Republic of Rwanda
Ministry of Education

RTB | RWANDA TVET BOARD

TVET LEVEL IV

SOFTWARE DEVELOPMENT

WEBSITE BUSINESS REQUIREMENTS ANALYSIS

TRAINEE MANUAL

RTB | RWANDA TVET BOARD

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

MODULE 2

WEBSITE BUSINESS REQUIREMENTS ANALYSIS

Unit 1: Collect client website requirements

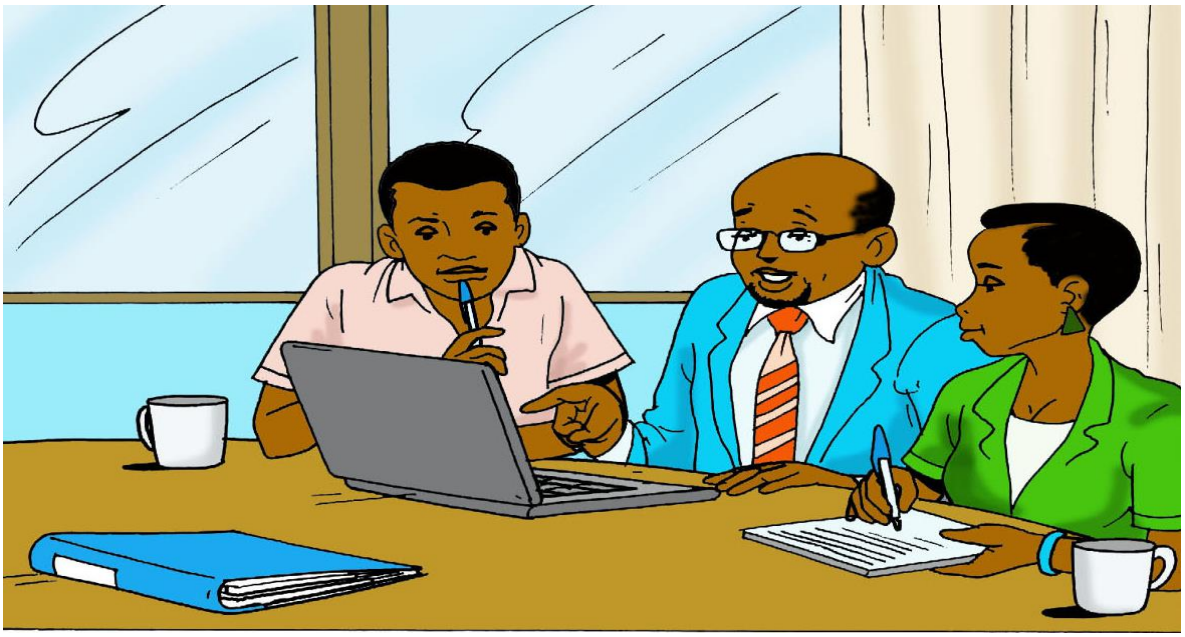
Unit 2: Brainstorm ideas about collected requirements

Unit 3: Analyze website requirements

Unit 4: Produce a feasibility project proposal

Unit 1:Collect client website requirements

Illustration of Learning Unit



Picture brief

Draw people who are in a meeting room surrounded by a round table, all concentrated on the laptop .Each one is having a notebook to note the requirement and key information on the website development and a laptop to sample the prototype.

Starting from Right to Left, the Lady is among the Website development team she is noting down the Client requirements of the website needed by the client, In the middle we have the Client who is showing them the prototype or website similarities to the one that he would like to be developed he is also sharing them information which will be used in the development.

It means he is sharing with them the information of the website that he wants , on the left we have also another member of the website development team he is collecting information and noting them down so that he can use them later while developing the website. Refer to the picture above

Topics

1.1 Analysis of ideas for communication to others

1.2 Stimulation of relevant response and reaction in relation with business sector

1.3 Description of client's demand

Unit Summary:

This unit describes skills, knowledge and attitudes required to collect client website requirements, brainstorm ideas about collected requirements, analyze website requirements to produce a feasible website business project proposal.

Self-Assessment: Unit 1

1. Look at the illustration above. What is happening? What do you think this unit will be about? What topics might be covered?

2. Fill in the self-assessment below.

There are no right or wrong ways to answer this survey. It is for your own use during this course. Think about yourself: do you think you can do this? How well? Read the statements across the top. Put a check in column that best represents your situation. At the end of this unit, we'll take this survey again.

My experience Knowledge, skills and attitudes	I don't have any experience doing this.	I know a little about this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
Communicate with the media					
Protect clients' information					
Organize collected information					
Do effective Presentation					
Filter relevant information					
Interact with Customer					
understand client's demand					
analyze the client's demand					

My experience Knowledge, skills and attitudes	I don't have any experience doing this.	I know a little about this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
Implement the client's demand					

Topic 1.1: Collection of client website requirements

Key Competencies:

Knowledge	Skills	Attitudes
1. Describe elements of Communicate with the media	1.identify elements of Communicate with the media	1.Be a Critical thinker
2. Describe concept of Protect clients' information	2. apply concept of Protect clients' information	2. Be a detail oriented
3.Describe the process of organize collected information	3. Organize collected information	3. Be Innovative

Getting Started: What do we know and where are we going?

Task:

Discuss about the following question in small group

1. What is media?
2. Have you ever used social media platforms?
3. What do you understand by interview?

Activity 1: Problem Solving

Task:

Keza is a business woman who like to hire a website developer to develop the website of her business to promote the agribusiness in her area.

The web developer will gather all the requirements and information she will need to avail so that they can build the website.

Do the following task in groups:

discuss how you should gather web requirements for the required website.

KEY FACTS 1.1

COMMUNICATION MEDIA IN BUSINESS

1.INTRODUCTION

A communication channel is a type of media that is used to transfer a message from one person to another.

In an organization, information flows forward, backwards and sideways. This information flow is referred to as communication. Communication channels refer to the way this information flows within the organization and with other organizations.

In this web known as communication, a manager becomes a link. Decisions and directions flow upwards or downwards or sideways depending on the position of the manager in the communication web.

For example, reports from lower level manager will flow upwards. A good manager has to inspire, steer and organize his employees efficiently, and for all this, the tools in his possession are spoken and written words.

For the flow of information and for a manager to handle his employees, it is important for an effectual communication channel to be in place.

1.1 THE WORKING OF A COMMUNICATION CHANNEL

Through a modem of communication, be it face-to-face conversations or an inter-department memo, information is transmitted from a manager to a subordinate or vice versa.

An important element of the communication process is the feedback mechanism between the management and employees.

In this mechanism, employees inform managers that they have understood the task at hand while managers provide employees with comments and directions on employee's work.

1.2 IMPORTANCE OF A COMMUNICATION CHANNEL

A breakdown in the communication channel leads to an inefficient flow of information. Employees are unaware of what the company expects of them. They are uninformed of what is going on in the company.

This will cause them to become suspicious of motives and any changes in the company. Also without effective communication, employees become department minded rather than company minded, and this affects their decision making and productivity in the workplace.

Eventually, this harms the overall organizational objectives as well. Hence, in order for an organization to be run effectively, a good manager should be able to communicate to his/her employees what is expected of them, make sure they are fully aware of company policies and any upcoming changes.

Therefore, an effective communication channel should be implemented by managers to optimize worker productivity to ensure the smooth running of the organization.

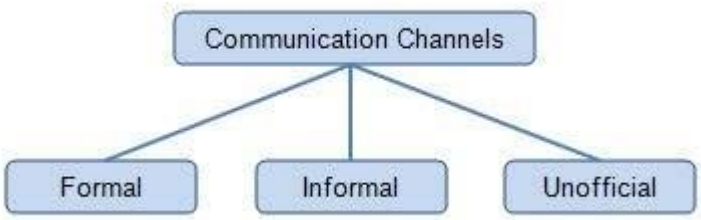
2. TYPES OF COMMUNICATION CHANNELS

The number of communication channels available to a manager has increased over the last 20 odd years. Video conferencing, mobile technology, electronic bulletin boards and fax machines are some of the new possibilities.

As organizations grow in size, managers cannot rely on face-to-face communication alone to get their message across.

A challenge the managers face today is to determine what type of communication channel should they opt for in order to carryout effective communication.

In order to make a manager's task easier, the types of communication channels are grouped into three main groups: formal, informal and unofficial.



2.1 Formal Communication Channels

- A formal communication channel transmits information such as the goals, policies and procedures of an organization. Messages in this type of communication channel follow a chain of command. This means information flows from a manager to his subordinates and they in turn pass on the information to the next level of staff.
- An example of a formal communication channel is a company's newsletter, which gives employees as well as the clients a clear idea of a company's goals and vision. It also includes the transfer of information with regard to memoranda, reports, directions, and scheduled meetings in the chain of command.
- A business plan, customer satisfaction survey, annual reports, employer's manual, review meetings are all formal communication channels.

2.2 Informal Communication Channels

- Within a formal working environment, there always exists an informal communication network. The strict hierarchical web of communication cannot function efficiently on its own and hence there exists a communication channel outside of this web. While this type of communication channel may disrupt the chain of command, a good

manager needs to find the fine balance between the formal and informal communication channel.

- An example of an informal communication channel is lunchtime at the organization's cafeteria/canteen. Here, in a relaxed atmosphere, discussions among employees are encouraged. Also managers walking around, adopting a hands-on approach to handling employee queries is an example of an informal communication channel.
- Quality circles, team work, different training programs are outside of the chain of command and so, fall under the category of informal communication channels.

2.3 Unofficial Communication Channels

- Good managers will recognize the fact that sometimes communication that takes place within an organization is interpersonal. While minutes of a meeting may be a topic of discussion among employees, sports, politics and TV shows also share the floor.
- The unofficial communication channel in an organization is the organization's 'grapevine.' It is through the grapevine that rumors circulate. Also those engaging in 'grapevine' discussions often form groups, which translate into friendships outside of the organization. While the grapevine may have positive implications, more often than not information circulating in the grapevine is exaggerated and may cause unnecessary alarm to employees. A good manager should be privy to information circulating in this unofficial communication channel and should take positive measures to prevent the flow of false information.
- An example of an unofficial communication channel is social gatherings among employees.

3. Media Channels

The basic media channels are written (hard copy print or digital formats), oral or spoken, and electronic and multimedia.

3.1 Oral Communications

Oral channels depend on the spoken word. They are the richest mediums and include face-to-face, in-person presentations, mobile phone conferences, group presentations, telephone, video meetings, conferences, speeches, interviews and lectures.

These channels deliver low-distortion messages because body language and voice intonation also provide meaning for the receiver.

3.1.1 INTERVIEW

An interview is an answer to know and ascertain how to fit certain expectation. An interview is beneficial to both the candidate and the organization, for it helps them to grow.

Interviews may be defined as face to face communication method for knowing some information. It is a process of collecting some information depending on the use of the information

3.2 Written Communications

Written communications include e-mails, texts, memos, letters, documents, reports, newsletters, spreadsheets, etc. (Even though e-mails are electronic, they are basically digital versions of written memos.) They are among the leaner business communications.

3.3 Electronic (Multimedia) Communications

Television broadcasts, web-based communications such as social media, interactive blogs, public and intranet company web pages, Facebook, and Twitter belong in this growing category of communication channels. Electronic communications allow messages to be sent instantaneously and globally. People can talk face-to-face across enormous distances.

3.3.1 DIGITAL MEDIA

Digital media is any communication based on digital data represented as sequences of the symbols 0 and 1.

3.3.1. 2 TYPES OF DIGITAL MEDIA.

a) Audio

Audio such as a music file or streaming music service. These can be based on lossy formats such as MP4 that are lower quality than the original recordings due to compression.

b) Video

Video that is recorded, stored and transmitted in a digital format. Consumer devices such as mobile phones produce reasonably small files that can be shared and played in the source format. Films and other high quality video media are produced using digital formats that are compressed but are still very large files that include copious metadata. As such, these formats are transcoded to a smaller format such as MPEG-4 for distribution to audiences.

c) Digital Publishing

Publishing such as books, magazines and newspapers that are distributed in electronic formats such as ebooks, mobile apps and web sites.

d) Information

Publication of knowledge, information and data in electronic formats such as documents, mobile apps and websites.

e) Photos

Digital photos that are captured, stored and shared in a digital format. Extremely high resolution images such as professional scans of artworks can be many gigabytes in size and difficult to distribute. Consumer and professional models of digital cameras mostly produce images that can be distributed in the source format.

f) Holograms

Three dimensional holographic images, video and related experiences. For example, a theme park that uses digital holograms in a haunted house to simulate the presence of ghosts.

g) Social Media

Online communities that allow people to post and comment on media.

h) Advertising

Digital advertising is commonly bought and sold on digital exchanges for placement Into digital media such as billboards, mobile apps and web sites.

i) Broadcast

Broadcast media such as television and radio that is delivered with digital technologies such as streaming media.

j) Interactive Media

Any media that allows users to take part. For example, a choose-your-own-adventure television show that allows audiences to navigate the story in dynamic ways.

3.3.1.3 SOCIAL MEDIA

Online communities that allow people to post and comment on media.

Example: Facebook

4. Conclusion

In any organization, three types of communication channels exist: formal, informal and unofficial.

While the ideal communication web is a formal structure in which informal communication can take place, unofficial communication channels also exist in an organization.

Through these various channels, it is important for a manager to get his/her ideas across and then listen, absorb, glean and further communicate to employees.

5. ORGANISING INFORMATION ON THE WEBSITE

5.1 WAYS TO ORGANIZE INFORMATION

5.1.1 **LOCATION**

Use this when organizing information around locales, from grand to small. For example, location can be used to

understand population distribution as well as the location of stress points in the body

5.1.2 **ALPHABET**

Use this when organizing large quantities of information, such as specialized glossaries or the online resources on your company's intranet. Warman suggests that alphabetizing information is also effective when an audience might not understand any another classification system.

5.1.3 **TIME**

Use time to organize information that is well, time-based or occurring in a fixed time frame. It might be a history of your organization, a schedule of yearly events or a way to document a complex process that occurs over time, like a laboratory procedure.

5.1.4 **CATEGORY**

Use the category approach when the information is similar in importance and the categories are intuitive or easy to understand. This is a good way to organize information about product models, job roles or human resource processes.

5.1.5 **HIERARCHY**

I think we are pretty familiar with organizing information by hierarchy. It's a classic instructional approach to designing content according to its importance in the scheme of things.

5.2. PROTECTION OF CLIENTS' INFORMATION

5.2.1 Confidentiality

Confidentiality refers to protecting information from being accessed by unauthorized parties. In other words, only the people who are authorized to do so can gain access to sensitive data. Imagine your bank records. You should be able to access them, of course, and employees at the bank who are helping you with a transaction should be able to access them, but no one else should.

Activity 2: Guided Practice

Task:

The school Management would like to hire a web developer to build a website of the school which will be used in presenting student's exam result.

In Small groups, Demonstrate a gathering information section and do the followings :

1. Interview the school (Client) on the requirements
1. Organize collected informations?
2. identify how to protect collected information

Activity 3: Application

Task:

Mugabe would like to hire someone to develop his personal website which will display the hierarchy of his achievement and other current projects.

Stage **a gathering and analysis of information and do the following in small group:**

1. Collect and analyze information's requirement on the website?
2. Organize the information collected on the website
3. Protect the information collected on the website

Points to Remember

- Use simple words while collecting requirement
- Always make the environment user friendly
- Focus on the necessary information to be collected

Formative Assessment

1. What do you understand by communication media?
2. How can you organize information on the website?
3. What is the purpose of confidentiality in the media?

Topic 1.2: Stimulation of relevant response and reaction in relation with business sector

Key Competencies:

Knowledge	Skills	Attitudes
1. Describe steps of effective presentation	1. apply steps of effective presentation	1.Be a Critical thinker
2. Describe steps of Filtering relevant information	2. Filter relevant information	2. Be a detailed oriented,
3. Explain process of interacting with customer	3. interact with customer	3. Be Friendly

Getting Started: What do we know and where are we going?

Task:

Discuss in small groups about the following questions:

A. Have you ever used PowerPoint in presentation?

B. What is public speaking?

C. What do you understand by customer satisfaction?

Activity 1: Problem Solving

Task:

Kicukiro district would like to build a website who will help Kicukiro district in publishing announcement and some other information to the public. Kicukiro District has given various information to help in developing that website.

Form small groups and discuss :

How to do a data presentation for the required website and do the following:

1. Prepare an effective presentation of all the collected information and requirements
2. Filter relevant information from the collection and requirement?
3. Prepare a summarize presentation of the relevant information collected?

Key Facts 1.1

1. AN EFFECTIVE PRESENTATION?

A communication media is the medium, mean, manner or method through which a message is sent to its intended receiver. The basic media channels are written (hard copy print or digital formats), oral or spoken, and electronic and multimedia.

1.1 STAGES IN PLANNING A PRESENTATION

1. Preparation

Many factors affect the design of your presentation. A powerful presenter will acknowledge and address each of the following: objectives; audience; venue, remit.

Objectives

Why you are making your presentation? Bear in mind what you want to achieve and what you want your audience to take away with them.

Audience

Your audience will have a variety of different experiences, interests and levels of knowledge. A powerful presenter will need to acknowledge these and prepare for and respond to them accordingly.

Venue

Where will you be making your presentation? What will the room be like? What
atmosphere will the physical conditions create?

Remit

You may well have been given a remit for your presentation; you will need to stick to this. For example, you may have been asked to present a paper at a conference in a certain style or meet certain assessment criteria on your course.

2. Choosing your main points

Once you have thought about the design of your presentation, you can define your main points. Try presenting no more than three main points in a ten-minute presentation. Always allow time for an adequate introduction and conclusion. Ask yourself:

what are the main points you wish to make?

are these points structured in a logical, coherent way?

do these main points reflect your own objectives and take account of the needs of your audience?

3. Choosing your supporting information

The supporting information helps your audience understand, believe in and agree with your main points. This evidence might take the form of factual data, points of detail or an explanation of process. It might be presented in imaginative ways using diagrams, pictures or video segments. Think about:

what will add *clarity* to your argument (explaining complex terms, reminding your audience of any supporting theories)?

what will add *authority* to your argument (making connections with other people's work, quoting experts, offering evidence from your own research)?

what will add *colour* to your argument (showing a video clip or a slide, using a practical example or a vibrant analogy)?

4. Establishing linking statements

The next stage is to develop the linear flow of your presentation. This can be achieved by using linking statements to show clearly how your main points fit together.

5. Developing an opening

The introduction to your presentation is crucial. It is your first point of contact with your audience; you can either capture or lose your audience's interest in a matter of seconds. Use your introduction to lay a clear foundation for the presentation to follow.

6. Developing a conclusion

Your conclusion is another important stage in your presentation. You can use it to remind your audience of your main points, draw these points to a stimulating conclusion and leave your audience with a lasting impression of the quality of your presentation.

7. Reviewing your presentation

Once you have written your presentation make sure that you review its content.

2. STEPS TO ORGANIZE INFORMATION

2.1. Review the questions.

The questions generated before the information was gathered should be reviewed. Why was this particular information necessary? What questions was it to answer? What kinds of decisions are to be made based on this information?

2.2. Organize the information.

The mechanics of organizing information for analysis will vary according to the thinking processes of different people. Sometimes it is best not to force a certain way of thinking. On the other hand, there is a certain logic that can be followed.

• Gather together all relevant information that has been collected.
• If necessary, sort information into parts which belong together.
• Some may have already been analyzed. Some may be partly analyzed, and some may need analysis.

2.3. Decide how to analyze information.

Analysis of parts may be simply to examine the relationship of one thing to another, or two things together.

2.1. Analyze quantitative information.

It is likely that quantitative (numbers) information will be computer by hand, or with the use of adding machines. Two straightforward ways to analyze information are Tally Sheets and Summary Sheets.

A. Tally sheets

Tally sheets are useful for summarizing information such as production figures, survival, figures, and nursery sales. It is especially important to think carefully about the pieces of information that, when paired, will answer the questions that were originally asked.

B. Summary sheets

To show information individually in order to see clearly the differences between each piece of information. They are especially useful for analyzing information from interviews.

2.5.Analyze qualitative information.

Analysis of qualitative (descriptive) information is a creative and critical process. The way the information has been gathered will probably determine how it can best be analyzed.

For example, if drawings of a community have been done at the beginning, middle and end of the project, can be analyzed by presenting a series of drawings to a number of individuals and asking them to:

• validate the drawings (are they truly representative, and if not, why not).
• rate the difference (very good, good, not very good).

2.6. Integrate the information.

Putting the analyzed parts together in a way that tells the complete story can be done by the team that has been assigned to gather and analyze information.

Activity 2: Guided Practice

Task:

Kalisa would like to build a website for political news and trends. Your assigned a task of collecting information and requirement to be used on that required website.

Demonstrate a gathering information section and do the followings :

1. Explain How can you Prepare an effective presentation of all the collected information and requirements?
2. Identify How can you Filter relevant information from the collection and requirement?
3. Identify How can you interact with the customer while collecting information?

Activity 3: Application

Task:

MUCYO want to build a website which will be used in live streaming of financial tutorials, He sent to the developer all the information he has about that website and all the data he used in brainstorming.

Do the following :

1. Prepare an effective presentation of all the collected information and requirements
2. Filter relevant information from the collection and requirement?
3. How can you interact with the customer while collecting information?

 **Points to Remember**

- Use simple words while presenting
- Focus on the necessary information to be presented
- Always use the same presentation template for the entire presentation
- Show your Passion and Connect with your Audience.

