result analysis refers to the assessment of whether the project's goals and deliverables were realistic and achievable given the constraints.

- **Types of feasibility study**



1. Technical feasibility

Technical Feasibility analyzes/evaluates current resources for hardware, software, and technology needed to develop the project. This technical feasibility study provides information on whether the appropriate resources and technology required for use in project development are in place. In addition, the feasibility study also analyzes the technical strength and capabilities of the technical team, whether existing technology can be used, and whether the selected technology is easy to maintain and upgrade.

- Analyze the technical skills and capabilities of software development team members.
- Determine if the relevant technology is stable and established.
- Assess that the technologies chosen for software development will have many users so that they can be consulted if they encounter problems or need improvement.

2. Operational Feasibility

Operational feasibility analyzes the level of service delivery according to requirements and the ease of operating and maintaining the product after deployment. Along with these other operational areas, it determines the product's usability, whether the software development team's decisions for the proposed solution are acceptable, and so on.

- Determine if the expected issue in the user request is a high priority.
- Determine if the organization is satisfied with alternative solutions proposed by the software development team.
- Determine if the solution proposed by the software development team is acceptable.
- Analyze whether users are comfortable with new software.

3. Economic feasibility

Project costs and benefits are analyzed in a profitability study. This means that as part of this feasibility study, a detailed analysis of the costs of the development project will be made. This includes all costs necessary for the final development, such as hardware and software resources required, design and development costs, operating costs, etc. It is then analyzed whether the project is financially beneficial to the organization.

- The costs incurred in software development generate long-term benefits for an organization.
- Costs required to conduct a complete software study (e.g., requirements extraction and requirements analysis).
- Hardware, software, development team, and training costs.

4. Legal Feasibility

In a legal feasibility study, the project is analyzed from the view of legality. This includes analysis of obstacles in the legal implementation of the project, data protection or social media laws, project certificates, licenses, copyrights, etc. Overall, a legal feasibility study is a study to determine whether a proposed project meets legal and ethical requirements.

5. Schedule Feasibility

A schedule feasibility study mainly analyzes the proposed project deadlines/deadlines, including the time it will take the team to complete the final project. This has a significant impact on the organization as the project's purpose may fail if it is not completed on time.

Feasibility Study Report

1. Definitions, acronyms, and abbreviations

This section should contain brief descriptions of possible definitions, acronyms, and abbreviations. These are displayed so that anyone can interpret them correctly. If not, please explain that it is not applicable. It must be listed in alphabetical order.

2. Overview

Use this section to describe what is included in the rest of the software proof-of-concept documentation. It is similar to the end of the introduction of an academic paper.

3. Purpose

Clearly and concisely describe the purpose of the project. Lighting traits focus on the management level. Use infinitives.

4. Scope/Range

Describe the project's scope and highlight which aspects are covered and which are not. For uncovered aspects: Justify why they are not covered.

5. Current diagnosis

Describe your current situation. Describe the software, its version, the supplier, a brief description of its characteristics, and how it is used. Highlight the current environment and the difficulty of that environment. Attach supporting documents such as receipts, contracts, spreadsheets, reports, etc.

6, Requirement

One of the key points of the feasibility study document is covered in a dedicated post on requirements.

7. Proposed alternative

List all alternatives for solving the problem, including the one you suggested. Look for similar solutions in the market or academic research in this area. Consider analysis time, implementation, and training time for the proposed tool.

8. Benefits

State the expected benefits of implementing the system. Tangible and intangible benefits.

9. Cost

Allocate costs for implementing alternatives as accurately as possible. Please enter the source of the expense. risk Identify potential risks associated with alternatives. It also identifies preventive and emergency measures. Consider different risks such as people; organization, tools; and requirements.

10. Timeline

Presentation of preparatory activities, including dates and resources. Based on the phases of software development.

❖ **Resources**

Analyzing the utilization of resources is about understanding how well the project managed its human, financial, and physical resources. This includes:

1. **Allocation:** Were resources allocated efficiently to various project tasks?
   Allocation refers to the process of distributing resources, whether they are financial, human, time, or other assets, among various tasks, projects, or activities within an organization.
2. **Utilization:** How well were the resources utilized? Was there any waste or excess?
   Utilization refers to the effective and efficient use of resources, assets, or capabilities to achieve desired outcomes or goals. The concept of utilization is relevant across various contexts, including business, project management, human resources, and technology.
3. **Availability:** Were there issues with resource availability that impacted the project?
   Availability refers to the state of being accessible, ready for use, or present when needed. The concept is applicable across various contexts, including technology, human resources, services, and more.

It's a crucial step in any project, especially when one needs to identify how long a project will take and calculate the associated costs.

Resources types:

1. **Financial Resources:**
   Evaluate the financial resources required for implementing the proposed changes. Assess budget constraints and identify potential funding sources.
2. **Human Resources:**
   Analyze the availability and expertise of human resources needed for implementation. Consider whether additional training or hiring is necessary.

3. **Technological Resources:**
   Ensure that the organization possesses or can acquire the necessary technological resources for the proposed changes.
4. **Time Resources:**
   Estimate the time required for implementation. Consider project timelines, deadlines, and any time-sensitive factors.

❖ **Competency**

Competency assessment looks at the skills and abilities of the project team and whether they were adequate for the project's needs. This involves:

1. **Skill Levels:** Did the team have the necessary skills and knowledge?
   Skill levels refer to the proficiency or competency levels that individuals possess in a particular skill or set of skills. Skill levels can vary from basic or entry-level skills to advanced or expert levels. Assessing and categorizing skill levels is essential for various purposes, including hiring decisions, employee development, training programs, and project assignments.
2. **Training and Development:** Was there a need for additional training or development during the project?

   Training and development refer to the processes by which individuals acquire new skills, knowledge, and competencies to enhance their performance, capabilities, and career growth. These processes are critical for both individuals and organizations, fostering continuous learning and adapting to changing environments
3. **Performance:** How did the team perform? Were there any gaps in competency that affected the project?
   Competencies are observable and measurable behaviors that are linked to successful job performance. They provide a framework for assessing and developing the skills and behaviors needed to excel in a particular role.

❖**Summarize Steps of Result Analysis**

To summarize the result analysis in project management, you would typically follow these steps:

1. Data Gathering: Collect all relevant data on project performance, including metrics related to feasibility, resource usage, and team competency.
2. The quality and relevance of the collected data play a crucial role in the accuracy and effectiveness of subsequent analyses or actions
3. Comparison Against Objectives: Compare the actual project outcomes with the initial objectives and performance benchmarks.
4. Assessment of Resource Use: Evaluate how effectively resources were managed throughout the project lifecycle.
5. Competency Evaluation: Review the performance of the project team and the impact of their competency on the project results.

6. Identification of Variances: Identify any discrepancies between planned and actual outcomes and analyze the reasons behind these variances.
7. Lessons Learned: Document lessons learned, particularly in areas of feasibility, resource management, and team performance.
8. Recommendations for Improvement: Based on the analysis, develop recommendations to improve future projects.
9. Reporting: Compile the analysis into a comprehensive report that can be presented to stakeholders.
10. Action Planning: Develop an action plan for implementing improvements in future projects based on the findings of the result analysis.
11. Archiving: Store all documentation from the project and the result analysis for future reference and organizational learning.

Practical Activity 2.4.2: Analysing feasibility

Task:

1: Read key reading 2.4.2

2: Analyse project feasibility based on the sample research result

3: Present your work to the trainer and whole class

Key readings 2.4.2.: Analysing feasibility

- **Analysing feasibility**

❖ **Steps to conduct a feasibility study**

You likely won't be conducting the feasibility study yourself, but you will probably be called on to provide insight and information. To conduct a feasibility study, hire a trained consultant or, if you have an in-house project management office (PMO), ask if they take on this type of work. In general, here are the steps they'll take to complete this work:

1. Run a preliminary analysis

Creating a feasibility study is a time-intensive process. Before diving into the feasibility study, it's important to evaluate the project for any obvious and insurmountable roadblocks. For example, if the project requires significantly more budget than your organization has available, you likely won't be able to complete it. Similarly, if the project deliverables need to be live and in the market by a certain date but won't be available for

several months after that, the project likely isn't feasible either. These types of large-scale obstacles make a feasibility study unnecessary because it's clear the project is not viable.

