



## **SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES**



### **ITA0389 Mobile Computing for 5G Application**

#### **Lab Manual**

**1. Use Figma to create an interactive diagram illustrating the components of a basic cellular system.**

**Aim:** -

To create an interactive diagram illustrating the components of a basic cellular system

**Procedure:** -

1. open Figma
2. Create a new file
3. Select the Frames
4. Fill in the content that is required for presentation
5. Design Visual Elements
6. Make it Interactive
7. Add Annotations and Explanations
8. Incorporate Multimedia
9. Storyboard Animation
11. Review and edit the Prototype
12. Save and Share

**Design:** -

# Basic Cellular System

There are mainly two types of Basic Cellular System:

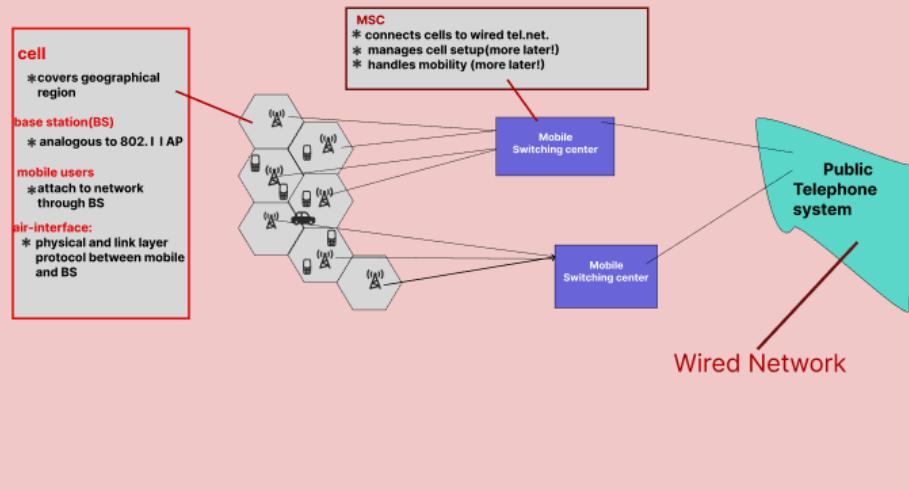
## 1.Circuit Switched :

In a circuit-switched system, each traffic channel is dedicated to a user until its cell is terminated.

## 2.Packet Switched:

In packet-switching, the packets are sent towards the destination irrespective of each other. Each packet has to find its own route to the destination. There is no predetermined path; the decision as to which node to hop to in the next step is taken only when a node is reached. Each packet finds its way using the information it carries, such as the source and destination IP addresses.

Components of a basic cellular system



## Analog Circuit-Switched System

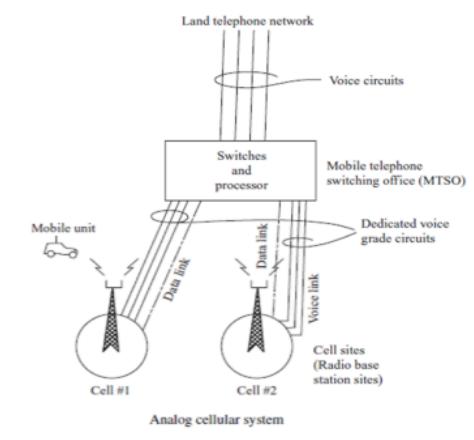
A basic analog cellular system consists of three subsystems:

1. A Mobile Unit

2. A Cell Site

3. A Mobile Telephone Switching Office (MTSO) with CONNECTIONS to link the three subsystems

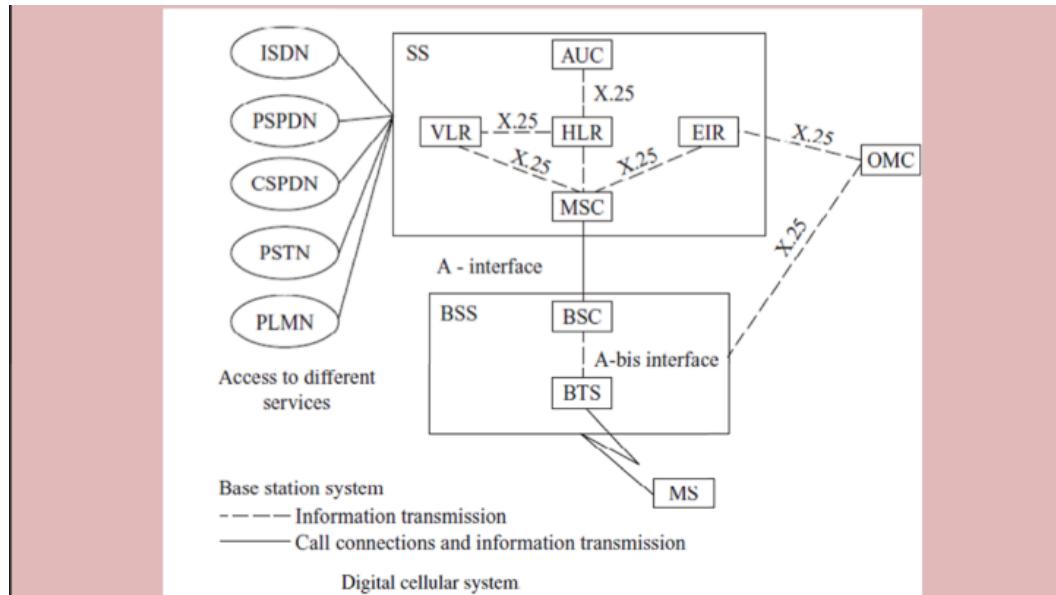
## Analog Circuit-Switched System



# Digital Circuit-Switched System

A Basic Digital System consists of four elements:

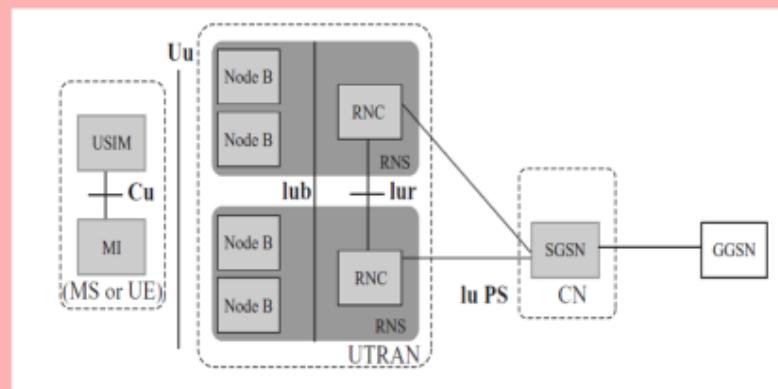
1. Mobile Station
2. Base Transceiver Station (BTS)
3. Base Station Controller (BSC)
4. Switching Subsystems



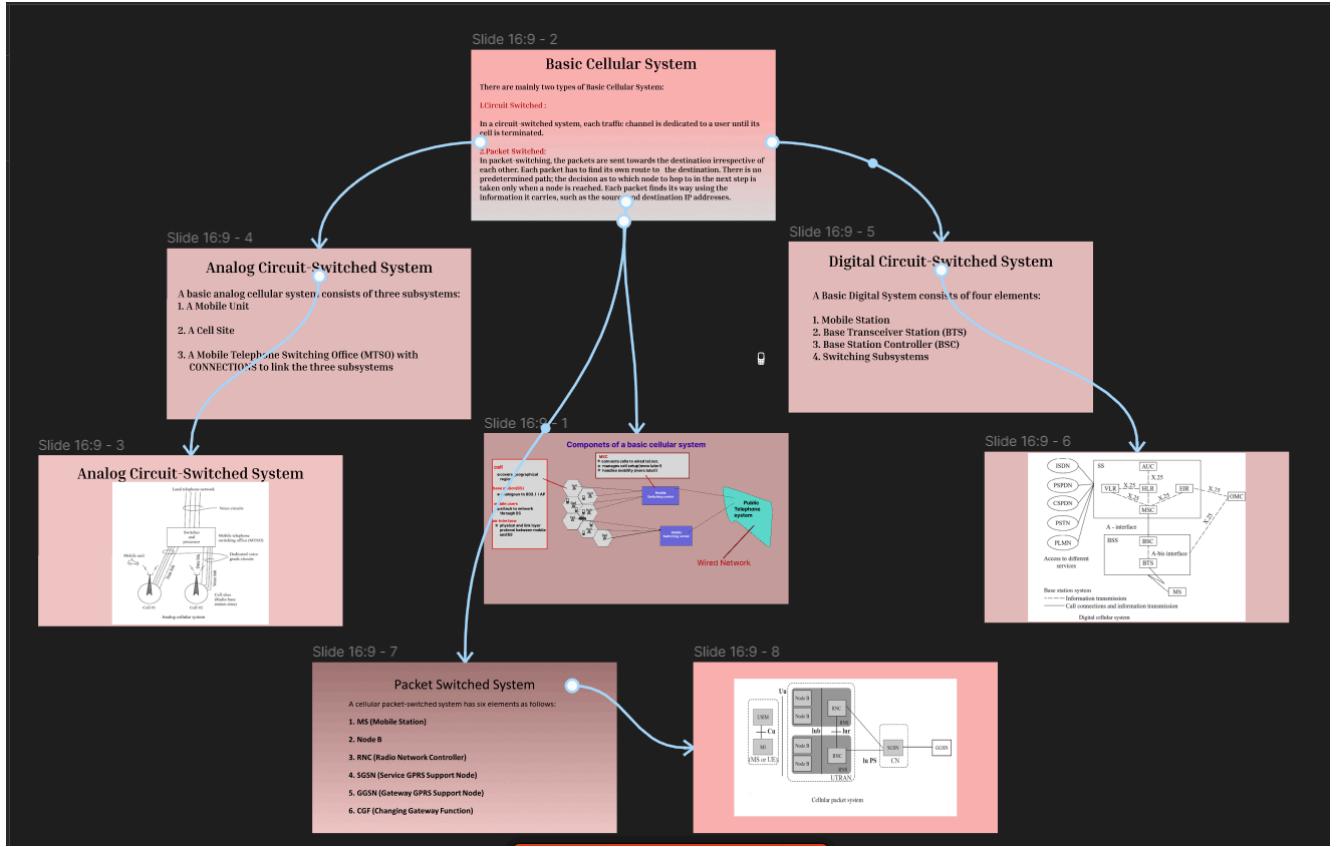
# Packet Switched System

A cellular packet-switched system has six elements as follows:

- 1. MS (Mobile Station)**
- 2. Node B**
- 3. RNC (Radio Network Controller)**
- 4. SGSN (Service GPRS Support Node)**
- 5. GGSN (Gateway GPRS Support Node)**
- 6. CGF (Changing Gateway Function)**



**Prototype: -**



## Result: -

Hence an interactive diagram illustrating the components of a basic cellular system using Figma is created and executed successfully

## 2.Design a user interface prototype for a mobile station using Figma, considering connectivity and convenience.

### Aim: -

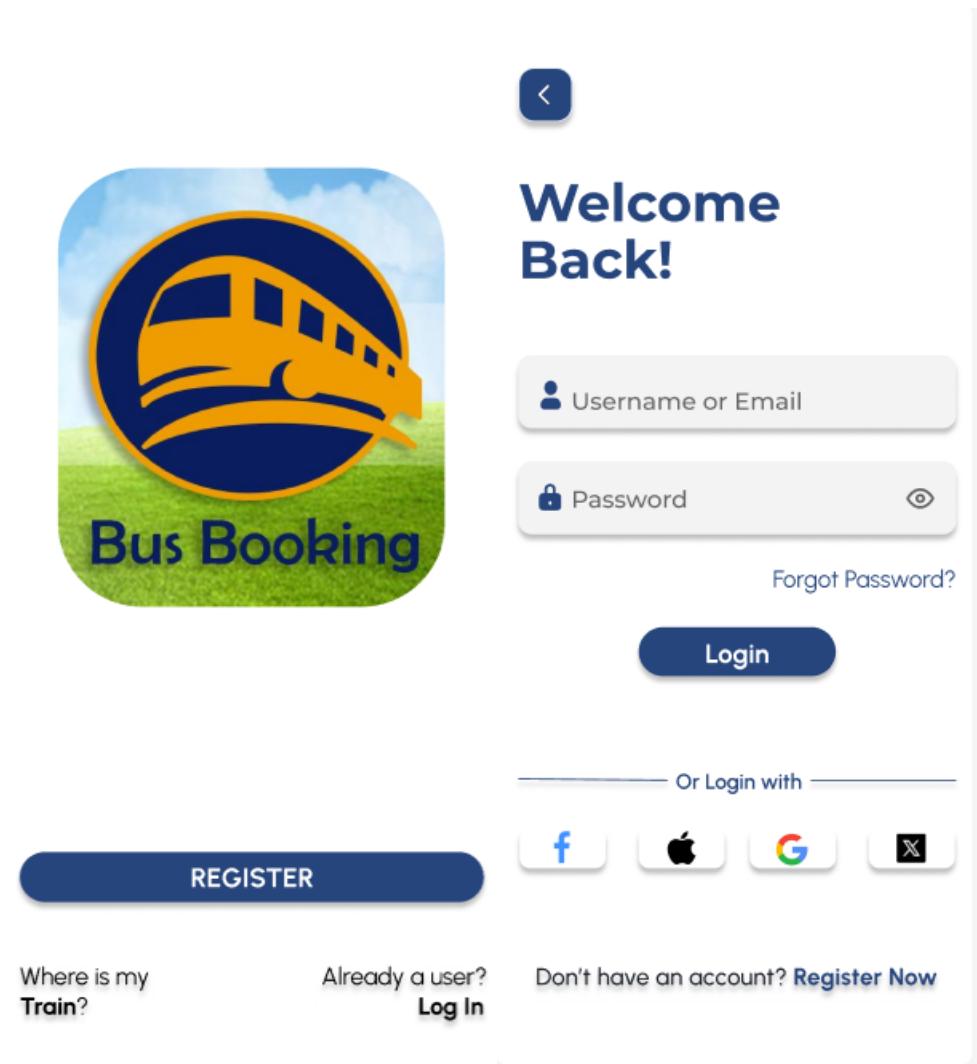
To create a user interface prototype for a mobile station using Figma, considering connectivity and convenience.

### Procedure: -

1. open Figma
2. Create a new file
3. Select the Frames
4. Design Visual Elements
5. Make it Interactive
6. Add icons on the Frame
7. Incorporate Multimedia
8. Storyboard Animation

9. Review and edit the Prototype
10. Save and Share

**Design:-**



## Forgot password?

Enter your email address

\* We will send you a message to set or reset your new password

**Submit**

## Create an account

Username or Email

Phone Number

Password 

Confirm Password 

**Create Account**

— Or Login with —



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Dinakaran



One way

Round

Multi-city

From —  
 **CHENNAI CHE**  
Central Railway Station



To —  
 **KERALA KL**  
Thiruvananthapuram Central Station

Departure —  
 26/May/2023

Return —  
+ Add Return Date

Traveller —  
1 Adult

Quota —  
General Quota

**SEARCH TRAIN****Hot offer**[See all](#)

25% OFF

25% discount  
with mastercard

33% OFF



Home



Booking



Offer



Inbox



Profile

## Select Your Train

CHE — KL

26/May/2023    1 passenger

### General Quota

| Train   | Departure    | Arrival     | Duration | Price   |
|---------|--------------|-------------|----------|---------|
| WAG 7   | 09:30 AM CHE | 09:30 PM KL | 12 hrs   | ₹ 1,500 |
| WAG 12B | 09:50 AM CHE | 08:50 PM KL | 11 hrs   | ₹ 1,800 |
| WAG 4   | 10:20 AM CHE | 10:20 PM KL | 12 hrs   | ₹ 1,700 |