 **Formative Assessment**

1. What are steps to organize information?
2. What are stages in planning a presentation?
3. What do you understand by summary sheets?

Topic 1.3: Description of client's demand

Key Competencies:

Knowledge	Skills	Attitudes
1. Explain concept of client demand	1. .identify the essential of client's demand	1.Be a Critical thinker
2. Describe approach of analysis of client demand	2. Analyze the client's demand	2. Be detailed oriented,
3. Elaborate the component of implementing the client's demand	3. implement the client's demand	3. Be organized to achieve the required result.

Getting Started: What do we know and where are we going?

Task:

Discuss in small groups about the following:

A. Have you ever been a Client?

B. What do you understand by a demand

C.how can you make a client happy?

Activity 1: Problem Solving

Task:

Form small groups to describes and address the client's needs

Kigali shoes ltd would like to hire a professional web developer to develop a website which will help Kigali shoes ltd to increase their presence online in terms of marketing of their products and reaching more visibility and do the following:

1. Explain properly the client's demand concept.
2. Briefly Sketch the process of analyzing client demand.
3. Prepare the component steps of implementing the client's demand

Key Facts 1.3

1.IDENTIFICATION OF CLIENT NEEDS

1.1 Introduction

Identifying customer needs is probably the most important step in the product development process. Only by understating target customers' needs can the enterprise design a product that fits those needs.

1.2 Steps to Outline the Client's needs

1.2.1. Define the scope of the project

This step includes formulating the mission for the development project. The scope should address the following:

A product description.

Key business goals.

Primary and secondary markets.

Assumptions.

Stakeholders.

1.1.2 List the client needs

This step include listing all the client information , terms and needs
here you will list all the information that you collected from the user

1.1.3 Gather raw data

This step is the about the data about the market and customers to be gathered. According to Lehmann and Winer to fully understand the customer, the following needs addressing:

- Who buys and uses the product. The roles of different actors in the purchasing process should be understood (initiator, influencer, decider, purchaser, and user).

- What customers buy and how they use it. Customer purchase benefits, not features; thus it is important to understand what is the value that the customer obtains from a product and its features.

- Where and when do customers buy. It is important to learn the preferred channels of distribution of customers, and also how these preferences evolve.

  As to when customers buy, focus should be on understanding the seasonality of demand, month, day, and whether sales and price breaks are most effective in prompting purchase decisions.

- How customer choose. This reflect the customer choose, it means factors that push the client to choose that product over others

.

1.1.4 Data Interpretation

In the data interpretation phase, the need statements by customers are "translated" into a language that can be used by product development teams. Needs should be focus on the benefits and not the features or solutions that customers sometimes suggest; also needs should be stated in a positive rather than negative way; and lastly, words such as "must" and "should" should be avoided

1.1.5 Organize the Client needs

Needs identified to this point need to be organized. Typically, a list of 50 to 300 or even more needs statements are collected, thus there is a need to reduce this to a list of critical ones.

The organization process consists of grouping similar needs, eliminating redundant statements, and creating "super groups" of two to five groups

1.1.6 Establish Importance of the client needs

In the last step of the needs identification process, some approach should be adopted to establish the relative importance of the needs identified thus far.

This is usually carried out by consensus among product development team members or with a survey of potential customers, where they are asked to rank or rate a list of a few need statements.

2.CREATIVITY AND INNOVATION DESIGN IN BUSINESS

2.1 INTRODUCTION

Creativity and Innovation are two different terms and they technically have different meanings. Creativity means originality, imagination and inventiveness that are brought out through resourcefulness. Innovation, on the other hand refers to modernization and improvement over an existing idea.

This increased probability of new product development leads to higher success rates of the company and at the same time leads to development of competencies, provides a higher competitive advantage and also helps handle competition in a better way. Implementing all of these in my organization would definitely bring in better revenues and help my organization propel ahead of competitors.

2.2 DIFFERENCES

Innovation is an important aspect of growth and development of individuals, organizations, cultures and societies. Innovation and creativity refer to bringing in new ideas to life.

Innovation can be achieved strategically through a process of creativity. This helps bring in a lot many new ideas in the firm and also develop a platform for breakthrough innovations.

It helps a firm be open to new ideas and develops the learning process in an organization.

It can help a firm build upon its competencies as well as grow and earn favorable environment for progressing. It also can help a firm take advantage of the information it has and opt for a lot many new product developments.

Yet, there are several differences between innovation and creativity. Creativity involves the usage of originality whereas innovation is more about using

already existing innovations for the purpose of improving upon it and using it for either a better usage or for commercialization purposes.

2.3 CONCLUSION

Innovation, creativity as well as analytical skills is highly essential in managing and succeeding in a business. Most of the successful companies like Apple, Hewlett Packard and many more have always been the result of a successful partnership between a creative and an analytical leader.

This helps create commercially viable innovation which is the key to success. Analysis of a concept is highly essential in any business and this is greatly impacted by cultural influences. Moreover, innovations like in the field of technology and entertainment re greatly influencing cultures and masses. It is also essential that innovation is a part of every organization that has to or needs to be dynamic.

3.LAYOUT CONSTRAINTS

It is a layout that gives you adaptable and flexible ways to create views for your applications.

It gives you many ways to place objects. You can constrain them to their container, to each other or to guidelines. This allows you to create large, complex, dynamic and responsive views in a flat hierarchy. It even supports animations!

4. Algorithm Analysis and Design

4.1 Introduction

Algorithm design isn’t easy, but it’s not impossible either. People who design algorithms don’t sit around looking for problems to solve, they are usually already involved in projects when a problem arises that requires a solution. This might not sound that hard because people tend to put algorithms in the same class as functions.

However, they are not functions, they are efficient paths to handling data as accurately and quickly as the computer allows.

It takes a special kind of person to design algorithms because the new algorithm has never been used before, and the designer is putting himself on a whole new path. Students at a college of engineering and computer science are likely to develop many algorithms during their study. It's advantageous to look at other algorithms or written functions but your ultimate goal is to produce an algorithm that solves problems as efficiently as possible.

Every algorithm needs a process in order to be created and utilized. Described below are the four stages of algorithm analysis and design:

4.2 STAGES OF ALGORITHM ANALYSIS AND DESIGN

4.2.1 Design

The first stage is to identify the problem and thoroughly understand it. This is where it's important you consult with everybody who has an interest in the problem. Speak with them and see how they see the problem and what they need out of the solution so their part of the project or program can progress.

After you obtain the input, break out the problem into stages and calculate what happens at each step so the next step can occur. All of this is elementary and you probably did this from the first computer science class you ever took, but the same basic rules apply.

This is also the point where you are going to flowchart and/or use pseudo code to work out the specific problems of solving the flow of operations within the code.

4.2.2 Analyze

Once you have the basic framework of the algorithm it's time to start analyzing how efficient the code is in solving the problem. Algorithm design is fluid and subject to individual plans. This is a step that some programmers like to attack after they have coded the algorithm and run it through the compiler. Others prefer to examine it prior

to writing the code and analyze results based on their expectations from the design stage.

Either way, what you are doing is looking for the efficiency of the algorithm. Algorithms are measured in time and space for their efficiency. Look at the algorithm you're designing and see how it works with different size data structures and what kind of time it takes to work through those structures. The problem here is deciding when the algorithm has reached maximum efficiency for the project and produces acceptable results.

4.2.3. Implement

Writing and coding the algorithm is the next step in the process. If you are the one writing the algorithm, then you need to write it in the coding language you understand the best. In order for you to know how to write the algorithm efficiently you have to know exactly what each line of code is going to accomplish when the program is executed. Write the code to execute quickly but can also handle the input data that it will receive.

If you are part of a team then have the best programmer in your group write the initial code, notate it well so the lesser experienced programmers will understand what is happening as the application is executed.

4.2.4. Experiment

Once the algorithm is designed and coded go back and experiment with different variables in the algorithm. Try and enter data that will make it fail or try and re-write the code to work it out most efficiently. Experimentation in algorithmic design is really just another step of the analyzing of the algorithm. Keep attacking the efficiency aspect until it executes as much data as necessary in the smallest amount of time. When you find flaws in what you have written or ways to write the code better, then go back to the design step and redesign the algorithm.

The design and analysis of algorithms is a circular process. You may find yourself becoming involved in any one of the steps. An experiment on an existing algorithm might lead to a new design. Or a re-coding of an algorithm might lead to a more

efficient execution. Wherever you find yourself, keep working towards the goal of efficiency of the algorithm.

Activity 2: Guided Practice

Task:

Form small groups and address the client's needs

KGL ltd would like to hire a professional web developer to develop a website which will work as a social network of its employee, the website should have the following

Features: Profile, Live chatting, comment, message and Share options

Do the following:

1. identify the essentials of client's demand
2. Analyze the client's demand
3. Apply the component of implementing the client's demand

Activity 3: Application

Task:

ONLINE ABC would like to hire a professional web developer to develop a website which will help them in selling the airplane tickets online, the website will combine all the selling point of tickets.

Form small groups and address the client's needs

1. Explain properly the client's demand

2. Anticipate creativity and innovation in the client's demand

3. Elaborate an implementation algorithm of the client's demand.

Points to Remember

- Detail all the requirements as the client demand
- Make sure the algorithm has addressed all the requirement
- Make sure that the implementation meets the prototype structure

Formative Assessment

1. What are the steps to Outline the Client's needs?
2. what do you understand by the creativity and innovation design in business?
3. What the stages of Algorithm analysis and design?

Self Reflection

Areas of strength	Areas for improvement	Actions to be taken to improve
1. **2.**	**1.** **2.**	**1.** **2.**

Unit 2: Brainstorm ideas about collected requirements

Illustration of Learning Unit

Picture Brief:

Draw people who are in a meeting room surrounded by a round table, all having the laptop or a notebook to brainstorm on the requirement and key information on the website development and a laptop to brainstorm on the prototype desired by the Client.

The developers team has gathered around to brainstorm ideas on how to implement the clients demand each team member will give ideas on how the clients demand can be achieved and all of them will brainstorm on the way forward on how to implement the client demand.

Topics

2.1 Identification of the key information

2.2 discussion of ideas

2.3 Analysis and review of data

Unit Summary:

This unit describes skills, knowledge and attitudes required to Identify key information according to the user's requirements; discuss ideas as per the proposed requirements and analyze and review data in relation with client's requirements to produce a feasible website business project proposal.

Self-Assessment: Unit 2

1. Look at the illustration above. What is happening? What do you think this unit will be about? What topics might be covered?

2. Fill in the self-assessment below.

There are no right or wrong ways to answer this survey. It is for your own use during this course. Think about yourself: do you think you can do this? How well? Read the statements across the top. Put a check in column that best represents your situation. At the end of this unit, we'll take this survey again.

My experience Knowledge, skills and attitudes	I don't have any experience doing this.	I know a little about this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
List the key information					
Brainstorm on the listed key information					
Identify the requirement processes					
Describe critical thinking on ideas					
Explain critical thinking process					
Apply critical thinking on ideas					
Describe the basic analysis of qualitative information Explain the analysis of qualitative information process					

My experience Knowledge, skills and attitudes	I don't have any experience doing this.	I know a little about this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
Evaluate and interpret qualitative information					

Topic 2.1 Identification of the key information

Key Competencies:

Knowledge	Skills	Attitudes
1. Describe the elements of identifying the key information	1.identify the key information	1.Be a Critical thinker
2. Describe process of analyzing the key information	2. Analyze the key information	2. Be a detail oriented
3.Elaborate the requirement processes of implementing the client's demand	Apply the elements of requirement processes of implementing the client's demand	3. Being organized to achieve the required result.

Getting Started: What do we know and where are we going?

Task:

In small groups discuss on the following:

1. How often do you watch TV or Listen to the Radio?

2.Why do you visit internet?

3.What do you understand by top stories in news?

4.What is the purpose of notice board?

Activity 1: Problem Solving

Task:

Mupenzi ltd want a website, Rutham FC has sponsored him in funding this project of building a website, Mupenzi ltd is hiring a web developer to build a website of displaying football news and trends, Mupenzi ltd has shared with the developer a folder containing all

the information which can be used in creating that website of football trends. Mupenzi ltd has shared many and various information to website developer.

The first task a developer is to identify key information to place on that website that he is about to develop

In small groups discuss how they should identify key information to place on that website.

Key Facts 2.1

1. ELEMENTS OF KEY INFORMATION SELECTION PROCESS

1.1 INTRODUCTION

Key information is defined as the main and useful information which can be selected among the given overall information to be used in the next steps of the development of the website.

1.2 ELEMENTS OF KEY INFORMATION SELECTION PROCESS

a) Organizational evaluation; by firstly defining and assessing the organizational environment and culture, a platform of values, beliefs and goals can be created on which to develop the role and person requirements. This is to ensure the leader's knowledge, skills, abilities and personal characteristics are matched to the organizational website development context
b) Role requirements; the role analysis will, if developed correctly, describe what the critical success factors are and how the defined measures of success can be predicted. What will be the role of the information on the highlighted requirements
c) Person requirements; the person analysis is designed to establish the critical knowledge, skills, abilities and personal characteristics required by the executive to achieve success in the role.
d) Users: may consist solely of external candidates but can involve one or more internal candidates together with several external candidates. It involves completing a comprehensive analysis of the user of the system which is being developed and specific client-driven factors, outlining key

companies and considering all options in order to gain access to the best executive talent for the role.

e) Matching methods: this element assesses and compares all the selected information to meet the core of the executive search and selection process, yet its effectiveness is reliant on the quality of the stages that precede it, as well as the rigour of the matching method itself.

f) Listing the key information: this element is a way of sorting all the highlighted information and make a final list of useful information

2.Brainstorming on the Listed key information

2.1 Introduction

Brainstorming is one of the most frequently used group-based creativity process used for problem solving. It is a method using which numerous ideas can be collected from a group of people in a short time.

It also provides a good background to have open discussions and communication during the entire project's duration.

Brainstorming sessions generally take place between 10 people, however the numbers vary depending on various factors.

The discussions of the group will be moderated by a leader who can also help in triggering different thoughts, which gives the participants time to connect their thoughts organically.

The whole process of brainstorming often takes one hour and is conducted through several stages, the first one of which is stating the topic of discussion and calling for different solutions.

However, a creative thinking expert will replace the standard approach from "How to…", and put it down as "In how many ways can we…".

The four basic rules of brainstorming are −

- No prejudice against any participant.
- No criticism of any idea, however unlikely.
- More the ideas, the better. People use them to connect different thoughts.

- Sharing relevant experiences to help people use ideas to construct new ones.

Like the verbal communication method used in brainstorming, there is also another written medium of creative thinking known as Brain-Writing.

In this process, ideas are generated by individuals and then written down on a piece of paper.

These notes are then reproduced and exchanged with other members of the group, who will then read these notes and write down ideas.

Generally, Brain-Writing follows the 6-3-5 Method in which six members of the group generate and write down three ideas in five minutes. After five minutes, each member of the group will pass his paper to the participant on the right, who reads it and adds three new ideas in another five minutes. This process continues until each participant gets the original piece of paper back.

2.2 Steps to Generate Effective Ideas Using Brainstorming

a) **Prepare for the session.** You need a conference room with a place for notes to be taken. You can use flip charts, a whiteboard, a computer that you can project onto a screen, or whatever works for your group. Make sure you have the right materials, such as pens with enough ink.

   Assign a person to write on the board. The key talent consideration for this is handwriting, not level. It's okay for an admin to take the notes, but the VP can also take on the note taker role.

b) **Gather your group together.** The interactions among participants are a critical part of brainstorming. It is possible to do so over video conference, but if possible, having everyone in the same room can help. If you expect the meeting to last a long time, snacks and drinks never hurt.

c) **State the problem clearly.** The purpose of brainstorming is to solve a specific problem. A good method is to write the problem clearly at the top of the board. For instance: “Location for company picnic” or “How to ensure employees always clock in and out” or “Ideas for the new marketing

campaign.” Having this in full view of everyone helps the meeting stay focused.

d) **Provide the necessary background information.** Ideally, you would provide the necessary information before the meeting, but sometimes you need to provide it during the meeting.

For instance, if your problem is, “How to ensure that employees always clock in and out,” you'd need to explain why that's a problem, what groups are forgetting to clock in/out, what the consequences of this are, and so forth.

Without this information, participants may not understand the real need for the brainstorming session, which will decrease the probability of a good session and a workable solution.

e) **There are no bad ideas in brainstorming.** While the group will, of course, generate some bad ideas, group members are asked not to offer criticism until after the brainstorming session has ended. The note taker should write down whatever ideas are thrown out without comment or criticism.

Other group members should take care not to comment negatively either. Remember that John's dumb idea may spark a thought in Carol's head that makes Polly think of the idea that is ultimately chosen. Ideas don't need to be logical or legal, just throw them out.

f) **Set a time limit.** A good brainstorming session doesn't last forever. Depending on the problem, 10 or even five minutes may provide adequate time. Other sessions can last longer, but regardless, state up front how long this will go on. The time crunch at the end might spur ideas.
g) **Go over your list of ideas.** Once the brainstorming session is complete, the group can discuss the list and pick out the most promising ideas. Even though you're rejecting ideas at this stage, take care not to become too critical of rejected ideas.

3.Requirements processes

3.1 Introduction

The requirement process is the sequence of activities that need to be performed in the requirements phase and that culminate in producing a high-quality document containing the SRS.

The requirements process typically consists of three basic tasks: problem or requirement analysis, requirements specification, and requirements validation.

Problem analysis often starts with a high-level “problem statement.” During analysis the problem domain and the environment are modeled in an effort to understand the system behavior, constraints on the system, its inputs and outputs, etc.

The basic purpose of this activity is to obtain a thorough understanding of what the software needs to provide. Frequently, during analysis, the analyst will have a series of meetings with the clients and end users.

In the early meetings, the clients and end users will explain to the analyst about their work, their environment, and their needs as they perceive them. Any documents describing the work or the organization may be given, along with outputs of the existing methods of performing the tasks.

In these early meetings, the analyst is basically the listener, absorbing the information provided. Once the analyst understands the system to some extent, he uses the next few meetings to seek clarifications of the parts he does not understand.

He may document the information or build some models, and he may do some brainstorming or thinking about what the system should do. In the final few meetings, the analyst essentially explains to the client what he understands the system should do and uses the meetings as a means of verifying if what he proposes the system should do is indeed consistent with the objectives of the clients.

The understanding obtained by problem analysis forms the basis of requirements specification, in which the focus is on clearly specifying the requirements in a document.

Issues such as representation, specification languages, and tools are addressed during this activity. As analysis produces large amounts of information and knowledge with possible redundancies, properly organizing and describing the requirements is an important goal of this activity.

Requirements validation focuses on ensuring that what have been specified in the SRS are indeed all the requirements of the software and making sure that the SRS is of good quality.

The requirements process terminates with the production of the validated SRS.

1.2 COMPONENT OF REQUIREMENT PROCESS

3.2.1 **Feasibility Study**

Feasibility is defined as the practical extent to which a project can be performed successfully.

To evaluate feasibility, a feasibility study is performed, which determines whether the solution considered to accomplish the requirements is practical and workable in the software.

Information such as resource availability, cost estimation for software development, benefits of the software to the organization after it is developed and cost to be incurred on its maintenance are considered during the feasibility study.

The objective of the feasibility study is to establish the reasons for developing the software that is acceptable to users, adaptable to change and conformable to established standards.

Various other objectives of feasibility study are listed below.

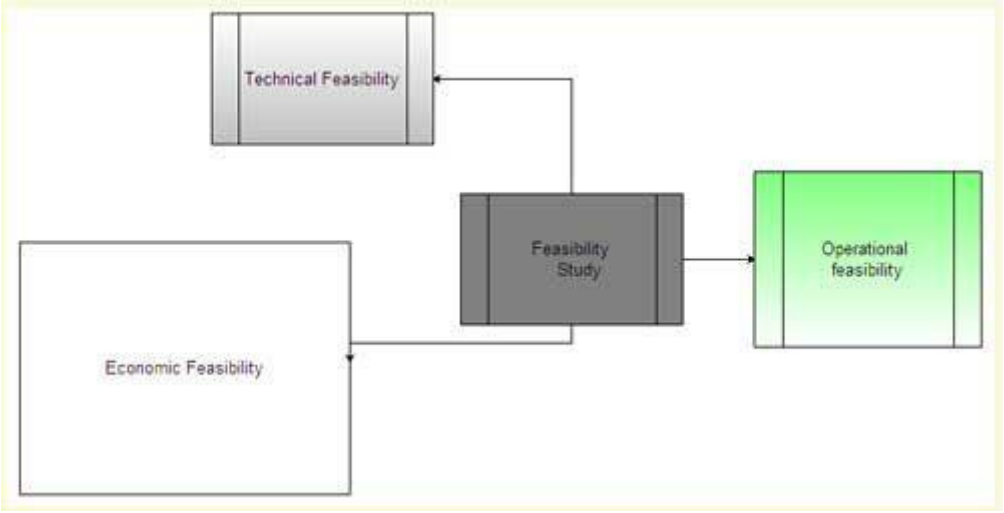
• To analyze whether the software will meet organizational requirements.

• To determine whether the software can be implemented using the current technology and within the specified budget and schedule.

• To determine whether the software can be integrated with other existing software.

3.2.1.1 Types of Feasibility

Various types of feasibility that are commonly considered include technical feasibility, operational feasibility, and economic feasibility.



Technical feasibility assesses the current resources (such as hardware and software) and technology, which are required to accomplish user requirements in the software within the allocated time and budget.

For this, the software development team ascertains whether the current resources and technology can be upgraded or added in the software to accomplish specified user requirements.

