SOFTWARE ENGINEERING

-ASSIGNMENT 1-

INDEX NO : ICT/22/908

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COURSE NO : ITC 1052

Content:

Question 01

FEASIBILITY ASSESSMENT

-ONLINE BANKING APPLICATION-

1). Functional Feasibility;

1.1 User login

This feature used by the user to login into system. Users are required to enter user Id and Password before they are allowed to enter the system. The user ID and Password will be verified and if the ID is invalid the user is not allowed to enter the system.

Functional Requirements

-User ID must be provide with the user register.

-The system must only allow user with a valid ID and password to enter the system

-The user must be able to logout after they finished using system.

1.2 Account Management;

Allowing users to create, update, close account;

This aspect assesses whether it is technically possible to provide users with the ability to perform actions such as creating new bank account, updating their existing account information's (e.g., contact details), or closing accounts.

Functional Requirements

-user can do changes their account any time

-ensuring the security and privacy of user data during the verification process of crucial.

1.3 Balance in query;

In summary the feasibility of providing real time account balance information and ensuring data accuracy and security in an online banking application is complex undertake.

Functional Requirements

-providing real time account balance information

-Ensuring data accuracy and security

1.4 Fund transfers;

Enabling transfers between user Accounts and External accounts;

This aspect assesses whether it is technically possible to enable fund transfers between user accounts within the same bank and external accounts held in other financial institutions.

Verification of transition security and confirmation:

Transitions are conducted securely by using encryption and secure communication channels to protect data during transfer.

Functional Requirements

-user must be required to authenticate themselves securely before initiating any transaction.

-the application must use secure communication protocols (HTTPS) to encrypt data during transmission, preventing interception or tampering.

1.5 Loan and credit applications;

This involve individuals or businesses submitting applications to financial institutons for loans or credit. The process includes documentation review, credit checks, risk assessment, interest rate determination approval or denial and ongoing monitoring.

Functional Requirements

-user must have the ability to submit loan an credit applications

-Should be possible for users to set up accounts using their personal data's

-should permit users to upload proof of identity and supporting documents like tax returns and income statements.

1.6 Account Statements and Reports;

Generating account statements and financial reports is feasible with modern digital tools, and customization options

Are available to tailor these reports to specific preferences. Users can choose the data range, accounts to include, transaction categories, graphical representation, and formatting.

Functional Requirements

-System should be possible for the system to gather and compile financial information from numerous sources, including bank accounts, investment accounts, and credit cards.

-The system should generate clear and comprehensive reports based on user-defined criteria.

2). Technical Feasibility;

Nowadays, very advanced communication methods are used in the banking industry in the world. When a person tries to access an account in a certain country, The user id and password are first taken from him. If those things are forgotten, advanced methods are used to retrieve it safety.

In today's digital financial environment, an application for managing online banking must be technically feasible. The application needs strong infrastructure that can handle rising user loads and transactions volumes in order to be successfully.

Sensitive financial data is protected by strict security controls, including authentication process and encryption. Implementing data backup and recovery system is must to reduce risks, as is compliance with pertinent laws and industry standards. For clients to have positive experience, seamless connection with other systems,

cross-platforms interoperability, and an intuitive interface and necessary. To ensure dependability and cost-effectiveness, through cost analysis and performance testing are required.

HARDWARE AND SOFTWARE REQUIREMENTS;

Hardware requirements:

Processor: Intel core i5 10^{th} gen processor

RAM :8GB

Display: color Display

Motherboard: GIGABYTE Z390 AORUS PRO, MSI H310M PRO-VDH PLUS supported motherboard.

Software requirements:

OS: Windows 8,9,10,11, Linux, Android, IOS

CMS : Word press

Front-End: HTML, CSS, Java script

Back-End: Web server, MYSQL, PHP

3). Financial Feasibility;

With the features described above (functional and non-functional) the cost of implementing this system as follows.

Cost	Amount (LKR)
System development (coding & testing)	200,000
Hardware implementation	150,000
Computers	500,000
web hosting service	50,000
Other system components	25,000
Total cost	925,000

When we considering the topic of financial feasibility, the following topics are affected.

- Developing and maintenance Costs
- Revenue Streams
- Market size and Competition
- Security investments
- Technology trends
- Financial Projections
- Risk Assessments
- User acquisition and Retention

❖What will be the annual cost of operation the system?