2. Evaluate financial feasibility

Think of the financial feasibility study as the projected income statement for the project. This part of the feasibility study clarifies the expected project income and outlines what your organization needs to invest in terms of time and money in order to hit the project objectives.

During the financial feasibility study, take into account whether or not the project will impact your business's cash flow. Depending on the complexity of the initiative, your internal PMO or external consultant may want to work with your financial team to run a cost-benefit analysis of the project.

3. Run a market assessment

The market assessment, or market feasibility study, is a chance to identify the demand in the market. This study offers a sense of expected revenue for the project and any potential market risks you could run into.

The market assessment, more than any other part of the feasibility study, is a chance to evaluate whether or not there's an opportunity in the market. During this study, it's critical to evaluate your competitor's positions and analyze demographics to get a sense of how the project will go.

4. Consider technical and operational feasibility

Even if the financials are looking good and the market is ready, this initiative may not be something your organization can support. To evaluate operational feasibility, consider any staffing or equipment requirements this project needs. What organizational resources—including time, money, and skills—are necessary in order for this project to succeed?

Depending on the project, it may also be necessary to consider the legal impact of the initiative. For example, if the project involves developing a new patent for your product, you will need to involve your legal team and incorporate that requirement into the project plan.

5. Review project points of vulnerability

At this stage, your internal PMO (Project Management Office) team or external consultant have looked at all four elements of your feasibility study financials, market analysis, technical feasibility, and operational feasibility. Before running their recommendations by you and your stakeholders, they will review and analyze the data for any inconsistencies. This includes ensuring the income statement is in line with your market analysis. Similarly,

now that they've run a technical feasibility study, are any liabilities too big of a red flag?)

Depending on the complexity of your project, there won't always be a clear answer. A feasibility analysis doesn't provide a black-and-white decision for a complex problem. Rather, it helps you come to the table with the right questions and answers so you can make the best decision for your project and for your team.

6. **Propose a decision**

The final step of the feasibility study is an executive summary touching on the main points and proposing a solution.

Depending on the complexity and scope of the project, your internal PMO or external consultant may share the feasibility study with stakeholders or present it to the group in order to field any questions live. Either way, with the study in hand, your team now has the information you need to make an informed decision.

Practical Activity 2.4.3: Analysing resources

Task:

1: Read key reading 2.4.3

2: Analyse resources based on the provided research result.

3: Present your work to the trainer and whole class

Key readings 2.4.3.: Analysing resources

- **Resource Analysis**

Resource Analysis is the process of identifying and evaluating all the resources that are available to achieve an objective or deliver a project.

To analyse resources, follow the below steps:

1. Analyse Resource Pool

The first step is to understand and analyse your existing resource pool. How can one do this? Get information about all the resources and their skillset, location, work preferences and availability in a single place. This has to be done at an organisational level and not by

locations or departments.

By analysing the resource pool, you'll be able to get answers to the following questions:

- What are the strengths of the resources available?
- Which teams have the most availability?
- Is there a way to optimize the existing workforce for upcoming projects?

2. Compare Workload with Capacity and Actual Time Spent on Tasks

Next step is to compare how the workload assigned compares to the capacity of each resource. Capacity planning reports can help with this assessment. Capacity assessment will aid in reducing any overbooking of resources (which, if commonly done, can lead an organisation down the rabbit hole of increasing employee dissatisfaction and high attrition).

Furthermore, you should also look into how much time is spent on each task. Is it being completed in the stipulated time or does the allocated time need alteration?

3. View Utilisation Rates

Utilisation rates, at all levels like project, team or location, show you how many hours of your team's work are billable versus non-billable. For example, when someone is assigned to admin work, this work can't be billed and is not adding to the profit line.

Resource analysis will help you see if your team is meeting the required utilization rates. If everyone has a high utilisation rate, and tasks are still pending, then you know that more resources have to be added.

Studying resource utilisation rates will also provide visibility into your project(s). The more transparency and the better you monitor your project, the more likely you'd be to catch risks before they develop into problems that could sidetrack the final status.

4. Create Placeholders

A smart resource allocation strategy is to create "placeholders" in situations where the right resource can't be identified immediately. By doing this you will be able to pinpoint what the missing pieces of the project puzzle are and fill them in.

5. See the Larger Picture

A common error in resource analysis and planning is that a manager can see fragmented pieces of information — could be by project stage or by location — but the ability to see the entire matrix is not there.

By using a single-screen and enterprise based resource planning software, a project manager can actually see the larger picture. eRS's single screen, multipurpose dashboard can provide all right information at your fingertips — one will be able to view everyone's

capacity, overtime, and remaining availability.

6. Plan for "What-If" Scenarios

We'd all want our projects to work without any unexpected situations, but that can be wishful thinking. Project conditions and demands can change to a multitude of things — circling back to our construction example, prices of material can change or a utility outage can delay delivery.

The best way to tackle such "what-if" situations is to have your resource analysis process include forecasting. By forecasting, via a resource allocation system, the project manager can see how the project will get impacted if there's a change in resources, new work gets added or costs increase.

Practical Activity 2.4.4: Analysing competency

Task:

1: Read key reading 2.4.4

2: Analyse competency based on the research result.

3: Present your work to the trainer and whole class

Key readings 2.4.4.: Analysing competency

- **Competency Analysis:**

1. **Assess skills and Expertise:**
   Assess the skills and expertise required for implementing the proposed changes. Identify any gaps and develop plans for skill development or recruitment.
2. **Evaluate Organizational Capability:**
   Evaluate the overall organizational capability to adapt to the proposed changes. Consider the organization's culture, structure, and capacity for change.
3. **Assess Vendor or Partner Competency:**
   If the proposed changes involve external vendors or partners, assess their competency and reliability.

Practical Activity 2.4.5: Summarising results of analysis

Task:

1: Read key reading 2.4.5

2: Summarise results based on provided research result

3: Present your work to the trainer and whole class

Key readings 2.4.5.: Summarising results of analysis

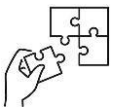
❖ **Steps to Summarize result from analysis:**

1. **Key Findings:**
   Summarize the key findings from the feasibility, resource, and competency analyses. Highlight any critical insights or obstacles.
2. **Recommendations:**
   Provide clear recommendations based on the analysis. Specify whether the proposed changes should proceed, be modified, or reconsidered.
3. **Risk Assessment:**
   Identify potential risks associated with the proposed changes and outline strategies for risk mitigation.
4. **Next Steps:**
   Summarize the recommended next steps for implementation. Clearly outline the actions to be taken and the responsibilities assigned.
5. **Communication:**
   Develop a communication plan to share the analysis results, recommendations, and next steps with key stakeholders. Ensure transparency and address any concerns.

Points to Remember

- Feasibility analysis is an investigation to check if a project is feasible or not. Types of feasibility are: Technical feasibility, Operational Feasibility, Economic feasibility, Legal Feasibility, and Schedule Feasibility

- Resources analysis focuses on Financial Resources, Human Resources, Technological Resources, and Time Resources
- In competency analysis analyst should analyse; Skill Levels, Training and Development, and Performance
    - After feasibility, resources and competency analysis analyst should summarise the results of analysis
    - To analyse feasibility, use the below steps
        - ✓ Run a preliminary analysis
        - ✓ Evaluate financial feasibility
        - ✓ Run a market assessment
        - ✓ Consider technical and operational feasibility
        - ✓ Review project points of vulnerability
        - ✓ Propose a decision
    - To analyse resources, use the below steps:
        - ✓ Analyse Resource Pool
        - ✓ Compare Workload with Capacity and Actual Time Spent on Tasks
        - ✓ View Utilisation Rates
        - ✓ Create Placeholders
        - ✓ See the Larger Picture
        - ✓ Plan for “What-If” Scenarios
    - **To analyse competency, consider the below steps:**
        - ✓ Skills and Expertise
        - ✓ Organizational Capability
        - ✓ Vendor or Partner Competency
    - Summarize the key findings from the feasibility, resource, and competency analyses. Highlight any critical insights or obstacles.
    - Provide clear recommendations based on the analysis.
    - Identify potential risks associated with the proposed changes and outline strategies for risk mitigation.
    - Summarize the recommended next steps for implementation. Clearly outline the actions to be taken and the responsibilities assigned.
    - Develop a communication plan to share the analysis results, recommendations, and next steps with key stakeholders. Ensure transparency and address any concerns.