Home    Booking    Offer    Inbox    Profile

## Train Details

09:30 AM — 12 hrs — 09:30 PM

CHE — KL

WAG 7    ₹ 1,500

CHE — KL

Central Railway Station    Thiruvananthapuram Central Station

Date: 26/05/2023    Time: 09.30

Quota: General Quota    Coach: S1

Price: ₹ 1,500

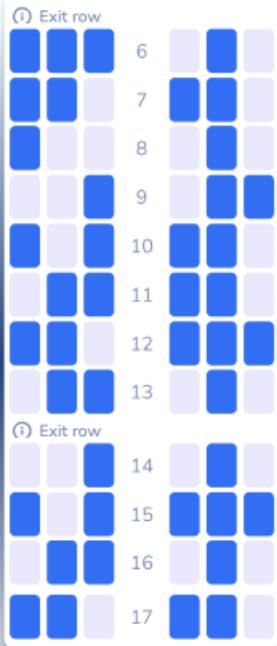
Cancel    Continue



## General Quota Seat

● Selected ● Emergency exit ● Reserved

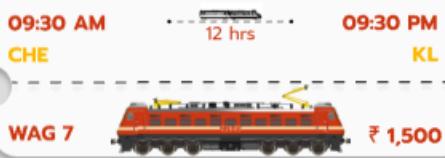
S1



Cancel

Continue

## Payment



Total ₹ 1,500

### Payment

VISA

\*\*\*\*\*0017

PayPal

\*\*\*\*\*0017

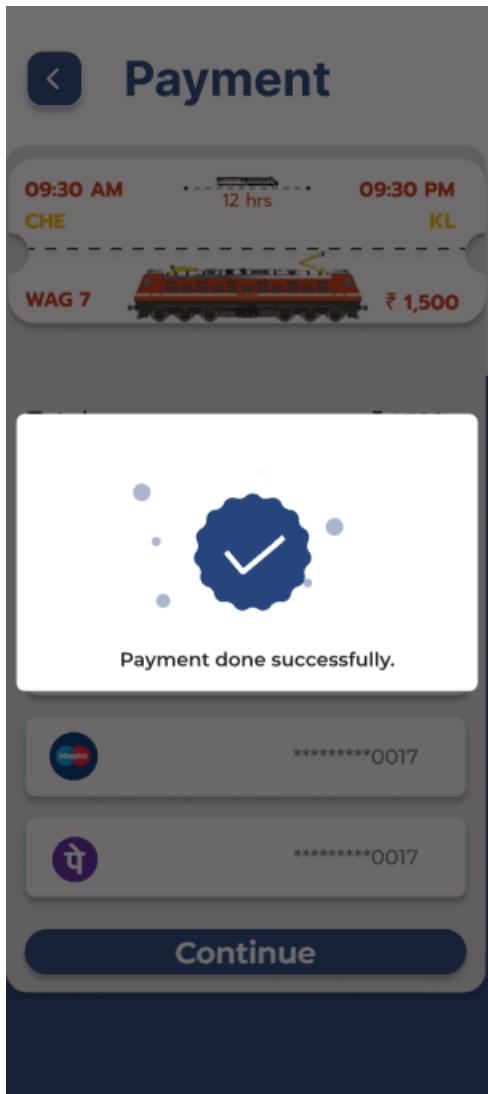


\*\*\*\*\*0017



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Continue



## E-Ticket



## Where is my Train?

From **KUMBAKONAM KMU** ↓ ↑  
To **THANJAVUR TJ**

**SEARCH TRAIN**

Train No. / Train Name 🔍

LIVE STATION **KUMBAKONAM** 🔍

◀

ALL DATES ▾

SHOW FARES ▾

---

KUM  
KUMBAKONAM → TJ  
THANJAVUR

---

|                    |          |               |         |  |
|--------------------|----------|---------------|---------|--|
| 16751              | 12:30 AM | →             | 1:00 AM |  |
| RAMESWARAM EXPRESS |          | RUN DAILY     |         |  |
| 22623              | 3:15 AM  | →             | 4:00 AM |  |
| UZHAVAN EXPRESS    |          | RUN DAILY     |         |  |
| 16811              | 7:15 AM  | →             | 8:00 AM |  |
| SALEM EXPRESS      |          | RUN DAILY     |         |  |
| 17315              | 1:15 PM  | →             | 2:00 PM |  |
| MYSURU EXPRESS     |          | S M T W T F S |         |  |

◀

RAMESWARAM EXPRESS

TODAY ▾

---

| Arrival  | Day 0 - May 26, Sun  | Departure |
|----------|----------------------|-----------|
| 12:30 PM | Kumbakonam           | 12:31 PM  |
| 12:35 PM | 0 km Platform 1      |           |
| 12:40 PM | Darasuram            | 12:42 PM  |
| ---      | 4 km Platform 1      | ---       |
| 12:45 PM | Swamimalai           | 12:47 PM  |
| ---      | 8 km Platform 1      | ---       |
| 12:55 PM | Sundaraperumal Kovil | 12:57 PM  |
| ---      | 18 km Platform 2     | ---       |
| 1:00 AM  | Papanasam            | 1:20 AM   |
| ---      | 23 km Platform 1     | ---       |
| 1:30 AM  | Thanjavur            | 1:32 AM   |
| ---      | 23 km Platform 1     | ---       |

At Kumbakonam

Updated few seconds ago ⟳

**Prototype: -**



### Result: -

A user interface prototype for a mobile station using Figma, considering connectivity and convenience using Figma is created and executed successful

### 3. Develop a flowchart in Figma depicting the operation of a Network Switching Subsystem in a mobile cellular system.

#### Aim: -

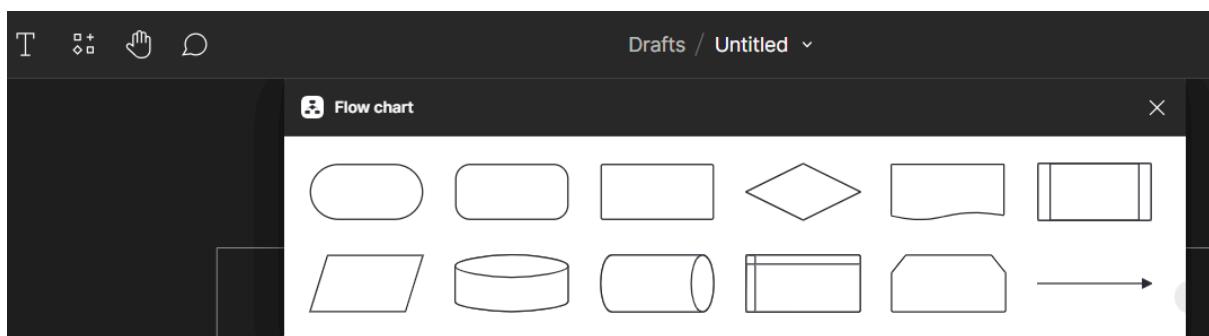
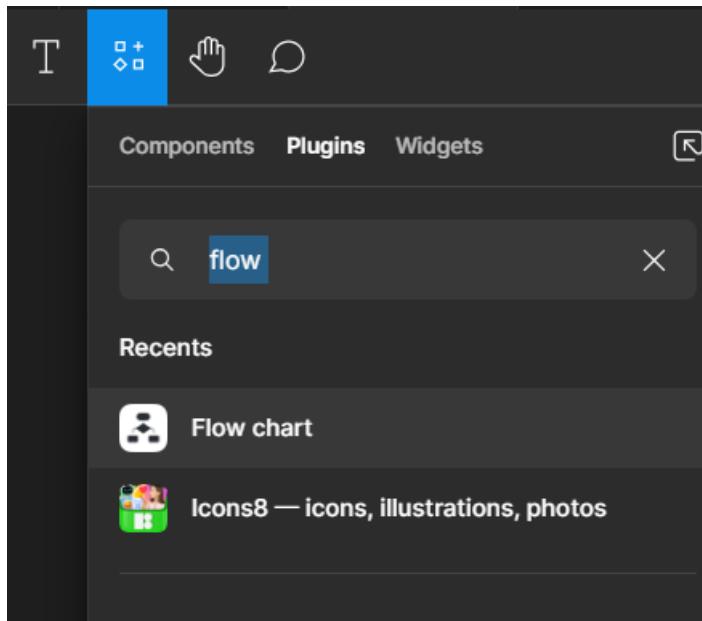
To draw a flowchart in Figma depicting the operation of a Network Switching Subsystem in a mobile cellular system

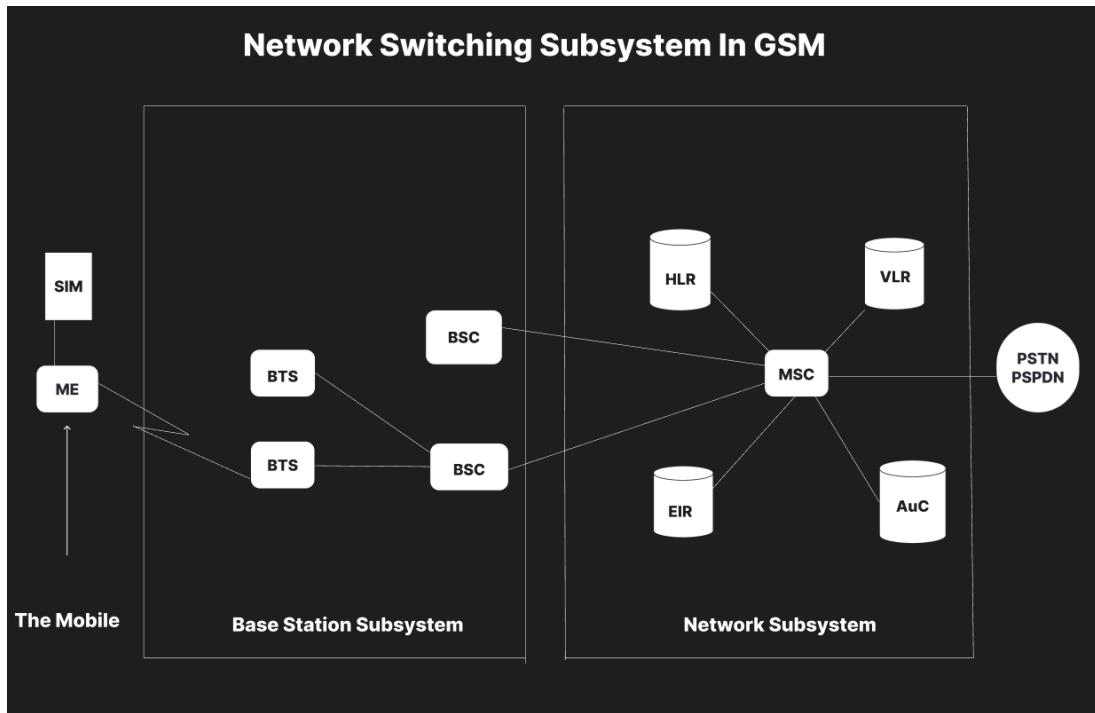
#### Procedure: -

1. open Figma
2. Create a new file
3. Click on the resources icon and click on the plugins

4. Search for the Flow Chart
5. Drag and drop the shapes on the screen
6. Now, enter the content on the shapes and connect them through Arrows.
7. Grouping and alignment
8. Review and edit
9. Save and share

**Design: -**





**Result: -**

Hence the flowchart in Figma depicting the operation of a Network Switching Subsystem in a mobile cellular system has been drawn successfully

**4. Create a visual representation in Figma highlighting the key elements of mobile network protocol stacks.**

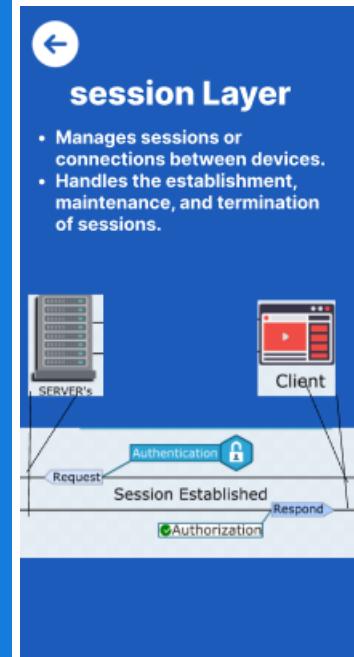
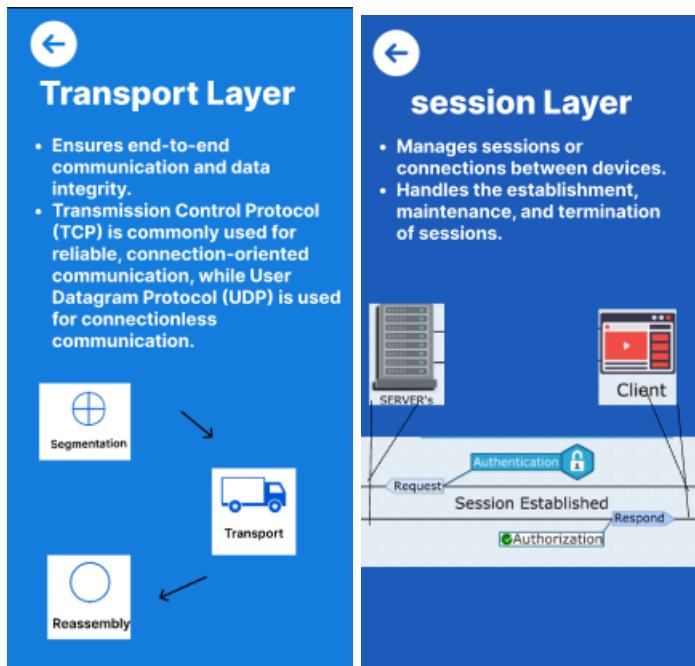
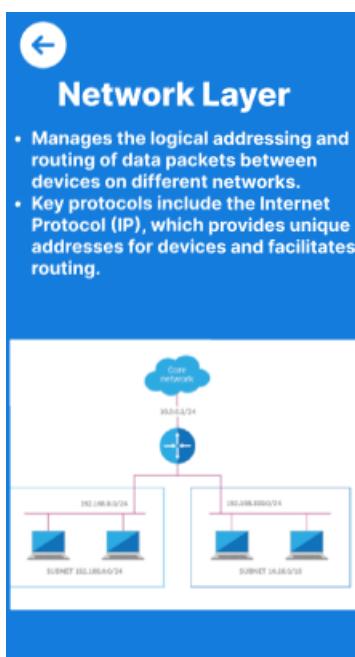
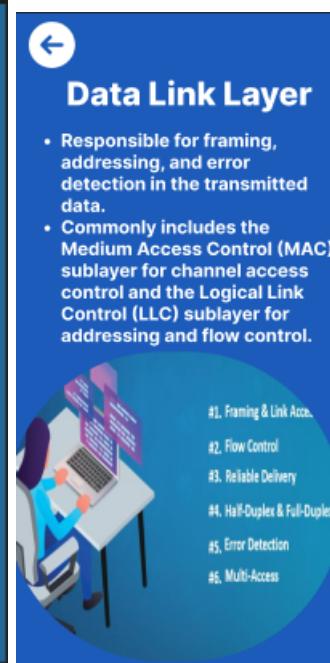
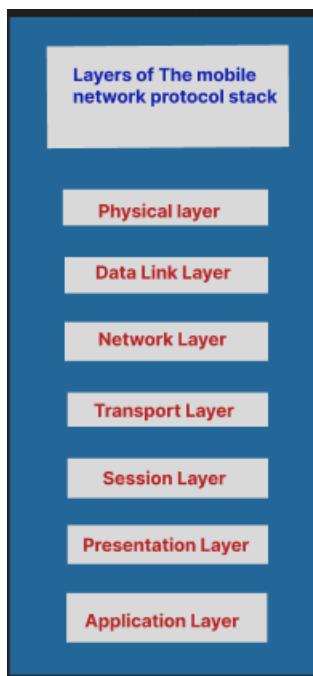
**Aim: -**

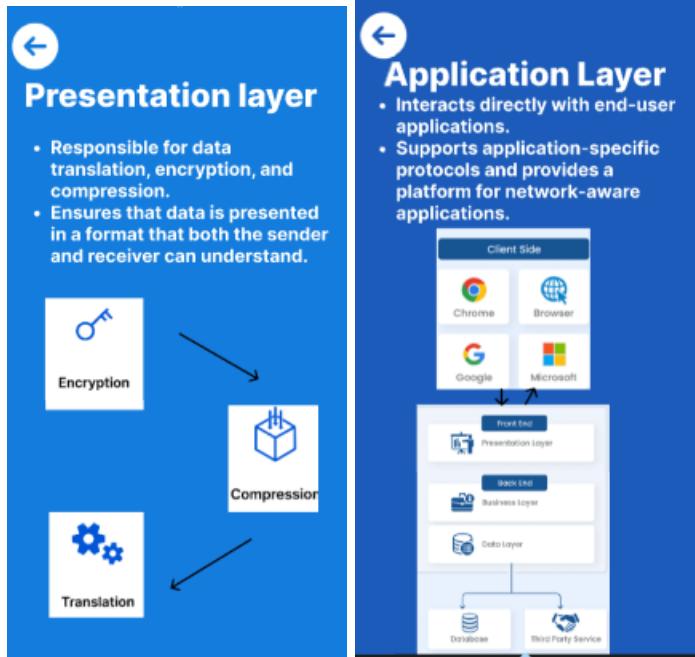
Design a visual representation in Figma highlighting the key elements of mobile network protocol stacks.