Annual cost	Amount (LKR)
Software maintenance	40,000
System backup	30,000
Update the system(monthly)	15,000
Other things	2500
Total amount of cost	87,500

Do we have the financial resources needed to implement the project been found?

We have internal & External financial resources to implement the project successfully.
Our internal financial resources include profits generated from business, retained earnings capital funds. While our external financial resources include our debt and sources or credits.

4). Operational Feasibility;

Operational feasibility is the degree to which a proposed system meets the criteria found in the requirements analysis phase of the project, solves issues, and possibilities discovered during scope definition.

Under operational feasibility the factors related to the process of the system considered.

- **Technology Infrastructure** → considered under the technical infrastructure, the required infrastructure, data storage facilities,

security measures, protocols are must be verified to be working properly.

- **Scalability** → Cheak to see if the program can handle an increased in users and transactions as the clientele grows. Scalability is essential for avoiding performance problems.

- **Cost analysis** → Analyzed the expenses associated with the creation, deployment and continuing upkeep of application. This involves both upfront and ongoing expenses.

- **User acceptance and Experience** → user acceptance and experiences are critical aspects of any digital application, including online banking application.

- **Regulatory compliance** → Ensure that the application compliance with financial regulations, data protections laws and industry standards as non-compliance can lead to legal issues.

The effective management, operation, and upkeep of Library systems depends on the establishment of procedural rules and regulations and the legalization of registration activities.

The accuracy of the information contained in the civil record is enhanced and registration completeness is ensured in part by legislation.

5). Organizational Feasibility;

An online banking application's organizational viability is determined by determining whether the organization is prepared to create Introduce and maintain the application.

6. Human Resource Feasibility:

Due to the service-based nature of the banking business, HRM has become increasingly crucial in the field of banking. The most significant issues facing the banking industry at any given time are the management of people within the company and the managing of financial and economic risks on a larger scale.

We have all the human resources required to develop the proposed system as shown below.

- Board of Directors
- Product managers
- Engineering managers
- Software architects
- Software developers
- UX/UI designers
- Business analysts
- Scrum master
- Testers
- Team leaders

Question 02

SRS

-ONLINE BANKING APPLICATION-

Created by : RANAWAKA.S.D

Index No : ICT/22/908

Date : 15/10/2023

Table of Content

1 . Introduction

1.1 Purpose

This SRS document will provide a complete understanding of the requirements for developing an Online Banking Application. Therefore, proper software can be developed for the end user and due to LMS and its good Knowledge the functionality will be used to develop later stages of the project.

1.2 Document Conventions

Primary fonts **:** Calibri (Body)

(Font size = 16)

Main Headings **:** Bold text with Calibri (Body)

(Font size = 22)

Sub Headings **:** Bold text with Calibri (Body)

(Font size = 18)

Main topics **:** Franklin Gothic Medium

(Font size=48)

Other text's **:** Normal black font

(Font size = 12)

1.3 Intended Audience and Reading suggestions

This SRS document has been created to show the complete functionality of the online banking application. This is used for software developers, testers, bank staff and other users.

1.4 Product Scope

An online banking software called “product Scope” gives customers access to a verity of financial services. Customers can use it to pay bills, transfers money, check balances, view transactions history, manage their accounts and set up automatic payments. The program has a user-friendly layout for a smooth banking experience and places ahigh priority on security with robust authentication procedures.

1.5 References

Template for this SRS is based on IEEE 830, and ISO/IEC/IEEE 29148

- Fundamentals of software engineering by John A McDermid
- Report of online banking system of ONLINE BANKING SYSTEM (https://www.scribd.com/doc/80911858/REPORT-OF-ONLINE-BANKING-SYSTEM)
- Fundamentals of Database System by Elmasri
- Software engineering seventh edition Lan sommerville
- Wark,R 2008, Online bankers
- http://www.wikipedia.com

2 . Overall description

2.1 Product perspective

An online banking application system is a system that operates automatically without being subject to anyone's actions. The system responds instantly to the inputs given by the users.

In general, due to the various problems in the current system, the system has been improved as an online banking application. There the user can access the system and perform various activities such as checking the balance, withdraw money, depositing money, exchanging money and paying different types of bills.

2.2 Product Functions

This section involves the final system as well as how user will it use summarize the major functions the product must perform must let us user perform.

- This first section deals with the functioning's of the administrative staff of the system.