Application of learning 2.4

EcoTech Industries is an industry located in district, it is conducting a project to optimize our energy management systems. After gathering data on current energy usage and efficiency trends, it needs a project requirement analyst to analyze the research results.

Indicative content 2.5: Report findings

Duration: 3hrs

Theoretical Activity 2.5.1: Description of report findings

Tasks:

1: Answer the following questions related the description of report of findings

I. What is a financial report and why is it important when gathering project requirement?

II. What do you understand by forecasting report?

2: Provide the answer for the asked questions

3: Present the findings to the whole class

4: Ask for clarification if necessary

4: For more clarification, read the key readings 2.5.1.

Key readings 2.5.1.: Description of report findings

- **Financial report**

Financial reporting is the process of documenting and communicating financial activities and performance over specific time periods, typically on a quarterly or yearly basis. Companies use financial reports to organize accounting data and report on current financial status. Financial reports are also essential in the projections of future profitability, industry position and growth, and many financial reports are available for public review.

✓ **Importance of financial reporting**

- Monitors income and expenses
- Ensures compliance
- Communicates essential data
- Supports financial analysis and decision-making

✓ **Types of financial reports**

- Balance sheet
- Income statement
- Cash flow statement

- Budget estimate

According to the purpose of this module budget estimate is needed

✓ **Badget estimate template**

Budget Estimate for [Project Name]

1. Project Overview
   - Project Name:
   - Project Manager:
   - Date:
   - Version:
2. Project Objectives
   - Briefly describe the main goals and objectives of the project.
3. Budget Summary

Category	Estimated Cost
Personnel	
Materials	
Equipment	
Travel	
Consulting/Contractors	
Utilities/Facilities	
Miscellaneous	
Contingency (e.g., 10%)	
Total Estimated Cost	

4. Detailed Breakdown

4.1 Personnel Costs
   - Role/Position:
   - Hours Estimated:
   - Hourly Rate:
   - Total Cost:

(Repeat for each role/position)

4.2 Materials Costs
   - Material:
   - Quantity:

(Repeat for each material)

4.3 Equipment Costs
   - Equipment:
   - Quantity:
   - Unit Cost:
   - Total Cost:

(Repeat for each piece of equipment)

4.4 Travel Costs

- Travel Type (e.g., airfare, accommodation, meals):
    - Destination:
    - Estimated Cost:
    - Number of Trips:
    - Total Cost: (Repeat for each travel type)

4.5 Consulting/Contractors Costs

- Consultant/Contractor Name:
- Scope of Work:
- Hourly Rate/Contract Rate:
- Estimated Hours/Total Contract Cost:
- Total Cost: (Repeat for each consultant/contractor)

4.6 Utilities/Facilities Costs

- Utility/Facility:
- Estimated Monthly Cost:
- Duration of Use:
- Total Cost: (Repeat for each utility/facility)

4. Miscellaneous Costs

- Item/Service:
- Description:
- Estimated Cost: (Repeat for each miscellaneous item/service)

5. Contingency

- Contingency Percentage (e.g., 10% of total estimated costs):
- Calculated Contingency Cost:

6. Summary and Notes

- Total Estimated Cost (including contingency):
- Notes:
    - Include any assumptions or special considerations.
    - Explain any potential cost fluctuations or risks.

7. Approval

- Prepared by:
- Approved by:
- Date of Approval:

3. Forecasting

Forecasting is the process of making predictions about future events, trends, or behaviors based on historical data and analysis. It involves using various techniques and models to

estimate future values and trends, which can help in planning, decision-making, and strategy development.

- **Types of financial forecasting**

Businesses conduct financial forecasting for varying purposes. Consequently, forecasting practices are categorized into four types:

1. Sales forecasting

Sales forecasting entails predicting the amounts of products/services you expect to sell within a projected fiscal period. There are two sales forecasting methodologies: top-down forecasting and bottom-up forecasting.

Sales forecasting has many uses and benefits, including budgeting and planning production cycles. It also helps companies manage and allocate resources more efficiently.

2. Cash flow forecasting

Cash flow forecasting entails estimating the flow of cash in and out of the company over a set fiscal period. It's based on factors such as income and expenses. It has many uses and benefits, including identifying immediate funding needs and budgeting. However, it is worth noting that cash flow financial forecasting is more accurate over a short term.

3. Budget forecasting

As a financial guide for your business' future, a budget creates certain expectations about your company's performance. Budget forecasting aims to determine the ideal outcome of the budget, assuming that everything proceeds as planned. It relies on the budget's data, which relies on financial forecasting data.

4. Income forecasting

Income forecasting entails analyzing the company's past revenue performance and current growth rate to estimate future income. It is integral to doing cash flow and balance sheet forecasting. Additionally, the company's investors, suppliers, and other concerned third parties use this data to make crucial decisions. For example, suppliers use it when determining how much to credit the company in supplies.

- **Financial forecasting methods**

1. **Quantitative forecasting** uses historical information and data to identify trends, reliable patterns, and trends.
2. **Qualitative forecasting** analyzes experts' opinions and sentiments about the company and market as a whole.

4. Produce Report

Parts of report

a. Executive Summary:

Begin the report with a concise executive summary that highlights key financial findings, the current project status, and any significant achievements or challenges.

b. Financial Analysis Section:
Present the detailed financial analysis, including revenue, expenses, ROI, and budget variance. Use charts and graphs to visualize key metrics and trends.

c. Forecasting Section:
Outline future revenue and cost projections. Clearly communicate the assumptions and methodologies used in the forecasting process. Discuss potential scenarios and their impact on financial outcomes.

d. Recommendations:
Based on the financial analysis and forecasting, provide recommendations for strategic decisions. This may include adjustments to the budget, reallocation of resources, or implementation of risk mitigation strategies.

e. Action Plan:
Develop a detailed action plan based on the recommendations. Specify the steps that need to be taken to improve financial performance, address budget variances, and mitigate risks.

f. Conclusion:
Summarize the key findings, recommendations, and action plan. Emphasize the overall financial health of the project and its alignment with organizational goals.

g. Appendices:
Include supporting documents in the appendices, such as detailed financial statements, budget breakdowns, and any additional data used in the analysis and forecasting.

h. Distribution:
Distribute the report to key stakeholders, including executives, project managers, and relevant team members. Ensure that the report is accessible and understandable to a diverse audience.

i. Feedback and Review:
Encourage feedback from stakeholders to improve future financial reporting. Schedule a review meeting to discuss the findings, recommendations, and any questions or concerns raised by stakeholders.

Practical Activity 2.5.2: Preparing financial report

Task:

1: Read key reading 2.5.2

2: Prepare a financial report of findings

3: Present your work to the trainer and whole class

Key readings 2.5.2: Preparing financial report

To prepare a financial report follow these steps:

a. Examine Revenue and Expenses

Conduct a detailed analysis of revenue and expenses related to the project. Examine the project's financial performance over the designated period.

b. Calculate Return on Investment (ROI):

Calculate the ROI by comparing the project's net profit to the initial investment. Assess whether the returns justify the resources allocated.

c. Analyse Budget Variance:

Analyze the variance between the budgeted and actual expenses. Identify areas where actual spending deviates from the planned budget and investigate the reasons behind any discrepancies.