Technical feasibility also performs the following tasks.

• Analyzes the technical skills and capabilities of the software development team members.

• Determines whether the relevant technology is stable and established.

• Ascertains that the technology chosen for software development has a large number of users so that they can be consulted when problems arise or improvements are required.

Operational feasibility assesses the extent to which the required software performs a series of steps to solve business problems and user requirements. This feasibility is dependent on human resources (software development team) and involves visualizing whether the software will operate after it is developed and be operative once it is installed. Operational feasibility also performs the following tasks.

• Determines whether the problems anticipated in user requirements are of high priority.

• Determines whether the solution suggested by the software development team is acceptable.

• Analyzes whether users will adapt to a new software.

• Determines whether the organization is satisfied by the alternative solutions proposed by the software development team.

Economic feasibility determines whether the required software is capable of generating financial gains for an organization. It involves the cost incurred on the software development team, estimated cost of hardware and software, cost of performing feasibility study, and so on. For this, it is essential to consider expenses made on purchases (such as hardware purchase) and activities required to carry out software development. In addition, it is necessary to consider the benefits that can be achieved by developing the software.

Software is said to be economically feasible if it focuses on the issues listed below.

• Cost incurred on software development to produce long-term gains for an organization.

• Cost required to conduct full software investigation (such as requirements elicitation and requirements analysis).

• Cost of hardware, software, development team, and training.

3.2.1.2. Feasibility Study Process

Feasibility study comprises the following steps.

• **Information assessment:** Identifies information about whether the system helps in achieving the objectives of the organization. It also verifies that the system can be implemented using new technology and within the budget and whether the system can be integrated with the existing system.

• **Information collection:** Specifies the sources from where information about software can be obtained. Generally, these sources include users (who will operate the software), organization (where the software will be used), and the software development team (which understands user requirements and knows how to fulfill them in software).

• **Report writing:** Uses a feasibility report, which is the conclusion of the feasibility study by the software development team. It includes the recommendations whether the software development should continue. This report may also include information about changes in the software scope, budget, and schedule and suggestions of any requirements in the system.

• **General information:** Describes the purpose and scope of feasibility study. It also describes system overview, project references, acronyms and abbreviations, and points of contact to be used.

System overview provides description about the name of the organization responsible for the software development, system name or title, system category, operational status, and so on.

Project references provide a list of the references used to prepare this document such as documents relating to the project or previously developed documents that are related to the project.

Acronyms and abbreviations provide a list of the terms that are used in this document along with their meanings.

Points of contact provide a list of points of organizational contact with users for information and coordination.

For example, users require assistance to solve problems (such as troubleshooting) and collect information such as contact number, e-mail address, and so on.

Management summary: Provides the following information.

• **Environment:** Identifies the individuals responsible for software development.

It provides information about input and output requirements, processing requirements of the software and the interaction of the software with other software.

It also identifies system security requirements and the system's processing requirements

• **Current functional procedures:** Describes the current functional procedures of the existing system, whether automated or manual.

It also includes the data-flow of the current system and the number of team members required to operate and maintain the software.

• **Functional objective:** Provides information about functions of the system such as new services, increased capacity, and so on.

• **Performance objective:** Provides information about performance objectives such as reduced staff and equipment costs, increased processing speeds of software, and improved controls.

• **Assumptions and constraints:** Provides information about assumptions and constraints such as operational life of the proposed software, financial constraints, changing hardware, software and operating environment, and availability of information and sources.

• **Methodology:** Describes the methods that are applied to evaluate the proposed software in order to reach a feasible alternative. These methods include survey, modeling, benchmarking, etc.

• **Evaluation criteria:** Identifies criteria such as cost, priority, development time, and ease of system use, which are applicable for the development process to determine the most suitable system option.

• **Recommendation:** Describes a recommendation for the proposed system. This includes the delays and acceptable risks.

• **Proposed software:** Describes the overall concept of the system as well as the procedure to be used to meet user requirements.

In addition, it provides information about improvements, time and resource costs, and impacts. Improvements are performed to enhance the functionality and performance of the existing software.

Time and resource costs include the costs associated with software development from its requirements to its maintenance and staff training. Impacts describe the possibility of future happenings and include various types of impacts as listed below.

• **Equipment impacts:** Determine new equipment requirements and changes to be made in the currently available equipment requirements.

• **Software impacts:** Specify any additions or modifications required in the existing software and supporting software to adapt to the proposed software.

• **Organizational impacts:** Describe any changes in organization, staff and skills requirement.

• **Operational impacts:** Describe effects on operations such as user-operating procedures, data processing, data entry procedures, and so on.

• **Developmental impacts:** Specify developmental impacts such as resources required to develop databases, resources required to develop and test the software, and specific activities to be performed by users during software development.

• **Security impacts:** Describe security factors that may influence the development, design, and continued operation of the proposed software.

• **Alternative systems:** Provide description of alternative systems, which are considered in a feasibility study. This also describes the reasons for choosing a particular alternative system to develop the proposed software and the reason for rejecting alternative systems.

3.2.2. Requirement gathering

A great user experience is all about enabling the end users to achieve their objective be it a website, a software system or a product. In order to fulfill their needs, we need to understand their work and the context of their work. The first and basic phase of software development life cycle is requirements gathering. They give clear, concise and agreed set of customer requirements that the software should provide.

Business analyst and subject experts are responsible for requirement gathering process.

Business customers have a tendency to expect software teams to be mind-readers, and to deliver a solution based on unspoken or unknown requirements.

Hence, all of the requirements need to be formally captured in a mammoth document.

3.2.2.1 Requirements Gathering Process Flow

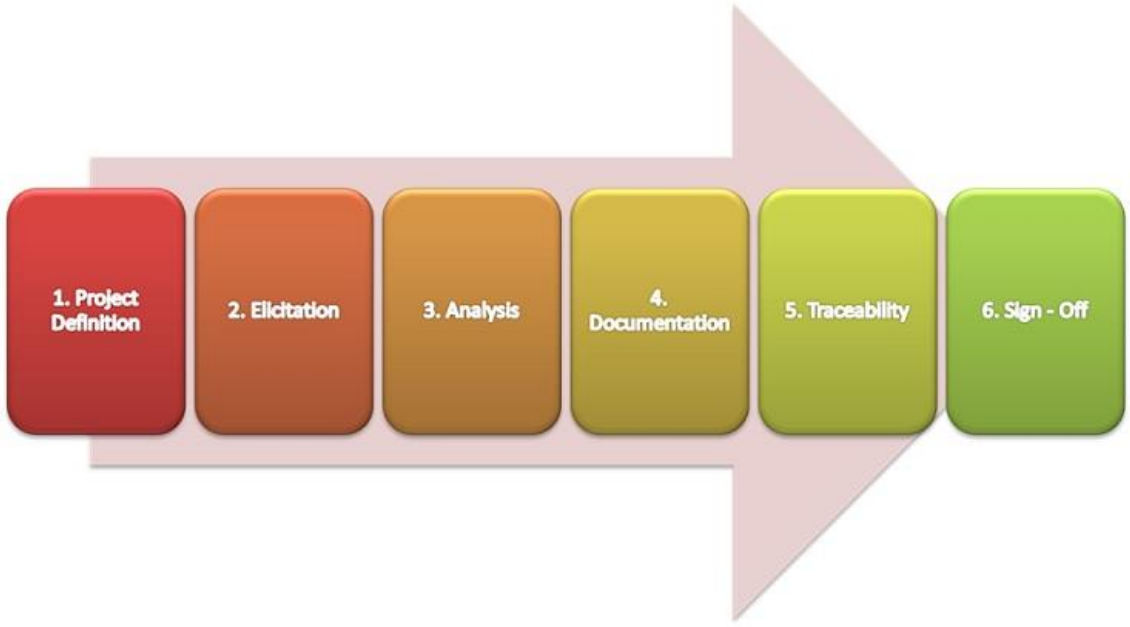
Soliciting and gathering business requirements is a critical first step for every project.

In order to bridge the gap between business and technical requirements, the business analysts must fully understand the business needs within the given context, align these needs with the business objectives, and properly communicate the needs to both the stakeholders and development team.

For that, they need to ensure requirements are written in a language that is understandable by both groups.

3.2.2.2 Requirement Gathering goes through the following Stages:

- Project Definition
- Elicitation
- Analysis
- Documentation
- Traceability
- Sign – Off



a) Project Definition

This stage is to define the business objectives that every project should understand and define so that all efforts can be prioritized against the value that the project is delivering to the business.

Listed below are the activities to be taking place during this stage.

- Clear definition of the requirements development efforts.
- Assumptions, Dependencies and Risks
- Identifying business stakeholders
- Change Management – Define how changes to the requirements will be handled.
- Benefits
- Funding for the project
- Interfaces with other systems
- Success criteria

b) Elicitation

In this stage, proper information is extracted to prepare to document the requirements.

There are many different business analysis techniques to elicit requirements and their priorities, including workshops, facilitated interviews, observations, or prototypes (can be discussed in separate article).

The stakeholder classes will be identified here about the clients who want the product to be built, the customers who will pay for it, end users and other stakeholders who will be impacted.

Then the stakeholder classes will be mapped to business goals. Identification of the input required with a degree of involvement and the influence for each identified stakeholder class.

The stakeholder representatives and the decision makers will have to be identified.

c) Analysis

In this stage, the rules will be verified and validated if they are unclear, incomplete, ambiguous, or contradictory.

The category of the requirement functional or non-functional will have to be figured and prioritized.

d) Documenting

Collate, author, and publish requirements to stakeholders. Establish naming conventions and definitions.

Trace requirements to sources. Document facts and assumptions.

e) Traceability

Verification with the stakeholders of the life of a requirement, from its origins, through its development and specification, to its subsequent deployment and use.

It ensures that all of that there aren't any scope 'holes' in the developed system due to missed requirements.

The activity also ensures that all of the requirements are internally consistent with each other.

f) Sign Off

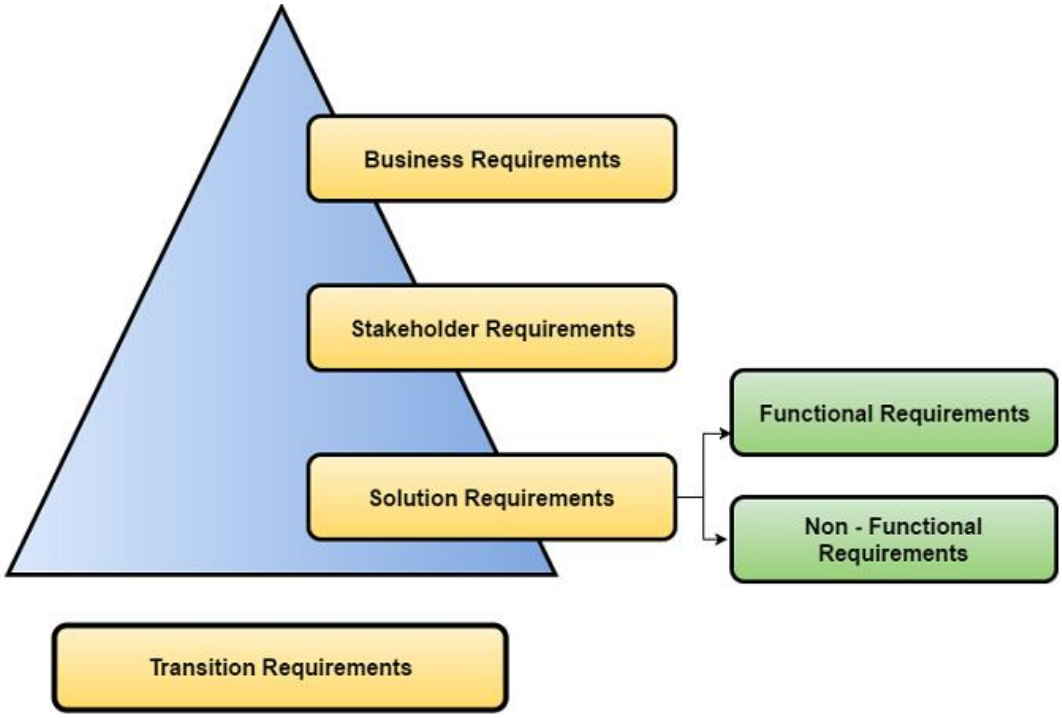
This is a secure acceptance of the requirements from the stakeholders. This step is the actual "SIGN OFF" from the users and sets the stage for the configuration work to start.

3.2.3 What are Requirements?

A requirement is a statement about a prospect of what the proposed system must do or adequately for solving the customer's problem. After the requirements has been raised by the stakeholder, it is the business analyst's role to further define, analyze, validate and prioritize the requirement statement.

The set of requirements as a whole represents a negotiated agreement among the stakeholders. A collection of requirements is a requirements document. For requirements to be effectively implemented and measured, they must be specific, unambiguous and clear.

a) Requirements Hierarchy



b) Business Requirements: High-level statement of enterprise needs goals and objectives. They confirm the scope of the project and identify stakeholders. They usually describe what a system or a solution should do. The business requirements should always be written from the point of view of the client. Although they are high-level broad requirements, the details on 'what' are the needs of the organization and 'why' these needs should be fulfilled, should be detailed.
c) Stakeholder Requirements: These are statements that describe the needs or problems of the stakeholders to implement a solution whether related to organizational or operational concerns. Stakeholder requirements act as a connector between business requirements and the other classes of solution requirements. It places the user at the center of focus and makes use of flowcharts, use case diagrams, use-case scenarios, and other process models to describe.
d) Solution Requirements: They describe a solution of how the stakeholder wants to implement the business and stakeholder requirements. They are often divided into sub-categories:

- Functional Requirements: Functional requirements describe the scope, functionality, behavior of the product, and connection to other systems that the developers must build into the product. They describe exactly what tasks the software must perform. They also define the business rules that the system must conform to.

The Business Analyst will capture and validate the functional requirements by the development of Use Cases (explained below).

- Non-Functional Requirements: Non-functional requirements define the system's quality characteristics, Constraints or standards that the system must have or comply with. They will describe the look and feel of the system. They decide the visual properties of the system, its usability, and the performance requirements – how big, how fast, etc. They also include the product's intended operating environment, maintainability, portability, reliability, security etc.
- Transition Requirements: Temporary capabilities to make transition to the new system. They are always temporary in nature and because they cannot be developed until both an existing and new solution are defined.

3.2.3 requirements specification

A software requirements specification (SRS) is a detailed description of a software system to be developed with its functional and non-functional requirements. The SRS is developed based the agreement between customer and contractors.

It may include the use cases of how user is going to interact with software system. The software requirement specification document consistent of all necessary requirements required for project development.

To develop the software system we should have clear understanding of Software system. To achieve this we need to continuous communication with customers to gather all requirements.

A good SRS defines the how Software System will interact with all internal modules, hardware, communication with other programs and human user interactions with wide range of real life scenarios.

Using the *Software requirements specification* (SRS) document on QA lead, managers creates test plan.

It is very important that testers must be cleared with every detail specified in this document in order to avoid faults in test cases and its expected results.

It is highly recommended to review or test SRS documents before start writing test cases and making any plan for testing.

Let's see how to test SRS and the important point to keep in mind while testing it.

1. Correctness of SRS should be checked. Since the whole testing phase is dependent on SRS, it is very important to check its correctness. There are some standards with which we can compare and verify.

2. Ambiguity should be avoided. Sometimes in SRS, some words have more than one meaning and this might confuse testers making it difficult to get the exact reference. It is advisable to check for such ambiguous words and make the meaning clear for better understanding.

3. Requirements should be complete. When tester writes test cases, what exactly is required from the application, is the first thing which needs to be clear. For e.g. if application needs to send the specific data of some specific size then it should be clearly mentioned in SRS that how much data and what is the size limit to send.

4. Consistent requirements. The SRS should be consistent within itself and consistent to its reference documents. If you call an input "Start and Stop" in one place, don't call it "Start/Stop" in another. This sets the standard and should be followed throughout the testing phase.

5. Verification of expected result: SRS should not have statements like "Work as expected", it should be clearly stated that what is expected since different testers would have different thinking aspects and may draw different results from this statement.

6. Testing environment: some applications need specific conditions to test and also a particular environment for accurate result. SRS should have clear documentation on what type of environment is needed to set up.

7. Pre-conditions defined clearly: one of the most important part of test cases is pre-conditions. If they are not met properly then actual result will always be different expected result. Verify that in SRS, all the pre-conditions are mentioned clearly.

8. Requirements ID: these are the base of test case template. Based on requirement Ids, test case ids are written. Also, requirements ids make it easy to categorize modules so just by looking at them, tester will know which module to refer. SRS must have them such as id defines a particular module.

9. Security and Performance criteria: security is priority when a software is tested especially when it is built in such a way that it contains some crucial information when leaked can cause harm to business. Tester should check that all the security related requirements are properly defined and are clear to him. Also, when we talk about performance of a software, it plays a very important role in business so all the requirements related to performance must be clear to the tester and he must also know when and how much stress or load testing should be done to test the performance.

10. Assumption should be avoided: sometimes when requirement is not cleared to tester, he tends to make some assumptions related to it, which is not a right way to do testing as assumptions could go wrong and hence, test results may vary. It is better to avoid assumptions and ask clients about all the “missing requirements” to have a better understanding of expected results.

11. Deletion of irrelevant requirements: there are more than one team who work on SRS so it might be possible that some irrelevant requirements are included in SRS.

Based on the understanding of the software, tester can find out which are these requirements and remove them to avoid confusions and reduce work load.

12. Freeze requirements: when an ambiguous or incomplete requirement is sent to client to analyze and tester gets a reply, that requirement result will be updated in the next SRS version and client will freeze that requirement.

Freezing here means that result will not change again until and unless some major addition or modification is introduced in the software.

Most of the defects which we find during testing are because of either incomplete requirements or ambiguity in SRS. To avoid such defects it is very important to test software requirements specification before writing the test cases. Keep the latest version of SRS with you for reference and keep yourself updated with the latest change made to the SRS.

Best practice is to go through the document very carefully and note down all the confusions, assumptions and incomplete requirements and then have a meeting with the client to get them clear before development phase starts as it becomes costly to fix the bugs after the software is developed.

After all the requirements are cleared to a tester, it becomes easy for him to write effective test cases and accurate expected results.

3.2.4.Requirements validation

Requirements validation is the process of checking that requirements defined for development, define the system that the customer really wants. To check issues related to requirements, we perform requirements validation.

We usually use requirements validation to check error at the initial phase of development as the error may increase excessive rework when detected later in the development process.

In the requirements validation process, we perform a different type of test to check the requirements mentioned in the Software Requirements Specification (SRS), these checks include:

- Completeness checks
- Consistency checks
- Validity checks
- Realism checks
- Ambiguity checks
- Verifiability

The output of requirements validation is the list of problems and agreed on actions of detected problems.

The lists of problems indicate the problem detected during the process of requirement validation.

The list of agreed action states the corrective action that should be taken to fix the detected problem.

There are several techniques which are used either individually or in conjunction with other techniques to check to check entire or part of the system:

1. Test case generation:
   Requirement mentioned in SRS document should be testable, the conducted tests reveal the error present in the requirement. It is generally believed that if the test is difficult or impossible to design than, this usually means that requirement will be difficult to implement and it should be reconsidered.
2. Prototyping:
   In this validation techniques the prototype of the system is presented

before the end-user or customer, they experiment with the presented model and check if it meets their need. This type of model is generally used to collect feedback about the requirement of the user.

3. Requirements Reviews:
   In this approach, the SRS is carefully reviewed by a group of people including people from both the contractor organisations and the client side, the reviewer systematically analyses the document to check error and ambiguity.

4. Automated Consistency Analysis:
   This approach is used for automatic detection of an error, such as nondeterminism, missing cases, a type error, and circular definitions, in requirements specifications.

   First, the requirement is structured in formal notation then CASE tool is used to check in-consistency of the system, The report of all inconsistencies is identified and corrective actions are taken.

5. Walk-through:
   A walkthrough does not have a formally defined procedure and does not require a differentiated role assignment.

   - Checking early whether the idea is feasible or not.
   - Obtaining the opinions and suggestion of other people.
   - Checking the approval of others and reaching an agreement.

Activity 2: Guided Practice

Task:

KIGALI COLLEGE is in a need of a website. The KIGALI COLLEGE Management would like to hire a professional web developer to build a website of displaying all information regarding the activities and trends of KIGALI COLLEGE, they have shared a folder containing all the information which can be used in creating that website in need. Your first assignment as a web developer is to identify key information among the shared information

In form small groups to discuss how they should identify key information to place on that website.

1.Select the key information to place on the KIGALI COLLEGE.

2.Brainstorm on the key information collected to meet the desired requirements of KIGALI COLLEGE

3. identify the requirement implementation process

4. **identify the feasibility study of this Kigali college project**

 **Activity 3: Application**

 **Task:**

MUZIKA ltd want a website to be used in the awarding ceremony, It's in that case MUZIKA ltd would like to hire a web designer to build a voting website, which will be used awarding the best music in this year.

They have shared a folder containing all the information which can be used in creating that website in need and the awards criteria

Your prior task as a web developer is to identify key information to be placed on the web among the shared information

In form small groups to discuss how they should identify how to identify key information to place on that website.

1. Identify the key information's on to place on this MUZIKA website?
2. Analyze the key information collected and the prototype of this MUZIKA Website
3. Process the implementation of the requirement of the MUZIKA Website?

 **Points to Remember**

- Avoid repetition in listing requirements
- Always make the client demand is considered
- Make sure the user friendly principle is considered

Formative Assessment

1. What do you understand by Requirements validation?
2. What are the component of requirement process?
3. List the element of brainstorming.