I. Accessing system settings
II. Transition Monitoring and Verification
III. Send monthly reports
IV. Customer support and Issue Resolution
V. Send broadcast messages/ mails
VI. User access Permissions
VII. Adding and Remove user from system
VIII. Report analysis

- This first section deals with the functioning's of the technical support of the system.

I. Send monthly reports
II. Maintain the system and checking
III. Update accounts

- This first section deals with the functioning's of the (Member's) users of the system.

I. Create the account
II. Checking the balance
III. Deposit money
IV. Withdraw money
V. Pay some kind of bills
VI. Search transaction history
VII. Change the profile settings

2.3 User Classes and Characteristics

There are different kinds of user Classes and Characteristics are in Online Banking application. Some of them are described given below

1) **. Registed peoples**
They already have a bank account and the bank depends of them. They can be called a group within the system.

2) . Unregisted peoples

They do not currently have a bank account. They can be called as outsiders; they do contact work from outside regarding the system.

3) . Bank Staff

Bank staff main purpose is helping to users their account managements and operating some processes.

4) . Director

Supervises the functioning of the system completely and various problems are discussed with the staff and necessary action is taken.

5) . Administration's

The maintenance related to the system is handled. There the work related to the support accounts for the users is done.

System administrators must to be more knowledgeable about the core components of the system and capable of resolving little issues brought on by power outages, disc crashes and other mishaps.

2.4 Operating Environment

Accessibility, security and functionality for users on a verity of platforms and devices are ensured by the operating environment of an Online Banking Application, which includes compatibility systems, browers,internet connectivity,security measures,hardware requirements ,regulatory compliance and many more things.

2.5 Design and Implementation Constraints

- User should be able to change their password and User IDs at any time.
- The system should be easy to use regardless so when users access the system.

- There should be some limit in the activities performed by the users in the system. only the admin's have the opportunity to work outside that limit.
- All the information's of system's services are displayed the application and users can take their information's quickly.
- Users may access from any computer that has an active internet connection with browsing capabilities.

2.6 User Documentation

Today in banking, people are not engaged in banking activities through maintaining account books as in the past. Instead, internet banking methods have been introduced. today this extremely popular all over the world. Updating account,deposite the money, withdraw the money activities as well as verification thought various methods should be performed. Also, users should be advised how to protect their data. With the help of this detailed documentation, customers can feel more empowered and secure in their ability to handle their funds within the online Banking System while complying with legal and regulatory requirements.

2.7 Assumptions and Dependencies

Assumptions are -

- The online banking system should be running 24 hours.
- The system should be belief that two-factor authentication biometric authentication, and usernames and passwords are examples of user authentication techniques.
- The system should be able to store more data capacity to offer quick database access.
- The system should provide search facility of and support quickly transactions.

Dependencies are –

- To manage consumer data and transactions, these applications need a strong server architecture.
- For users to view account details, make transitions access their accounts, the user interface is necessary.
- The information of all the users must be stored in a database that is accessible by the Library System.
- No power failures
- No network failures

3 . External Interface Requirements

3.1 User Interfaces

He system provides a sophisticated platform for the user to enter their account information as well as log into their account. If a user enters incorrect account information i.e., wrong username or wrong password, an error will pop up indicating that they have entered incorrect information. If the online banking application has a new user who wants to register and wants to become a member, they can simply sign up. If a user does not remember their password, they can retrieve their password after answering a security question.

3.2 Hardware Interfaces

Consider the above topic, this application should run successfully on various platforms.

	Mobile	Pc
Memory	512 MB	1GB
Storage	1 GB	2 GB
Network	Broadeband internet connection	Broadeband internet connection
Processor	Intel Dule core 1.8GH_z /AMD Rysen 3 or higher	200 MH_z Processor, ARMv5 or Higher
Input Method	Touch screen/Buttons	Keyboard/mouse/Buttons
Display	LED,LCD,OLED	LED,LCD,OLED

3.3 . Software Interfaces

Need to development –

- OS (Windows 7,8,9,10,11)
- HTML, CSS and Asp.net, C#
- Visual Studio
- Printer
- LAN connectivity (Access to internet)

3.4 . Communications Interfaces

A user's access to managing their financial operations is through the communication interface of an online banking application. It usually has features like transaction's histories, bill payment choices, secure messaging account s summarize and access to support services. It can also facilitate financial transfers. A flawless banking experience requires a responsive, secure, and user-friendly interface.

4 . System Features

4.1 . User Login

Users must enter the usernames and passwords before entering the system. After checking its validity, the user is entered into the system. This way an unauthorized person has not access to the system.