Practical Activity 2.5.3: Preparing forecasting report

Task:

1: Read key reading 2.5.3

2: As a project requirement analyst, you are requested to prepare a forecasting report based on findings

3: Present your work to the trainer and whole class

Key readings 2.5.3.: Preparing forecasting report

Steps to prepare Forecasting report:

- **Steps to do financial forecasting**

Many integral aspects of your company's current and future operations hinge on the results of your financial forecasts. For example, forecasting results will influence investors' decisions, determine how much your company can get in credit, and more.

As such, accuracy cannot be overemphasized. Here is a step-by-step guide to ensure that you do it right:

1. Define the purpose of a financial forecast

What do you hope to learn from the financial forecast? Do you hope to estimate how many units of your products or services you will sell? Or perhaps you wish to see how the company's current budget will shape its future? Defining your financial forecast's purpose is essential to determining which metrics and factors to consider when doing it.

2. Gather past financial statements and historical data

One of the components of financial forecasting involves analyzing past financial data, as explained. As such, it is important to gather all relevant historical data and records, including:

- Revenue
- Losses
- Liabilities
- Investments
- Equity
- Expenditures
- Comprehensive income
- Earnings per share
- Fixed costs

It's important to ensure that you gather all required information as your financial forecast's results will be inaccurate if you exclude relevant data.

3. Choose a time frame for your forecast

Financial forecasts are designed to give business owners an insight into the company's future. You get to decide how far into the future to look, and it can range from several weeks to several years. However, most companies do forecasts for one fiscal year.

Financial forecasts change over time as factors such as business and market trends change. Consequently, it is worth noting that financial forecasting is more accurate in the short term than in the long term.

4. Choose a financial forecast method

There are two financial forecasting methods:

- **Quantitative forecasting** uses historical information and data to identify trends, reliable patterns, and trends.
- **Qualitative forecasting** analyzes experts' opinions and sentiments about the company and market as a whole.

Each method is suitable for different uses and has its strengths and shortcomings. However, qualitative forecasting is more suitable for startups without past data to which they can refer.

5. Document and monitor results

Financial forecasts are never 100% accurate and tend to change over time. As such, it is important to document and monitor your forecast's results over time, especially after major internal and external developments. It is also important to update your forecasts to reflect the latest developments. Using forecasting software to automate related tasks may help too.

6. Analyze financial data

Regularly analyzing financial data is the best way to tell whether your financial forecasts are accurate. Additionally, continuous financial management and analysis helps you prepare better for the next financial forecast and gives you crucial insights into the company's current financial performance.

7. Repeat based on the previously defined time frame

Smart companies conduct regular financial forecasting to stay in the know and in control. As such, it is advisable to repeat the process once the time period set for the current financial forecast elapses. It's also prudent to keep collecting, recording, and analyzing data to improve your financial forecasts' accuracy.

Practical Activity 2.5.4: Producing report of findings

Task:

1: Read key reading 2.5.4

2: As a project requirement analyst, you are requested to design a report of research findings

3: Present your work to the trainer and whole class

4: Read key reading 2.5.4 and ask clarification where necessary

Key readings 2.5.4.: Producing report of findings

a. Executive Summary:

Begin the report with a concise executive summary that highlights key financial findings, the current project status, and any significant achievements or challenges.

b. Financial Analysis Section:

Present the detailed financial analysis, including revenue, expenses, ROI, and budget variance. Use charts and graphs to visualize key metrics and trends.

c. Forecasting Section:

Outline future revenue and cost projections. Clearly communicate the assumptions and methodologies used in the forecasting process. Discuss potential scenarios and their impact on financial outcomes.

d. Recommendations:

Based on the financial analysis and forecasting, provide recommendations for strategic decisions. This may include adjustments to the budget, reallocation of resources, or implementation of risk mitigation strategies.

e. Action Plan:

Develop a detailed action plan based on the recommendations. Specify the steps that need to be taken to improve financial performance, address budget variances, and mitigate risks.

f. Conclusion:

Summarize the key findings, recommendations, and action plan. Emphasize the overall financial health of the project and its alignment with organizational goals.

g. Appendices:

Include supporting documents in the appendices, such as detailed financial statements, budget breakdowns, and any additional data used in the analysis and forecasting.

h. Distribution:

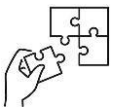
Distribute the report to key stakeholders, including executives, project managers, and relevant team members. Ensure that the report is accessible and understandable to a diverse audience.

i. Feedback and Review:

Encourage feedback from stakeholders to improve future financial reporting. Schedule a review meeting to discuss the findings, recommendations, and any questions or concerns raised by stakeholders.

Points to Remember

- **A financial report** is a formal record of the financial activities and position of a business, organization, or individual over a specific period, typically prepared at the end of an accounting period such as a quarter or a fiscal year.
- **A forecasting report** is a document that predicts future financial performance, trends, or outcomes based on historical data, current market conditions, and various assumptions.
- To prepare budget estimate, use the below steps:
  - ✓ Project Overview
  - ✓ Project Objectives
  - ✓ Budget Summary
  - ✓ Detailed Breakdown
- To prepare a financial report follow the bellow steps:
  - ✓ Define the purpose of a financial forecast
  - ✓ Gather past financial statements and historical data
  - ✓ Choose a time frame for your forecast
  - ✓ Choose a financial forecast method
  - ✓ Document and monitor results
  - ✓ Analyze financial data
  - ✓ Repeat based on the previously defined time frame
- **Steps to produce report of findings**
  - ✓ Write Executive Summary
  - ✓ Write Financial Analysis result
  - ✓ Write Forecasting result
  - ✓ Add Recommendations
  - ✓ Prepare Action Plan
  - ✓ Conclude
  - ✓ Add appendices
  - ✓ Distribute report
  - ✓ Consider Feedback and Review



Application of learning 2.5.

As a requirement analyst at HealthPlus Solutions, you're tasked with enhancing the patient management system. The research was conducted on patient data security and user interface preferences, apply your skills to reporting findings.

Learning outcome 2 end assessment

Theoretical assessment

Question 1. Distinguish the characteristics of Agile from the characteristics of waterfall methodologies in the below table:

Characteristics	**Agile**	**Waterfall**
1.Iterative development with frequent releases.		
2.Continuous customer collaboration and feedback.		
3.Clearly defined stages.		
4.Embraces change and adapts to evolving requirements.		
5.Easy to arrange tasks.		
6.Process and results are well documented		

Question 2: Match the types of non-functional requirements to their description

Answers	**Requirements**	**Description**
a)..	Performance requirements	are specifications that outline the criteria for designing and evaluating a system's user interface and overall user experience.
b)..	Maintainability requirements	focus on the ease of maintaining and updating the project deliverables over time.
c)..	Recoverability requirements	define the criteria that must be satisfied in terms of the system's performance.
d)..	Usability requirements	in a project refer to the ability of a system or application to recover from faults, errors, or unexpected events and resume normal operations.
e)..	Accessibility requirements	address the inclusivity and availability of the project deliverables to users with disabilities or special needs.

Question 3: The project scope is just a way of describing what you have agreed to work on. It demonstrates the project's limitations and restrictions.

a) True

b) False

Question 4: Which type of research is primarily driven by curiosity and aims to expand knowledge without immediate practical applications?

A) Exploratory Research

B) Fundamental Research

C) Survey Research

D) Case Study Research

Question 5: Which research methodology is best suited for gathering information directly from a sample population and is commonly used in business to forecast production?

A) Exploratory Research

B) Fundamental Research

C) Survey Research

D) Case Study Research

Question 6: Which type of research methodology involves an in-depth examination of a specific individual, group, organization, or situation and is focused on understanding complex phenomena?

A) Exploratory Research

B) Fundamental Research

C) Survey Research

D) Case Study Research

Question 7: Conducting research involves systematically collecting and analyzing information to answer a specific question or solve a problem.

True or False?

Question 8: A plan is an informal document that provides a rough idea of how a project might proceed.

True or False?

Question 9: True or False:

The implementation phase of research involves only designing the research methods and procedures without actually collecting data.