**Procedure: -**

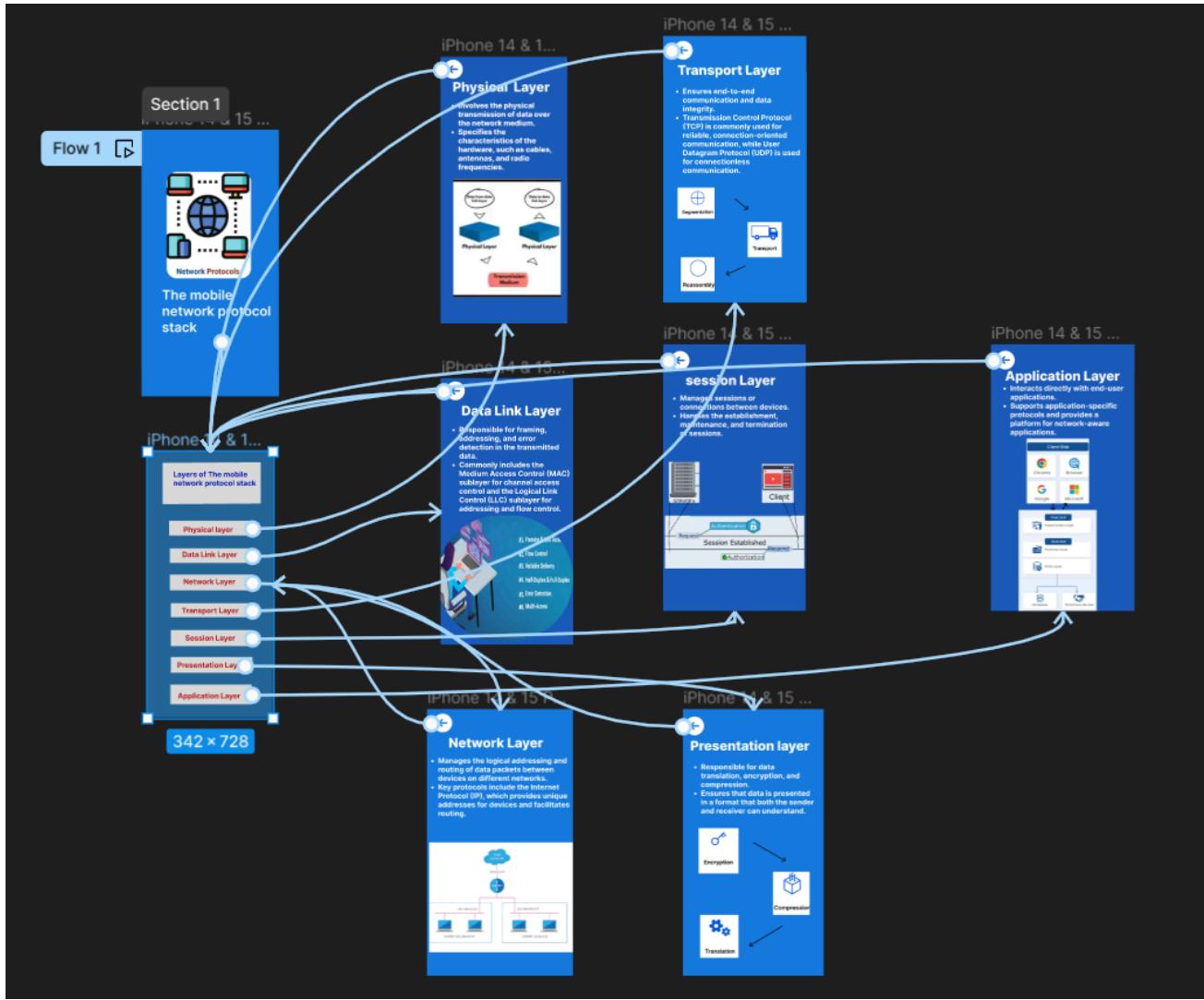
1. open Figma
2. Create a new file
3. Select the Frames
4. Fill in the content that is required for presentation
5. Design Visual Elements
6. Make it Interactive
7. Add Annotations and Explanations
8. Incorporate Multimedia
9. Storyboard Animation
11. Review and edit the Prototype
12. Save and Share

**Design: -**





Prototype: -



### Result: -

Hence the visual representation in Figma highlighting the key elements of mobile network protocol stacks is created and executed successfully

## 5. Design a wireframe for a mobile application that incorporates localization features using Figma.

### Aim: -

To design a wireframe using Figma for a mobile application that incorporates localization features

### Procedure: -

1. open Figma
2. Create a new file
3. Select the Frames
4. Design Visual Elements

5. Make it Interactive
6. Add icons on the Frame
7. Incorporate Multimedia
8. Storyboard Animation
9. Review and edit the Prototype
10. Save and Share

**Design:** -



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## Welcome Back

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Email Address  
example@gmail.com

Password

[Forgot Password?](#)

Login

Or continue with



Doesnot have an account? [Signup](#)

[←](#)

## Verify Account

Please enter the verification code sent to example@gmail.com

2 1   

01:26

Didn't receive code? [Resend again](#)

[Verify](#)

1    2    3  
4    5    6  
7    8    9  
\*    0   



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Where?

Ex: New York

Check-in

DD/MM/YY

Check-out

DD/MM/YY

Guests

- 1 +

Room

- 1 +

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**Location**  
**Bali, Indonesia**

**24 OCT-26 OCT**   **3 guests**

**Search Hotel By Name**

**Recommended Hotels**

**AYANA Resort**  
Bali, Indonesia  
\$200 - \$500 USD /night

**COMO Uma Re**  
Bali, Indonesia  
\$300 - \$500 USD /night

**Business Accommodates**

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**Location**  
**Bali, Indonesia**

**Search Hotel By Name**

**Recommended Hotels**

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**Sort By**  
\$ - \$\$ Price Lower to Higher

**Ratings**

**4 stars**

**Price Ranges**  
\$90-\$350

**Facilities**

**APPLY**

## Hotel Details



**AYANA Resort**

10% OFF    ★ 4.5 (120 Reviews)

📍 Karang Mas Estate, Jimbaran, Bali, Indonesia

**Description**

Nestled in the lush tropical paradise of Jimbaran, Bali, AYANA Resort and Spa offers an enchanting escape for travelers seeking luxury, relaxation, and breathtaking ocean views... [Read more](#)

**Contact Info**

 **John Mail**  
Receptionist  

**Gallery**

\$350 USD / night 

**Booking Summary**



**AYANA Resort**  
Bali, Indonesia  
**\$350 USD /night**

|                     |             |
|---------------------|-------------|
| <b>Booking Date</b> | 1-Oct-2023  |
| <b>Check-in</b>     | 24-Oct-2023 |
| <b>Check-out</b>    | 26-Oct-2023 |
| <b>Guests</b>       | 3           |
| <b>Room(s)</b>      | 1           |

---

|               |           |
|---------------|-----------|
| <b>Amount</b> | \$350 x 2 |
| <b>Tax</b>    | \$30      |
| <b>Total</b>  | \$730     |

**CONTINUE TO PAYMENT**

[←](#)

## Payment

Total Price  
**\$750.00**

5% vst included

Payment method

Card Holder Name

Your Name

Card Number

\*\*\*\*\* \* \* \* \*

Expiry date      CVV

MM/YY      \*\*\*\*

**PAY NOW**



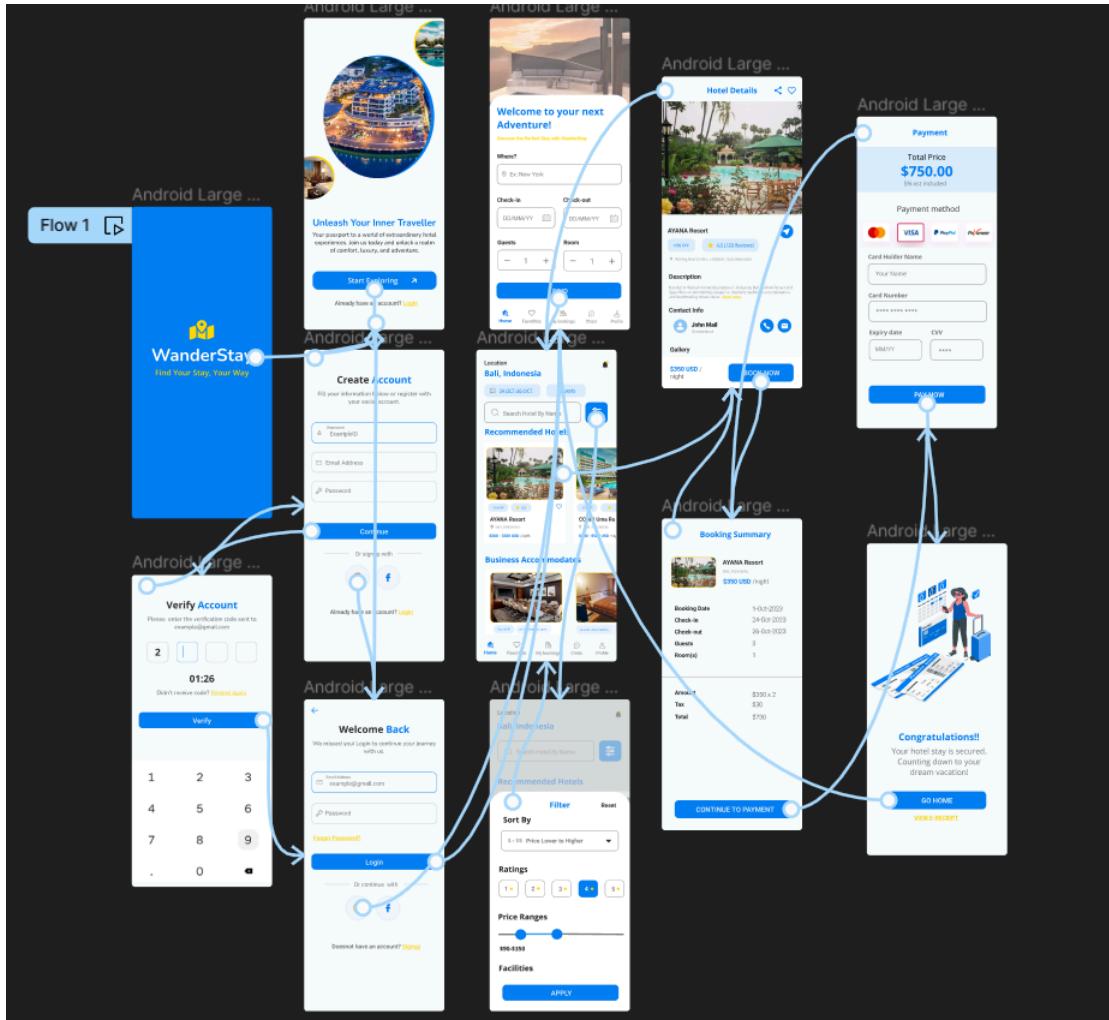
**Congratulations!!**

Your hotel stay is secured.  
Counting down to your  
dream vacation!

**GO HOME**

[VIEW E-RECEIPT](#)

**Prototype: -**



### **Result: -**

Hence the wireframe for a mobile application that incorporates localization features using Figma is created and executed successfully

## **6. Use Figma to simulate a handoff scenario in a mobile network and visualize the process.**

**Aim:** -To simulate a handoff scenario in a mobile network and visualize the process using Figma.

### **Procedure:**

1. Open Figma
2. Create a new file
3. Select the Frames
4. Fill in the content that is required for presentation
5. Design Visual Elements

6. Make it Interactive
7. Add Annotations and Explanations
8. Incorporate Multimedia
9. Storyboard Animation
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11. Save and Share

### Design:

**HANDOFF IN MOBILE NETWORK**

**Handoff:**  
Design handoff is the process of handing over a finished design for implementation. It involves transferring a designer's intent, knowledge, and specifications for a design and can include visual elements, user flows, interaction, animation, copy, responsive breakpoints, accessibility, and data validations.

**Execution:**  
Design handoff tools facilitate smoother transitions from design to development. These tools provide engineers with practical documentation, high-fidelity prototypes, and features to communicate and collaborate effectively.

**Why do we need handoff?**  
Mobile-Assisted handoff is generally used when a mobile phone helps a base station to transfer the call to another base station with better-improved connectivity and more signal strength. This handoff is used in TDMA technique-based GSM devices.

**What is a handoff in UX?**  
The Design Handoff plays a vital role in UX projects, serving as a crucial step where designers transfer their work to the development team.

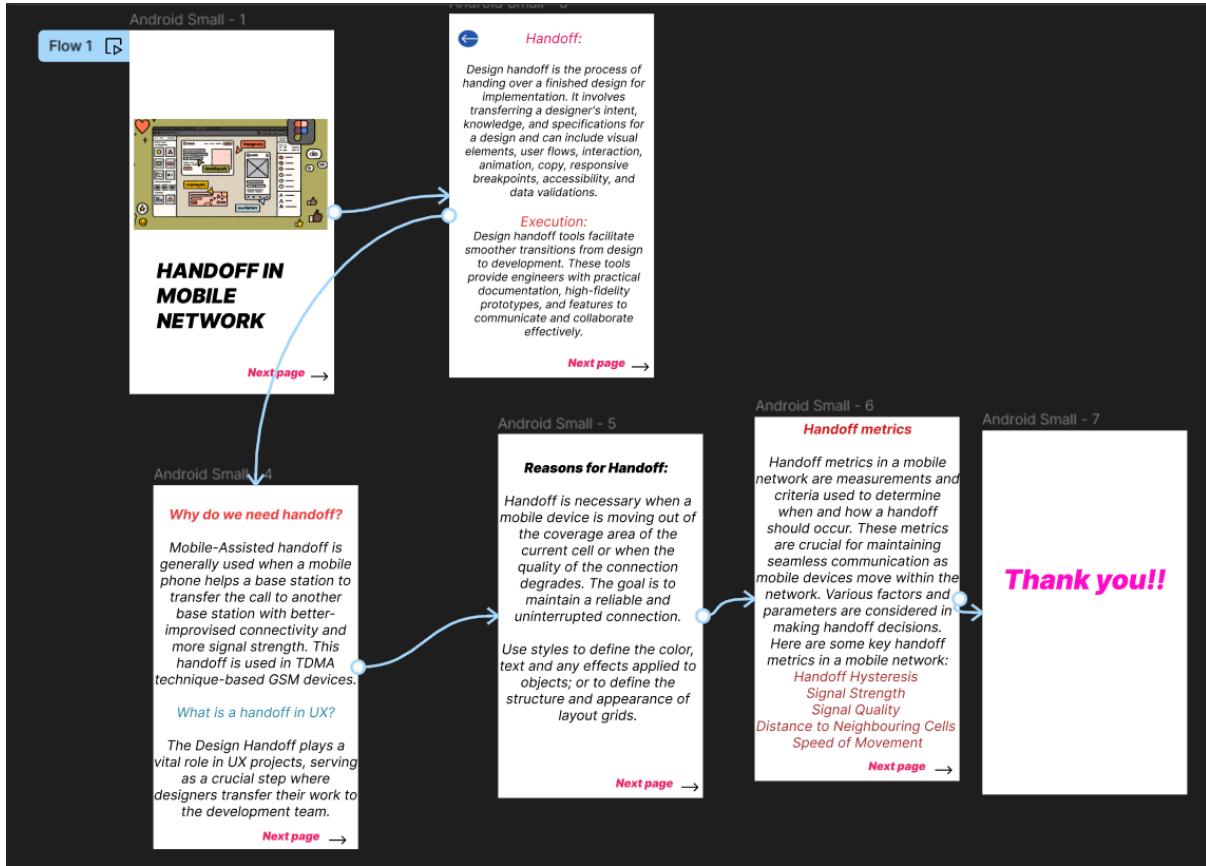
**Reasons for Handoff:**  
Handoff is necessary when a mobile device is moving out of the coverage area of the current cell or when the quality of the connection degrades. The goal is to maintain a reliable and uninterrupted connection.

Use styles to define the color, text and any effects applied to objects; or to define the structure and appearance of layout grids.

**Handoff metrics**  
Handoff metrics in a mobile network are measurements and criteria used to determine when and how a handoff should occur. These metrics are crucial for maintaining seamless communication as mobile devices move within the network. Various factors and parameters are considered in making handoff decisions. Here are some key handoff metrics in a mobile network:  
*Handoff Hysteresis  
Signal Strength  
Signal Quality  
Distance to Neighbouring Cells  
Speed of Movement*

**Thank you!!**

### Prototype:



## Result:

Hence the simulated a handoff scenario in a mobile network and visualized the process using Figma.

## 7. Develop a dashboard prototype in Figma displaying performance criteria for a cellular system.

**Aim:** To develop a dashboard prototype in Figma displaying performance criteria for a cellular system.

### Procedure:

1. Open Figma
2. Create a new file
3. Select the Frames
4. Fill in the content that is required for presentation
5. Design Visual Elements
6. Make it Interactive

7. Add Annotations and Explanations

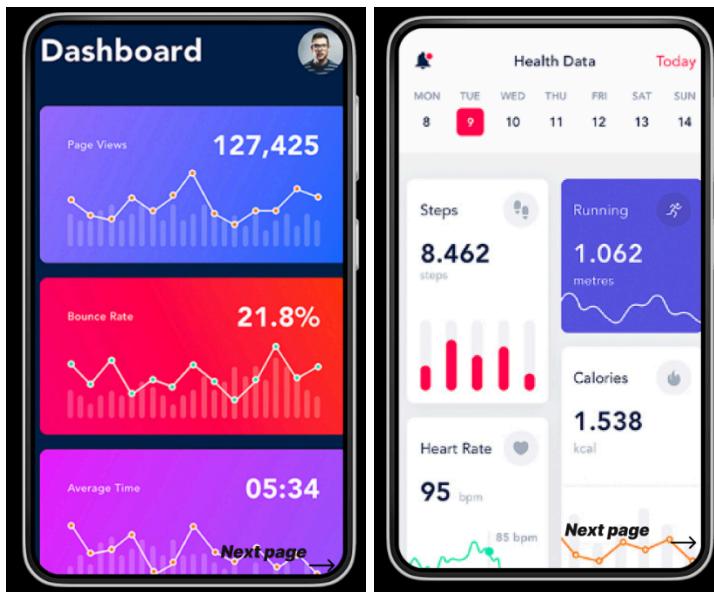
8. Incorporate Multimedia

9. Storyboard Animation

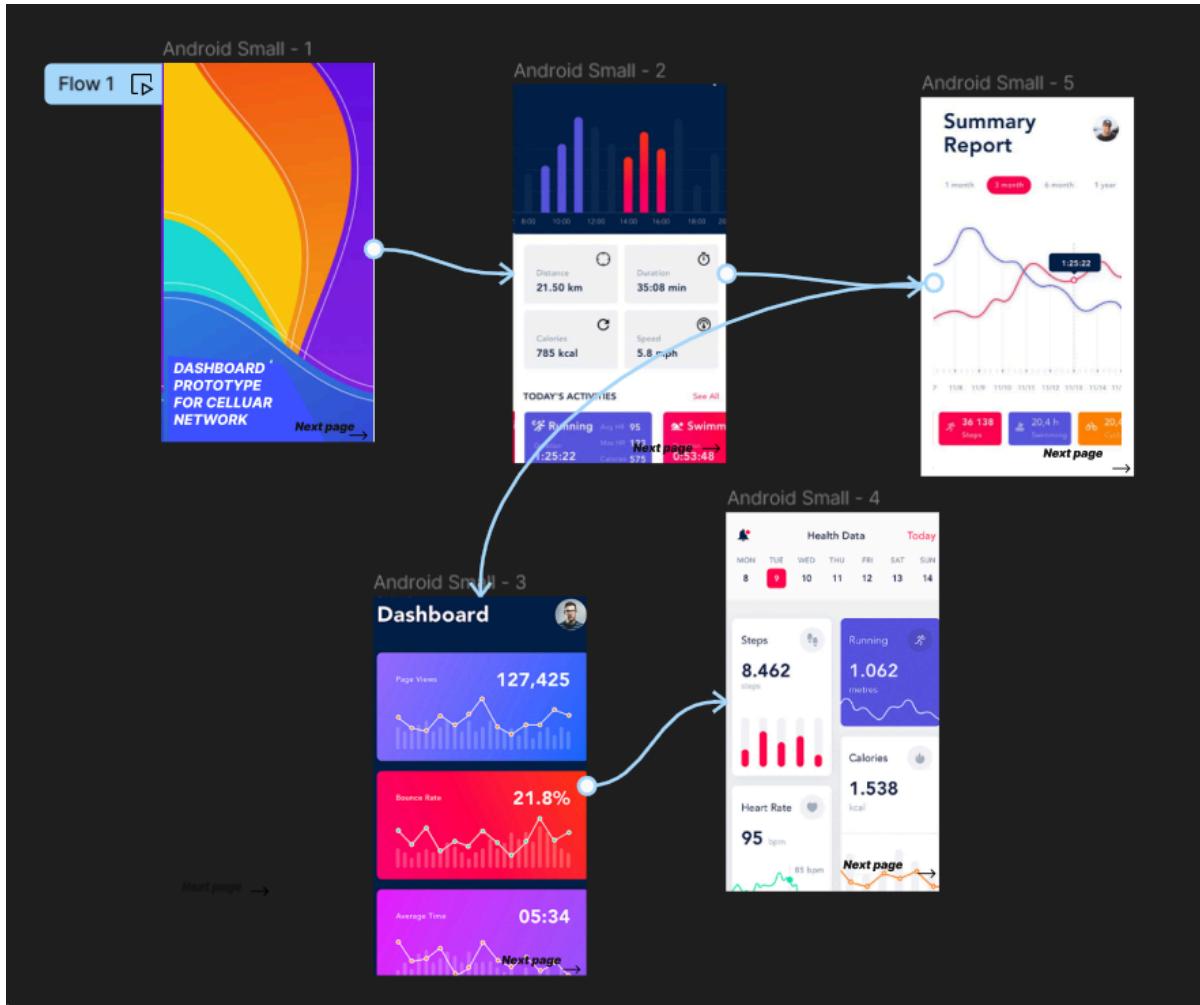
10. Review and edit the Prototype

11. Save and Share

### Design:



### Prototype:



## Result:

Hence developed a dashboard prototype in Figma displaying performance criteria for a cellular system.