FUNCTIONAL REQUIREMENTS

-user must enter the usernames and passwords before entering the system.

-The system must only allow user with valid ID and Password.

-The user must be able to log out the system after finished use the system.

4.2 .Create Account

The user must have an account to access the system and perform its functions'. He does not have an account should be able to create the new account.

FUNCTIONAL REQUIREMENTS

-user must have an account before access the system.

-The system must be able to verify the information's.

4.3 . Check the balance

Users are entering their accounts they should be able to check their current balance.

FUNCTIONAL REQUIREMENTS

-System must be able to display current balance of each user when their request to it.

-

4.4 .Deposit money

After logging into the system users deposit money into their accounts.

FUNCTIONAL REQUIREMENTS

-System should reject when users enter a value lower than the minimum allowable value users should be able to adjust the amount of it is entered incorrectly.

4.4 . Withdraw money

After logging into system users are withdraw some money in their accounts.

FUNCTIONAL REQUIREMENTS

-The system should limit the amount of money that can be taken at one time

-The account must have more money that the amount entered by the user and entered value is incorrectly request must be reject

4.5 . Pay different type of bills

Different types of bills can be paid through the user accounts.

FUNCTIONAL REQUIREMENTS

-Users should be able to paid different types of bills through their accounts

5 . Other Nonfunctional Requirements

5.1 Performance Requirements

An online banking application must be quick, able to manage multiple users concurrently and data secure. When more people sigh up, it ought to grow smoothy without becoming a slower. Encryption and other security measures shouldn't cause transaction's delays. To keep it functioning properly and identify issues early on, regular monitoring and maintenance are required.

5.2 . Safety Requirements

The data in the database may be destroyed due to the interface of various external parties.therefore,strategies should be applied to protect the data.

5.3 . Security Requirements

- The system should store the data in the database very securely.
- Customers should be able to change their accounts details only up to a certain limit It should not possible to change other details in the system.
- Strict security measures should be applied so that outside parties cannot back the system.
- The admins and members are having separate accounts. Members should not be able to access the database only the admin should have the authority to make changes to the database.

5.4 . Software quality attributes

5.4.1. Reliability

An online banking application is a platform that stores a large amount of sensitive data of users. It is the responsibility of the system to protect it without giving outside.

5.4.2. Maintainability

Different versions of the product should be easy to maintain, the system should adapt to updates made in the system over time.

5.4.3. Usability

This application should handle easily and user friendly. Provide the service fast and accurately to users. Also, the new users are easy to understand to use the system.

5.4.4. Correctness

Both the navigations and internal computations made by the applications must be accurately as well as its functionality. This indicates Functional requirements must be met by application.

5.5.5. Durability

This system will be connect with database properly.

5.5.6. Business Rules

For online banking application apps to function securely and effectively, business rules are crucial. Regulations compliance, interest calculation bill payments, cash transfers, sessions time out, customer assistance and user authentication are just a few of topics they mentioned. In addition, the adherence to banking laws and regulations, these guidelines aid in safeguarding user data and ensuring the system runs smoothly.

6. Other Requirements

There are specific tasks for each person in this application. According to the person connecting with the system, the tasks that he can and cannot are separate.

Online banking Application must provide a,

- User-Friendly interface
- Secure communication
- Mobile accessibility
- Integrate customer support
- Categorize transactions
- Compliance with regulations
- Scalability...etc.

A complete online banking application that satisfies user expectations and safely and effectively must adhere to these specifications.

Appendix A: Glossary

SRS: software requirements specification-A document that outlines the functions and performance standards of the software.

User: use to system any time.

Administration: Maintain the system and control.

HTML, CSS, C#: Those are web developing platforms.