Question 10: Match the feasibility study types to their descriptions

Answer	Types of feasibility	Description
1 -	1.Technical Feasibility	A. Analyzes whether the technologies chosen for software development will have many users and assesses if the relevant technology is stable and established.
2 -	2.Operational Feasibility	B. Determines if the expected issue in the user request is a high priority and analyzes whether users are comfortable with new software.
3 -	3.Economic Feasibility	C. Assesses costs related to hardware, software, development, and training to determine if the project is financially beneficial.
4 -	4.Legal Feasibility	D. Examines the project's compliance with legal and ethical standards, including data protection, licenses, and copyrights.
5 -	Schedule Feasibility	E. Analyzes the proposed project deadlines and the time required to complete the project to ensure timely completion.

Question 11: Which of the following resources should be analyzed during results analysis to understand the management and impact on a project?

a) Resource Allocation, Resource Utilization, Resource Availability
b) Financial Resources, Human Resources, Technological Resources, Time Resources
c) Human Resources, Allocation, Availability, Time Resources
d) Financial Resources, Technological Resources, Resource Allocation, Utilization

Answer:

Question 12: Which of the following aspects are evaluated during a competency assessment to determine if the project team's skills and abilities were adequate?

a) Resource Allocation, Utilization, Availability.
b) Financial Resources, Human Resources, Technological Resources.

c)Skill Levels, Training and Development, Performance.

d) Team Communication, Budget Management, Resource Availability

Question 13: True or False:

A financial report includes an Executive Summary that highlights key financial findings, current project status, and significant achievements or challenges, making it important for gathering project requirements.

Question 14: True or False:

A forecasting report is a section that outlines past revenue and cost data, without making any projections or discussing potential future scenarios.

Practical assessment

IKAZE shop Ltd is an electronic shop located in MUSANZE District. The Manager of this shop usually faces more inconveniences and the sales revenue is reduced. No ways he has to publish the goods and services easily to the buyers from different regions around the country and outside. He observed the situations and found that the online shopping system should be a good result to raise up his sales revenues. Therefore, the Manager has decided to look for qualified software project requirements analyst to perform the following tasks:

- ✓ To plan for research
- ✓ To conduct this research
- ✓ To elaborate project scope for project
- ✓ To conduct research and present (show) the results to the Manager of IKAZE shop Ltd
- ✓ To perform Feasibility, Resources, Competency analysis and create a Summary based on research conducted
- ✓ Generate financial and forecasting reports from the research findings.

THIS TASK WILL BE PERFORMED IN 3 HOURS

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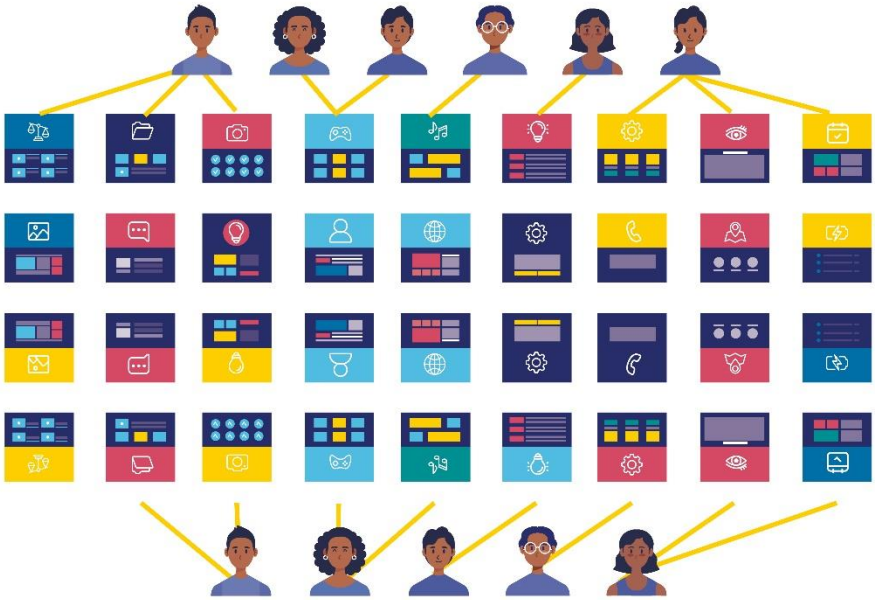


Indicative contents
3.1 Identification of the target audience **3.2** Creation of user story **3.3** Elaborate task flow

Key Competencies for Learning Outcome 3: Determine user requirement

Knowledge	Skills	Attitudes
• identification of target audience • Description of user story	• Creating user story • Elaborating project back log • Creating site map • Generating project task flow	• Being Critical thinker in creating user story • Being Decision maker in creating site map • Being Organiser in elaborating project task flow

Duration: 20hrs

Learning outcome 3 objectives:

By the end of the learning outcome, the trainees will be able to:

1. Describe properly target audience based on project goals
2. Describe properly user story based on project goals
3. Create appropriately user story based on project goals
4. Create appropriately sitemap based on user story
5. Generate properly Task flow based on user story

Resources

Equipment	Tools	Materials

• Computer	• Web browsers • Trello • Excel	• Internet • Papers • Pens

Indicative content 3.1: Identification of target audience

Duration: 4 hrs

Theoretical Activity 3.1.1: Description of target audience

Tasks:

1: Answer the following questions related the target audience identification

I. What do you understand by Target audience?

II. Give characteristics of target audience

III. What are target audience pain point?

2: Present the provided answers

3: Ask questions where necessary.

4: For more clarification, read the key readings 3.1.1.

Key readings 3.1.1.: Description of target audience

✓ **Definition**

The target audience refers to the specific group of individuals that a message, product, or service is intended to reach and appeal to. Identifying and understanding the target audience is a crucial aspect of marketing, communication, and content creation. The target audience is the group that is most likely to be interested in and influenced by what is being offered.

Here are some key considerations when defining a target audience:

1. **Demographics:**
   Age, gender, education level, income, occupation, marital status, and other demographic factors help define a target audience.
2. **Psychographics:**
   Lifestyle, interests, values, attitudes, and behaviors of the audience provide insights into their motivations and preferences.
3. **Geographics:**

Location and geographic factors, such as region, country, urban or rural areas, can play a role in defining the target audience.

4. **Behavioral Factors:**
   Purchasing behavior, brand loyalty, product usage, and other behavioral patterns help understand how the audience interacts with products or services.
5. **Needs and Challenges:**
   Understanding the needs, challenges, and pain points of the audience helps tailor products or messages to address specific concerns.
6. **Communication Preferences:**
   Knowing how the audience prefers to receive information (e.g., social media, email, in-person) helps in crafting effective communication strategies.
7. **Cultural Considerations:**
   Cultural background, values, and traditions can influence how individuals perceive and respond to messages.
8. **Technological Proficiency:**
   Assessing the audience's comfort and proficiency with technology is important for digital communication strategies.
9. **Competitor Analysis:**
   Understanding the target audience of competitors can help refine and differentiate the messaging to better appeal to a specific group.
10. **Accessibility:**
    Consideration of physical, cognitive, or sensory accessibility requirements ensures inclusivity in reaching a broader audience.
11. **Social Influences:**
    Recognizing the impact of social circles, influencers, and community networks on the target audience's decisions and preferences.
12. **Timing and Seasons:**
    Awareness of specific times, seasons, or events that might influence the audience's needs or behaviors.
13. **Feedback and Iteration:**
    Collecting and incorporating feedback from the target audience allows for continuous improvement in meeting their needs and expectations.
14. **Marketing Channels:**
    Identifying the most effective channels for reaching the audience, whether it's through online platforms, traditional media, or other channels.
15. **Sustainability and Ethics:**

Consideration of the audience's values regarding sustainability, ethical practices, and corporate social responsibility.