## 8. Create an infographic in Figma explaining the concept of Public Land Mobile Network (PLMN).

**Aim:** To create an infographic in Figma explaining the concept of Public Land Mobile Network (PLMN).

### Procedure:

1. Open Figma
2. Create a new file
3. Select the Frames

4. Fill in the content that is required for presentation
5. Design Visual Elements
6. Make it Interactive
7. Add Annotations and Explanations
8. Incorporate Multimedia
9. Storyboard Animation
10. Review and edit the Prototype
11. Save and Share

### **Design:**

**Public Land Mobile Network (PLMN)**

**Components of PLMN**

- Base Stations (Cell Towers): Transmit and receive signals to and from mobile devices within their coverage area.
- Mobile Switching Center (MSC): Manages the connection between mobile devices and facilitates call routing.
- Home Location Register (HLR): Stores subscriber information and handles tasks related to authentication and call routing.

**Coverage Areas:**

- PLMNs cover a specific geographical area, and multiple PLMNs collectively provide extensive coverage, allowing users to communicate seamlessly while moving within the network.

**Network Operators:**

**International Roaming:**

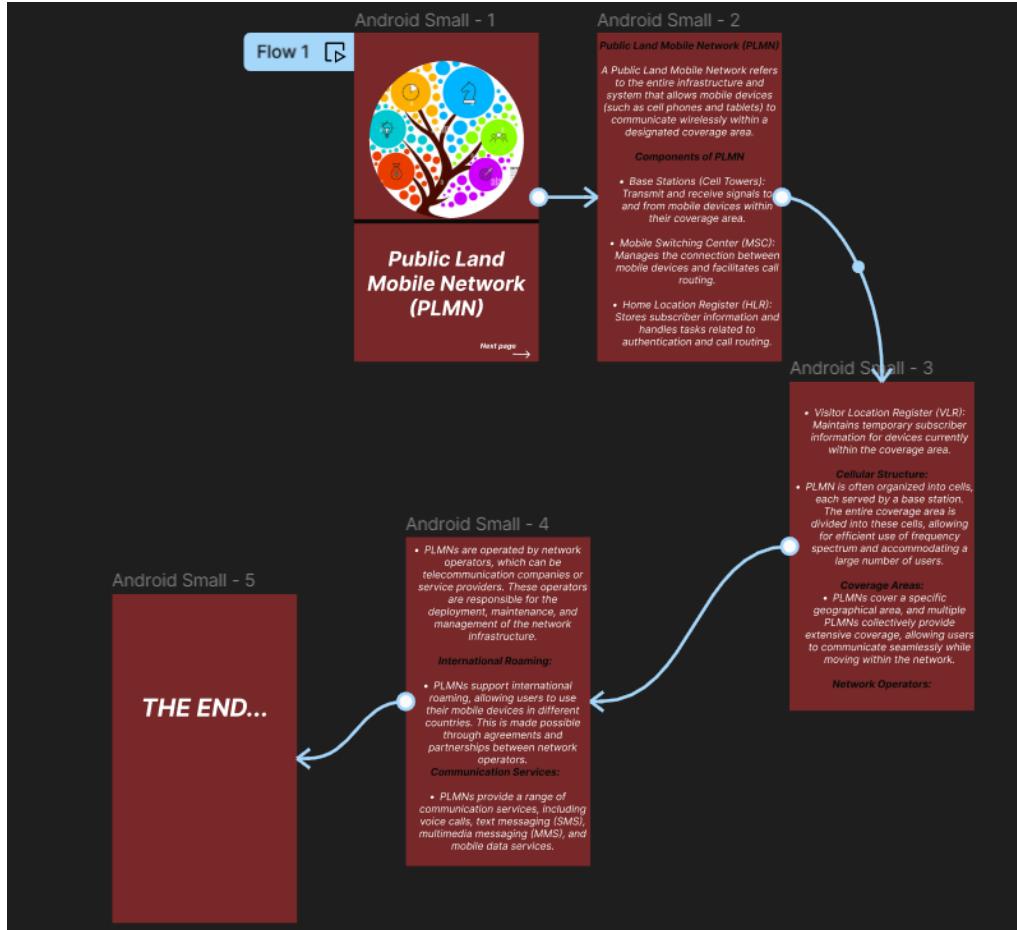
- PLMNs support international roaming, allowing users to use their mobile devices in different countries. This is made possible through agreements and partnerships between network operators.

**Communication Services:**

- PLMNs provide a range of communication services, including voice calls, text messaging (SMS), multimedia messaging (MMS), and mobile data services.

**THE END...**

## Prototype:



## Result:

Hence created an infographic in Figma explaining the concept of Public Land Mobile Network (PLMN).

## 9. Develop a user interface prototype for a GSM service using Figma.

**Aim:** To develop a user interface prototype for a GSM service using Figma.

### Procedure:

1. Open Figma
2. Create a new file
3. Select the Frames

4. Fill in the content that is required for presentation
5. Design Visual Elements
6. Make it Interactive
7. Add Annotations and Explanations
8. Incorporate Multimedia
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11. Save and Share

### Design:

The diagram illustrates a user interface flow for a mobile application. It consists of three distinct screens:

- Login Screen:** A dark-themed screen with a "LOGIN" title at the top. It features two input fields labeled "Username" and "Password", and a prominent yellow "LOGIN" button at the bottom.
- GSM SERVICE Screen:** A red-themed screen titled "GSM SERVICE". It includes a back arrow icon and a detailed description of what GSM stands for and its significance. It also highlights the use of digital technology for both voice and data transmission, and the use of SIM cards for authentication.
- Search Results Screen:** A red-themed screen featuring a search bar with a magnifying glass icon and the word "SEARCH". Below the search bar is a list of bullet points detailing the benefits of GSM, such as Digital Signal Transmission, International Roaming, Compatibility, SIM Cards, Security, and Efficient Use of Spectrum.



Features of GSM are :

1. Supports international roaming
2. Clear voice clarity
3. Ability to support multiple handheld devices.
4. Spectral / frequency efficiency
5. Low powered handheld devices.
6. Ease of accessing network
7. International ISDN compatibility.
8. Low service cost.
9. New features and services.

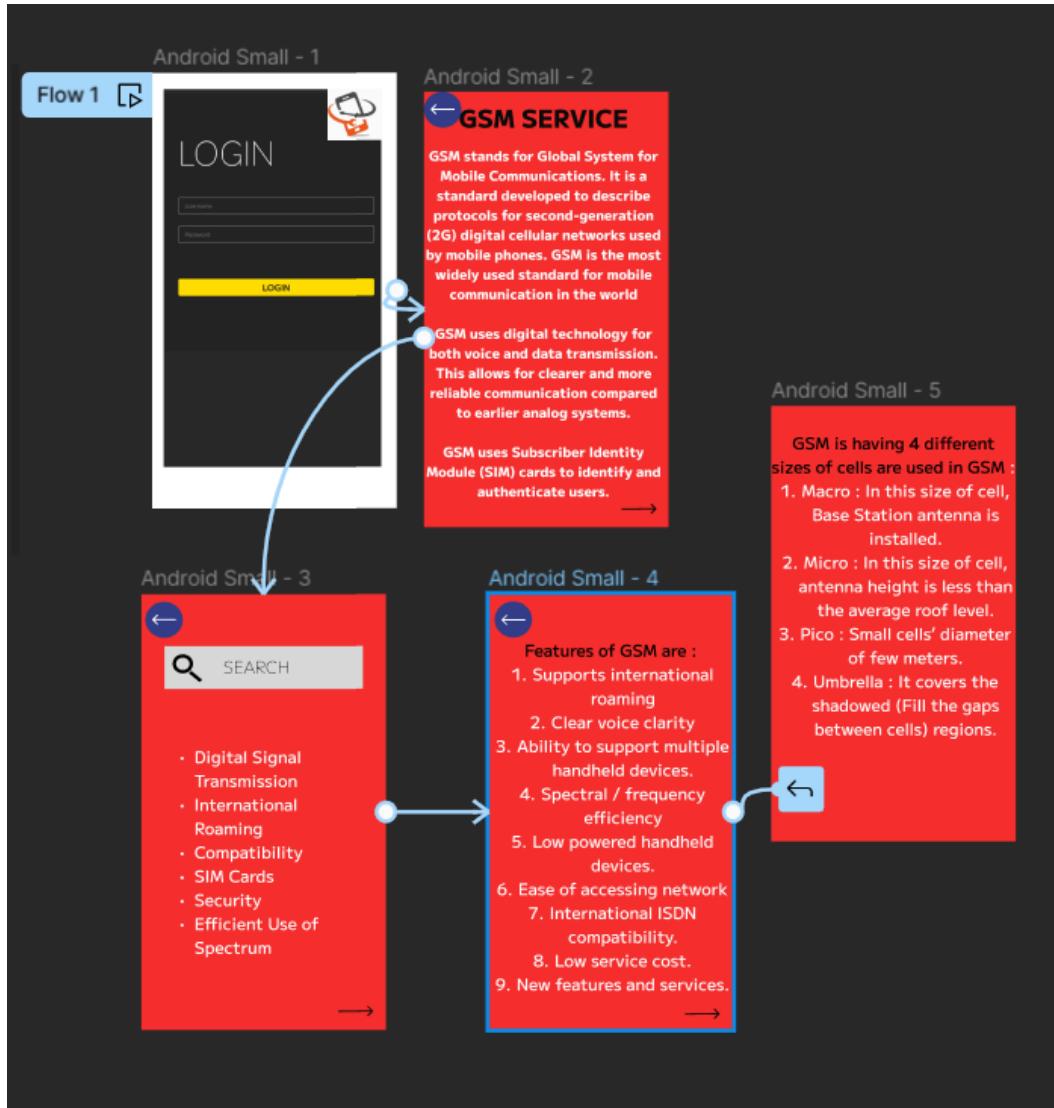


GSM is having 4 different sizes of cells are used in GSM :

1. Macro : In this size of cell, Base Station antenna is installed.
2. Micro : In this size of cell, antenna height is less than the average roof level.
3. Pico : Small cells' diameter of few meters.
4. Umbrella : It covers the shadowed (Fill the gaps between cells) regions.



**Prototype:**



### Result:

Hence developed a user interface prototype for a GSM service using Figma.

## 10. Create a visual representation in Figma showcasing the differences between various multiple access techniques.

**Aim:** To create a visual representation in Figma showcasing the differences between various multiple access techniques.

### Procedure:

- Open Figma

2. Create a new file
3. Select the Frames
4. Fill in the content that is required for presentation
5. Design Visual Elements
6. Make it Interactive
7. Add Annotations and Explanations
8. Incorporate Multimedia
9. Storyboard Animation
10. Review and edit the Prototype
11. Save and Share

### Design:

**Differences between various multiple access techniques.**

**ENTER →**

**Frequency Division Multiple Access (FDMA):**

- Concept:
- Allocates different frequency bands to individual users.
- Each user is assigned a unique frequency channel for communication.
- Representation:
- In a visual representation, you can use rectangles to represent different frequency bands.
- Label each rectangle with the corresponding user or communication channel.
- Key Points:
- Users transmit simultaneously, each using its allocated frequency band.
- Suitable for analog signals and FDMA is commonly used in analog radio communication.

**Time Division Multiple Access (TDMA):**

- Concept:
- Divides the time into slots or frames.
- Each user is assigned a specific time slot during which it can transmit.
- Representation:
- Visualize time slots as distinct sections within a timeline.
- Label each section with the corresponding user or device.
- Key Points:
- Users take turns to transmit during their designated time slots.
- Efficient for digital communication, commonly used in GSM (Global System for Mobile Communications).

**Code Division Multiple Access (CDMA):**

- Concept:
  - Allows multiple users to share the same frequency band simultaneously.
  - Each user is assigned a unique code to distinguish its signal from others.
- Representation:
  - Use triangles or other shapes to represent users, with unique patterns or colors representing their codes.
- Show overlapping areas to indicate simultaneous transmission.
- Key Points:
  - Users transmit simultaneously on the same frequency using different codes.
- CDMA is widely used in digital cellular networks, such as in 3G and 4G technologies. →

**Visual Summary**

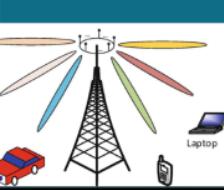
In your visual representation, you can create a comparative diagram with three sections, each highlighting the key characteristics and visual elements of FDMA, TDMA, and CDMA. Use clear labels, color coding, and arrows to illustrate differences in how these techniques allocate resources and manage multiple users on a shared medium.

THE END...

## Prototype:

Android Small - 1

Flow 1 ↗



**Differences between various multiple access techniques.**

ENTER →

Android Small - 2

**Frequency Division Multiple Access (FDMA):**

- Concept:
  - Allocates different frequency bands to individual users.
  - Each user is assigned a unique frequency channel for communication.
- Representation:
  - In a visual representation, you can use rectangles to represent different frequency bands.
- Label each rectangle with the corresponding user or communication channel.
- Key Points:
  - Users transmit simultaneously, each using its allocated frequency band.
- Suitable for analog signals and FDMA is commonly used in analog radio communication. →

Android Small - 5

**Visual Summary**

In your visual representation, you can create a comparative diagram with three sections, each highlighting the key characteristics and visual elements of FDMA, TDMA, and CDMA. Use clear labels, color coding, and arrows to illustrate differences in how these techniques allocate resources and manage multiple users on a shared medium.

THE END...

Android Small - 3

**Time Division Multiple Access (TDMA):**

- Concept:
  - Divides the time into slots or frames.
- Each user is assigned a specific time slot during which it can transmit.
- Representation:
  - Visualize time slots as distinct sections within a timeline.
- Label each section with the corresponding user or device.
- Key Points:
  - Users take turns to transmit during their designated time slots.
- Efficient for digital communication, commonly used in GSM (Global System for Mobile Communications). →

Android Small - 4

**Code Division Multiple Access (CDMA):**

- Concept:
  - Allows multiple users to share the same frequency band simultaneously.
  - Each user is assigned a unique code to distinguish its signal from others.
- Representation:
  - Use triangles or other shapes to represent users, with unique patterns or colors representing their codes.
- Show overlapping areas to indicate simultaneous transmission.
- Key Points:
  - Users transmit simultaneously on the same frequency using different codes.
- CDMA is widely used in digital cellular networks, such as in 3G and 4G technologies. →

**Result:**

Hence created a visual representation in Figma showcasing the differences between various multiple access techniques.

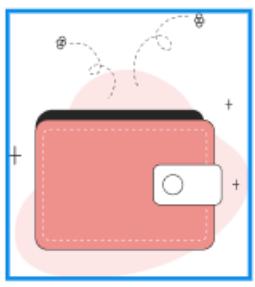
**11. Design a wireframe for a mobile application that incorporates security measures using Figma.****Aim: -**

Using Figma design a wireframe for a mobile application (Bank app UI) that incorporates security measures.