Topic 2.2 Discussion of ideas

Key Competencies:

Knowledge	Skills	Attitudes
1. Describe the elements of critical thinking	**1. identify elements of critical thinking**	1.Be a Critical thinker
2. Describe process of critical thinking	2. Analyze the critical thinking	2. Be a detail oriented
3. Elaborate the element of critical thinking	3.Apply the elements of requirement processes of implementing the client's demand	3. Being organized to achieve the required result.

Getting Started: What do we know and where are we going?

Task:

In small groups discuss on the following:

1.Have you ever participated in debate?

2.What does group discussion mean to you?

3.What do you understand by team spirit?

Activity 1: Problem Solving

Task: KARONGI PRIMARY SCHOOL management has decided to launch a website which can be used for various purpose.

KARONGI PRIMARY SCHOOL would like to hire a website developer to build a website for displaying student notes tutorials, KARONGI PRIMARY SCHOOL has shared a folder containing all the information, requirements and anything related in creating that website of tutorials of students

As a website developer you will analyze the ideas discussed as per the proposed requirements

In small groups discuss how you should discuss ideas as per the proposed requirements in the development of the website required by KARONGI PRIMARY SCHOOL.

KEY FACTS 2.2

1.Critical thinking

1.1 INTRODUCTION

Critical thinking is the ability to think clearly and rationally about what to do or what to believe. It includes the ability to engage in reflective and independent thinking. Someone with critical thinking skills is able to do the following:

- understand the logical connections between ideas
- identify, construct and evaluate arguments
- detect inconsistencies and common mistakes in reasoning
- solve problems systematically
- identify the relevance and importance of ideas
- reflect on the justification of one's own beliefs and values

Critical thinking is not a matter of accumulating information. A person with a good memory and who knows a lot of facts is not necessarily good at critical thinking. A critical thinker is able to deduce consequences from what he knows, and he knows how to make use of information to solve problems, and to seek relevant sources of information to inform himself.

Critical thinking should not be confused with being argumentative or being critical of other people. Although critical thinking skills can be used in exposing fallacies and bad reasoning, critical thinking can also play an important role in cooperative reasoning and

constructive tasks. Critical thinking can help us acquire knowledge, improve our theories, and strengthen arguments. We can use critical thinking to enhance work processes and improve social institutions.

Some people believe that critical thinking hinders creativity because it requires following the rules of logic and rationality, but creativity might require breaking rules. This is a misconception. Critical thinking is quite compatible with thinking "out-of-the-box", challenging consensus and pursuing less popular approaches. If anything, critical thinking is an essential part of creativity because we need critical thinking to evaluate and improve our creative ideas.

1. 2. The importance of critical thinking

The importance of critical thinking can be found below :

1. Critical thinking is a domain-general thinking skill. The ability to think clearly and rationally is important whatever we choose to do. If you work in education, research, finance, management or the legal profession, then critical thinking is obviously important. But critical thinking skills are not restricted to a particular subject area. Being able to think well and solve problems systematically is an asset for any career.
2. Critical thinking is very important in the new knowledge economy. The global knowledge economy is driven by information and technology. One has to be able to deal with changes quickly and effectively. The new economy places increasing demands on flexible intellectual skills, and the ability to analyse information and integrate diverse sources of knowledge in solving problems. Good critical thinking promotes such thinking skills, and is very important in the fast-changing workplace.
3. Critical thinking enhances language and presentation skills. Thinking clearly and systematically can improve the way we express our ideas. In learning how to analyse the logical structure of texts, critical thinking also improves comprehension abilities.
4. Critical thinking promotes creativity. To come up with a creative solution to a problem involves not just having new ideas. It must also be the case that the new ideas being generated are useful and relevant to the task at hand. Critical thinking plays a crucial role in evaluating new ideas, selecting the best ones and modifying them if necessary
5. Critical thinking is crucial for self-reflection. In order to live a meaningful life and to structure our lives accordingly, we need to justify and reflect on our values and decisions. Critical thinking provides the tools for this process of self-evaluation.
6. Good critical thinking is the foundation of science and democracy. Science requires the critical use of reason in experimentation and theory confirmation. The proper functioning of a liberal democracy requires citizens who can think

critically about social issues to inform their judgments about proper governance and to overcome biases and prejudice.

3. Steps to better critical thinking on proposed ideas as per requirement

1. ORGANISE INFORMATION
   We have no difficulty in locating information. The key is that the information is selected and structured appropriately. With Rationale's grouping maps you can drag information from the web onto your workspace via the scratchpad and include colour, hyperlinks and images. The structured, pyramid like maps provide a guide for students to structure the information in such a way that reveals the connections between the main topic and its various themes or categories.
2. STRUCTURE REASONING
   Many people provide opinions but rarely provide supporting reasons for their view. Rationale's reasoning maps encourage people to support their responses and to consider different opinions. It uses colour conventions to display reasoning – green for reasons, red for objections and orange for rebuttals. It also includes indicator or connecting words so that the relationship between statements is clearly understood.
3. CONSIDER EVIDENCE
   A test of a solid argument is how good the evidence is that underpins the claims. Rationale's basis boxes provide a means to identify the basis upon which a statement is given. The icons provide a visual guide as to the range of research utilised and the strength of the evidence that is provided.
4. IDENTIFY ASSUMPTIONS
   We often talk about analysing arguments. This can mean a few things including looking at the logical structure of the argument to ensure it is valid or well formed and also identifying assumptions or co premises. For those who require higher levels of analysis, Rationale provides the analysis map format to show the relationships between main premises and co premises.
5. EVALUATE ARGUMENTS
   Once arguments for and against an issue have been logically structured, they need to be evaluated. Rationale provides a visual guide for the evaluation of claims and evidence – the stronger the colour, the stronger the argument while icons designate acceptable or rejected claims. While learning this process of evaluating arguments, the colour and icons provide immediate undertanding and communication of the conclusion.
6. COMMUNICATE CONCLUSION
   Presenting ideas orally or in writing is crucial and is often the distinguishing feature between good results and average ones. Rationale has essay and letter writing templates to build skills and confidence. Templates provide instruction and generation of prose. When exported, there is a structured essay plan with detailed instructions to assist understanding of clear and systematic prose.

4. Business Sector

4.1 Introduction

A business sector meaning pertains to the distinctions made between businesses.

These distinctions are made according to industry or sector. There are multiple ways to classify businesses by sector.

Some economists like to divide businesses according to corporate, nonprofit, and government organizations.

4.2 CLASSIFICATION OF THE BUSINESS SECTOR

The business sector has the following classification, the only problem with this classification system is that it precludes the fourth sector, including government agencies and agencies that are government-controlled.

a) The Primary Sector

The primary sector acts as a foundation for all other businesses. It creates the raw materials that go on to support every other sector. Industries that fall within the primary sector include:

- agricultural
- farming
- fishing
- forestry
- mining

In developing countries, the primary sector constitutes a large part of their economy. In the United States, the economy continues to see a gradual shift from the primary sector to the secondary and tertiary sectors, due to advancements in technology.

b) The Secondary Sector

Once the primary sector produces the raw materials, the secondary sector transforms them into various products. The secondary sector includes the manufacturing industry, comprising a significant portion of the United States workforce. However, the Bureau of Labor Statistics expects employment in manufacturing to continue to decline.

Similar to the primary sector, technology is a major factor in the secondary sector's decline. Technology allows manufacturers to get more done with fewer resources.

c) The Tertiary Sector

Most of the workers in the United States are members of the tertiary sector. This is the segment that provides a service to the public. Examples include:

- hotels
- retail industry
- restaurants
- sales

Each of these sectors relies on the products produced in the secondary and primary sectors. The tertiary sector also encompasses the transportation industry that goes on to deliver the secondary sector's manufactured products to tertiary businesses.

Technology has created a subcategory within the tertiary sector known as the quaternary sector. This category includes phone, cable, and internet providers.

d) The Public Sector

Even though government agencies also provide a service to the public, this section is different from the tertiary sector. In fact, it requires completely separate consideration.

Examples of the public sector include:

- libraries
- schools

The public sector includes any organization owned or operated by a government agency. Unlike the private sector, these organizations rely on taxpayer dollars instead of revenue from customers who are paying for goods or services.

These agencies may outsource work to private contractors which will then perform the work for private and public sector clients.

4.3 Why Are There Business Sectors?

It's important to distinguish between business sectors because there's are major differenced between a business that operates in the primary sector and

a business that provides a service. There are also major differences between businesses within the same sector.

For example, a coal mine and a farm are both in the primary sector but are very different. Also, a business that produces chocolate is different from a business that produces car tires, but you'll find them in the same sector.

Business sectors comprise a variety of different firms. Some are small; others are large. Some may be set up as corporations, partnerships, or proprietorships. Some may be home-based, while others operate in dozens of factories across the country.

5. Business Plan development

5.1 INTRODUCTION

The business plan sets out how the owners/managers of a business intend to realise its objectives. Without such a plan a business is likely to drift.

The business plan serves several purposes:it

(1) enables management to think through the business in a logical and structured way and to set out the stages in the achievement of the business objectives.

(2) enables management to plot progress against the plan (through the management accounts)

(3) ensures that both the resources needed to carry out the strategy and the time when they are required are identified.

(4) is a means for making all employees aware of the business's direction (assuming the key features of the business plan are communicated to employees)

(5) is an important document for for discussion with prospective investors and lenders of finance (e.g. banks and venture capitalists).

(6) links into the detailed, short-term, one-year budget.

5.2 The Link Between the Business Plan and the Budget

A budget can be defined as "a financial or quantitative statement", prepared for a specific accounting period (typically a year), containing the plans and policies to be pursued during that period.

The main purposes of a budget are:

- to monitor business unit and managerial performance (the latter possibly linking into bonus arrangements)
- to forecast the out-turn of the period's trading (through the use of flexed budgets and based on variance analyses)
- to assist with cost control.

Generally, a functional budget is prepared for each functional area within a business (e.g. call-centre, marketing, production, research and development, finance and administration). In addition, it is also normal to produce a "capital budget" detailing the capital investment required for the period, a "cash flow budget", a "stock budget" and a "master budget", which includes the budgeted profit and loss account and balance sheet.

5.3 Preparing a Business Plan

A business plan has to be particular to the organisation in question, its situation and time. However, a business plan is not just a document, to be produced and filed. Business planning is a continuous process. The business plan has to be a living document, constantly in use to monitor, control and guide the progress of a business. That means it should be under regular review and will need to be amended in line with changing circumstances.

Before preparing the plan management should: - review previous business plans (if any) and their outcome. This review will help highlight which areas of the business have proved difficult to forecast historically. For example, are sales difficult to estimate? If so why? - be very clear as to their objectives - a business plan must have a purpose - set out the key business assumptions on which their plans will be based (e.g. inflation, exchange rates, market growth, competitive pressures, etc.) - take a critical look at their business. The classical way is by means of the strengths-weaknesses-opportunities-threats (SWOT) analysis, which identifies the business's situation from four key angles. The strategies adopted by a business will be largely based on the outcome of this analysis.

5.4 Preparing the Budget

A typical business plan looks up to three years forward and it is normal for the first year of the plan to be set out in considerable detail. This one-year plan, or budget, will be prepared in such a way that progress can be regularly monitored (usually monthly) by checking the variance between the actual performance and the budget, which will be phased to take account of seasonal variations.

The budget will show financial figures (cash, profit/loss working capital, etc) and also non-financial items such as personnel numbers, output, order book, etc. Budgets can be produced for units, departments and products as well as for the total organization.

Budgets for the forthcoming period are usually produced before the end of the current period. While it is not usual for budgets to be changed during the period to which they relate (apart from the most extraordinary circumstances) it is common practice for revised forecasts to be produced during the year as circumstances change.

A further refinement is to flex the budgets, i.e. to show performance at different levels of business. This makes comparisons with actual outcomes more meaningful in cases where activity levels differ from those included in the budget.

5.5 What Providers of Finance Want from a Business Plan

Almost invariably bank managers and other providers of finance will want to see a business plan before agreeing to provide finance. Not to have a business plan will be regarded as a bad sign. They will be looking not only at the plan, but at the persons behind it. They will want details of the owner/managers of the business, their background and experience, other activities, etc. They will be looking for management commitment, with enthusiasm tempered by realism. The plan must be thought through and not be a skimpy piece of work. A few figures on a spreadsheet are not enough.

The plan must be used to run the business and there must be a means for checking progress against the plan. An information system must be in place to provide regular details of progress against plan. Bank managers are particularly wary of businesses that are slow in producing internal performance figures.

Lenders will want to guard against risk. In particular they will be looking for two assurances:

(1) that the business has the means of making regular payment of interest on the amount loaned, and

(2) that if everything goes wrong the bank can still get its money back (i.e. by having a debenture over the business's assets). Forward-looking financial statements, particularly the cash flow forecast, are therefore of critical importance. The bank wants openness and no surprises. If something is going wrong it does not want this covered up, it wants to be informed - quickly.

Activity 2: Guided Practice

Task:

The school management want to build a website to manage the school activities , the management concluded to hire a web developer to build a website which will manage all the school activities MIS (Management Information System), School have shared a folder containing all the information which can be used in creating that website in need.

As a professional web developer you will have to discuss ideas with the school management on the proposed requirement .

In small groups to discuss on the implementation of ideas as per requirement to place on that website and how it will operate.

1. Discuss on ideas as proposed in the requirement.
2. Integrate the discussed ideas in a business plan?
3. Classify this project in the business sector

Activity 3: Application

Task:

SMART TAX LTD want to build a website which can be used in managing taxes, they have opened a public offer to hire a web developer who can build a website of managing income taxes in 15 sectors, SMART TAX LTD has shared with web developer a folder containing all the information which can be used in creating that website of taxes management.

SMART TAX LTD will have to discuss ideas with the wesite developer on the proposed requirement to indicate him what will be the interface, function and other technicalities of the website.

In small groups discuss how you should discuss on ideas of how we can develop the requested website of SMART TAX LTD.

1. Identify the ideas to discuss about in developing that website?

2.Analyze the feasibility of several ideas as given in the proposed requirements of SMART TAX LTD.

3. Process the implementation of SMART TAX ltd requirements.

 **Points to Remember**

- Avoid unnecessary cost on the business plan
- Make sure that your project is placed in the right business sector
- Keep your business file confidential

 **Formative Assessment**

1. What do you understand by Business Sector?
2. What are the steps of critical thinking?
3. What is the link between the Business Plan and the Budget?

Topic 2.3 Basis analysis of qualitative information

Key Competencies:

Knowledge	Skills	Attitudes
1. Describe the elements of analyzing qualitative information	**1. identify elements of analysis of qualitative information**	1.Be a Critical thinker
2. Describe process of analyzing qualitative information	2. Analyze the process of analysis of qualitative information	2. Be a detail oriented
3. Evaluate and Interpret the element of analyzing qualitative information	3.analyze of qualitative information	3. Being organized to achieve the required result.

Getting Started: What do we know and where are we going?

Task:

In small groups discuss on the following:

1.Have you ever did a survey?

2.What do you understand by audit?

3.What do you understand by data analysis?

Activity 1: Problem Solving

Task:

SYNERTECH ltd as an IT Web development company has recently won the bidding of developing a tutorials website for KAGARAMA HIGH SCHOOL. KAGARAMA HIGH SCHOOL has shared a folder containing all the information which can be used in creating that website of tutorials of students

SYNERTECH ltd must identity the qualitative and quantitative information to display on that website to be developed in order to proceed with the development.

After brainstorming on the relevance of the information shared by KAGARAMA HIGH SCHOOL

Perform an analysis and review of the data in relation with the requirement given by SYNERTECH ltd

In small groups analyze the qualitative and quantitative information to placed on the kagarama high school website

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KEY FACTS 2.3

1 QUALITATIVE DATA

1.1 INTRODUCTION

Qualitative data is defined as the data that approximates and characterizes. Qualitative data can be observed and recorded. This data type is non-numerical in nature.

This type of data is collected through methods of observations, one-to-one interview, conducting focus groups and similar methods. Qualitative data in statistics is also known as categorical data. Data that can be arranged categorically based on the attributes and properties of a thing or a phenomenon.

1.2. Qualitative Data Examples

Qualitative data is also called categorical data since this data can be grouped according to categories.

For example, think of a student reading a paragraph from a book during one of the class sessions.

A teacher who is listening to the reading gives a feedback on how the child read that paragraph.

If the teacher gives a feedback based on fluency, intonation, throw of words, clarity in pronunciation without giving a grade to the child, this is considered as an example of qualitative data.

It's pretty easy to understand the difference between qualitative and quantitative data, qualitative data does not include numbers in its definition of traits whereas quantitative data is all about numbers.

- The cake is orange, blue and black in color (qualitative).
- Females have brown, black, blonde, and red hair (qualitative).

Quantitative data is any quantifiable information that can be used for mathematical calculation or statistical analysis.

This form of data helps in making real-life decisions based on mathematical derivations. Quantitative data is used to answer questions like how many? how often? how much? This data can be validated and verified.

In order to better understand the concept of qualitative data and quantitative data, it's best to observe examples of particular datasets and how they can be defined. Following are examples of quantitative data:

- There are 4 cakes and three muffins kept in the basket (quantitative).
- 1 glass of fizzy drink has 97.5 calories (quantitative).

1.3 Importance of Qualitative Data

Qualitative data is important in determining the particular frequency of traits or characteristics.

It allows the statistician or the researchers to form parameters through which larger data sets can be observed.

Qualitative data provides the means by which observers can quantify the world around them.

For a market researcher, collecting qualitative data helps in answering questions like, who their customers are, what issues or problems they are facing and where do they need to focus their attention so problems or issues are resolved.

Qualitative data is about the emotions or perceptions of people, what they feel. In quantitative data, these perceptions and emotions are documented. It helps market researcher understand the language their consumers speak. This, in turn, helps the researchers identify and deal with the problem effectively and efficiently.

1.4 Qualitative Data Collection Methods.

Qualitative data collection is exploratory in nature, it involves in-depth analysis and research. Qualitative data collection methods are mainly focused on gaining insights, reasoning, and motivations hence they go deeper in terms of research. Since the qualitative data cannot be measured, this leads to the preference for methods or data collection tools that are structured to a limited extent.

Here are the qualitative data collection methods:

- One-to-One Interviews: One of the most commonly used data collection instrument for qualitative research, mainly because of its personal approach. The interviewer or the researcher collects data directly from the interviewee on a one-to-one basis.

  The interview may be informal and unstructured – conversational. The questions asked are mostly open-ended questions, spontaneous, with the interviewer letting the flow of the interview dictate the next questions to be asked.

- Focus groups: This is done in a group discussion setting. The group is limited to 6-10 people and a moderator is assigned to moderate the ongoing discussion.

Depending on the data which is sorted, the members of a group may have something in common. For example, a researcher conducting a study on track runners will choose athletes who are track runners or were track runners and have sufficient knowledge of the subject matter.

- Record keeping: This method makes use of the already existing reliable documents and similar sources of information as the data source. This data can be used in a new research. This is similar to going to a library. There one can go over books and other reference material to collect relevant data that can likely be used in the research.

- Process of observation: In this qualitative data collection method, the researcher immerses himself/ herself in the setting where his respondents are, and keeps a keen eye on the participants and takes down notes. This is known as the process of observation.

Besides taking notes, other documentation methods, such as video and audio recording, photography and similar methods can be used.

- Longitudinal studies: This data collection method is performed on the same data source repeatedly over an extended period of time. It is an observational research method that goes on for a few years and in some cases can go on for even decades. The goal of this data collection method is to find correlations through an empirical study of subjects with common traits.
- Case studies: In this method, data is gathered by in-depth analysis of case studies. The versatility of this method is demonstrated in how this method can be used to analyze both simple and complex subjects. The strength of this method is how judiciously it uses a combination of one or more qualitative data collection methods to draw inferences.

2 Qualitative Data Analysis

2.1 Introduction

Analyzing your data is vital, as you have spent time and money collecting it in the first place. This is an essential process because you don't want to find yourself in the dark even after putting in so many efforts.

However, there are no set ground rules for analyzing qualitative data, it all begins with understanding the two main approaches to qualitative data

2.2 Two Main Approaches to Qualitative Data Analysis

a) Deductive Approach

The deductive approach involves analyzing qualitative data based on a structure that is predetermined by the researcher. In this case, a researcher can use the questions as a guide for analyzing the data. This approach is quick and easy and can be used when a researcher has a fair idea about the likely responses that he/she is going to receive from the sample population.

b) Inductive Approach

The inductive approach, on the contrary, is not based on a predetermined structure or set ground rules/framework. This is more time consuming and a thorough approach to qualitative data analysis. Inductive approach is often used when a researcher has very little or no idea of the research phenomenon.

2.3 5 Steps to Qualitative Data Analysis

Whether you are looking to analyze qualitative data collected through a one-to-one interview or qualitative data from a survey, these simple steps will ensure a robust data analysis.

I. Step 1: Arrange your Data

Once you have collected all the data, it is largely unstructured and sometimes makes no sense when looked at a glance. It is, therefore, essential that as a researcher you need to first transcribe the data collected.

The first step in analyzing your data is arranging your data systematically. Arranging data simply means converting all the data into a text format.

You can either export the data into a spreadsheet or manually type in the data or choose from any of the computers assisted qualitative data analysis tools.

II. Step 2: Organize all your Data

After transforming and arranging your data, the immediate next step is to organize your data.

There are chances you most likely have a large amount of information that still needs to be arranged in an orderly manner.