Layer: Represents a specific session on application

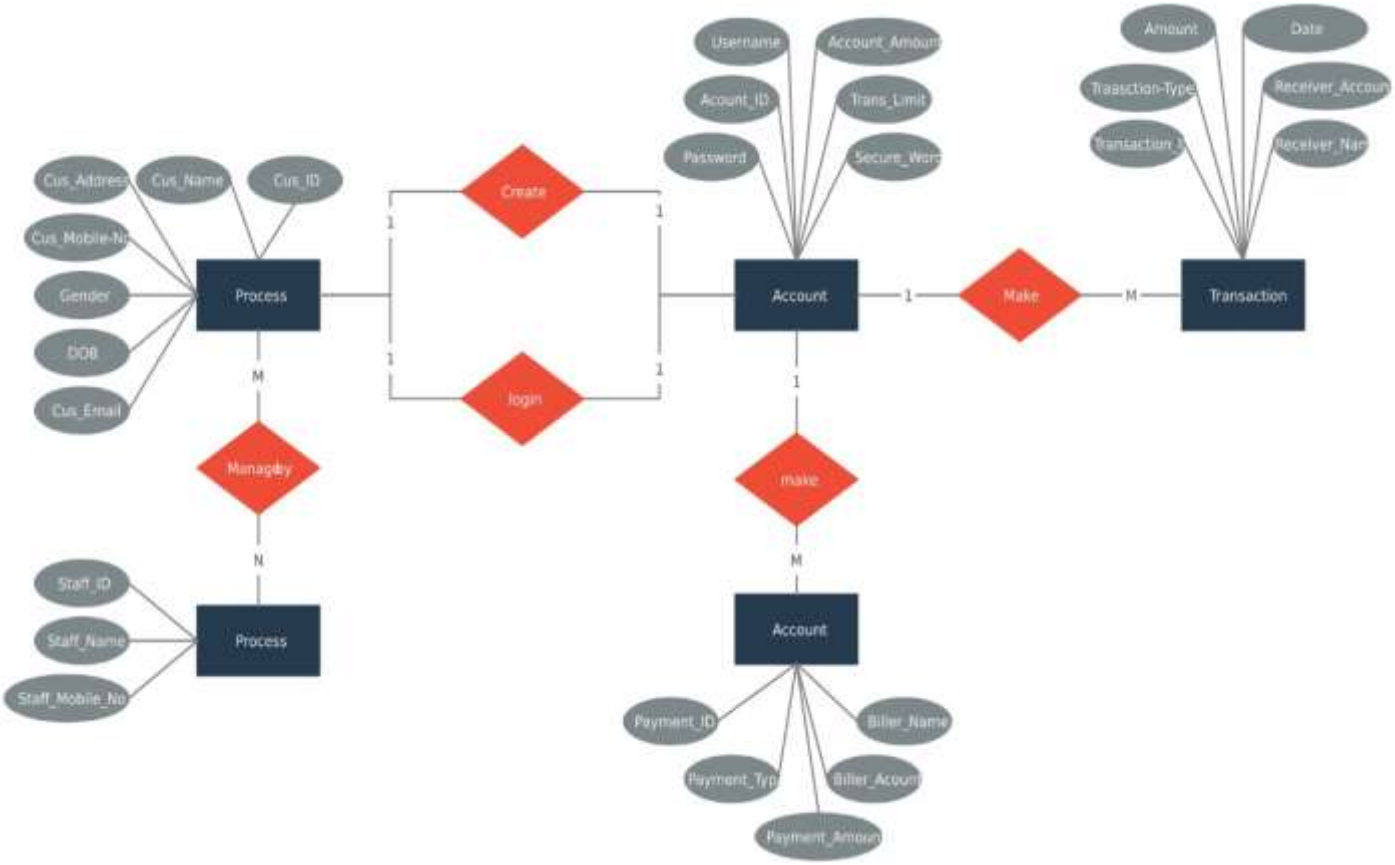
Use Case: A broad level diagram of represent basic overview of system.

Interface: Something used to communicate across different mediums.