**Procedure: -**

1. open Figma
2. Create a new file
3. Select the Frames
4. Design Visual Elements
5. Make it Interactive
6. Add icons on the Frame
7. Incorporate Multimedia
8. Storyboard Animation
9. Review and edit the Prototype
10. Save and Share

**Design: -**



**We are into automating  
Microfinance in World**

**Paynow is a Microfinance  
business Software**

Skip



**Next**

Skip



**Next**

**PAYNOW**

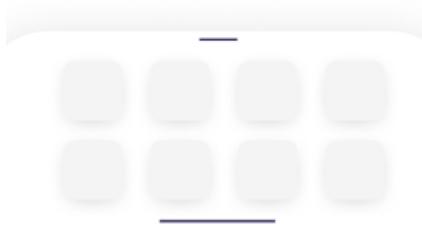
FAST & AFFORDABLE BANKING



Swipe up to login

**PAYNOW**

FAST & AFFORDABLE BANKING





Swipe up to login

More

Sign Up

## < Sign Up (27px)

Sign up for safe, secure and instant banking  
with paynow



### Sign Up Via Credit

description text here for sign up ho ahead sign up right now signup  
sample text lorem ipsum text for example



### Instant Sign Up

description text here for sign up ho ahead sign up right now signup  
sample text lorem ipsum text for example

## Sign Up Via Credit

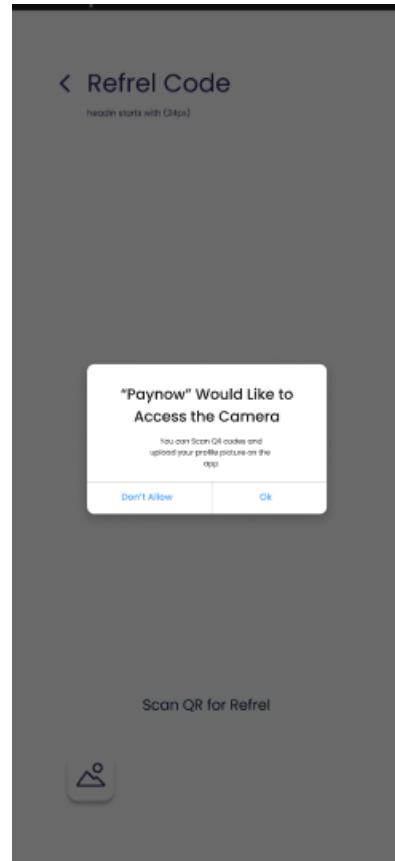
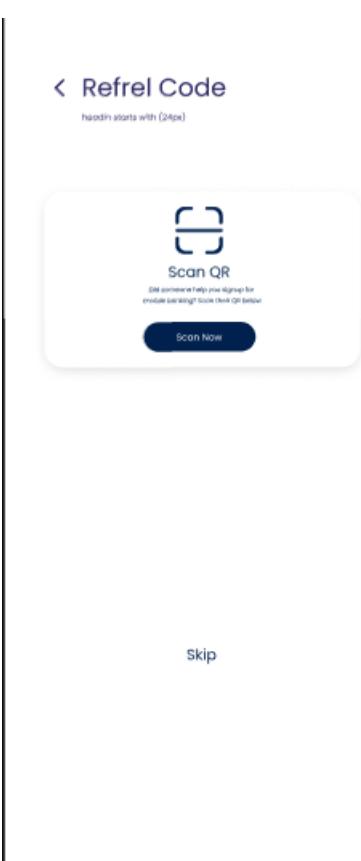
Sign up instantly

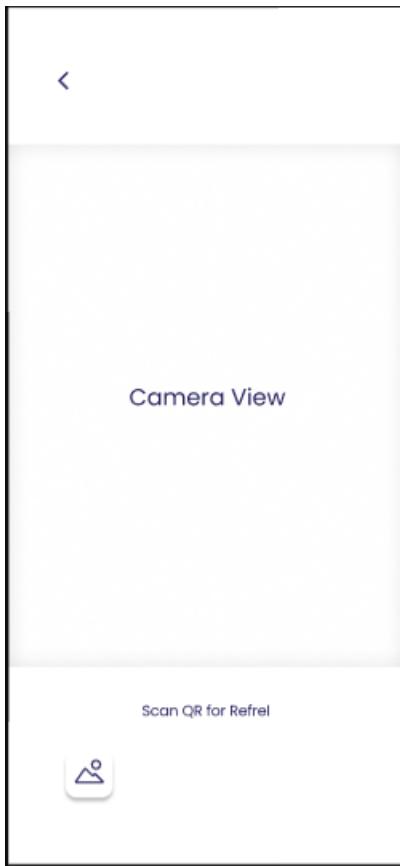
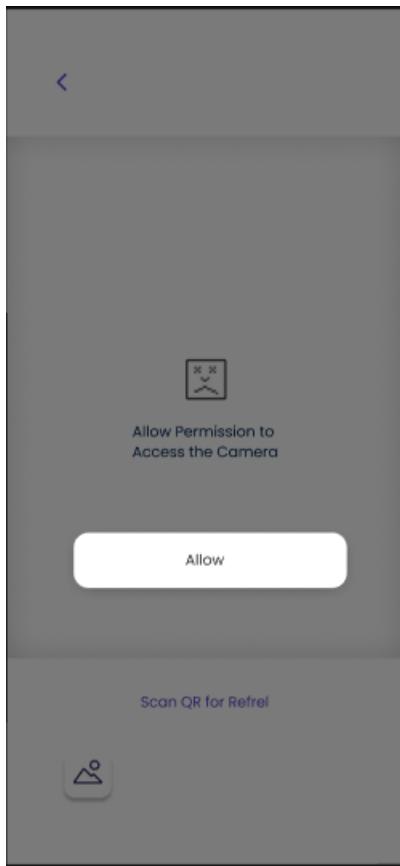
Get Started

Proceed

Congratulations

Get Started





Get Started



Hello  
Ibrahim

Add your loans to unlock full features

**Repayment Amount**  
**61,500** 5,000/month

180k  
140k  
120k  
100k  
80k  
60k  
40k  
30k  
20k  
0

2022 2023 2024 2025 2026 2027 2028 2029 2030

**Loan History**

| Amount | Status   |
|--------|----------|
| 55,000 | Rejected |
| 36,600 | Clear    |
| 85,000 | Disburse |

**Home** **Location** **Finance** **Scan QR** **Profile**

## < Finance

### Connected Account



**UBL Digital**

## < Payment

### Connect with Bank Account

Search or select recipients bank

**All Banks**

**Easypaisa**

**JazzCash**

**HBL Limited**

**PayPro**

### Set up a payment

**Regular Payment** \$200

**Round-ups** \$200

**Additional payments** \$200

Add Account Number

XXXXXXXXXXXXXX

Show bank format

|   |   |   |
|---|---|---|
| 1 | 2 | 3 |
| 4 | 5 |   |
| 6 | 7 | 8 |
| 0 |   | ⌫ |

Add bank account number →

Profile

Personal Details

Bank Account Details

Account opening Form

Invite Friend to Paynow

Home Location Finance Scan QR Profile

Profile

Name: Muhammad Ibrahim

Login Name: IbilMemon

Mobile Number: \* \* \* \* \* 6225221

Email: ibrahimmemon930@gmail.com

Note: All communication, including OTPs will be sent to your contact detail mentioned here.

Home Location Finance Scan QR Profile

**Enable Location**

Allow Paynow to use your location and find locations of all biometric, cash agents and business near you.

Deny      Enable Location Access

Agents nearby

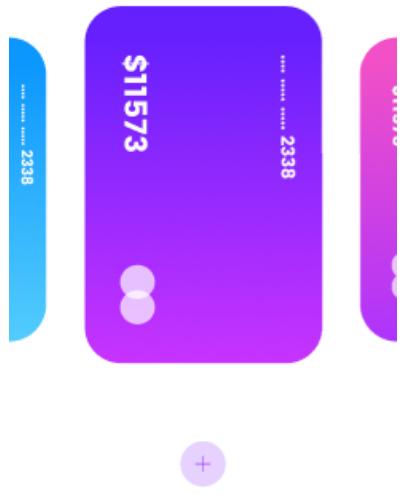
... .... 2338  
\$11573

| Category        | Description | Date | Amount    |
|-----------------|-------------|------|-----------|
| HBO             | Today       |      | -\$6.27   |
| Spotify         | Yesterday   |      | -\$9.99   |
| Ane Clothing    | Yesterday   |      | -\$36.89  |
| Desntist Clinic | May 17th    |      | -\$104.00 |
| Patreon         | May 16th    |      | -\$3.99   |

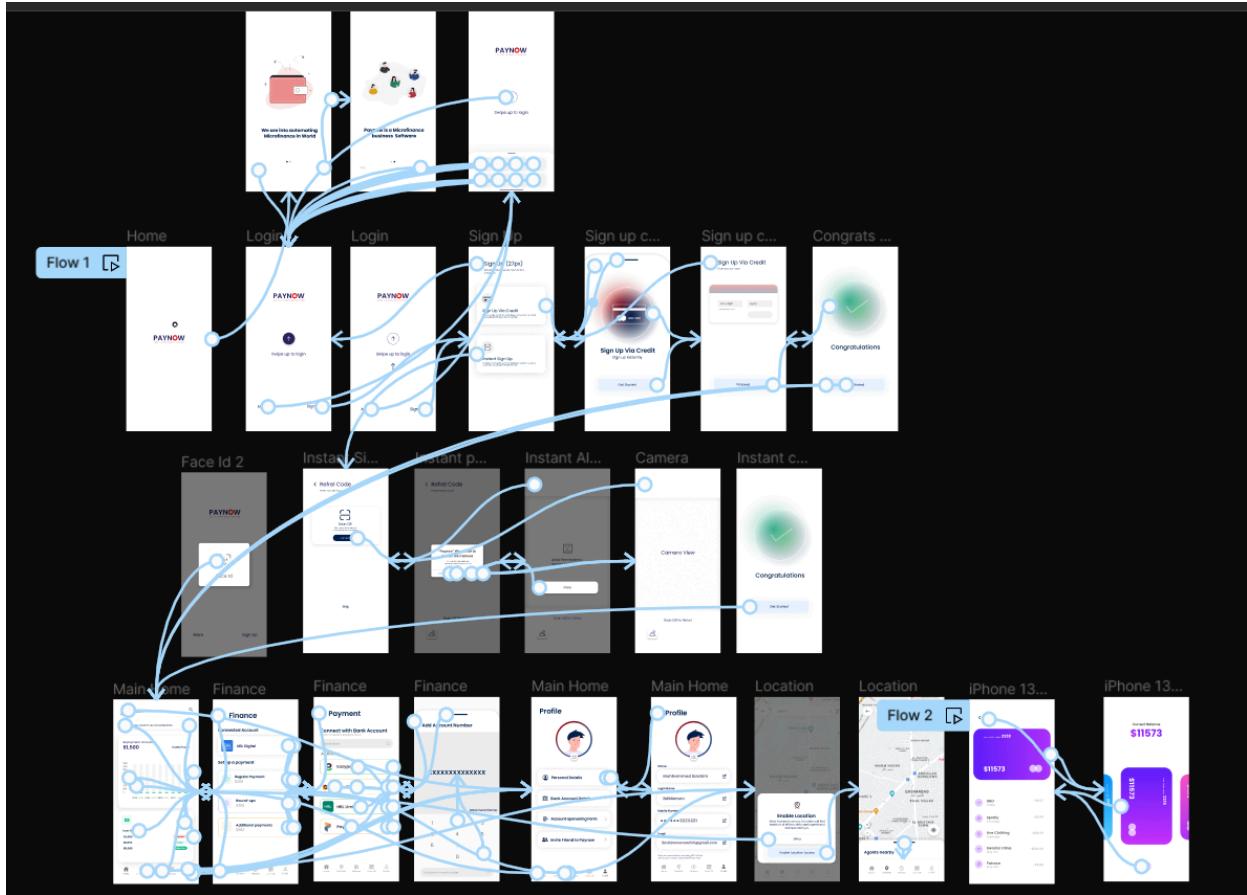
---

Current Balance

**\$11573**



**Prototype: -**



### **Result: -**

A wireframe for a mobile application that incorporates security measures using Figma is created and executed successfully

## **12. Use Figma to create an interactive diagram illustrating the evolution from 1G to 5G.**

### **Aim: -**

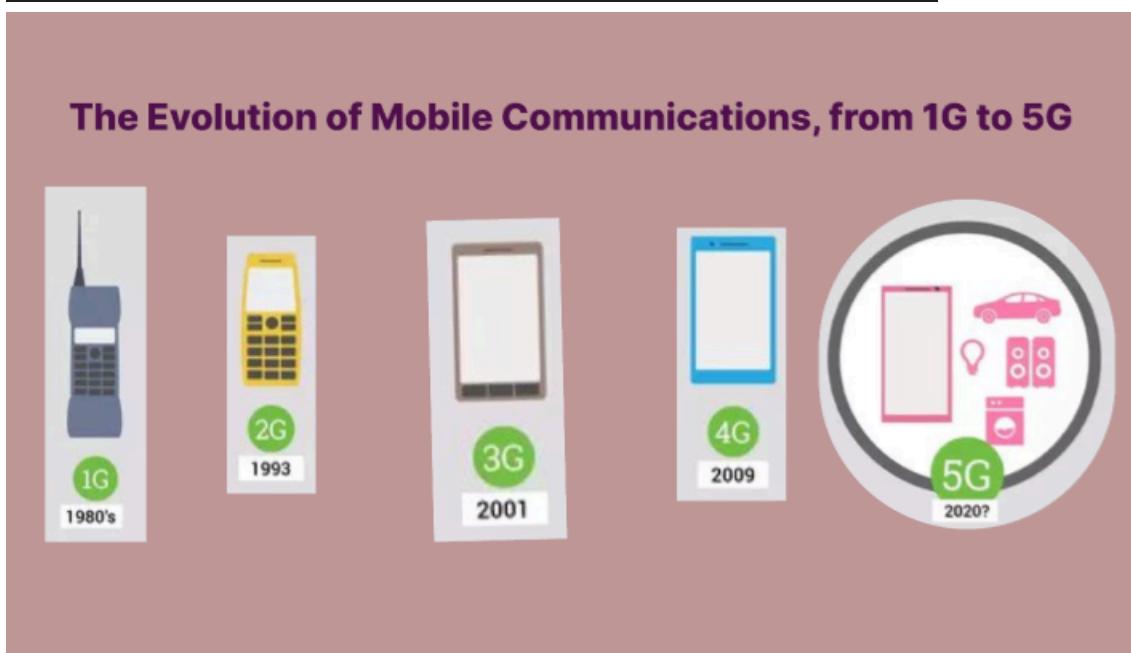
Design an interactive diagram illustrating the evolution from 1G to 5G using Figma.

### **Procedure: -**

1. open Figma
2. Create a new file
3. Select the Frames
4. Fill in the content that is required for presentation
5. Design Visual Elements
6. Make it Interactive
7. Add Annotations and Explanations
8. Incorporate Multimedia
9. Storyboard Animation

11. Review and edit the Prototype
12. Save and Share

**Design:** -





## Evolution Of 1G

### 1. Introduction of 1G:

- The first commercially available 1G network was launched in Japan in 1979 by NTT (Nippon Telegraph and Telephone).
- This generation of mobile networks introduced analog voice communication and primarily provided mobile voice services.

### 2. AMPS Standard (Advanced Mobile Phone System):

- In the United States, the Advanced Mobile Phone System (AMPS) became the prevalent 1G standard.
- AMPS used analog modulation for voice transmission and provided basic voice calling services.

### 3. Limited Data Services:

- 1G networks were primarily designed for voice communication, and data services were extremely limited.
- Data services were characterized by low data transfer rates, typically used for simple messaging services.

### 4. First Mobile Phones:

- The introduction of 1G saw the emergence of the first generation of mobile phones. These devices were bulky and had limited battery life compared to modern standards.

### 5. Global Expansion:

- Following the initial deployment in Japan and the United States, 1G networks expanded globally, reaching other countries in Europe and Asia.

### 6. Challenges:

- 1G networks faced challenges such as limited capacity, poor call quality, and susceptibility to interference and eavesdropping.

### 7. Transition to Digital Technologies:

- Towards the end of the 1G era, digital technologies began to emerge as a successor to analog systems. The transition to digital paved the way for more advanced and efficient mobile communication systems.



## Evolution of 2G

### 1. GSM (Global System for Mobile Communications):

- GSM, introduced in the early 1990s, was a major milestone in the 2G evolution.
- It shifted from analog to digital communication, using a combination of Time Division Multiple Access (TDMA) and Frequency Division Multiple Access (FDMA) to allow multiple users to share the same frequency band.

### 1. Digital Voice and Encryption:

- 2G networks brought digital voice encoding, significantly improving call quality and reducing interference.
- Enhanced encryption was introduced to improve the security of communication, making it more difficult for unauthorized parties to intercept conversations.

### 1. SMS (Short Message Service):

- One of the notable features introduced with 2G was SMS, allowing users to send short text messages between mobile devices.
- SMS quickly gained popularity and became a ubiquitous form of communication.

### 1. Data Services:

- While primarily designed for voice communication, 2G networks started to support data services at low speeds.
- GPRS (General Packet Radio Service) and EDGE (Enhanced Data rates for GSM Evolution) were introduced as enhancements to GSM, providing limited data capabilities.

### 1. Global Roaming:

- 2G networks facilitated global roaming, allowing users to use their mobile devices in different countries with compatible networks.

### 1. SIM Cards:

- Subscriber Identity Module (SIM) cards became a standard feature in 2G networks. These removable cards contained subscriber information and allowed users to switch devices easily.

### 1. Introduction of Multimedia Messaging (MMS):

- Towards the end of the 2G era, some networks began supporting Multimedia Messaging Service (MMS), enabling the exchange of multimedia content such as pictures and videos.



## Evolution of 3G

### 1. UMTS (Universal Mobile Telecommunications System):

- UMTS, based on the WCDMA (Wideband Code Division Multiple Access) air interface, was one of the first 3G technologies.
- UMTS significantly increased data transfer speeds compared to 2G technologies, allowing for enhanced multimedia services.

### 2. HSPA (High-Speed Packet Access):

- HSPA is an enhancement of UMTS, offering higher data rates through the introduction of new protocols.
- HSDPA (High-Speed Downlink Packet Access) improved downlink speeds, while HSUPA (High-Speed Uplink Packet Access) improved uplink speeds.

### 3. HSPA+ (Evolved High-Speed Packet Access):

- HSPA+ further extended the capabilities of HSPA, providing even higher data rates.
- It introduced multiple input, multiple output (MIMO) technology and higher order modulation schemes.

### 4. EV-DO Rev. B (Evolution-Data Optimized Revision B):

- While CDMA2000 and EV-DO were primarily associated with 3G in CDMA networks, EV-DO Rev. B was an upgrade that increased data rates and system capacity.