One great way to organize the data is going back to your research objectives and then organizing the data based on the questions asked. Arrange your research objective in a table so it appears visually clear.

At all costs, avoid temptations of working with unorganized data. You will end up wasting time and there will be no conclusive results obtained.

III. Step 3: Set a Code to the Data Collected

Setting up proper codes for the collected data takes you a step ahead. Coding is one of the best ways to compress a huge amount of information collected.

Coding of qualitative data simply means categorizing and assigning properties and patterns to the collected data.

Coding is an important step in qualitative data analysis as you can derive theories from relevant research findings.

After assigning codes to your data, you can then begin to build on the patterns to gain in-depth insight into the data that will help make informed decisions.

IV. Step 4: Validate your Data

Validating data is one of the important steps of qualitative data analysis for successful research.

Since data is quintessential for research, it is extremely important to ensure that the data is not flawed.

Please note that data validation is not just one step in qualitative data analysis, this is a recurring step, that needs to be followed throughout the research process.

There are two sides to validating data:

a) First, it is about the accuracy of your research design or methods.

b) Second, it's about the reliability, which is the extent to which the methods produce accurate data consistently.

c)

V. Step 5: Concluding the Analysis Process

It is important to finally conclude your data, which means, presenting your data in a systematic manner, a report, that can be readily used.

The report should state the method that you as a researcher used to conduct the research studies, the positives, and negatives and study limitations.

In the report, you should also state the suggestions/inferences of your findings and any related area for future research.

2.4. Advantages of Qualitative Data

I. It helps in-depth analysis: Qualitative data collected provide the researchers with in-depth analysis of subject matters. While collecting qualitative data, the researchers tend to probe the participants and can gather ample amount of information by asking the right kind of questions. From a series of question and answers, the data that is collected is used to draw conclusions.

II. Understand what customers think: Qualitative data helps the market researchers to understand the mindset of their customers. The use of qualitative data gives businesses an insight into why a customer purchased a product. Understanding customer language helps market research infer the data collected in a more systematic manner.

III. Rich data: Collected data can be used to conduct research in the future as well. Since the questions asked to collect qualitative data are open-ended questions, respondents are free to express their opinions which leads to collecting more information.

2.5 Disadvantages of Qualitative Data

I. Time-consuming: As collecting qualitative data is more time consuming, fewer people are studies in comparison to collecting quantitative data and unless time and budget allow, a smaller sample size is included.
II. Not easy to generalize: Since fewer people are studied, it is difficult to generalize the results of that population.
III. Is dependent on researcher's skills: This type of data is collected through one-to-one interviews, observations, focus groups etc. it relies on the researcher's skills and experience to collect information from the sample.

Activity 2: Guided Practice

Task:

MINEDUC would like to recruit a website developer to build a website to manage all the school activities MIS (Management Information System), they have shared with the software developer a folder containing all the information which can be used in creating that website in need.

The website developer will first analysis the qualitative and quantitative relevance of the information shared by MINEDUC
As a software developer Perform an analysis and review of the data in relation with the requirement given by MINEDUC

In form small groups to discuss on how the analysis and review of the data in relation with the requirement given by Mineduc will be performed and do the following:

1. Identify data collections methods to suite the development of the MIS
2. Apply the qualitative data analysis approach on the data in relation with the requirement of MIS given by Mineduc?
3. Validate the final data set after interpretation

Key Fact 1.3

1. Quantitative Data

1.1 Introduction

Quantitative data is defined as the value of data in the form of counts or numbers where each data-set has an unique numerical value associated with it. This data is any quantifiable information that can be used for mathematical calculations and statistical analysis, such that real-life decisions can be made based on these mathematical derivations. Quantitative data is used to answer questions such as “How many?”, “How often?”, “How much?”. This data can be verified and can also be conveniently evaluated using mathematical techniques.

For example, there are quantities corresponding to various parameters, for instance, “How much did that laptop cost?” is a question which will collect quantitative data. There are values associated with most measuring parameters such as pounds or kilograms for weight, dollars for cost etc.

Quantitative data makes measuring various parameters controllable due to the ease of mathematical derivations they come with. Quantitative data is usually collected for statistical analysis using surveys, polls or questionnaires sent across to a specific section of a population. The retrieved results can be established across a population.

1.2 Types of Quantitative Data with Examples

The most common types of quantitative data are as below:

I. Counter: Count equated with entities. For example, the number of people who download a particular application from the App Store.

II. Measurement of physical objects: Calculating measurement of any physical thing. For example, the HR executive carefully measures the size of each cubicle assigned to the newly joined employees.

III. Sensory calculation: Mechanism to naturally “sense” the measured parameters to create a constant source of information. For example, a digital camera converts electromagnetic information to a string of numerical data.

IV. Projection of data: Future projection of data can be done using algorithms and other mathematical analysis tools. For example, a marketer will predict an increase in the sales after launching a new product with thorough analysis.

V. Quantification of qualitative entities: Identify numbers to qualitative information. For example, asking respondents of an online survey to share the likelihood of recommendation on a scale of 0-10.

1.3 Collection Methods

As quantitative data is in the form of numbers, mathematical and statistical analysis of these numbers can lead to establishing some conclusive results.

There are two main Quantitative Data Collection Methods:

I. Surveys: Traditionally, surveys were conducted using paper-based methods and have gradually evolved into online mediums. Closed-ended questions form a major part of these surveys as they are more effective in collecting quantitative data. The survey makes include answer options which they think are the most appropriate for a particular question. Surveys are integral in collecting feedback from an audience which is larger than the conventional size. A critical factor about surveys is that the responses collected should be such that they can be generalized to the entire population without significant discrepancies. On the basis of the time involved in completing surveys,

They are classified into the following:

a) Longitudinal Studies: A type of observational research in which the market researcher conducts surveys from a specific time period to another, i.e., over a considerable course of time, is called longitudinal survey. This survey is often implemented for trend analysis or studies where the primary objective is to collect and analyze a pattern in data.

b) Cross-sectional Studies: A type of observational research in which the market research conducts surveys at a particular time period across the target sample is known as cross-sectional survey. This survey type implements a questionnaire to understand a specific subject from the sample at a definite time period.

To administer a survey to collect quantitative data, the below principles are to be followed.

1. **Fundamental Levels of Measurement – Nominal, Ordinal, Interval and Ratio Scales:** There are four measurement scales which are fundamental to creating a multiple-choice question in a survey in collecting quantitative data. They

are, nominal, ordinal, interval and ratio measurement scales without the fundamentals of which, no multiple choice questions can be created.

2. **Use of Different Question Types:** To collect quantitative data, close-ended questions have to be used in a survey. They can be a mix of multiple question types including multiple-choice questions like semantic differential scale questions, rating scale questions etc. that can help collect data that can be analyzed and made sense of.

3. **Survey Distribution and Survey Data Collection:** In the above, we have seen the process of building a survey along with the survey design to collect quantitative data. Survey distribution to collect data is the other important aspect of the survey process. There are different ways of survey distribution.

   Some of the most commonly used methods are:

   - Email: Sending a survey via email is the most commonly used and most effective methods of survey distribution. You can use the QuestionPro email management feature to send out and collect survey responses.
   - Buy respondents: Another effective way to distribute a survey and collect quantitative data is to use a sample. Since the respondents are knowledgeable and also are open to participating in research studies, the responses are much higher.
   - Embed survey in a website: Embedding a survey in a website increases a high number of responses as the respondent is already in close proximity to the brand when the survey pops up.
   - Social distribution: Using social media to distribute the survey aids in collecting higher number of responses from the people that are aware of the brand.
   - QR code: QuestionPro QR codes store the URL for the survey. You can print/publish this code in magazines, on signs, business cards, or on just about any object/medium.
   - SMS survey: A quick and time effective way of conducting a survey to collect a high number of responses is the SMS survey.
   - QuestionPro app: The QuestionPro App allows to quickly circulate surveys and the responses can be collected both online and offline.
   - API integration: You can use the API integration of the QuestionPro platform for potential respondents to take your survey.

II. One-on-one Interviews: This quantitative data collection method was also traditionally conducted face-to-face but has shifted to telephonic and online platforms. Interviews offer a marketer the opportunity to gather extensive data from the participants. Quantitative interviews are immensely structured and play a key role in collecting information.

There are three major sections of these online interviews:

1. Face-to-Face Interviews: An interviewer can prepare a list of important interview questions in addition to the already asked survey questions. This way, interviewees provide exhaustive details about the topic under discussion. An interviewer can manage to bond with the interviewee on a personal level which will help him/her to collect more details about the topic due to which the responses also improve. Interviewers can also ask for an explanation from the interviewees about unclear answers.

2. Online/Telephonic Interviews: Telephone-based interviews are no more a novelty but these quantitative interviews have also moved to online mediums such as Skype or Zoom. Irrespective of the distance between the interviewer and the interviewee and their corresponding time zones, communication becomes one-click away with online interviews. In case of telephone interviews, the interview is merely a phone call away.

3. Computer Assisted Personal Interview: This is a one-on-one interview technique where the interviewer enters all the collected data directly into a laptop or any other similar device. The processing time is reduced and also the interviewers don't have to carry physical questionnaires and merely enter the answers in the laptop. All of the above quantitative data collection methods can be achieved by using surveys, questionnaires and polls.

1.4. Analysis Methods

Data collection forms a major part of the research process. This data however has to be analyzed to make sense of. There are multiple methods of analyzing quantitative data collected in surveys.

They are:

I. Cross-tabulation: Cross-tabulation is the most widely used quantitative data analysis methods. It is a preferred method since it uses a basic tabular form to

draw inferences between different data-sets in the research study. It contains data that is mutually exclusive or have some connection with each other.

II. Trend analysis: Trend analysis is a statistical analysis method that provides the ability to look at quantitative data that has been collected over a long period of time. This data analysis method helps collect feedback about data changes over time and if aims to understand the change in variables considering one variable remains unchanged.

III. MaxDiff analysis: The MaxDiff analysis is a quantitative data analysis method that is used to gauge customer preferences for a purchase and what parameters rank higher than the others in this process. In a simplistic form, this method is also called the “best-worst” method. This method is very similar to conjoint analysis but is much easier to implement and can be interchangeably used.

IV. Conjoint analysis: Like in the above method, conjoint analysis is a similar quantitative data analysis method that analyzes parameters behind a purchasing decision. This method possesses the ability to collect and analyze advanced metrics which provide an in-depth insight into purchasing decisions as well as the parameters that rank the most important.

V. TURF analysis: TURF analysis or Total Unduplicated Reach and Frequency Analysis, is a quantitative data analysis methodology that assesses the total market reach of a product or service or a mix of both. This method is used by organizations to understand the frequency and the avenues at which their messaging reaches customers and prospective customers which helps them tweak their go-to-market strategies.

VI. Gap analysis: Gap analysis uses a side-by-side matrix to depict quantitative data that helps measure the difference between expected performance and actual performance. This data analysis helps measure gaps in performance and the things that are required to be done to bridge this gap.

VII. SWOT analysis: SWOT analysis, is a quantitative data analysis methods that assigns numerical values to indicate strength, weaknesses, opportunities and threats of an organization or product or service which in turn provides a holistic picture about competition. This method helps to create effective business strategies.

VIII. Text analysis: Text analysis is an advanced statistical method where intelligent tools make sense of and quantify or fashion qualitative and open-ended data into easily understandable data. This method is used when the raw survey data is unstructured but has to be brought into a structure that makes sense.

1.5 Steps to conduct Quantitative Data Analysis

For Quantitative Data, raw information has to presented in meaningful manner using analysis methods. Quantitative data should be analyzed in order to find evidential data that would help in the research process.

I. Relate measurement scales with variables: Associate measurement scales such as Nominal, Ordinal, Interval and Ratio with the variables.This step is important to arrange the data in proper order. Data can be entered into an excel sheet to organize it in a specific format.

II. Connect descriptive statistics with data: Link descriptive statistics to encapsulate available data. It can be difficult to establish a pattern in the raw data.

Some widely used descriptive statistics are:

- Mean- An average of values for a specific variable
- Median- A midpoint of the value scale for a variable
- Mode- For a variable, the most common value
- Frequency- Number of times a particular value is observed in the scale
- Minimum and Maximum Values- Lowest and highest values for a scale
- Percentages- Format to express scores and set of values for variables

III. Decide a measurement scale: It is important to decide the measurement scale to conclude a descriptive statistic for the variable. For instance, a nominal variable score will never have a mean or median and so the descriptive statistics will correspondingly vary. Descriptive statistics suffice in situations where the results are not to be generalized to the population.

IV. Select appropriate tables to represent data and analyze collected data: After deciding on a suitable measurement scale, researchers can use a tabular format to represent data. This data can be analyzed using various techniques such as Cross-tabulation or TURF.

1.6. Quantitative Data Examples

Listed below are some examples of quantitative data that can help understand exactly what this pertains:

- I updated my phone **6 times** in a quarter.

- My teenager grew by **3 inches** last year.
- **83 people** downloaded the latest mobile application.
- My aunt lost **18 pounds** last year.
- **150 respondents** were of the opinion that the new product feature will not be successful.
- There will be **30% increase** in revenue with the inclusion of a new product.
- **500 people** attended the seminar.
- **54% people** prefer shopping online instead of going to the mall.
- She has **10 holidays** in this year.
- Product X costs **$1000**.

As you can see in the above 10 examples, there is a numerical value assigned to each parameter and this is known as, quantitative data.

1.7 Advantages of Quantitative Data

Some of advantages of quantitative data, are:

- Conduct in-depth research: Since quantitative data can be statistically analyzed, it is highly likely that the research will be detailed.
- Minimum bias: There are instances in research, where personal bias is involved which leads to incorrect results. Due to the numerical nature of quantitative data, the personal bias is reduced to a great extent.
- Accurate results: As the results obtained are objective in nature, they are extremely accurate.

1.8 Disadvantages of Quantitative Data

Some of disadvantages of quantitative data, are:

- Restricted information: Because quantitative data is not descriptive, it becomes difficult for researchers to make decisions based solely on the collected information.

- Depends on question types: Bias in results is dependent on the question types included to collect quantitative data. The researcher's knowledge of questions and the objective of research are exceedingly important while collecting quantitative data.

1.9. Differences between Quantitative and Qualitative Data

There are some stark differences between quantitative data and qualitative data. They are:

Quantitative Data	**Qualitative Data**
Associated with numbers	Associated with details
Implemented when data is numerical	Implemented when data can be segregated into well-defined groups
Collected data can be statistically analyzed	Collected data can just be observed and not evaluated
Examples: Height, Weight, Time, Price, Temperature, etc.	Examples: Scents, Appearance, Beauty, Colors, Flavors, etc.

Activity 3: Application

Task:

Mwalimu Saccoo is in a need of website, it is in that order that he would like to build a website of displaying all information and activities performed by this Mwalimu Saccoo, They have hired an expert in website development.

They have shared with the software developer a folder containing all the information which can be used in creating that website.

The website developer should analyze the qualitative and quantitative data from the information shared by the Mwalimu Saccoo to know what information to place on the website.

After brainstorming on the relevance of the information shared by Mwalimu Saccoo

Perform an analysis and review of the data in relation with the requirement given by Mwalimu Saccoo

In form small groups discuss how they will analysis and review of the data in relation with the requirement given by Mwalimu Saccoo and do the following:

1. Identify the qualitative and quantitative data from the information shared Mwalimu Saccoo in relation with the requirement.

2. Analyze the qualitative and quantitative data from the given information

3. Apply a final data set in relation with the requirement to be used by the website developer on the website.

Points to Remember

- Always strive for the customer satisfaction
- Always make sure all the data has been captured and been used accordingly
- Keep the shared data and requirement confidential

Formative Assessment

1.What is the difference between qualitative data and quantitative data

2. What are the Steps to conduct qualitative data analysis

3. What are the Steps to conduct Quantitative Data Analysis

Self Reflection

Areas of strength	Areas for improvement	Actions to be taken to improve
1. **2.**	**1.** **2.**	**1.** **2.**

Unit 3:Analyze website requirements

In the above conference room Website analyst who is standing in front with microphone is interpreting business website through identifying user interface and user experience criteria as well as identification of website development tools. Two person (a girl and boy) on the left of business analyst have computers to display business website to the clients. The clients in front of the panel one boy is having a phone together with head phone is viewing interpreted website on smart phone, the next girl having head phone to understand business interpretation but she have disability of seeing, the next boy who has a computer together with head phone is viewing interpreted website through laptop and the last one is a girl who has head phone is understanding interpretation of business websites.

Topics

3.1 Interpret website requirements

3.2 Review client's business sector

3.3 Define service to be provided to the clients

Unit Summary: This unit describes skills, knowledge and attitudes required to analyze the main website requirements, describing user interface, understanding and using website development tool and language, analyze business model and produce Website structure as well as processes, Define service to be provided to the clients, Describing Website acceptance criteria, explaining and identifying website delivery date.

Self-Assessment: Unit 3

1. Look at the illustration. What is happening? What do you think this unit will be about? What topics might be covered?

2. Fill in the self assessment below.
   There are no right or wrong ways to answer this survey. It is for your own use during this course. Think about yourself: do you think you can do this? How well? Read the statements across the top. Put a check in column that best represents your situation. At the end of this unit, we'll take this survey again.

My experience Knowledge, skills and attitudes	I don't have any experience doing this.	I know a little about this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
Identify website deliverables					
Identify User Interface and user experience criteria					
Identify Website Development Tools and Language					
Structure business model					
Identify website structure and process					
Perform website maintenance					
Explain website delivery dates					
Identify website grantee					

Topic 3.1: Analysis of Website Requirement

Key Competencies:

Knowledge	Skills	Attitudes
1. Explain website deliverables	**1.** Identify website deliverables	**1.** Be Critical Thinker
2. Describe user Interface and user experience criteria	**2.** Use user Interface and user experience criteria	**2.** Be Flexible
3. Name Website Development Tools and Language	**3.** Identify Website Development Tools and Language	**3.** Being Creative

teps :

Getting Started: What do we know and where are we going?

Task In small group , discuss about

What do they know about website?

Which link do you find between business and a website?

Activity 1: Problem Solving

Task

A shop is going to interpret website requirements of a business website for sales management system but it has the problem of identifying website deliverables, web development tools and language as well as web interface.

1. In small groups, do the following:

a. Identify website deliverable for sales management system

b. Use User interface of hotel management system

c. Identify tools and languages to use for hotel management system

Facts 3.1

1 INTRODUCTION TO WEBSITE DELIVERABLES

In web design, term deliverables refer to items that document phases of the website design process

1.1 Functional requirements

Functional requirements refers to something that is essential as system can do in web design

For instance: In sales management system it print the invoice to the customer on products being sold the cashier may need to “Add customer name” and “print invoice”. This means that it is functional requirement to the system of sales management system.

Some functional requirements in web design are:

- Authentication make

  The term Authentication this is where client for the system use username and password to gain access to the system and the system check if user name and password match to gain access to the system
- Authorization levels

  For Authorisation level if the system verifies who has the right to use the system
- Business rule

  Business rules describe the operations, definitions and constraints that apply to an organization.
- Reporting requirements

  Report is important when you analyse data this allows you to:
  a. Communicate what you do
  b. Monitor and track progress
  c. Demonstrate impact
  d. Document lesson learned.
- Transaction corrections

  Proper analysis of business transaction is very important to make a correct journal entry.
- External interfaces

  Produce interfaces that is more user friendly.

1.2 Non-functional requirements

Non-functional requirements describe how system should behave

Example:

“Modified data in a database of sales management system should be updated for all users accessing it within 2 seconds.”

Some non-functional requirements include:

- Availability
  This describe how the system will be available to all clients
  Will the system be available
- Security

This describe the protection of the system from the theft of or damages to their hardware, software.

- Capacity
  This involves the number of user to access the system
- Scalability
  This involves scale of data that the system will cover
- Environment
  This involves how the system will protect the environment
- Maintainability
  This involves maintain the security of the system.

2. USER INTERFACE AND USER EXPERIENCE CRITERIA OF BUSINESS WEBSITES

In web design user interface this is where client/user interacts with the system

2.1 COMPONENT OF USER INTERFACES

a. Text size

The main size of your body in web design is 16px(16 pixels)

b. Fonts

The main size of your font style in web design is 16px(16 pixels)

c. Styles

Example of best style in web design:

Use good illustrations and Cartoons, Good transparency

d. Format

Use good format for your website

e. Color

Use good colors for your website for interaction with clients:

Example: These are key points for considering business website color

Women don't like gray, orange, and brown.

Men don't like purple, orange, and brown.

Use blue in order to cultivate user's trust.

Yellow is for warnings.

Green is ideal for environmental and outdoor products.

3 IDENTIFICATION OF WEBSITE DEVELOPMENT TOOLS AND LANGUAGES USED IN BUSINESS WEBSITES.

Website development tools and languages must be identified properly in business website

Example:

Web development tools:

- Sublime Text,Chrome
- Developer Tools, jQuery,GitHub.Twitter Bootstrap, Angular .js, Sass.

Web languages:

- Python,JavaScript,CSS / HTML,C++,PHP,C,SQL

3.1 Language libraries

A library is a collection of data that can be accessed by a program.

Every programming language have its standard library

For example:

The C Standard Library:

The C Standard Library is a set of C built-in functions, constants and header files like <stdio.h>, <stdlib.h>, <math.h>, etc

Example:

This is a simple program that use libraries in c programming language to add two numbers

Response:

Addition of two numbers in C

```
#include<stdio.h>

int main()

{

int a, b, c;

printf("Enter two numbers to add\n");

scanf("%d%d", &a, &b);

c = a + b;

printf("Sum of the numbers = %d\n", c);

return 0;
```

This above program the library language is <stdio.h> which cause communication for the whole program means that if for instance a=2,b=3 so c as the sum of a and b this will print 5 as out put.