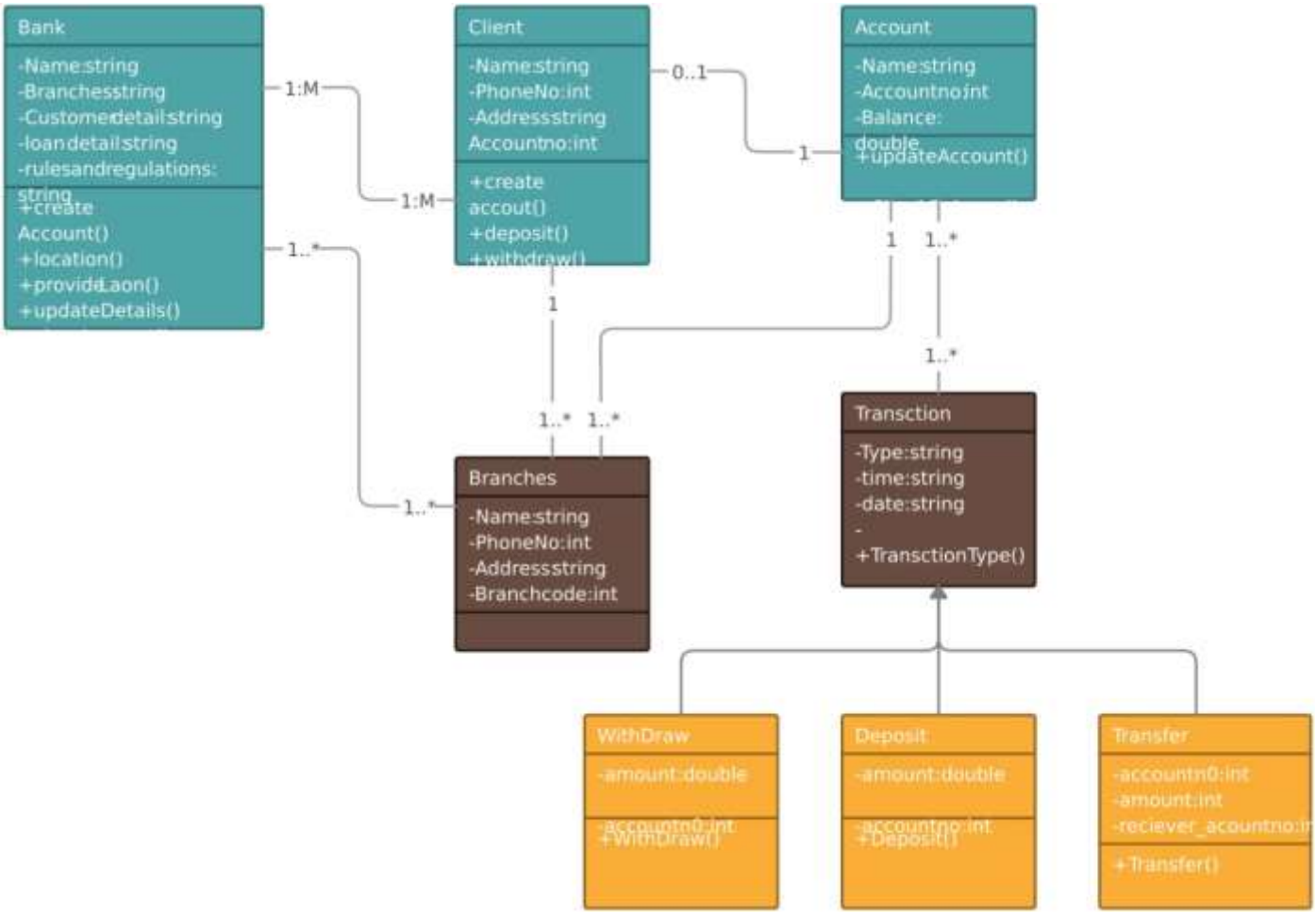
Hyperlink: A link from hypertext document to another location.

Appendix A: Analysis Models

ER Diagram:



Context Diagram:



ER diagram and Context Diagram were drawn using an online tool: **creately.com**

Question 03

Scenarios

-ONLINE BANKING SYSTEM-

Users:

Main scenarios:

- Keep members disciplines
- Maintain the details
- Contact customer support
- Funds transfers

Alternative scenarios:

- See other details
- Alerts and notifications

Bank Administration:

Main scenarios :

- Manage customer details
- Checking all the services
- Branch services integration
- Reporting and documentation

Alternative scenarios:

- See member's details
- Refreshing the system

Obtaining an account statement:

Main scenarios :

- Login to the system application
- Clock the balance showing image
- Select the last transaction data range
- After submit the statement
- Download the statement

Alternative scenarios:

- Requset to bank assistance
- Fastly delivery to statement

Question 04

SOFTWARE PROCESS MODEL

-ONLINE BANKING SYSTEM-

A software process model is representing an abstract model of distinct phrases in the particular system to improve design, product management, and project management. It is also known as a software development life cycle.

Agile model is used to this application

Why Agile model is used to?

- Rapid, ongoing software development and delivery results in satisfied customers.
- Regular communication between the customer, developer, and product owner
- The product is developed quickly, and it is often delivered in weeks as opposed to months.
- The most effective way to communicate is through in person interactions.
- It consistently prioritized high quality design and technological proficiency.

Question 05

USE CASE DIAGRAM

-ONLINE BANKING SYSTEM-