✓ **Characteristics of target audience**

1. **Technical Knowledge:** Consider the level of technical knowledge and expertise of the target audience.
2. **Roles and Responsibilities**: Identify the specific roles and responsibilities of the target audience within the software project. This includes project managers, business analysts, designers, developers, testers, and other relevant stakeholders.
3. **Domain Expertise:** Consider the level of domain expertise possessed by the target audience. Are they familiar with the industry or domain in which the software solution will be implemented?
4. **User Characteristics**: If the software project involves end-users or customers, consider their characteristics. This includes factors like age, education level, technical proficiency, and any specific needs or preferences.
5. **Communication Preferences:** Take into account the preferred communication channels and formats of the target audience.
6. **Organizational Culture:** Consider the organizational culture and values of the stakeholders involved. This can influence the decision-making process, priorities, and communication styles.

- ✓ **Target audience pain points**

When it comes to software project requirements, the target audience, which includes stakeholders such as project managers, business analysts, developers, and users, may experience various pain points.

Common target audience pain points

1. **Incomplete Requirements:** Missing or incomplete requirements can leave gaps in the understanding of the project scope and functionalities. This can result in inefficiencies, as stakeholders may have to make assumptions or seek clarifications, leading to additional time and effort.

2. **Conflicting Requirements:** Different stakeholders may have conflicting priorities or expectations, resulting in contradictory requirements.
   Resolving such conflicts requires effective communication and negotiation to ensure consensus among the stakeholders.

3. **Changing Requirements:** Software projects often face changing requirements throughout the development lifecycle. The target audience may encounter challenges in managing these changes, which can affect timelines, budgets, and the overall project scope.

4. **Lack of Stakeholder Involvement:** If stakeholders are not adequately involved in the requirement gathering and analysis process, they may feel disconnected from the

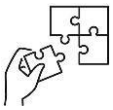
project. This can result in misalignment between the software solution and their actual needs, leading to dissatisfaction and usability issues.

5. **Lack of Clarity in User Requirements:** Understanding user requirements is crucial for creating software that meets their needs. However, if user requirements are unclear or not effectively communicated, it can result in a mismatch between the software's functionality and user expectations.

6. **Poor Documentation and Communication:** Insufficient or ineffective documentation of requirements can hinder the development process. Stakeholders may struggle to access and understand the requirements, resulting in misinterpretations or missed details.

Points to Remember

- The target audience refers to the specific group of individuals that a message, product, or service is intended to reach and appeal to.
- Characteristics of Target audience are: Technical Knowledge:
    - ✓ Roles and Responsibilities
    - ✓ Domain Expertise
    - ✓ User Characteristics
    - ✓ Communication Preferences
    - ✓ Organizational Culture
- **Common Target audience pain points in project requirement analysis are:**
    - ✓ Incomplete Requirements
    - ✓ Conflicting Requirements
    - ✓ Changing Requirements
    - ✓ Lack of Stakeholder Involvement
    - ✓ Lack of Clarity in User Requirements
    - ✓ Poor Documentation and Communication



Application of learning 3.1.

Bright Future Secondary School has requested the development of a new website to make essential school information easily accessible to students, parents, school staff, and the broader community. To ensure the website is user-friendly and meets the specific needs of

its users, the project requirement analyst has been assigned the task of identifying the target audience of that website.

The analyst must begin by conducting a thorough analysis of the different groups that will interact with the website. Each audience has distinct needs, pain points, and levels of technical ability.

Indicative content 3.2: Creation of user story

Duration: 8hrs

Theoretical Activity 3.2.1: Description of user story

Tasks:

1: You are asked to answer the following questions related the user story

I. What is a user story?

II. Give a format of a user story

2: Present the answers to the whole class

3: Ask questions where necessary.

4: For more clarification, read the key readings 3.2.1.

Key readings 3.2.1.: Description of user story

- **Description of user story**

1. Definition

User story is a concise, informal description of a specific feature or functionality from the perspective of an end user or customer.
It typically follows a specific format that includes the role of the user, the task they want to accomplish, and the reason for doing so. User stories are commonly used in agile development methodologies to capture and prioritize user requirements.

User stories are often written on index cards or in dedicated software tools, and they serve as a communication tool between the development team and stakeholders. They help to prioritize and plan the development of features based on the needs and priorities of the users.

- **Parts of a user story:**
  - **Role:** The role identifies the user or stakeholder who will benefit from the described functionality. It specifies who the feature is intended for and helps provide context.
  - **Goal:** The goal expresses the desired outcome or action the user wants to achieve. It represents what the user expects to be able to do with the software.
  - **Benefit:** The benefit explains the value or advantage that the user will gain by accomplishing the goal. It highlights the positive impact or result that the user expects from using the software.
  - **Format**

As the "As a [user], I want [action] so that [benefit]" format.
A user story typically follows a simple format that includes the user role, the desired action, and the intended benefit.
The format is commonly expressed as:

- As a [User Role],
- I want to [Action],
- So that [Benefit].

Practical Activity 3.2.2: Creating a user story

Task:

1: Read Key reading 3.2.2.

2: Read the below task:

As a project requirement analyst, you are asked to create a project user story based on research results

3: Create user story

4: Present your work to the trainer and whole class

Key readings 3.2.2.: Creating a user story

❖ **Step-by-step guide to creating a user story**:

1. **Identify the User or Stakeholder:**

Determine who the primary user or stakeholder is for the feature or functionality. This is crucial for framing the story from the user's perspective.

2. **Define the User's Goal:**

Clearly articulate what the user wants to achieve or the goal they are trying to fulfill. This helps in understanding the purpose of the user story.

3. **Write the User Story Title:**

Compose a concise title that captures the user's role and goal. Follow the format: "As a [role], I want [an action] so that [benefit/value]."

4. **Craft Acceptance Criteria:**

List the specific conditions that must be met for the user story to be considered complete. These criteria should be measurable, testable, and provide a clear definition of done.

5. **Add Additional Information/Notes:**

Include any relevant additional information or notes that provide context or specify details not covered in the acceptance criteria. This could include technical considerations, design preferences, or other important details.

a) **Assign Priority:**

Indicate the priority level of the user story. Priorities are commonly classified as High, Medium, or Low. This helps the team understand the relative importance of the user story.

b) **Collaborate with Stakeholders:**

Discuss the user story with relevant stakeholders, including product owners, designers, and developers, to ensure a shared understanding. Address any questions or concerns and gather input to refine the user story.

c) **Revise and Refine:**

Based on feedback and collaboration, revise and refine the user story as needed. Ensure that it accurately represents the user's needs and aligns with the overall project goals

Theoretical Activity 3.2.3: Description of project Backlogs

Tasks:

1: You are requested to answer the following questions related the project backlog

I. What do you understand by project backlog?
II. Write down elements of project backlog

2: Provide the answer for the asked questions

3: Present the findings to the whole class

4: Ask questions where necessary

5: For more clarification, read the key readings 3.2.3. In addition,

Key readings 3.2.3.: Description of project Backlogs

- **Definition of project backlog**

A project backlog is a prioritized list of all the work items that need to be completed for a project. It serves as a central repository of tasks, features, user stories, bugs, technical improvements, and any other activities that need to be addressed during the course of the project. The project backlog is typically managed by the product owner or project manager. Agile methodology focuses on products. Still, project-based organizations are still applying some Agile practices, such as working with backlogs. The project backlog replaces the product backlog. The main difference is that the project backlog is temporary. It will live as long as the single project. Whereas a product backlog (in theory) will have no end date and be used continuously throughout the lifecycle of a product.

1. **Characteristics of a project backlog:**

- **Comprehensive:** The project backlog should capture all the necessary requirements, features, and tasks that need to be completed for the project. It should be a comprehensive list of work items.
- **Prioritized:** The backlog should be prioritized based on the value and importance of each item. The highest-priority items should be at the top of the backlog, representing the most critical requirements or features.
- **Dynamic:** The backlog is a living document that evolves throughout the project. It should be regularly reviewed, refined, and reprioritized based on changing needs, feedback, and new insights.