4 FRAMEWORKS

A web framework (WF) or web application framework (WAF) is a software framework that is designed to support the development of web applications including web services, web resources, and web APIs

4.1 Types of framework that are used in business websites

- Linear Scripting Framework

Linear Scripting Framework is a basic level test automation framework which is in the form of 'Record and Playback' in a linear fashion.

- Modular Testing Framework

In the modular testing framework, testers create test scripts on module wise by breaking down the complete application under test into smaller, independent tests. In simple words, testers divide the application into multiple modules and create test scripts individually.

- Data-driven Framework

Data-driven is a test automation framework which stores test data in a table or spread spreadsheet format. . In this framework, input values are read from data files and are stored into a variable in test scripts. Ddt (Data Driven testing) enables building both positive and negative test cases into a single test.

- Keyword Driven Testing Framework

A keyword-driven framework is a table-driven testing or action word based testing. It is a software testing method suitable for both manual and automated testing

- Hybrid Driven Testing Framework

A combination of the Data-Driven and Keyword-Driven (or Modular-Driven) frameworks is commonly said to be a Hybrid-Driven framework. For example, a combination of Page Objects, a Keyword-Driven framework, a Data-Driven framework, an object repository, and reporting listeners provides a powerful Hybrid framework

- Behavior Driven Development Testing Framework

Behavioral Driven Development (BDD) is a software development approach that has evolved from TDD (Test Driven Development). In both development approaches, tests are written ahead of the code, but in BDD, tests are more user-focused and based on the system's behavior.

4.2 Advantages of framework in business websites

services for handling email

- Get to know your email platform thoroughly.
- Schedule email-time every day, and stick with the routine.
- Close or block the email after your scheduled time.
- Declutter the inbox every day.
- Keep them sorted.

database interaction in business websites

Data obtained by interaction detection methods is stored in databases and available for analysis

Activity 2: Guided Practice

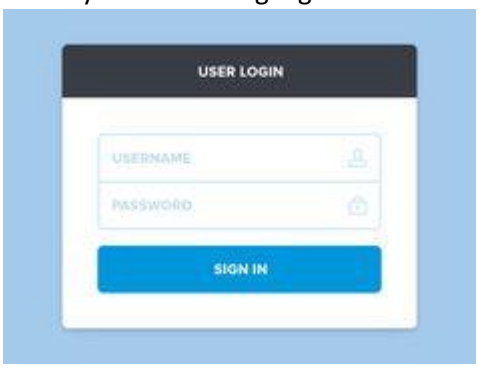
Task

A shop is going to use sales management system for selling their products

Describe functional and nonfunctional requirement, user interface and tools

In pair, do the following

1. Identify website deliverables for sales management system
2. Use User interface of hotel management system
3. Identify tools and languages to use for hotel management system



4. Identify the component of the above login user interface

Activity 3: Application

Task :

A field visit has been organised at synertech company which sells business website for the purpose of analysing its websites.

Ask trainees to do the following in pair :

1. Identify website deliverables for sales management system
2. Use user interface for e business
3. Identify Frameworks for hotel management system
4. Identify tools and languages for e business

5. Identify the component of the above login user interface

Each one will share his/her experience gained from workplace with the rest of the class

Points to Remember

- Use interface based on new technology
- Remember to use standard language and tools to the website
- Use standard deliverables

Formative Assessment

1. **What are the steps of designing good user interface**
2. **Give examples of languages for creating business websites**
3. **what is framework**
4. **Outline web development tools**
5. **Design user interface for login to the system**

Topic 3.2: Review client's business sector

Key Competencies:

Knowledge	Skills	Attitudes
1. Explain business model	1. Identify business model	1. Be Critical Thinker
2. Describe website structure and processes	2. Identify website structure and processes	2 .Be Flexible
3. Explain website maintenance	3. Perform website maintenance	3. Being Creative

Steps:

Getting Started: What do we know and where are we going?

In small group, discuss about:

1. Have you ever done any business?
2. If yes, how was it modeled?
3. Do you know how to set up a business?

Activity 1: Problem Solving

Task

Peter is the owner of 'Ikaze restaurant' is going to review client's business sector of a business website for sales management system but he has the problem of developing business model, structuring website process and performing websites maintenance.

1. In small groups, do the following task:

a) Explain website business model for sales management system for the Ikaze restaurant.
b) Describe Website structure and processes for sales management system for the Ikaze restaurant.
c) Perform Website maintenance for sales management system for the Ikaze restaurant.

2. After all groups have finished discussing, they should present to the rest of the class. (Choose an appropriate methodology).

Key Facts 3.2

1 INTRODUCTION TO BUSINESS MODEL.

In web design business model refer to a plan for the successful operation of a business, identifying sources of revenue, the intended customer base, products, and details of financing.

1.1 Clients business sector

Client business sector allows potential web design clients to decide if your business is the one they would like to work with.

1.2 Existing and similar platforms

Major existing platforms include the Apple and Android App Stores, Mozilla and Chrome browser extensions, social platforms like Facebook, Twitter, and Pinterest, as well as newer platforms that are growing rapidly (Tumblr, Snapchat, etc.).

2 WEBSITE STRUCTURE AND PROCESSES FOR BUSINESS WEBSITE

2.1 Website design lifecycle

- Gathering Information: Purpose, Main Goals, and Target Audience.

This involves gathering information that are input (Essential) to the system that is going to be developed.

- Planning: Sitemap and Wireframe Creation.

After gathering information there is planning for what the system will do system will do in terms of the business like billing invoice to sales management system.

- Design: Page Layouts, Review, and Approval Cycle.

- After planning the system you start a design based on user requirement

- Content Writing and Assembly.

Here you write content for your website as well as your blog or business website

- Coding.

Here you start to develop codes to solve problem identified through gathering information

- Testing, Review, and Launch.

At these stages you need to test the codes you have developed whether they have solved identified problem otherwise you go back to planning.

- Maintenance: Opinion Monitoring and Regular Updating.

After coding and testing you have to provide maintenance for de system you have developed.

2.2 Theme of the website

Your theme is the overall look, feel and style of your website.

This includes things like the color scheme, layout and style elements. In essence, your website theme is a direct representation of your brand and has a direct impact on your users' experience

2.2.1 Steps for choosing theme for your business website:

- Know what type of website you're building.
- Consider all costs and don't compromise pay for quality.
- Take your time.
- Look for flexibility and customization options.
- Always choose responsive.
- Know your template provider and customer support.
- Strive for SEO friendly templates.

2.3 Layout constraints

The Layout Editor uses constraints to determine the position of a UI (User Interface) element within the layout. A constraint represents a connection or alignment to another view, the parent layout, or an invisible guideline.

2.3.1 Guidelines in constraint layout

Guidelines are small visual helpers to design layouts with. Views can be aligned to a guideline which can simplify layouts, especially if you have the same margin values duplicated on a lot of elements. Other views in the layout can then constrain themselves to the guideline

2.3.2 Advantage of constraint layout

Constraint Layout. The main advantage of Constraint Layout is allows you to make large and complex layouts with a flat view hierarchy. No nested view groups like inside Relative Layout or Linear Layout etc.

You can make Responsive UI for android using Constraint Layout and its more flexible compare to Relative Layout

3 DETAILED CONTENT OF BUSINESS MODEL

Key partners.

Describes the most *important* assets required to make a *business model* work. These can be things like your office, hosting

Key activities.

Key Activities are the most important activities in executing a company's value proposition. These include your product distribution, research, and development, strategy etc. It is the most important activities in executing a company's value proposition.

Value proposition.

These include your product distribution, research, and development, strategy etc. It is the most important activities in executing a company's value proposition. What key resources do your value propositions require? Key Resources describes the most important assets required to make a business model work.

Customer relationship.

Customer relationships describes the type of relationship a company establishes with its specific customer segments. Customer relationships are driven by customer acquisition, customer retention, and boosting sales in other words you need to get, keep, and grow your customer relationships.

Customer segment.

By Customer Segments is meant the different groups of people or organizations an enterprise aims to reach and serve. Customers make the heart of any business model, and without them no company can be profitable.

Key resource.

Key resources includes Intellectual resources, such as your brand, patents, copyrights, partnerships, and customer databases. This can include recipes for those who deal with food.

Distribution channel.

A distribution channel represents a chain of businesses or intermediaries through which the final buyer purchases a good or service. Distribution channels include wholesalers, retailers, distributors, and the Internet. In a direct distribution channel, the manufacturer sells directly to the consumer.

Cost structure.

Cost structure refers to the types, relative proportions of fixed, and variable costs that a business incurs. Product, service, product line, customer, division, or geographic region can define the concept in smaller units, such as.

4 BUSINESS WEBSITE MAINTAINANCE

Website maintenance is the act of regularly checking your website for issues and mistakes and keeping it updated and relevant. This should be done on a consistent basis in order to keep your website healthy, encourage continued traffic growth, and strengthen your SEO and Google rankings.

4.1 Step guide to website maintenance

- **Thoroughly review and test the entire website (annually or after any updates).**

  Set aside time to methodically and thoroughly review all pages of the website. You may find broken links, features that do not work or areas that can use improvement. Pay special attention to overall user experience, load time, missing or outdated content, missing page titles or meta tags (content descriptions), inconsistent styles or formatting, typos or grammatical errors, features and business logic, and compliance with certain accessibility standards (if applicable) such as ADA (Americans with Disabilities Act).

- **Test your website forms/checkout process (quarterly or after any updates).**

  Make sure to regularly test all calls to action and points of contact/sale, such as “Contact Us” forms and the checkout process on your website. There is nothing worse than discovering your contact form stopped working after a website update and you lost business opportunities due to this flaw.

- **Review your KPIs, SEO (Search Engine Optimization) and analytics reports (monthly).**

In order to gauge your website's performance effectively, you must set and measure the KPIs (key performance indicators), search engine ratings and the general website analytics for at least a month. This process will indicate the effectiveness of the website and will help expose possible problems.

- **Security updates and bug fixes (monthly or as patches are released).**

Be sure that both your web developer and hosting provider update the software and install upgrades, security patches, bug fixes or any other updates that may compromise the operating system, web server, database, CMS, etc. Ideally, patches should be installed as soon as they are released. Failure to install a security patch may make your website vulnerable to an attack.

- **Renew your domain names (annually).**

Ensure that all your domain names are renewed in a timely manner. Your website's domain name is your most prized possession. Allowing it to expire can mean catastrophe.

Check backups (annually).

Be sure that your entire website is backed up the website itself and the data. Have your web developer or hosting company thoroughly check the backups to ensure they are working and that the data is retrievable.

- **Test browser compatibility (annually).**

As time passes, website layouts or technology may become incompatible with new browsers. Regularly review and test your website in various versions of mainstream browsers: Microsoft Internet Explorer, Google Chrome, Mozilla Firefox and Apple Safari.

- **Update dates and copyright notices (annually).**

Review and update any copyright dates or any date-specific text or references throughout your website. Your homepage especially should contain no stale or outdated information (e.g., a year-old press release).

- **Review contact information (annually or as needed).**

Contact information on your website should always be up to date and accurate, including team member names, addresses and phone numbers. A change in staff responsibilities may require emails to be routed to a different team member. Any real-time changes to your organization should automatically trigger you to think, “Should I update the website?”

- **Review and update legal disclaimers (annually).**

Review and update your privacy policy, site terms and conditions of use, terms of sale and any disclaimers to ensure they are compliant with policies and laws.

Just like any other business tool, your website requires regular check-ups and maintenance. Industries and organizations are ever changing and your website should match to stay on the cutting edge. With these measures in place, it is sure to run like a well-oiled machine.

2.2 Key Benefits of business website Maintenance

- **Software Updates**

Most websites today even though they are easy to edit are complex software applications. Just like the operating system on your computer, they need to be kept up to date for security and performance reasons. In WordPress websites, this means regularly updating the core software as well as any plugins and themes (there is generally at least one official WordPress update every month). When doing so, always perform a backup first. That way, if there is a hiccup, you can roll back to a working site version.

- **Security**

Most modern websites contain thousands of lines of code and depend on specific software that runs on your web-hosting server. Hackers often discover vulnerabilities in code and will attempt to take advantage of this, trolling the Internet for sites that might be suitable candidates to be exploited. You can help prevent this by keeping your web hosting server’s software, and your website’s software updated with the latest patches and security releases.

- **Fresh Content**

The content on your website should keep your readers coming back. No one wants to read the same content week after week or be looking at outdated information about an event that happened 3 months ago. If you’re not updating your website, you are essentially telling your potential customers that you are not paying attention to your

business or you may even be giving them an impression that you may be going out of business.

- **SEO**

The search engines prefer sites that are fast, error free, well maintained and most of all; they love to index fresh content. So, every time you update the website, you are giving the search engines new material with which to rank your site. You must ensure your website is regularly updated with material related to the subjects with which you want people to find your business.

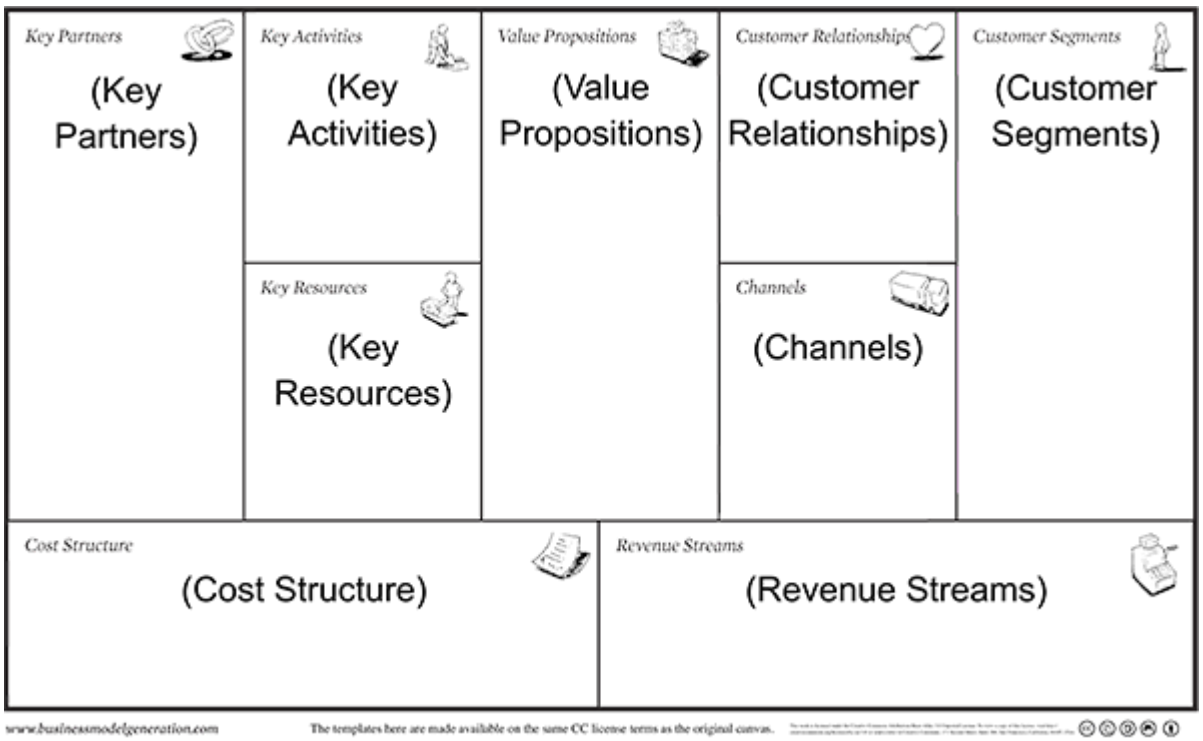
Activity 2: Guided Practice

Task

A shop is going to review client's business sector of sales management system for selling their products

In pair, do the following:

1. Structure business model of sales management system
2. Identify Website structure and processes required for website of sales management system
3. Perform website maintenance of sales management system



4. Identify the components of the above business model.

Activity 3: Application

Task :

A field visit has been organized at Synertech Company which sells business website for analyzing its websites.

In pair, do the following:

1. Structure business model for sales management system
2. identify Website structure and processes for hotel management system
3. identify website maintenance for sales management system

Points to Remember

- Always develop business model based on new business technology
- Focus on website structure and processes required while developing website
- Keep maintenance of business website every day

Formative Assessment

1. **Outline the best business model**
2. **What are the steps for website planning?**
3. **Outline steps for website development life cycle**

Topic 3.3: Define service to be provided to the clients

Key Competencies:

Knowledge	Skills	Attitudes
1. Explain Website delivery dates	1. Identify website delivery dates	1. Be Critical Thinker
2. Describe Website acceptance criteria	2. Identify Website acceptance criteria	2.Be Flexible
3. Describe website grantee	3. Identify website grantee	3.Being Creative

Steps :

Getting Started: What do we know and where are we going?

Task

In small group, observe the above picture

1. What do you see on the above photo?
2. Which methods do you think is used on the above picture for communication?
3. What is the link between the photo and the topic we have, of Interpret website

Activity 1: Problem Solving

Task

Synertech Company ltd is going to define service to be provided to the clients of a business website for inventory management but it has the problem of identifying business delivery date, Identify website acceptance criteria and identify website grantee.

1. In small groups, do the following:

a) Explain website delivery date of inventory management for Synertech company ltd.
b) Describe Website acceptance criteria of Inventory management for Synertech company ltd.
c) Describe Website grantee for inventory management of inventory management for Synertech company ltd.

2. After all groups have finished discussion, make a presentation to the rest of the class. (Choose an appropriate methodology). Other groups can give their contributions.

Key Facts 3.3

1. INTRODUCTION TO WEBSITE DELIVERY DATES

Delivery plays an important role, in any ecommerce business. A proper schedule delivery allows customer to receive the products at the time they decide. Website Scheduled delivery date for products allow customers to choose the exact time and date slot where they would like their product to be delivered.

1.1 Testing phase

In web testing there are basic steps to make app right you need to go through 6 basic steps of the testing phase:

Step 1: Functionality Testing

FUNCTIONAL TESTING is a type of software testing whereby the system is tested against the functional requirements/specifications. Functions (or features) are tested by feeding them input and examining the output. Functional testing ensures that the requirements are properly satisfied by the application.

Step 2: Usability Testing

Usability testing is a technique used in user-centered interaction design to evaluate a product by testing it on users. This can be seen as an irreplaceable usability practice, since it gives direct input on how real users use the system

Step 3: Interface Testing

Interface Testing is defined as a software testing type which verifies whether the communication between two different software systems is done correctly. A connection that integrates two components is called interface.

Step 4: Compatibility Testing

Compatibility testing is a type of software testing used to ensure compatibility of the system/application/website built with various other objects such as other web browsers, hardware platforms, users (in case if it's very specific type of requirement, such as a user who speaks and can read only a particular language)

Step 5: Performance Testing

This refer to the test of how the system will perform and performance of the system is in three types:

a) Performance testing looks to validate speed, scalability and/or stability.

b) Load testing looks to validate behavior under normal and peak load conditions.

c) Stress testing looks to validate the behavior when the application is pushed beyond normal load conditions.

Step 6: Security Testing

Security testing is a type of software testing that intends to uncover vulnerabilities of the system and determine that its data and resources are protected from possible intruders.

1.1.1 Testing Automation Tools for Software Testing

- Selenium.

Selenium is a testing framework to perform web application testing across various browsers and platforms like Windows, Mac, and Linux.

- TestingWhiz.

TestingWhiz is an automated testing tool for web and cloud applications. It is an affordable solution based on a robust FAST automation engine and is built on advanced technology which includes keyword driven and data driven techniques.

- HPE Unified Functional Testing (HP – UFT formerly QTP) .

HPE Unified Functional Testing (UFT) software, formerly known as HP QuickTest Professional (QTP), provides functional and regression test automation for software applications and environments. ... HPE Unified Functional Testing supports keyword and scripting interfaces and features a graphical user interface.

- TestComplete.

. TestComplete is a functional automated testing platform developed by SmartBear Software. TestComplete gives testers the ability to create automated tests for Microsoft Windows, Web, Android (operating system), and iOS applications.

.

- Ranorex.

.

. Ranorex is a powerful tool for test automation. It is a GUI test automation framework used for the testing of web-based, desktop, and mobile applications. Ranorex does not have its own scripting language to automate application. It uses standard programming languages such as VB.NET and C#.

.

- Sahi.

.

. Sahi is automation and testing tool for web applications. Different from many other commercial testing tools, Sahi is an open source tool. As an automation tool, Sahi provides the facility of recording and play backing of scripts.

.

- Watir.

. Watir, pronounced as water, is a group of Ruby libraries for automated web browsers. It allows writing the tests which are easy to read and maintain. In other words, it is a simple and flexible tool.

.

- Tosca Testsuite.

TOSCA is an automation tool for functional and regression testing of various software products. It also includes GUI, CLI (command line interface), integrated test management, and API. The tool was developed by TRICENTIS Technology & Consulting GmbH, the Austrian company. The tool is created in VB6, C#, and Java.

1.2 Debugging of business websites

Debugging is the process of detecting and removing of existing and potential errors (also called as 'bugs') in a software code that can cause it to behave unexpectedly or crash. To prevent incorrect operation of a software or system, debugging is used to find and resolve bugs or defects.

1.2.1 Debugging strategies

- Incremental and bottom-up program development.