### 5. 4G LTE (Long-Term Evolution):

- LTE is often considered part of the 3G to 4G transition, offering a substantial leap in data rates and network efficiency.
- LTE provides all-IP (Internet Protocol) based communication, low-latency connectivity, and improved spectral efficiency.

The introduction of LTE Advanced and LTE Advanced Pro continued to enhance 4G capabilities, offering features like Carrier Aggregation, enhanced MIMO, and improved modulation schemes.



## Evolution of 4G

### 1. LTE (Long-Term Evolution):

- LTE is the technology that forms the foundation of 4G networks.
- It introduced significant improvements in data transfer rates, reduced latency, and enhanced spectral efficiency.
- LTE networks provided a substantial boost in download and upload speeds compared to 3G technologies.

### 2. LTE-Advanced (LTE-A):

- LTE-A is an enhancement of the original LTE standard, introducing additional features to improve performance.
- Carrier Aggregation: Allows the combination of multiple LTE carriers to increase data rates and capacity.
- MIMO (Multiple Input, Multiple Output): Utilizes multiple antennas for improved throughput and coverage.
- Higher Modulation Schemes: Supports more advanced modulation techniques for increased data rates.

### 3. LTE-Advanced Pro:

- LTE-Advanced Pro, also known as 4.5G or 4.9G, represents further enhancements beyond LTE-A.
- Enhanced Carrier Aggregation: Supports more carrier aggregation combinations for even higher data rates.
- Massive MIMO: Utilizes a large number of antennas to enhance spectral efficiency and network capacity.
- Improved IoT (Internet of Things) Support: Enhanced support for IoT devices with lower power consumption and extended coverage.

### 4. Gigabit LTE:

- Gigabit LTE represents a milestone in achieving peak download speeds of up to 1 Gbps.
- Utilizes advanced technologies such as 4x4 MIMO, 256-QAM modulation, and carrier aggregation to achieve higher data rates.

### 5. 5G Introduction:

- While 5G is considered a distinct generation of mobile technology, its introduction and coexistence with 4G are crucial in the evolution of mobile networks.
- 5G networks bring significantly higher data rates, lower latency, and the ability to connect a massive number of devices simultaneously.
- Initial 5G deployments may involve non-standalone (NSA) architectures, where 5G and 4G networks work together to provide enhanced services.

### 6. Dual Connectivity:

- Dual Connectivity is a feature that allows devices to simultaneously connect to both 4G and 5G networks, providing improved performance and a smoother transition to full 5G coverage.



## Evolution of 5G

### 1. Pre-5G Technologies:

- Before the formal introduction of 5G, there were enhancements and technologies in the 4G LTE (Long-Term Evolution) era, such as LTE Advanced (LTE-A) and LTE Advanced Pro, that provided stepping stones toward the capabilities of 5G.

### 2. Release 15 - 5G NR (New Radio):

- In December 2017, the 3rd Generation Partnership Project (3GPP) released the first official 5G standard, known as Release 15.
- 5G NR introduced new radio technologies, frequency bands, and massive MIMO (Multiple-Input, Multiple-Output) for improved spectral efficiency.
- The initial focus was on enhanced Mobile Broadband (eMBB), providing faster data rates and increased network capacity.

### 3. Release 16 - Expanded Capabilities:

- Released in July 2020, 3GPP's Release 16 expanded the 5G capabilities to support a broader range of use cases and industries.
- It introduced features such as URLLC (Ultra-Reliable Low Latency Communication) for applications with stringent latency requirements, and mMTC (massive Machine Type Communication) for connecting a massive number of IoT devices.
- Integrated access technologies like Wi-Fi and fixed broadband for seamless connectivity.

### 4. Release 17 - Further Enhancements:

- 3GPP's Release 17, expected to be completed in 2022, is anticipated to bring further enhancements to 5G.
- It aims to address more advanced use cases, improve network efficiency, and continue evolving the 5G ecosystem.

### 5. Deployment and Commercialization:

- Commercial deployments of 5G networks began around 2019, with various countries and telecom operators rolling out 5G services in stages.

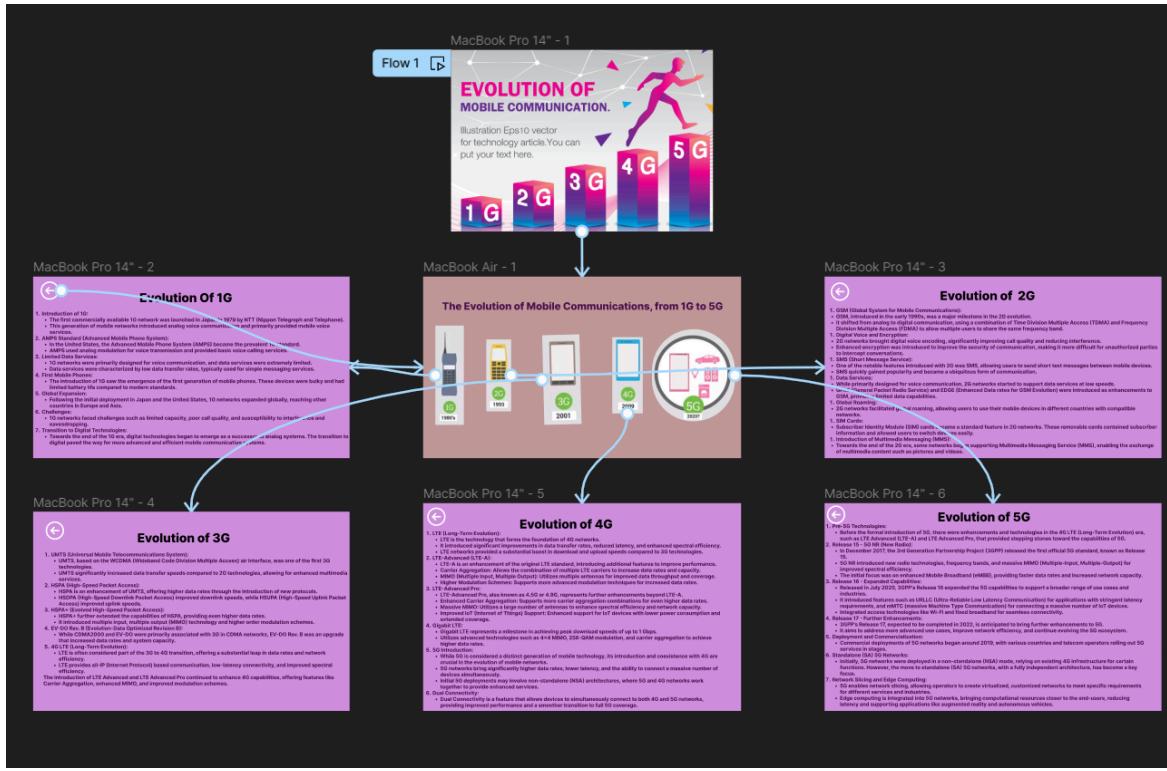
### 6. Standalone (SA) 5G Networks:

- Initially, 5G networks were deployed in a non-standalone (NSA) mode, relying on existing 4G infrastructure for certain functions. However, the move to standalone (SA) 5G networks, with a fully independent architecture, has become a key focus.

### 7. Network Slicing and Edge Computing:

- 5G enables network slicing, allowing operators to create virtualized, customized networks to meet specific requirements for different services and industries.
- Edge computing is integrated into 5G networks, bringing computational resources closer to the end-users, reducing latency and supporting applications like augmented reality and autonomous vehicles.

Prototype: -



## Result: -

Hence an interactive diagram illustrating the evolution from 1G to 5G in Figma is created and executed successfully

## 13.Design an infographic in Figma comparing mobile communication and mobile computing

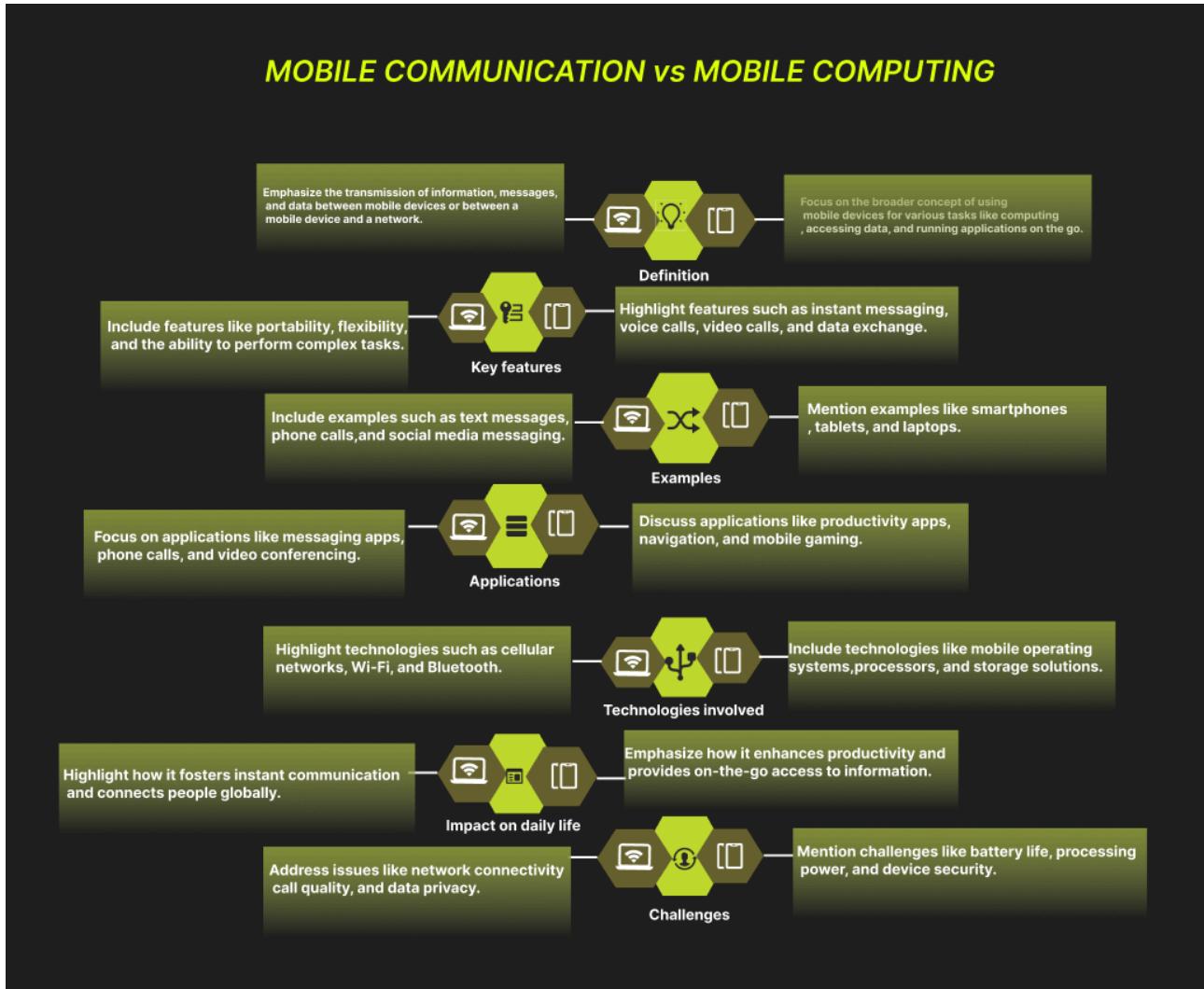
### Aim: -

Using Figma design an infographic comparing mobile communication and mobile computing

### Procedure: -

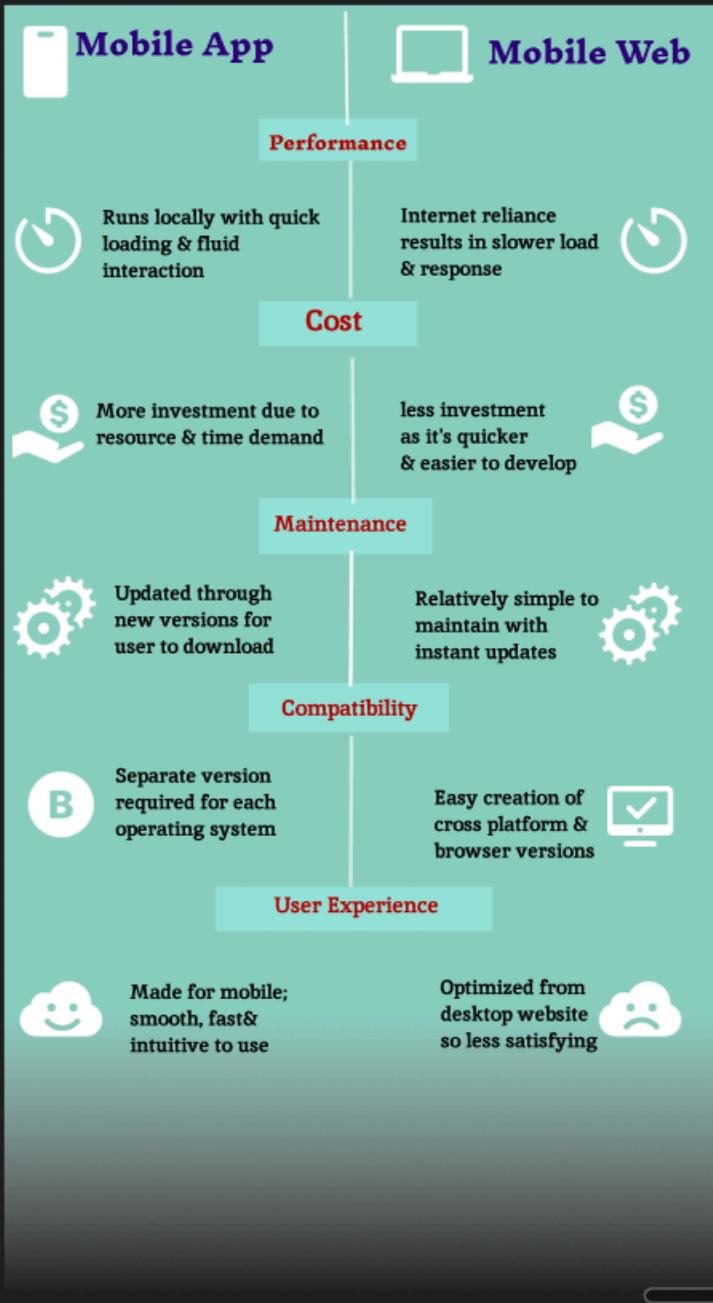
1. open Figma
2. Create a new file
3. Select the Frames
4. Fill in the content that is required for presentation
5. Design Visual Elements
6. Make it Interactive
7. Add Annotations and Explanations
8. Incorporate Multimedia
9. Storyboard Animation
11. Review and edit the Prototype
12. Save and Share

## Design: -



# Mobile app vs Mobile web

Frame 1



## Result: -

An infographic design in Figma comparing mobile communication and mobile computing is created successfully.

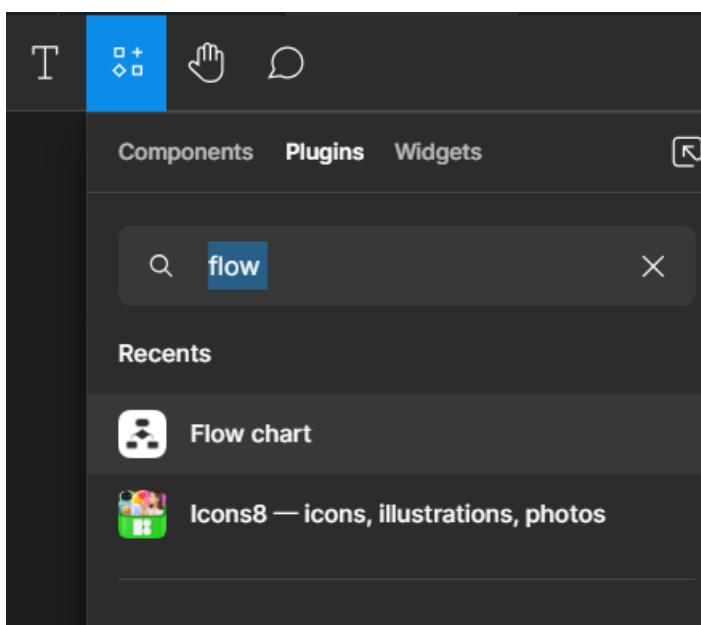
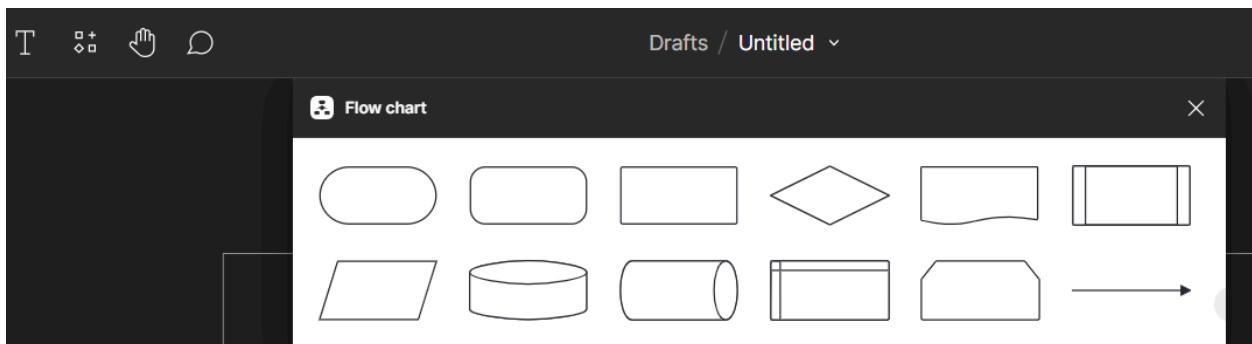
14. Develop a flowchart in Figma explaining the operation of General Packet Radio Service (GPRS).