- **Granular:** The backlog items should be broken down into small, manageable units of work. This allows for better estimation, planning, and tracking of progress.
- **Estimable:** Each backlog item should be estimable, meaning it should be possible to estimate the effort or time required to complete it. This helps with resource allocation and planning.
- **Transparent**: The backlog should be visible and accessible to all stakeholders involved in the project. This promotes transparency and allows for collaboration, feedback, and alignment.
- **Traceable:** The backlog items should be traceable back to the project's goals, objectives, and user needs. This ensures that the work being done aligns with the overall project vision.
- **Refinable:** The backlog is not set in stone and should be regularly refined and updated. As new information becomes available or priorities change, backlog items may be added, removed, or modified.

Product backlog best practices should be implemented for your project backlog.

2. Sample project backlog

A project backlog for a hypothetical software development project

ID	User Story	Priority	Estimate	Acceptance Criteria	Status
1	As a user I want to create an account	High	5	User can fill out a registration form	In Progress
2	As a user I want to log in to my account	High	3	User can enter valid credentials	Not Started
3	As a user I want to reset my password	Medium	8	User receives a password reset email	Not Started

In this example let's explain each element:

- **ID:** Unique identifier for each backlog item.
- **User Story:** Describes a specific functionality from the user's perspective.
- **Priority:** Indicates the importance of the item (High, Medium, Low).
- **Estimate:** Represents the relative effort or complexity of the task.
- **Acceptance Criteria:** Conditions that must be met for the user story to be considered complete.
- **Status:** Tracks the current state of each item (e.g., Not Started, In Progress)

Practical Activity 3.2.4: Creating a project backlogs

Task:

1: Read key reading 3.2.4

2: Read the below task:

As a project requirement analyst, you are asked to create project backlog based on the created user story

3: Create user story

4: Present your work to the trainer and whole class

Key readings 3.2.4.: Creating a project backlogs

- **Steps to create a project backlog:**

1. Identify and Gather Requirements: Start by identifying and gathering all the requirements for your project. This can be done through stakeholder interviews, meetings, workshops, or by reviewing existing documentation. Ensure that you have a clear understanding of the project scope and objectives.

2. Break Down Requirements: Once you have gathered the requirements, break them down into smaller, manageable units. This can be done by decomposing high-level requirements into more specific features, user stories, or tasks.

3. Prioritize Requirements: Prioritize the requirements based on their importance, business value, or customer needs. Collaborate with stakeholders, product owners, or the project team to determine the priority order. Consider factors such as project goals, dependencies, and constraints.

4. Define Acceptance Criteria: For each requirement or user story, define clear acceptance criteria that outline the conditions that must be met for the item to be considered complete. This helps ensure that everyone has a shared understanding of what is expected.

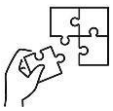
5. Estimate Effort: Estimate the effort or complexity associated with each requirement or task. This can be done using techniques like story points, time-based estimates, or relative sizing. Effort estimation helps in planning and resource allocation.

6. **Document and Organize:** Document the requirements, user stories, or tasks in a

structured format. This can be done using project management tools, spreadsheets, or dedicated backlog management software. Organize the items in a logical manner, such as by priority, functional area, or sprint.

Points to Remember

- User story is a concise, informal description of a specific feature or functionality from the perspective of an end user or customer.
  - Format of user story: As a [User Role], I want to [Action], So that [Benefit].
  - **Follow the below steps to create user stories**
    - ✓ Identify the User or Stakeholder
    - ✓ Define the User's Goal
    - ✓ Write the User Story Title
    - ✓ Craft Acceptance Criteria
- A project backlog is a prioritized list of all the work items that need to be completed for a project.
  - Elements of project backlog:
    - ✓ Unique identifier
    - ✓ User Story
    - ✓ Priority
    - ✓ Estimate
    - ✓ Acceptance Criteria
    - ✓ Status
  - To create project backlog pass through the below steps
    - ✓ Identify and Gather Requirements
    - ✓ Break Down Requirements
    - ✓ Prioritize Requirements
    - ✓ Define Acceptance Criteria
    - ✓ Estimate Effort
    - ✓ Document and Organize



Application of learning 3.2.

At HealthCare Innovators Inc., we are launching a project to develop a new telemedicine platform that enables patients to consult with doctors remotely to help the patient that are not able to came to the health care. The health care needs requirement analyst to create detailed user stories that capture the needs of various users, including patients seeking medical advice, doctors conducting virtual consultations, and administrative staff managing appointments. Each user story should describe the specific goals, actions, and expected outcomes from the perspective of these different user roles. The analyst has also to create a project backlog.

Indicative content 3.3: Elaborate project task flow

Duration: 8 hrs

Theoretical Activity 3.3.1: Description of sitemap

Tasks:

1: You are requested to answer the following questions related the sitemap

I. What is the use of sitemap in project requirement analysis?

II. What are main types of site map

III. What elements a site map designer should embed in a site map?

2: Present the answers to the whole class

3: Ask questions where necessary.

4: For more clarification, read the key readings 3.3.1.

Key readings 3.3.1.: Description of site map

- **A site map**

A site map is a structured representation or list of the pages within a website. It serves as a navigational aid by outlining the website's structure and helps users find information. Site maps can also be used by search engines to crawl a website more effectively, as they provide a guide to the site's content and organization.

✓ **Primary types of site maps**

XML sitemap

An XML sitemap is a file that lists all the pages on your website. Which makes it easier for search engines to crawl and index your content.

XML sitemaps are written for search engine bots—not users.

Along with the list of pages, an XML sitemap can also include other technical details. Like when the page was last modified, how frequently the page content is likely to change, and the page's priority relative to other pages on the site