One of the most effective ways to localize errors is to develop the program incrementally, and test it often, after adding each piece of code. It is highly likely that if there is an error, it occurs in the last piece of code that you wrote. With incremental program development, the last portion of code is small; the search for bugs is therefore limited to small code fragments. An added benefit is that small code increments will likely lead to few errors, so the programmer is not overwhelmed with long lists of errors.

- Instrument program to log information.

Typically, print statements are inserted. Although the printed information is effective in some cases, it can also become difficult to inspect when the volume of logged information becomes huge. In those cases, automated scripts may be needed to sift through the data and report the relevant parts in a more compact format. Visualization tools can also help understanding the printed data.

- Instrument program with assertions.

Assertions check if the program indeed maintains the properties or invariants that your code relies on. Because the program stops as soon as it an assertion fails, it's likely that the point where the program stops is much closer to the cause, and is a good indicator of what the problem is. An example of assertion checking is the repOK() function that verifies if the representation invariant holds at function boundaries. Note that checking invariants or conditions is the basis of defensive programming. The difference is that the number of checks is usually increased during debugging for those parts of the program that are suspected to contain errors.

- Use debuggers.

If a debugger is available, it can replace the manual instrumentation using print statements or assertions. Setting breakpoints in the program, stepping into and over functions, watching program expressions, and inspecting the memory contents at selected points during the execution will give all the needed run-time information without generating large, hard-to-read log files.

2. WEBSITE ACCEPTANCE CRITERIA TO BUSINESS WEBSITE

Here are a few tips that'll help you write great acceptance criteria: Keep your criteria well-defined so any member of the project team understands the idea you're trying to convey. Keep the criteria realistic and achievable. Define the minimum piece of functionality you're able to deliver and stick to it.

2.1 Agreement in business website

An offer is an open call to anyone wishing to accept the promise of the offeror and generally, is used for products and services. Acceptance occurs when an offeree agrees to be mutually bound to the terms of the contract by giving consideration, or something of value like money, to seal the deal.

2.1.1 elements of a valid contract in business website

- offer

An offer occurs when one party presents something of value that they wish to exchange for something else of value.

For instance, when a caterer wishes to create a Catering Contract with a client, the offer is the terms of the catering service, which includes the catering schedule and the cost of the service.

After an offer is presented, it can be accepted or declined. Acceptance simply means that the offer presented was accepted.

- Acceptance

Acceptance and offer go hand-in-hand, and although acceptance may seem redundant, it is an important element that ensures contracts are not formed without being properly acknowledged, agreed, and accepted.

The interesting thing about acceptance is that it doesn't need to be said or written to be conveyed; it can be determined through conduct. For instance, if I offered my neighbor 5,000 Rwf to mow my lawn and he mowed my lawn without verbally accepting my agreement, his action suggests he agreed, and I would have to pay him 5,000Rwf as promised.

- consideration
  Consideration is essentially the benefit both parties receive for performing the contract (i.e. a service for money). Oftentimes, consideration is money, but it can be a service, an object, or anything else of value. In fact, consideration can even be a right, interest, or benefit.

- mutuality of obligation

At some point, you may have heard the phrase "meeting of the minds". This phrase is typically applied to mutuality or intention and simply means all the parties involved in the contract actually intended to create a valid, enforceable contract.

In business dealings, it is often understood that the parties expected to be bound to a contract, but things can get tricky with promises formed between family and friends.

For instance, a son tells his mother that he will tile his mother's floor over the weekend in exchange for one of her old cars. After the son tiles the floor, the mother refuses to transfer the car's Bill of Sale to him.

In this example, there is a chance that the mother was joking or humoring her son when she agreed to trade her car as payment. So, although there was an accepted offer and consideration, a court may still be unsure if the mother intended to form an actual contract with her son.

- **Capacity**

Not everyone is eligible to form a contract, which is where capacity comes in. Capacity means that a person has the legal ability to sign the contract.

It can involve mental capacity, as in the ability to understand the contents of the document (i.e. a sound mind). This can include individuals with cognitive impairments, individuals who are incapacitated, and more.

This does not include individuals who fail to understand the document for no legitimate reason. For example, someone can't claim they did not have the capacity to sign a contract simply because they didn't understand a word used in the document.

- A written instrument.

  Instrument. A formal or legal written document; a document in writing, such as a deed, lease, bond, contract, or will. A writing that serves as evidence of an individual's right to collect money, such as a check.

2.2 Timeframe in business website

Time frame refers to a specified period of time in which something occurs or is planned to take place.

"the work had to be done in a time frame of fourteen working days"

2.1.1 Project timeframe

Project scheduling is a mechanism to communicate what tasks need to get done and which organizational resources will be allocated to complete those tasks in what timeframe.

A project is made up of many tasks, and each task is given a start and end (or due date), so it can be completed on time.

2.1.2 Difference between timeframe and time line in business websites

timeline is a graphical representation of sequence of events (past or future);

While

Timeframe is to analyse a sequence of events or activities.

2.1.3 Advantages of timeframe in business websites

- Motivation to Accomplish Goals

When you have a written plan and schedule, it's similar to maintaining an ongoing "to-do" list for your business. Completing and checking off the items on your plan will help motivate you and your employees to accomplish your project goals. Each item you complete represents a success for you and your business.

- Streamlines Team Communication

When you plan and schedule your projects, it also helps improve communication among your team. All members have the same guideline to follow when working so they are all on the same page. If any of your employees are confused about the process or timeline, they can simply refer to the written plan.

- Keeps Costs Under Control

A well-developed project plan and schedule also allows you to manage your project costs more efficiently. When developing the plan, you can list the estimated investment required to complete each step then calculate the total cost of the project.

- Preparation for Unexpected

Another benefit of planning and scheduling is that your small company is better prepared in case of an unexpected occurrence compared with not outlining a plan ahead of time. A thorough plan contains multiple solutions: one as the main course of action and the rest as backups to that preferred option. If the unexpected occurs, you can then default to "Plan B" and continue seamlessly throughout the project.

4. BUSINESS WEBSITE GRANTEES

A grantee is an entity receiving title to a piece of real estate. The grantee is the buyer. When the grantee sells the property, the grantee becomes the grantor.

2.2 Free maintenance

At the point of maintenance website developer give grantee to the clients like six months to provide free service to any problems of maintenance occurred in website developed then after those six months completed any cost of maintenance will be charged to the clients

4.2 content of website maintenance agreement

- Scan for vulnerabilities

Security should be the primary reason for the maintenance of the website.

- Repairs and fixes

This is all related to errors, bugs, and broken links.

- Browser compatibility testing

Ensure that all aspects of your website are functioning properly in the most common browsers.

4.3 Free training support

Normally business support website developed require training to the user of the system during the grantee agreed between client and website developer then after the period of grant any training support needed by clients is charge to the clients.

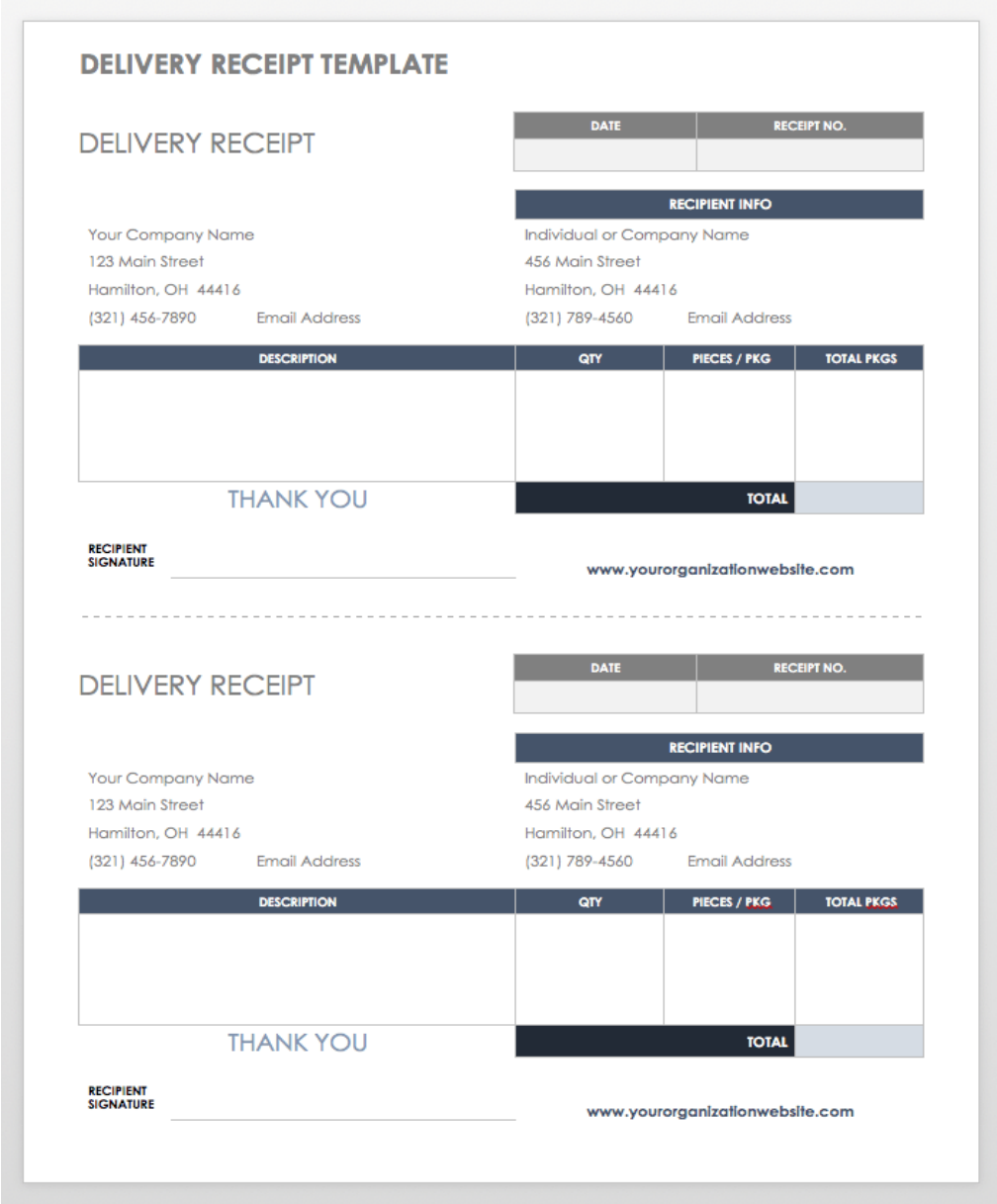
Activity 2: Guided Practice

Task

Algorithm Inc. Is going to define service to be provided to the clients of a business website for patient management system.

In pair, do the following:

1. Identify Website delivery dates required for website of patient management.
2. Identify website acceptance criteria for patient management system
3. Identify website grantee for patient management system



DELIVERY RECEIPT TEMPLATE

DELIVERY RECEIPT

DATE	RECEIPT NO.

RECIPIENT INFO
Individual or Company Name 456 Main Street Hamilton, OH 44416 (321) 789-4560 Email Address

Your Company Name
123 Main Street
Hamilton, OH 44416
(321) 456-7890 Email Address

DESCRIPTION	QTY	PIECES / PKG	TOTAL PKGS
		TOTAL	

THANK YOU

RECIPIENT SIGNATURE _____

www.yourorganizationwebsite.com

DELIVERY RECEIPT

DATE	RECEIPT NO.

RECIPIENT INFO
Individual or Company Name 456 Main Street Hamilton, OH 44416 (321) 789-4560 Email Address

Your Company Name
123 Main Street
Hamilton, OH 44416
(321) 456-7890 Email Address

DESCRIPTION	QTY	PIECES / PKG	TOTAL PKGS
		TOTAL	

THANK YOU

RECIPIENT SIGNATURE _____

www.yourorganizationwebsite.com

4. Identify the component of the above delivery template

Activity 3: Application

Task :

A field visit has been organised at Andela company which sells business website for the purpose of analysing its websites.

In pair, do the following :

1. identify website delivery date for restaurant management system
2. identify Website acceptance criteria for hotel management system
3. Identify website grantee for restaurant management system

Points to Remember

- Focus on website delivery date while delivering website
- Remember use of accepted criteria for the website developed

Formative Assessment

1. **In web application testing, Outline 6 basic steps of testing phase.**
2. **Debug the following program**

Addition of two numbers in C

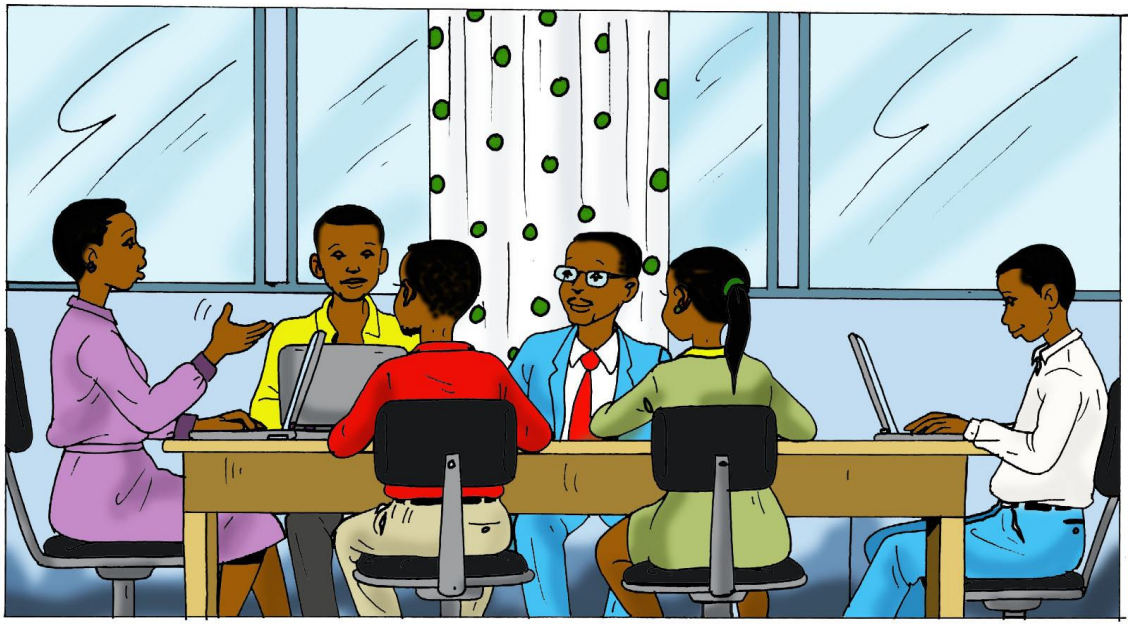
```
#include<stdio.h>
int main()
{
a, b, c;
printf("Enter two numbers to add\n");
scanf("%d%d", &a, &b);
c = a + b;
printf("Sum of the numbers = %d\n", c);
}
```

3. **Outline content of website maintenance agreement**
4. **Outline the elements of a valid contract**
5. **Differentiate between timeframe and time line in business websites**

Self Reflection

Areas of strength	Areas for improvement	Actions to be taken to improve
1. **2.**	**1.** **2.**	**1.** **2.**

Unit 4: Produce a feasibility project proposal



This illustration unit shows people in the meeting room two girls who have developed final proposal of business website ,one the right with black hair who has computer in front switched on and the desktop of that computer there is proposal format to be explained to the clients in front, another girl with white hair on the left side has a book together with switched on computer in front on its monitor there is proposal content to be explained to client that are in front there are four clients who are in front on the same table for the girls described above. three girls and one boy in front who are smiling and paying attention to understand proposal format and content

Topics

4.1 Identify website specifications and alternatives

4.2 Describe project proposal

4.3 Explain feasibility project proposal

Unit Summary: This unit describes skills, knowledge and attitudes required to explain website design timeframe and cost, describe application parameters with system hardware.

This unit describes skills, knowledge and attitudes required to explain website proposal format, describe contract proposal elaboration as well as describing project launch

Self-Assessment: Unit 4

1. Look at the illustration. What is happening? What do you think this unit will be about? What topics might be covered?

2. Fill in the self assessment below.
   There are no right or wrong ways to answer this survey. It is for your own use during this course. Think about yourself: do you think you can do this? How well? Read the statements across the top. Put a check in column that best represents your situation. At the end of this unit, we'll take this survey again.

My experience Knowledge, skills and attitudes	I don't have any experience doing this.	I know a little about this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
Estimate website design timeframe and cost					
Analyse Application parameters with system hardware					
Analyse exemption plan of business website					
Structure website proposal format					
Elaborate contract proposal					
Launch the project					

Topic 4.1: Identify website specifications and alternatives

Key Competencies:

Knowledge	Skills	Attitudes
1. Describe website design timeframe and cost 2.Explain application parameters with system hardware	1.Estimate website design timeframe and cost 2.Analyse application parameters with system hardware	1.Be Critical Thinker 2.Be Flexible

3.Describing exemption plan of business website	3.Analyse exemption plan of business website	3.Being creative

Steps :

Getting Started: What do we know and where are we going?

Task

In small group, observe the above picture

1. What do you see on the above photo?
2. Which methods do you think is used on the above picture for designing?
3. What is the link between the photo and the topic we have.

Activity 1: Problem Solving

A supermarket is going to confirm website specifications and alternatives of a business website for sales management system but it has the problem in estimation of website design timeframe and cost, confirming application parameters with system hardware

1. In small group, do the following:

a) Describe Website design timeframe and cost for sales management
b) Explain Application parameters with system hardware for sales management
c) Describing exemption plan for sales management system

2. After all groups have finished discussion, make a presentation to the rest of the class. (Choose an appropriate methodology). Other groups can give their contributions.

Key Facts 4.1

1. INTRODUCTION WEBSITE DESIGN TIMEFRAME AND COST

Normally all websites are not created equal because the serve various purposes, feature different technology, require different functionality. This means that they vary greatly in cost.

1.1 Outlining website design

Creating website outline is a very simple and is a quick pre-production step that a developer, designer or any type of person on the line can take care of.

1.1.1 General principles for a website outline

There are some basic steps you should follow in creating the website outline.
Basic steps to follow:

- Brainstorm ideas, and note them down.

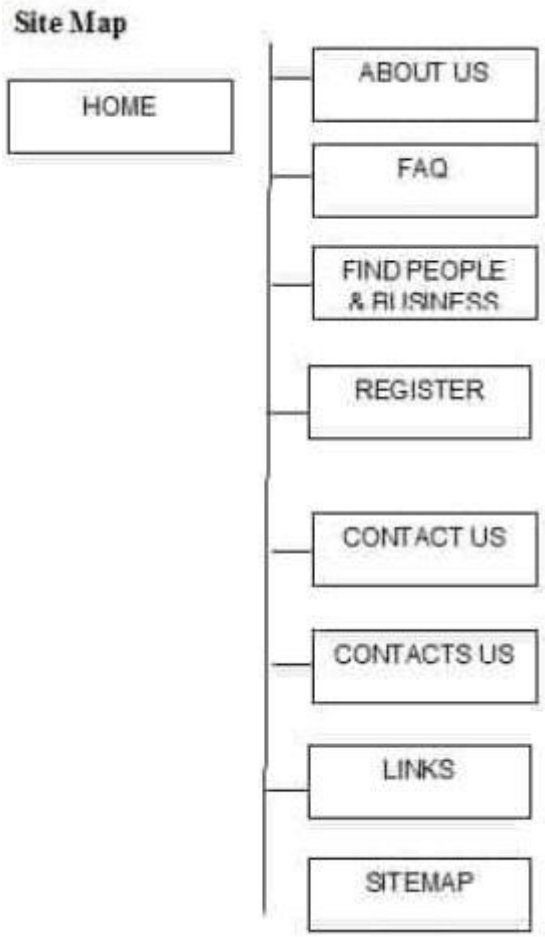
The second step involves reviewing your ideas, selecting the valid ones and analyzing them. In this phase, you should also group them by categories and subcategories. Depending on the content you're supposed to generate from them, and the correlation between the items, you should have, at this stage, a logical approach for your website outline.

- **Create a website map**

  In the first steps of drawing your website outline, you should draft a sitemap. It refers to the website information architecture.
  A sitemap shows how pages are organized in the website and on how many levels. As a best practice, you should try and restrict the number of page levels to 3. However, it's not a standard you should strictly follow, if your website content needs a more complex structure, go for it.

  Example of site map :

  This is an example of a list of sitemaps you can start from. You can choose one that suits your content, and replace the sections with your own.
  From simple sitemaps to more elaborate ones, there are many structures you can use for inspiration in the creation of your website outline.



A sitemap helps you give a definite structure to the website, and map everything out before proceeding to the actual creation of the website.
Also, a sitemap ensures all parts of the structure reinforce the purpose of the website. This way, the website outline will be the sure path to building an effective website of your own.

- Website Content Outline

A website content outline is more specific than a general website outline. It refers to mapping out content elements within a website page. It involves deciding if a call-to-action button should be placed in the menu, or a section on the company's mission should be part of the About Us page.

Once the general frame of the website has been created, you can start developing it and adding details for each page.

1. You need to think a content outline from the perspective of your company's message. It has to be clear, and it has to follow the users' website browsing the internet behavior.

2. You should base your content outline on data (data regarding warm and cold areas, heatmaps, clicks, events generation, page scrolling, etc.).In the absence of such data, you should base the content outline on your assumptions, provided you know well your audience.
3. You can test 2 or 3 variants of one page, to gather actionable data for the final version of the website.

Repeat the process for every page included in the website sitemap, then analyze the website content outline as a whole. There might be tweaks and refines you should make, before starting to actually build the website.