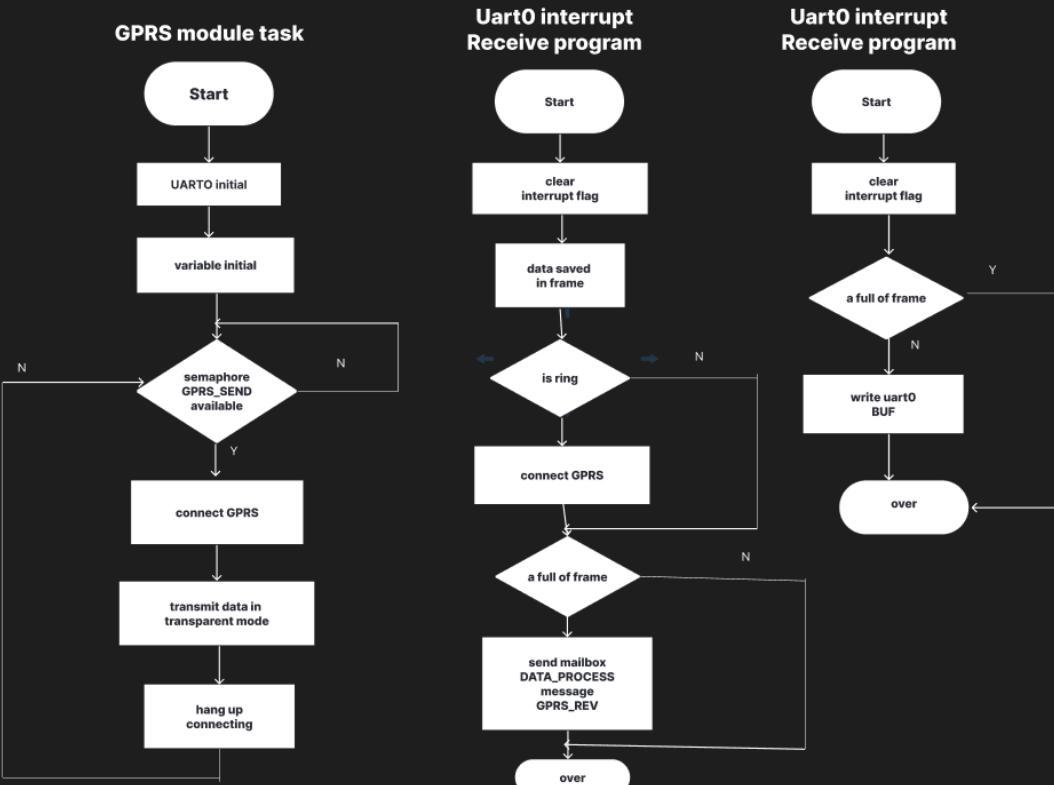
**Aim: -**

Draw a flowchart in Figma explaining the operation of General Packet Radio Service (GPRS).

**Procedure: -**

1. open Figma
2. Create a new file
3. Click on the resources icon and click on the plugins
4. Search for the Flow Chart
5. Drag and drop the shapes on the screen
6. Now, enter the content on the shapes and connect them through Arrows.
7. Grouping and alignment
8. Review and edit
9. Save and share

**Design: -**



## The operation of General Packet Radio Service (GPRS)

**Result:** -

Hence the flowchart in Figma explaining the operation of General Packet Radio Service (GPRS) has been drawn successfully.

**15) Design an interactive presentation in Figma explaining the issues in mobile IP.**

**Aim:**

To Design an interactive presentation in Figma explaining the issues in mobile IP

**Procedure:**

1. Define Presentation Structure
2. Create a Figma Project
3. Design Visual Elements
4. Make it Interactive
5. Add Annotations and Explanations

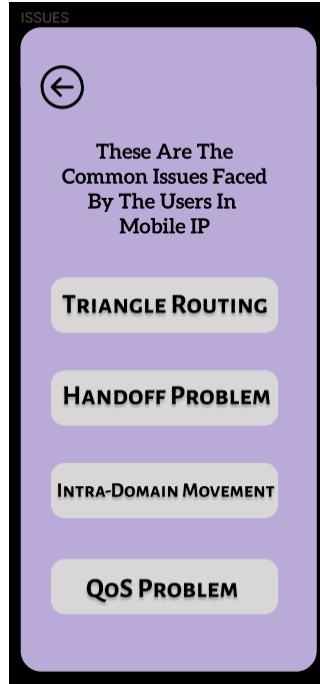
6. Incorporate Multimedia
7. Storyboard Animation
8. Test the Prototype
9. Collaborate and Gather Feedback
10. Finalize and Share

**Step By Step Procedure :**

**Interface Of Experiment:**



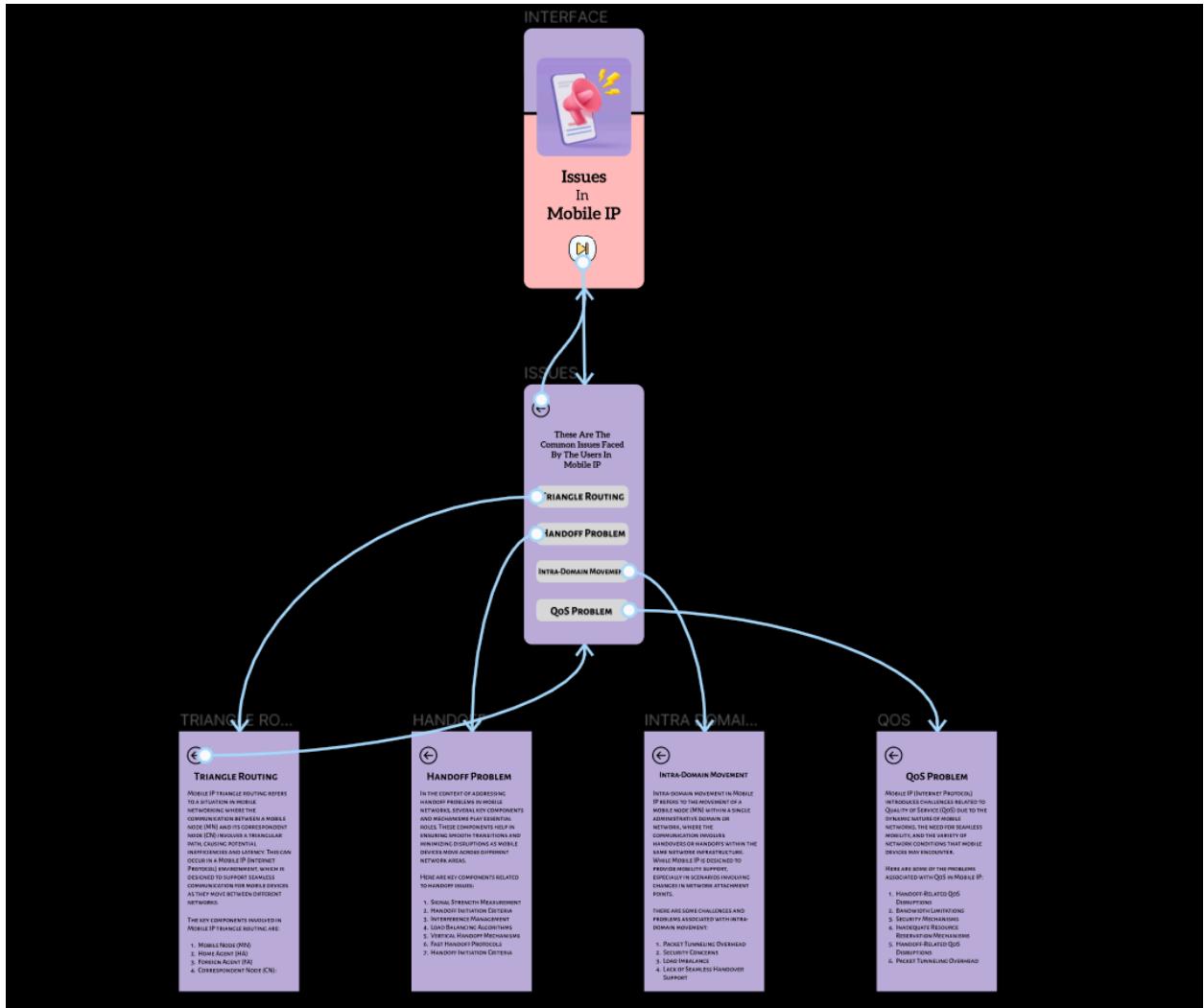
**Next Page:**



## Final Step:

|   |   |   |  |
|---|---|---|--|
| <p><b>TRIANGLE ROUTING</b></p> <p>MOBILE IP TRIANGLE ROUTING REFERS TO A SITUATION IN MOBILE NETWORKING WHERE THE COMMUNICATION BETWEEN A MOBILE NODE (MN) AND ITS CORRESPONDENT NODE (CN) INVOLVES A TRIANGULAR PATH, CAUSING POTENTIAL INEFFICIENCIES AND LATENCY. THIS CAN OCCUR IN A MOBILE IP (INTERNET PROTOCOL) ENVIRONMENT, WHICH IS DESIGNED TO SUPPORT SEAMLESS COMMUNICATION FOR MOBILE DEVICES AS THEY MOVE BETWEEN DIFFERENT NETWORKS.</p> <p>THE KEY COMPONENTS INVOLVED IN MOBILE IP TRIANGLE ROUTING ARE:</p> <ol style="list-style-type: none"> <li>1. MOBILE NODE (MN)</li> <li>2. HOME AGENT (HA)</li> <li>3. FOREIGN AGENT (FA)</li> <li>4. CORRESPONDENT NODE (CN):</li> </ol> | <p><b>HANDOFF</b></p> <p>IN THE CONTEXT OF ADDRESSING HANDOFF PROBLEMS IN MOBILE NETWORKS, SEVERAL KEY COMPONENTS AND MECHANISMS PLAY ESSENTIAL ROLES. THESE COMPONENTS HELP IN ENSURING SMOOTH TRANSITIONS AND MINIMIZING DISRUPTIONS AS MOBILE DEVICES MOVE ACROSS DIFFERENT NETWORK AREAS.</p> <p>HERE ARE KEY COMPONENTS RELATED TO HANDOFF ISSUES:</p> <ol style="list-style-type: none"> <li>1. SIGNAL STRENGTH MEASUREMENT</li> <li>2. HANDOFF INITIATION CRITERIA</li> <li>3. INTERFERENCE MANAGEMENT</li> <li>4. LOAD BALANCING ALGORITHMS</li> <li>5. VERTICAL HANDOFF MECHANISMS</li> <li>6. FAST HANDOFF PROTOCOLS</li> <li>7. HANDOFF INITIATION CRITERIA</li> </ol> | <p><b>INTRA DOMAIN MOVEMENT</b></p> <p>INTRA-DOMAIN MOVEMENT IN MOBILE IP REFERS TO THE MOVEMENT OF A MOBILE NODE (MN) WITHIN A SINGLE ADMINISTRATIVE DOMAIN OR NETWORK, WHERE THE COMMUNICATION INVOLVES HANOVERS OR HANDOFFS WITHIN THE SAME NETWORK INFRASTRUCTURE. WHILE MOBILE IP IS DESIGNED TO PROVIDE MOBILITY SUPPORT, ESPECIALLY IN SCENARIOS INVOLVING CHANGES IN NETWORK ATTACHMENT POINTS.</p> <p>THERE ARE SOME CHALLENGES AND PROBLEMS ASSOCIATED WITH INTRA-DOMAIN MOVEMENT:</p> <ol style="list-style-type: none"> <li>1. PACKET TUNNELING OVERHEAD</li> <li>2. SECURITY CONCERN</li> <li>3. LOAD IMBALANCE</li> <li>4. LACK OF SEAMLESS HANDOVER SUPPORT</li> </ol> | <p><b>QoS</b></p> <p>MOBILE IP (INTERNET PROTOCOL) INTRODUCES CHALLENGES RELATED TO QUALITY OF SERVICE (QoS) DUE TO THE DYNAMIC NATURE OF MOBILE NETWORKS, THE NEED FOR SEAMLESS MOBILITY, AND THE VARIETY OF NETWORK CONDITIONS THAT MOBILE DEVICES MAY ENCOUNTER.</p> <p>HERE ARE SOME OF THE PROBLEMS ASSOCIATED WITH QoS IN MOBILE IP:</p> <ol style="list-style-type: none"> <li>1. HANDOFF-RELATED QoS DISRUPTIONS</li> <li>2. BANDWIDTH LIMITATIONS</li> <li>3. SECURITY MECHANISMS</li> <li>4. INADEQUATE RESOURCE RESERVATION MECHANISMS</li> <li>5. HANDOFF-RELATED QoS DISRUPTIONS</li> <li>6. PACKET TUNNELING OVERHEAD</li> </ol> |
|---|---|---|--|

## Prototype:



## Result:

Hence the interactive presentation in Figma explaining the issues in mobile IP is created and executed successfully.

## 16. Develop a wireframe for a mobile application that addresses challenges related to ad hoc wireless networks using Figma.

### Aim: -

Create a Wireframe for a mobile application that addresses challenges related to ad hoc wireless networks using Figma.

### Procedure: -

1. open Figma
2. Create a new file
3. Select the Frames
4. Design Visual Elements
5. Make it Interactive
6. Add icons on the Frame
7. Incorporate Multimedia
8. Storyboard Animation
9. Review and edit the Prototype
10. Save and Share

**Design: -**



## **challenges related to ad hoc wireless networks**

*Ad hoc wireless networks in mobile computing, also known as Mobile Ad hoc Networks (MANETs), present several challenges due to their dynamic and decentralized nature. These challenges impact the design, implementation, and performance of ad hoc wireless networks. Here are some key challenges related to MANETs:*

***Dynamic Topology***

***Limited Bandwidth and Energy Constraints***

***Routing Protocols***

**Security Concerns**

**Quality of Service (QoS) Provisioning**

**Scalability**

**Resource Management**

***Topology Control:***

***Interference and Channel Access***

***Mobility Management***





### 1. Dynamic Topology:

- MANETs have a dynamic topology as nodes move unpredictably. This dynamic nature makes it challenging to establish and maintain stable network connections.
- Frequent changes in network topology require efficient routing protocols that can adapt to these changes.

### 2. Limited Bandwidth and Energy Constraints:

- Devices in ad hoc networks often operate on limited battery power. Energy efficiency is crucial, and communication protocols need to be designed to minimize energy consumption.
- Limited bandwidth is another constraint, requiring efficient use of available resources for data transmission.

### 3. Routing Protocols:

- Developing robust and efficient routing protocols for ad hoc networks is challenging due to the dynamic nature of the topology.



### 4. Security Concerns:

- MANETs are susceptible to various security threats, including eavesdropping, data tampering, and denial of service attacks.
- The absence of a centralized infrastructure makes it challenging to implement traditional security measures.

### 5. Quality of Service (QoS) Provisioning:

- Providing QoS in MANETs is challenging due to the dynamic nature of the network. Ensuring reliable and timely delivery of data while considering factors like bandwidth, delay, and jitter is complex.

### 6. Scalability:

- As the number of nodes in the network increases, scalability becomes a concern. Traditional routing protocols may face scalability issues when dealing with a large number of nodes.

### 7. Resource Management:

- Efficient resource management, including bandwidth allocation and energy conservation, is crucial for the proper functioning of MANETs.
- Optimizing resource usage while considering the dynamic nature of the network is a significant challenge.