Example of XML sitemap

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
<!-- Generated by Screaming Frog SEO Spider 11.2 -->
<urlset xmlns="http://www.sitemaps.org/schemas/sitemap/0.9">
  <url>
    <loc>https://www.digitalvidya.com/</loc>
    <lastmod>2020-02-17</lastmod>
    <changefreq>daily</changefreq>
    <priority>0.9</priority>
  </url>
  <url>
    <loc>https://www.digitalvidya.com/data-science-course/</loc>
    <lastmod>2020-02-17</lastmod>
    <changefreq>daily</changefreq>
    <priority>0.8</priority>
  </url>
  <url>
    <loc>https://www.digitalvidya.com/certified-data-analytics-course/</loc>
    <lastmod>2020-02-17</lastmod>
    <changefreq>daily</changefreq>
    <priority>0.8</priority>
  </url>
  <url>
    <loc>https://www.digitalvidya.com/data-science-course-in-bangalore/</loc>
    <lastmod>2020-02-17</lastmod>
    <changefreq>daily</changefreq>
    <priority>0.8</priority>
  </url>
  <url>
    <loc>https://www.digitalvidya.com/data-science-course-in-ghaziabad/</loc>
    <lastmod>2020-02-17</lastmod>
```

HTML sitemap

An HTML sitemap is a page on your website listing all important website pages.

It serves as a table of contents. And helps both search engine bots and human visitors easily navigate through your site.

Unlike XML sitemaps, HTML sitemaps are designed primarily for users.

They provide a handy overview of your website's structure and allow visitors to find specific pages quickly.

An example of an HTML sitemap:

✓ **Difference between XML and HTML sitemaps.**

- **XML sitemaps are:**
  - Intended for search engines
  - Written in XML code
  - Able to include URLs in any order
  - Not designed for human readability or navigation
- **HTML sitemaps are:**
  - Intended for users
  - Created in HTML and displayed as webpages
  - Helpful for providing a structured list of links to pages within the site
  - Designed for human readability and navigation. But can also be used by search engines for crawling.

2. Elements of sitemap

- **Main Pages or Modules:** The sitemap highlights the main pages or modules of the software application.
- **Sub-Pages or Screens:** Within each main page or module, the sitemap depicts the sub-pages or screens that are part of that section.
- **Navigation Flow:** The sitemap illustrates the navigation flow between the different pages or screens of the software.

- **Relationships and Dependencies:** The sitemap may also indicate relationships and dependencies between different pages or modules.
- **Information Hierarchy:** The sitemap helps establish the information hierarchy of the software.

Practical Activity 3.3.2: Creating a sitemap

Task:

1: Read key reading 3.3.2

2: Read the task describe below:

As a project requirement analyst, you are asked to create a sitemap using provided sample requirements

3: Based on provided requirements create a sitemap

4: Present your work to the trainer and whole class

Key readings 3.3.2.: Creating a sitemap

1. A sitemap

Steps to create site map

1. **Identify main pages or modules:** The sitemap highlights the main pages or modules of the software application.
2. **Sub-Pages or Screens:** Within each main page or module, the sitemap depicts the sub-pages or screens that are part of that section.
3. **Define Navigation Flow:** The sitemap illustrates the navigation flow between the different pages or screens of the software.
4. **Establish Relationships and Dependencies:** The sitemap may also indicate relationships and dependencies between different pages or modules.

   5.Create Information Hierarchy: The sitemap helps establish the information hierarchy of the software.

Theoretical Activity 3.3.3: Description project task flow

Tasks:

1: You are requested to answer the following questions related the task flow

I. What is a task flow?

II. Why project task flow is necessary in project requirement analysis?

2: Present the findings to the whole class

3: Ask questions where necessary.

4: For more clarification, read the key readings 3.3.3.

Key readings 3.3.3.: Description project task flow

1. Task flow

Task flow is a representation of the steps and interactions a user takes to accomplish a specific task or goal within a software application.

It maps out the sequence of actions and screens that a user encounters, highlighting the path they follow to complete a particular task.

2. Why project task flow

Task flows are valuable in software project requirement analysis as they help to:

1. Identify user needs,
2. Uncover potential pain points, and
3. Inform the design and development process.

Practical Activity 3.3.4: Generating project task flow

Task:

1: Read key reading 3.3.4

2: You are requested to go in computer lab to generate a task follow by using Trello software Referring to the site map provided

3: Present your work to the trainer and whole class.

Key readings 3.3.4.: Generating project task flow

To elaborate generate a task flow using Trello, you can follow these steps:

1. **Create a Trello Board:** Sign in to Trello or create a new account. Create a board for your project or task flow by clicking on the "Create new board" option.
2. **Set up Lists:** On your board, create lists that represent different stages or steps in your task flow. For example, you might have lists like "To Do," "In Progress," "Testing," and "Completed." Click on the "Add a list" option to create lists on your board.
3. **Add Cards:** Within each list, create cards to represent individual tasks or steps in your task flow. Click on the "Add a card" option within a list to create cards. Each card represents a specific task that needs to be completed.
4. **Provide Details:** Click on a card to open it and provide additional details. You can add descriptions, due dates, attachments, and comments to provide more context and information about the task.
5. **Customize Cards:** Customize your cards using labels, assign members to cards, and use checklists to break down tasks into smaller subtasks. You can also add attachments like files or links that are relevant to the task.
6. **Move Cards Across Lists:** Drag and drop cards across the lists as they progress through the task flow. For example, move a card from the "To Do" list to the "In Progress" list when work on the task begins.
7. **Track Progress:** Visualize your task flow by tracking the movement of cards across lists. You can quickly see which tasks are in progress, which are completed, and which ones need attention.
8. **Collaborate and Communicate**: Share your Trello board with team members to collaborate and work together on tasks. Use comments, mentions, and attachments to communicate and provide updates on tasks.
9. **Set Due Dates and Reminders:** Assign due dates to cards to track deadlines and ensure timely completion of tasks. Trello can send notifications and reminders to keep everyone informed about upcoming due dates.

10. **Iterate and Improve:** Continuously review and refine your task flow as you progress. Adapt the board, lists, and cards as needed based on feedback, changes in requirements, or new insights.

Points to Remember

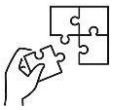
- Sitemap serves as a navigational aid by outlining the website's structure and helps users find information.
- Main types of sitemaps are: **XML** and **HTML**
- Difference between XML and HTML sitemap
    - **XML sitemaps are:**
        - Intended for search engines
        - Written in XML code
        - Able to include URLs in any order
        - Not designed for human readability or navigation

    While

    - **HTML sitemaps are:**
        - ✓ Intended for users
        - ✓ Created in HTML and displayed as webpages
        - ✓ Helpful for providing a structured list of links to pages within the site
        - ✓ Designed for human readability and navigation. But can also be used by search engines for crawling.
- Element of a sitemap
    - ✓ Main Pages or Modules:
    - ✓ Sub-Pages or Screens
    - ✓ Navigation Flow
    - ✓ Relationships and Dependencies
    - ✓ Information Hierarchy
- **To create sitemap, use the below steps:**
    - ✓ Identify main pages or modules

- ✓ Sub-Pages or Screens
- ✓ Define Navigation Flow
- ✓ Establish Relationships and Dependencies
- ✓ Create Information Hierarchy

- Task flow is a representation of the steps and interactions a user takes to accomplish a specific task or goal within a software application.
  - Task flow is necessary because it is used to:
    - ✓ Identify user needs
    - ✓ Uncover potential pain points
    - ✓ Inform the design and development process.
  - Steps to generate task flow by using Trello:
    - ✓ Create a Trello Board
    - ✓ Set up Lists
    - ✓ Add Cards
    - ✓ Provide Details
    - ✓ Customize Cards
    - ✓ Move Cards Across Lists
    - ✓ Track Progress
    - ✓ Collaborate and Communicate
    - ✓ Set Due Dates and Reminders
    - ✓ Iterate and Improve



Application of learning 3.3.

You have been appointed to lead the development of a new e-commerce website for a fashion retailer. The website will feature a wide range of products, including clothing, accessories, and footwear, along with customer reviews, a secure payment gateway, and a user-friendly checkout process. Additionally, there will be a section for promotional campaigns, a blog for fashion tips, and a customer support page with live chat functionality. To ensure all these features are systematically planned and incorporated, you need to create a site map that outlines only the project requirements for the website. This site map should detail each functional area, necessary integrations, and user interactions, providing a clear and organized framework that will guide the development process and ensure that every requirement is addressed effectively.

Learning outcome 3 end assessment

Theoretical assessment

Question 1: …… is a concise, informal description of a specific feature or functionality from the perspective of an end user or customer.

a. Project backlog
b. User story
c. Audience

Question 2: From the below list tick, the parts of a user story?

- ☐ Customer
- ☐ User
- ☐ Role
- ☐ Objective
- ☐ Benefit
- ☐ All the above

Question 3: write **True** for the correct statements and **False** for incorrect statements

1. **A project backlog** is a prioritized list of all the work items that need to be completed for a project.
2. **A project backlog** will have no end date and be used continuously throughout the lifecycle of a product.
3. **The project backlog** is typically managed by the product owner or project manager.

Question 4: The flowing list include elements of project backlog except:

- ○ Identifier
- ○ User story
- ○ Role
- ○ Priority

Question 5: The use of sitemap is to:

a) Serves as a navigational aid by outlining the website's structure and helps users find information.
b) Crawl a website more effectively, as they cannot provide a guide to the site's content and organization.

Question 6: based on provided characteristics differentiate XML from HTML site map by ticking in appropriate cell.

Characteristics	XML	HTML
Intended for search engines		
Intended for users		
Helpful for providing a structured list of links to pages within the site		
Able to include URLs in any order		
Not designed for human readability or navigation		

Question 7: Write **True** to the correct statements and **False** to wrong statements

a) Task flow is a representation of the steps and interactions a user takes to accomplish a specific task or goal within a software application.
b) A well generated task flow covers users pain points.
c) Site map Inform the design and development process
d) It maps out the sequence of actions and screens that a user encounters, highlighting the path they follow to complete a particular task.

Practical assessment

KABONA TSS is a school, which is located in your district. It wishes to deploy a student information (MIS) system to manage and keep a track of records about the student's information easily. The processes of implementing this software project are ongoing and all requirements have been collected, and the remaining is the creation of User story and elaboration of task flow of the project. Therefore, the management of KABONA TSS wishes a software project Analysist to perform the following tasks:

a) Create a site map of the project
b) Generate task flow of the project

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