1.2 Setting time according to tasks

In any small business, setting goals and practicing time management techniques are two necessary elements for success. Annually, at a minimum, small business owners and managers should meet to determine the business goals for the upcoming period. The business goals that are set should be SMART–specific, measurable, attainable, realistic and timely. Time management comes into play with the measurable and timely aspects of goal setting.

1.2.1 Steps for setting time to web design project:

- Set goals the right way

  There's a right and wrong way to set goals. If you don't set your goals the right way, then you'll lack the proper targets, which will force you to fall off track. But when you set them the right way, the sky is the limit. Use the SMART goal setting method to help you see things through. And when you do set those goals, make sure you have powerful deep down meanings for wanting to achieve them.

- Find a good time management system.

  For managing your time is to find the right system to actually do it. The quadrant time-management system is probably the most effective. It splits your activities into four quadrants based on urgency and importance. Things are either urgent or important, both, or neither. Neither (quadrant 4) are the activities that you want to stay away from, but it's the not-urgent-but-important quadrant (2) that you want to focus on.

- Audit your time for seven days straight.

  Spend seven days straight assessing how you spend the time you do have right now. What are you doing? Record it in a journal or on your phone. Split this up into blocks of 30 minutes or an hour. What did you get done? Was it time wasted? Was it well spent? If you use the quadrant system, circle or log the quadrant that the activity was associated with. At the end of the seven days, tally

up all the numbers. Where did you spend the most time? Which quadrants? The results might shock you.

- Schedule email response times

  Turn off your email throughout the day. When your email is pouring in, it's easy to get distracted. Schedule time to read and respond to emails. If there's something urgent, someone will call or text you. But when you have your email open, those distractions interrupt your thought flow and it's harder to get back on track.

- Eliminate bad habits.

  One of the biggest time-wasters we have are our bad habits. Whether it's Netflix binge-watching, excessively surfing social media, playing games, going out frequently to drink with friends, or so on, and those bad habits take away the precious little time that we do have. Use your time wisely by eliminating your bad habits if you're serious about achieving big goals in life.

- Take frequent breaks when working

  One study suggests that you should work for 52 minutes and break for 17. You might not have the luxury to do that. But you should take frequent breaks. If you're an entrepreneur working for yourself, this is crucial. It's easy to run on fumes and not even know it. Keep your mental, emotional and physical states at peak levels by breaking frequently.

- Meditate or exercise every morning.

  You might not think that this will help to better manage your time, but meditating and exercising every single morning gives you balance. Cut the toxins out of your life and get serious by doing this and watch as your energy, stamina and mental focus takes a drastic shift.

- Make to-do lists in the evening for the next day

  Every single evening before bed, make a list for the next day. Look at your goals and see what you can do to help move you closer. This doesn't happen overnight. It takes time. But by making to-do lists, you're effectively setting goals for the day. Daily goals are easier to achieve while helping to move us towards the longer and bigger goals. But that happens by creating to-do lists.

- Get a mentor who can guide you.

  Finding a mentor is crucial. It's easy to get distracted and dissuaded when you don't have someone guiding you. But when you can personally rely on someone who's been through the wringer and can help you achieve your goals, it's easier

to stay on track with your time. Find a good mentor that can help you along your path.

- Turn off social media app alerts.

Incessant social media app alerts aren't helping you with your time. It's definitely hurting you. Turn them off. You don't need alerts every moment or to know everything happening with your friends. It's not important. What's most important is to have some peace of mind and be better able to focus on the task at hand.

1.3 Estimating the cost of website design

Normally the cost of web design may vary based on the functionality of designed websites and the technology that will be used to build that website.

Examples:

- Medium business web design

Medium-sized businesses can benefit from the same design strategies that help small businesses, but they may have a larger web design budget to work with more detailed items. If you run one of these businesses, you can go beyond the basics and incorporate web design elements that are more geared toward growth instead of simply establishing a presence. By incorporating growth strategies into your web design, you can show your competition that you're ready to give them a run for their money.

Estimate: $2,000 - $3,000

- Large business web design

Big businesses need websites that are designed to compete. When you operate a large business, you're duking it out with your competition on an hourly basis, and your site visitors expect a streamlined, polished experience. Money might be an object, but with your competitors constantly breathing down your neck, you need to make sure your website's design is the absolute best in the industry even if it requires you to redesign the whole site.

Estimate: $6,500 - $10,000

- Corporate web design

If you're the big man on campus, then your primary concern is to establish and maintain yourself as the industry top dog. With a web design budget that could potentially outstretch a smaller company's gross annual earnings, you can invest in the nitty-gritty details of your website on every page to make sure the design is the best it can possibly

be. Your web design should be nothing less than world class. The standard by which other companies in your industry judge themselves.

Estimate: $10,000+

2. APPLICATION PARAMETERS WITH SYSTEM HARDWARE

Application software are the software that help users of computer to perform a certain tasks while

System software is a software which control computer hardware and provide a platform for running application software.

2.1.1 A good web site speed

If your site loads in 2.9 seconds, it is faster than approximately 50% of the web. if your site loads in 1.7 seconds, it is faster than approximately 75% of the web. if your site loads in 0.8 seconds, it is faster than approximately 94% of the web.

2.1.2 A good web site response time

Average page size: 1.56MB; As you can see the location you are accessing the website plays a significant role in the response time, but the average is around 3.5 seconds. “The lower, the better” rule applies here as well, of course, but if your site is able to fully load under 2 seconds, that is a great result.

2.1.3 A good web site availability

Website availability (also call website uptime) refers to the ability of the users to access and use a website or web service. A website's availability is typically communicated as a percentage for a given span of time. There website must be available all the time when user need access to the system.

2.1.4 A good website portability

Portability is a characteristic attributed to a computer program if it can be used in an operating systems other than the one in which it was created without requiring major rework. Porting is the task of doing any work necessary to make the computer program run in the new environment. A website must be able to run in different devices with different operating system.

2.1.5 A good digital footprint

A digital footprint is your online identity and individuality and is what makes you unique. It is builds the online reputation, or impression depending on the things you do online. It is important to be aware of it because anything posted online is permanent and stays there forever regardless of being deleted.

3. EXEMPTION PLAN OF BUSINESS WEBSITE

This plan involves for the website users as well as the availability of the system

3.1 Capacity of business website

The Performance is based on more human work, and the capacity is based on especial the one on the web, and then you actually need to spend more time to the .You (or the business) needs to specify the expected server

This means that the average user on your website will click approximately once every 2 minutes (every 114 seconds). This number can vary a lot, but for E-commerce the rule of thumb is once per minute.

If a website developed for maximum capacity of three users it will be a big problem if the user of the system increased to a hundred users which will lead to crush of the system.

3.2 Availability of website

Website availability (also call website uptime) refers to the ability of the users to access and use a website or web service. A website's availability is typically communicated as a percentage for a given span of time.

This means that if the users of the system overloaded the system capacity to serve uses decrease.

Activity 2: Guided Practice

Task:

A supermarket is going to confirm website specifications and alternatives of a business website for sales management system

In small group, do the following:

1. Estimate website design timeframe and cost for sales management system
2. Analyse application parameters with system hardware for sales management system
3. Analyse exemption plan for sales management system

4. Identify the design of the above home page for sales management system

Activity 3: Application

A field visit organised to Rwamagana hospital for its website of patient management system

In Small group, do the following :

1. Estimate website design timeframe and cost for patient management system
2. Analyse application parameters with system hardware for patient management system
3. Analyse exemption plan for patient management system

Tell trainees that each one will share his/her experience gained from workplace with the rest of the class

Points to Remember

- Use standard design
- Confirm application with high speed at lower cost
- Low response time to application

Formative Assessment

1. On the example bellow of Website Outline for Ecommerce discuss the purpose of home page:

- **Home Page**
- **Products List**
    - ✓ Product Categories
    - ✓ Products
    - ✓ Checkout pages
- **Services**
    - ✓ Shipping
- **About Us**
- **Contact**
- Terms of service and privacy policy
-

2. What do you understand by software and hardware compatibility?

3. Outline web design process

Topic 4.2: Adjust the proposal

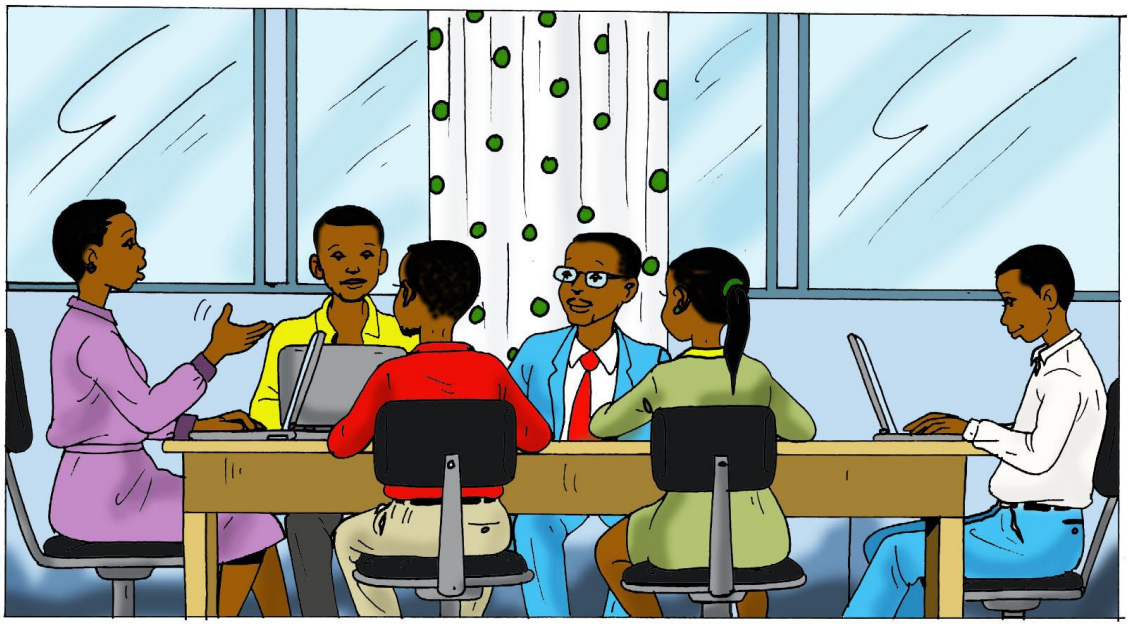
Key Competencies:

Knowledge	Skills	Attitudes
1. Explain website proposal format	1. Structure website proposal format	1. Be Critical Thinker
2. Describe contract proposal	2. Elaborate contract proposal	2.Be Flexible
3.Describe process for project launch	3.Launch the project	3.Being creative

Steps :

Getting Started: What do we know and where are we going?

Task



In small group, observe the photo above and discuss about:

1. What do you see on the above photo?
2. What methods do you think used on the above picture for explaining proposal format?
3. What is the link between the photo and the topic we have of Adjust the proposal

Activity 1: Problem Solving

Task

A supermarket is going to adjust the proposal of a business website for sales management system but it has the problem of developing website proposal format, contract proposal elaboration as well as the problem of launching project.

1. In small group, discuss the following:

a. Explain Website proposal format for sales management system of supermarket
b. Describe contract proposal for sales management system of supermarket
c. Describe process for launching the project for sales management

2. After all groups have finished discussion, make a presentation to the rest of the class. (Choose an appropriate methodology). Other groups can give their contributions.

Key Facts 4.2

1. BUSINESS WEBSITE PROPOSAL ELABORATION

A proposal is a common request from companies and individuals looking for website design services. A web design proposal isn't just a breakdown of costs or estimate of work (although some of that information is included). A proposal is a common request from companies and individuals looking for website design services.

1.1 Proposal format of business websites.

The following are the format of website proposal:

- Start with a firm introduction. This should start out with a hook.

To introduce a firm we do the following:

Step 1:

Start with a bang. Open with a sentence that grabs interest and establishes a reason to keep reading.

Step 2:

Introduce yourself in terms that matter to the person to whom you're writing.

Step 3:

Tell the prospect what you can do for him or her.

Step 4:

Keep your letter short.

Step 5:

Make a clear point.

Step 6:

Edit and proofread.

Step 7:

Sign your letter.

- State the problem. After the introduction, you'll get into the body, the meat of your work.

A problem statement is usually one or two sentences to explain the problem your process improvement project will address. In general, a problem statement will outline the negative points of the current situation and explain why this matters.

- Propose solutions.

  Proposed Solution. Having hooked your audience into the problem, now you want to paint a picture of what the world will be like when you solve the problem. Your proposed solution should relate the current situation to a desired result and describe the benefits that will accrue when the desired result is achieved.

- Include a schedule and budget.

  The following are steps for writing a budget for project proposal

Step 1: Build a Gantt Chart.

Step 2: Add Person-Days Per Company.

Step 3: Estimate Labour Costs.

Step 4: Add Subcontracting and Travel Costs.

Step 5: Bring It All Together.

- Wrap up with a conclusion.

The following are steps for writing a conclusion for a proposal

Writing a Basic Conclusion:

Restate the topic. You should briefly restate the topic as well as explaining why it is important.

Restate your thesis.

Briefly summarize your main points.

Add the points up.

Make a call to action when appropriate.

Answer the “so what” question.

- Edit your work.

  At this point you have to edit your work you have done by correcting where an error can occur in business website proposal

- Proofread your work.

Proofreading is the process of reviewing the final draft of a piece of writing to ensure consistency and accuracy in grammar, spelling, punctuation, and formatting.

1.2 Content of business website proposal

- A Hook.

A good business proposal should catch the reader's attention and then make them want to read more.

- A Problem.

is item is important in a business proposal, because it discusses the whole reason they ed to seek your services.

- A Plan.
- Your Qualifications.
- Costs.

1.3 Text Size of business website proposal

The proposal must be clear, readily legible, and conform to the following four requirements: (1) an Arial, Courier New or Palatino Linotype at a font size of 10 points or larger, Times New Roman at a font size of 11 points or larger; or Computer Modern family of fonts at a font size of 11 points or larger must be used

1.4 Text Font of business website proposal

Most people agree that a simple Arial Black or Verdana as a font for headings will give your proposal a clean and professional look.

2. CONTRACT PROPOSAL ELABORATION IN BUSINESS WEBSITE

Is a proposal a legal contract is a question that can be answered by determining the elements of a contract and a proposal. Contracts are written documents that contain offer(s) that are legally binding, an acceptance of said offer(s), and value/consideration to be provided.

Unlike an offer, a proposal is not a promise or commitment but, if accepted by the other party, its proposer is expected to follow through and negotiate for the creation of a binding contract. A proposal can turn into a legally-binding contract, but the language of the contract doesn't have to read like a proposal.

2.1 Elements of valid contract to the business website

- An offer.

  An offer is explicit proposal to contract which, if accepted, completes the contract and binds both the person that made the offer and the person accepting the offer to the terms of the contract.

- An acceptance.

  Acceptance must be given by the person to whom the proposal is made:
  An acceptance to be valid must be given only by a person to whom offer has been given. In other words, acceptance must move from the offeree and no one else.

- An intention to create a legal relationship.

  Intention to create legal relations is defined as an intention to enter a legally binding agreement or contract. Intention to create legal relations is one of the necessary elements in formation of a contract. If there is no agreement by both of the parties, it may make the contact being a void agreement.

- A consideration (usually money).

Consideration is a benefit which must be bargained for between the parties, and is the essential reason for a party entering into a contract. In a contract, one consideration (thing given) is exchanged for another consideration.

2. PROJECT LAUNCH IN BUSINESS WEBSITE

A project's destiny is set very early, often before the project even starts. A properly run project launch is the first opportunity when all of the key project stakeholders are gathered and can identify and correct issues

2.1 consideration in project launch to the business website

- Stop aiming for perfection. When launching a new business, it's natural to want everything to go smoothly.
- Build a support system.
- Think about the long term, not just day to day.
- Grow your skills
- Start small.

2.2 steps for launching a new website project

- **Start your web development project**

Entrepreneurs are becoming increasingly aware of how important their online presence is to the future their business.

Technology and online marketing are evolving so fast that you may be losing business because your website doesn't support the features that customers—or search engines—want.

- **Build the foundation**

Just like an engineer wouldn't start a building without blueprints, you must have a plan that sets out must-haves and nice-to-haves. Often there is a wish list from different stakeholders that can inflate budgets, create scope creep and delay launch without necessarily supporting your business objectives.

- **Find the right partner**

Once you have the requirements documented there are lots of options on how to develop the new website. You can buy an out-of-the-box solution with a monthly fee; use a freelance web developer; or hire a full-service web agency.

- **Manage your web development project**

Once you have identified the right firm, make sure to sign a contract that includes your build requirements and milestones with specific dates. Once the project starts, supervise the process because there will always be unexpected things that occur. If you're involved, they won't come out of the blue.

One area where a lot of entrepreneurs get stuck is writing. That's why we highly recommend using a professional copywriter for content creation. Legal and tax considerations, back office systems, domain name, etc. are other elements that can become show stoppers if not flagged early and dealt with.

- **Track your progress and celebrate your new website**

Make sure you understand what you're reviewing at each phase so you can sign off on the deliverables (as defined in the build requirements document) with confidence.

Also, make sure you track any bugs with your web partner and confirm an analytics solution is in place from day one to measure your performance. If it's an e-commerce website test every step of the ordering process to ensure a smooth client experience and optimal sale conversion.

Activity 2: Guided Practice

Task

Ndoli supermarket is going to adjust the proposal of a business website for sales management system.

In small group, do the following:

1. Structure website proposal format for sales management system of Ndoli supermarket
2. Elaborate contract proposal for sales management system of Ndoli supermarket
3. Launch the project for sales management system of Ndoli super market

4. Complete the following contract proposal template

Contractor Proposal

Date: ____/____/_____

Submitted To: _____ of Company: _____

City, State, ZIP: _____

Good Until: ____/____/_____ Job: Name / Number: _____

Date of Plans: ____/____/_____ Approximate Start Date: ____/____/_____

Architect: _____ Approximate End Date: ____/____/_____ we

hereby submit the following specifications and estimates for:

_____

_____

Alternates:

_____

_____ This

proposal does not include:

_____

We propose to furnish material and labor to complete the above specifications, for the sum of:

Rwf_____

Payments are to be made as follows: _____

Contractor's Signature: _____

Acceptance of Proposal: The above price, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as listed above.

Owner's Signature: _____Date: _____

Activity 3: Application

Task :

After going to field visit of Simba supermarket for its ajustements of website for sales management system

In Small group, do the following :

1. Structure website proposal format for website for sales management system of Simba supermarket
2. Elaborate contract proposal for sales management system of Simba supermarket
3. Launch the project for sales management system of Simba supermarket

Tell trainees that each one will share his/her experience gained from workplace with the rest of the class

Points to Remember

- Use standard format
- Include required all required information in content
- Develop proposal draft that meet with website user requirements

Formative Assessment

1. How can I write proposal?

2. Explain Text Size of business website proposal

3. Explain Text Font of business website proposa

Self Reflection

Areas of strength	Areas for improvement	Actions to be taken to improve
1. **2.**	**1.** **2.**	**1.** **2.**

Summative Assessment

Integrated situation **Resources**

Eden Hotel is a well reputed facility which host international and governmental meetings and provides accommodation of both locals and abroad visitors. Located in Gasabo District, this hotel delivers several services including entertainment services, swimming pool services, fitness and spa services, restaurants and bars.

Currently, Eden Hotel doesn't have an efficient way to communicate with the customers which results into lack of efficient service delivery

In terms of solving customer's complaints. The hotel is looking for a website analyst to analyze the hotel's business requirements to facilitate developers in designing a website which is going to advertise hotel services and expand their information to the global market.

From the above information provided you are required to:

- Contact director manager to acquire detailed information about the project
- Prepare a website business requirement proposal needed to develop Eden Hotel website by identifying:
  - ➢ Hotel's services and activities
  - ➢ Website design tools
  - ✓ Design language
  - ✓ Frameworks
  - ➢ Timeframe for the website design and implementation
  - ➢ Cost estimation
- Present the draft of proposal to the manager for approval

Note: Timing

Assessment Criterion 1: Quality of Process

Check list	Score	
	Yes	No
Indicator: Requirement processes are identified		
✓ Feasibility study		
✓ Requirement gathering		
✓ Requirements specification		
✓ Requirements validation		
Indicator: Outlined information are identified		
Indicator: Proposed business requirements are discussed		
✓ Business sector		
✓ Sample business plans		
Indicator: Website deliverables are interpreted		
✓ Functional requirements		
✓ Non-functional requirements		
Indicator: Development tools and languages are identified		
✓		
Indicator: Business model is reviewed		
✓ Design lifecycle		
✓ Themes		
✓ Layouts		
Indicator: Website acceptance criteria are defined		
✓ Agreement		
✓ Delivery		
✓ Timeframe		
Indicator: Detailed website specifications are confirmed		
✓ Compatibility with system hardware		
Indicator: Detailed alternative solutions are confirmed		
✓ Website design tasks are outlined		
✓ Timeframe for the website design is estimated		

Cost of website design is estimated		
Indicator Final proposal copy is elaborated		
✓ Proposal format is adjusted to meet requirements		
Observation		

Assessment Criterion 2: Quality of product

	Yes	No
Indicator: Website business requirements is analyzed		
✓ Input and output data are defined		
✓ Website feasibility is clarified		
✓ Website scope is defined		
Indicator: Proposal is developed		
✓ Technical documentation is Written		
✓ Content format and styles are applied		
Observation		

Assessment Criterion 3: Relevance

Check list	**Score**	
	Yes	**No**
Indicator: Website proposal is developed		
✓ The final website proposal		
Indicator: Time is respected		
✓ The work is done in given time		
Observation		