#### **8. Topology Control:**

- *Maintaining control over the network topology is essential for efficient routing and resource management.*
- *Strategies for topology control involve adjusting transmission power and selecting appropriate neighbors to optimize network connectivity.*

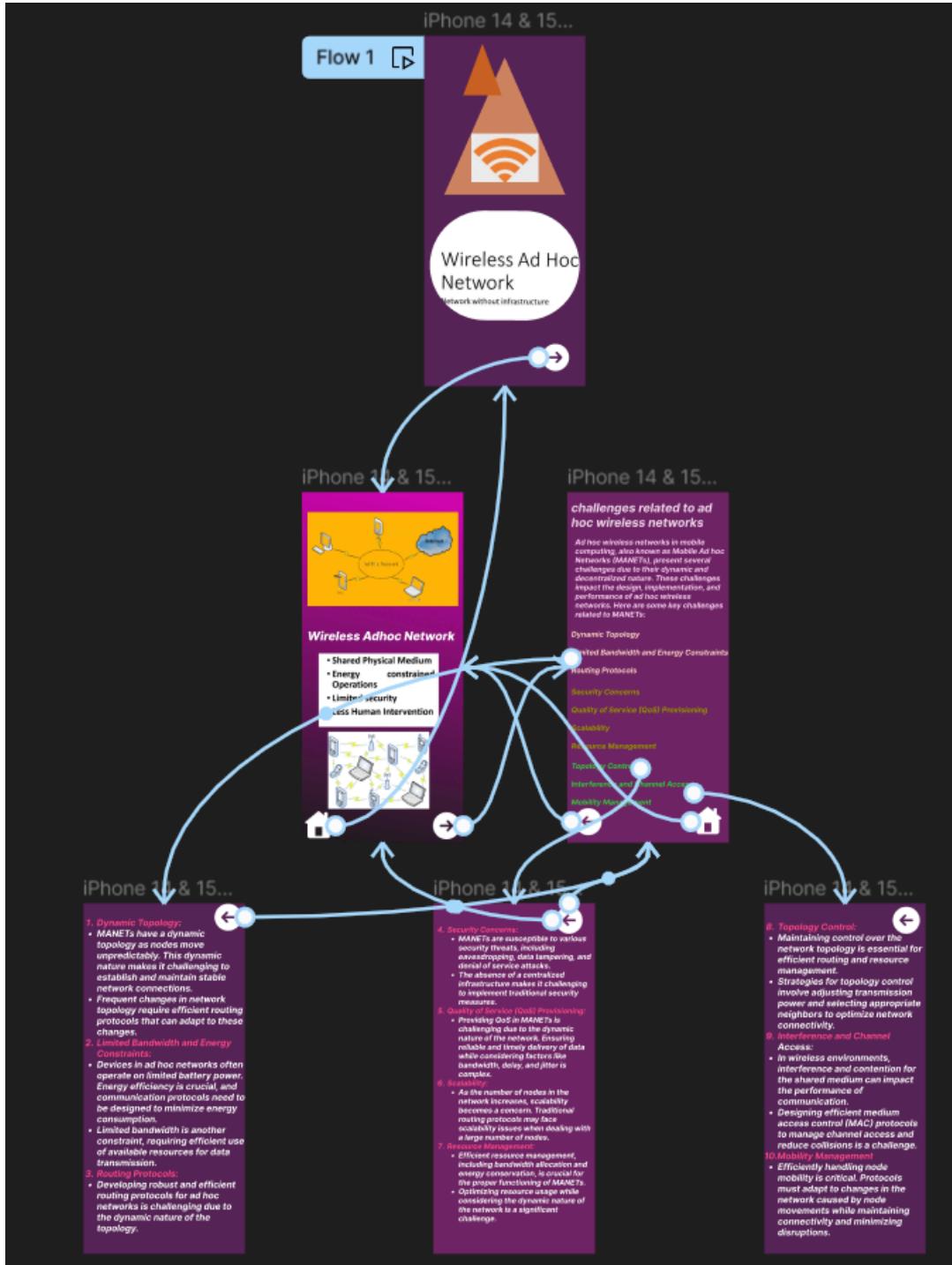
#### **9. Interference and Channel Access:**

- *In wireless environments, interference and contention for the shared medium can impact the performance of communication.*
- *Designing efficient medium access control (MAC) protocols to manage channel access and reduce collisions is a challenge.*

#### **10. Mobility Management**

- *Efficiently handling node mobility is critical. Protocols must adapt to changes in the network caused by node movements while maintaining connectivity and minimizing disruptions.*

**Prototype: -**



## Result: -

Hence a wireframe for a mobile application that addresses challenges related to ad hoc wireless networks using Figma is created and executed successfully

**17) Create a visual representation in Figma illustrating the operation of proactive and reactive routing protocols in mobile IP.**

**Aim:**

Create a visual representation in Figma illustrating the operation of proactive and reactive routing protocols in mobile IP.

Procedure:

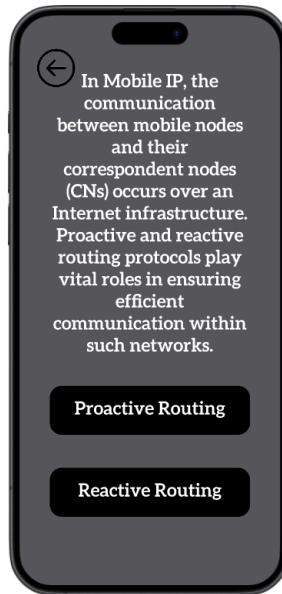
1. Define Presentation Structure
2. Create a Figma Project
3. Design Visual Elements
4. Make it Interactive
5. Add Annotations and Explanations
6. Incorporate Multimedia
7. Storyboard Animation
8. Test the Prototype
9. Collaborate and Gather Feedback
10. Finalize and Share

**Step By Step Procedure :**

**Interface Of Experiment:**



**Next Page:**



## Final Step:

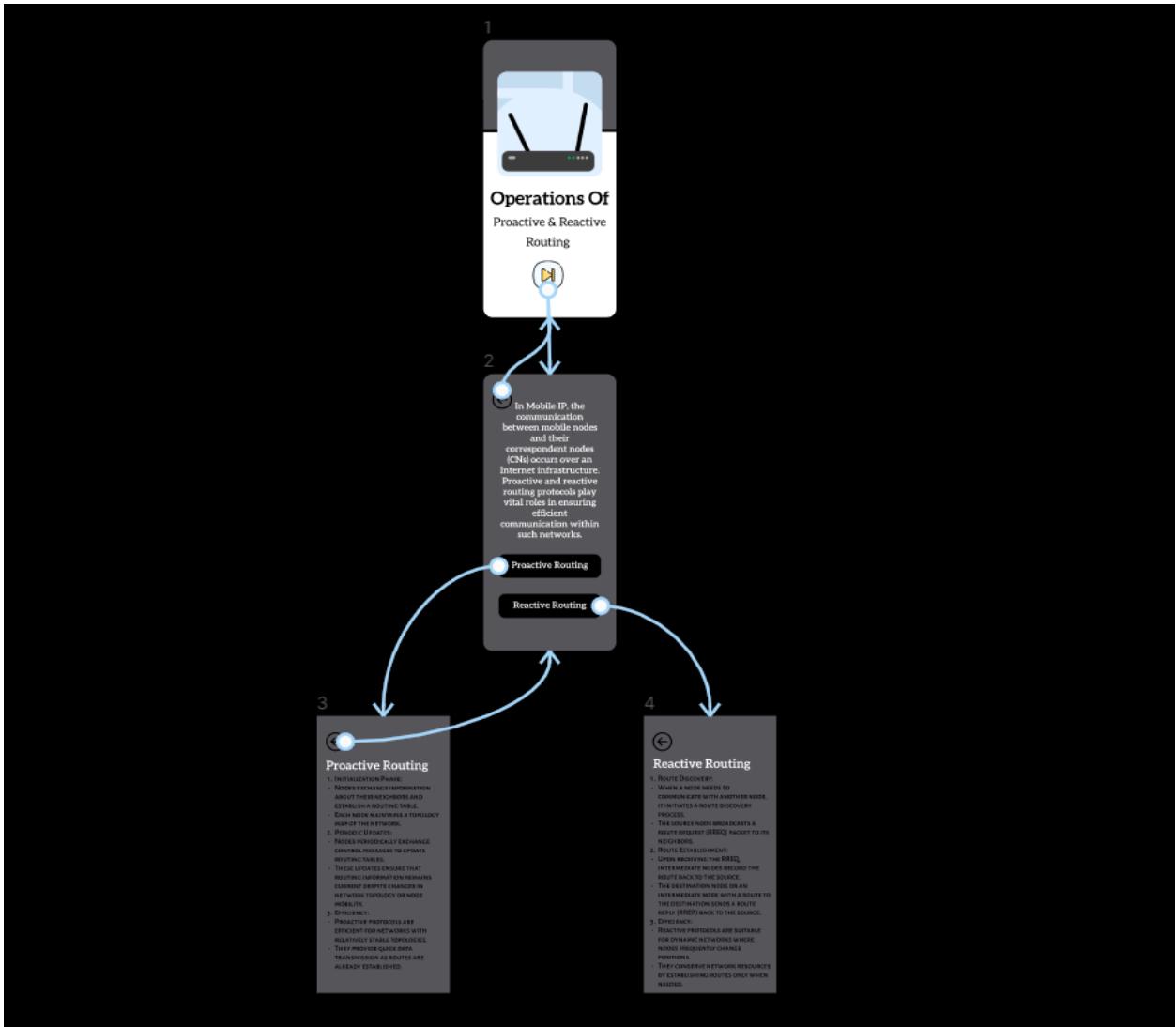
**Proactive Routing**

1. INITIALIZATION PHASE:
  - NODES EXCHANGE INFORMATION ABOUT THEIR NEIGHBORS AND ESTABLISH A ROUTING TABLE.
  - EACH NODE MAINTAINS A TOPOLOGY MAP OF THE NETWORK.
2. PERIODIC UPDATES:
  - NODES PERIODICALLY EXCHANGE CONTROL MESSAGES TO UPDATE ROUTING TABLES.
  - THESE UPDATES ENSURE THAT ROUTING INFORMATION REMAINS CURRENT DESPITE CHANGES IN NETWORK TOPOLOGY OR NODE MOBILITY.
3. EFFICIENCY:
  - PROACTIVE PROTOCOLS ARE EFFICIENT FOR NETWORKS WITH RELATIVELY STABLE TOPOLOGIES.
  - THEY PROVIDE QUICK DATA TRANSMISSION AS ROUTES ARE ALREADY ESTABLISHED.

**Reactive Routing**

1. ROUTE DISCOVERY:
  - WHEN A NODE NEEDS TO COMMUNICATE WITH ANOTHER NODE, IT INITIATES A ROUTE DISCOVERY PROCESS.
  - THE SOURCE NODE BROADCASTS A ROUTE REQUEST (RREQ) PACKET TO ITS NEIGHBORS.
2. ROUTE ESTABLISHMENT:
  - UPON RECEIVING THE RREQ, INTERMEDIATE NODES RECORD THE ROUTE BACK TO THE SOURCE.
  - THE DESTINATION NODE OR AN INTERMEDIATE NODE WITH A ROUTE TO THE DESTINATION SENDS A ROUTE REPLY (RREP) BACK TO THE SOURCE.
3. EFFICIENCY:
  - REACTIVE PROTOCOLS ARE SUITABLE FOR DYNAMIC NETWORKS WHERE NODES FREQUENTLY CHANGE POSITIONS.
  - THEY CONSERVE NETWORK RESOURCES BY ESTABLISHING ROUTES ONLY WHEN NEEDED.

## Prototype:



## Result:

Hence the illustrating the operation of proactive and reactive routing protocols in mobile IP is created and executed successfully

**18) Use Figma to create an infographic comparing and contrasting the architectures of Android, iOS, and Windows.**

**Aim:**

To use Figma to create an infographic comparing and contrasting the architectures of Android, iOS, and Windows.

**Procedure:**

1. Define Presentation Structure
2. Create a Figma Project
3. Design Visual Elements
4. Make it Interactive
5. Add Annotations and Explanations
6. Incorporate Multimedia
7. Storyboard Animation
8. Test the Prototype
9. Collaborate and Gather Feedback
10. Finalize and Share

**Step By Step Procedure :****Interface Of Experiment:****Next Page:**



## Final Step:

**Android**

- OPEN SOURCE AND CUSTOMIZABILITY:**
  - ANDROID IS BUILT ON A MODIFIED VERSION OF THE LINUX KERNEL, MAKING IT OPEN-SOURCE AND HIGHLY CUSTOMIZABLE.
- APPLICATION SANDBOX:**
  - ANDROID APPLICATIONS RUN WITHIN A SANDBOXED ENVIRONMENT, ENSURING SECURITY AND PREVENTING ONE APP FROM INTERFERING WITH OTHERS OR ACCESSING SENSITIVE SYSTEM RESOURCES WITHOUT PROPER PERMISSIONS.
- USER INTERFACE:**
  - ANDROID FOLLOWS A MODULAR APPROACH TO USER INTERFACE DESIGN, WITH LAYOUTS DEFINED USING XML FILES AND INTERACTION HANDLED THROUGH JAVA-BASED ACTIVITIES.

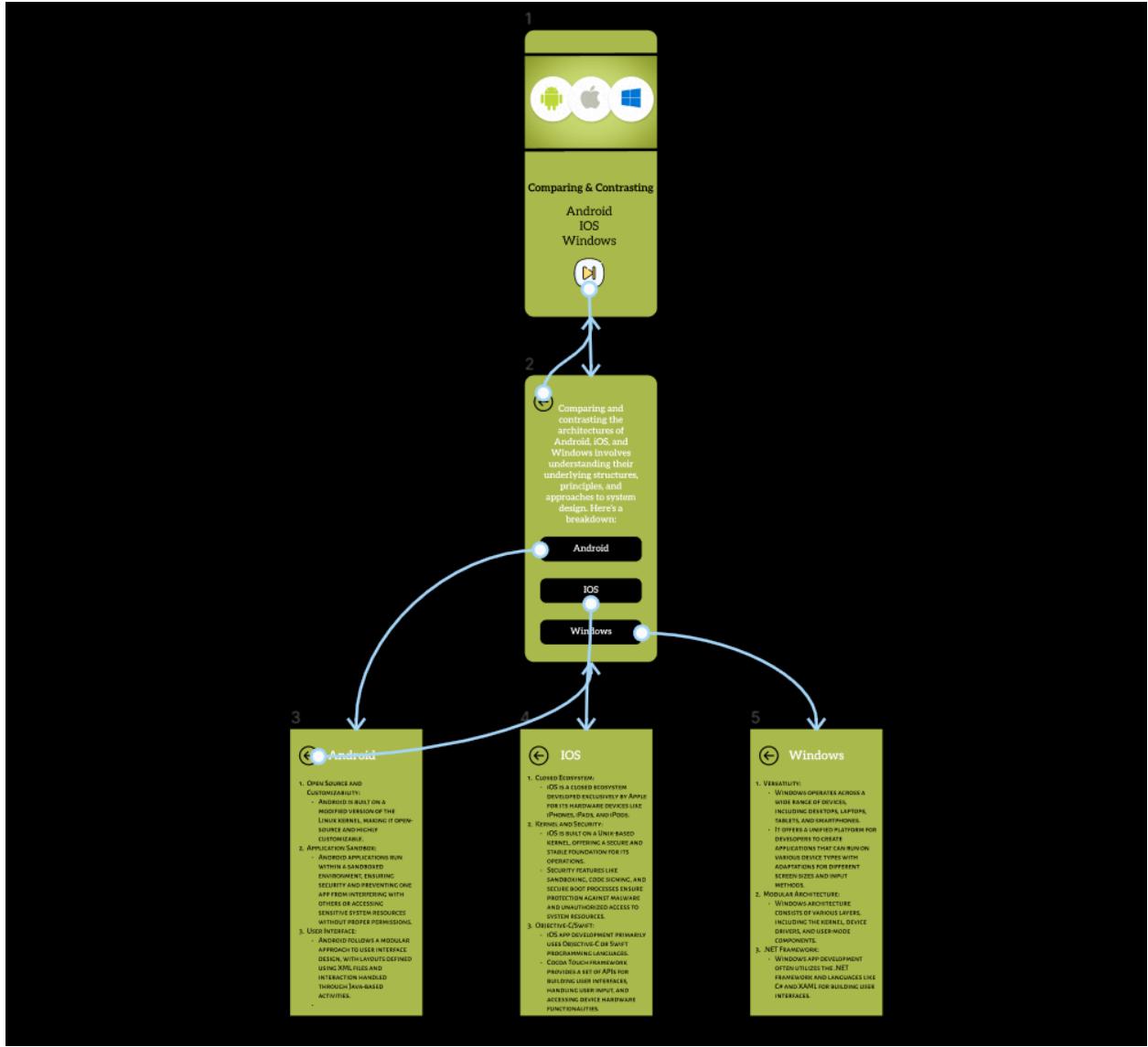
**iOS**

- CLOSED ECOSYSTEM:**
  - IOS IS A CLOSED ECOSYSTEM DEVELOPED EXCLUSIVELY BY APPLE FOR ITS HARDWARE DEVICES LIKE IPHONES, iPADS, AND iPods.
- KERNEL AND SECURITY:**
  - IOS IS BUILT ON A UNIX-BASED KERNEL, OFFERING A SECURE AND STABLE FOUNDATION FOR ITS OPERATIONS.
  - SECURITY FEATURES LIKE SANDBOXING, CODE SIGNING, AND SECURE BOOT PROCESSES ENSURE PROTECTION AGAINST MALWARE AND UNAUTHORIZED ACCESS TO SYSTEM RESOURCES.
- OBJECTIVE-C/SWIFT:**
  - IOS APP DEVELOPMENT PRIMARILY USES OBJECTIVE-C OR SWIFT PROGRAMMING LANGUAGES.
  - COCOA TOUCH FRAMEWORK PROVIDES A SET OF APIs FOR BUILDING USER INTERFACES, HANDLING USER INPUT, AND ACCESSING DEVICE HARDWARE FUNCTIONALITIES.

**Windows**

- VERSATILITY:**
  - WINDOWS OPERATES ACROSS A WIDE RANGE OF DEVICES, INCLUDING DESKTOPS, LAPTOPS, TABLETS, AND SMARTPHONES.
  - IT OFFERS A UNIFIED PLATFORM FOR DEVELOPERS TO CREATE APPLICATIONS THAT CAN RUN ON VARIOUS DEVICE TYPES WITH ADAPTATIONS FOR DIFFERENT SCREEN SIZES AND INPUT METHODS.
- MODULAR ARCHITECTURE:**
  - WINDOWS ARCHITECTURE CONSISTS OF VARIOUS LAYERS, INCLUDING THE KERNEL, DEVICE DRIVERS, AND USER-MODE COMPONENTS.
- .NET FRAMEWORK:**
  - WINDOWS APP DEVELOPMENT OFTEN UTILIZES THE .NET FRAMEWORK AND LANGUAGES LIKE C# AND XAML FOR BUILDING USER INTERFACES.

## Prototype:



## Result:

Hence the comparing and contrasting the architectures of Android, iOS, and Windows is created and executed successfully.

## 19) Develop a user interface prototype for an Android application using Figma.

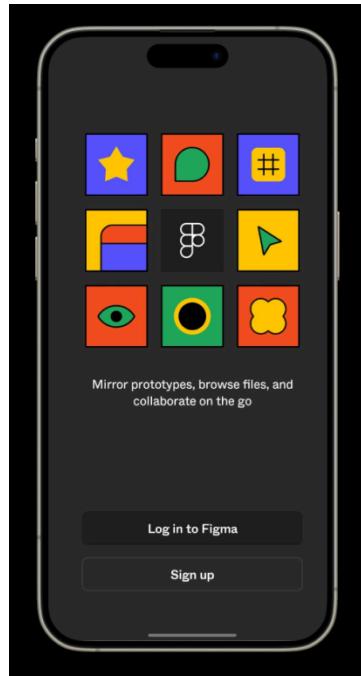
**Aim:**

To Develop a user interface prototype for an Android application using Figma.

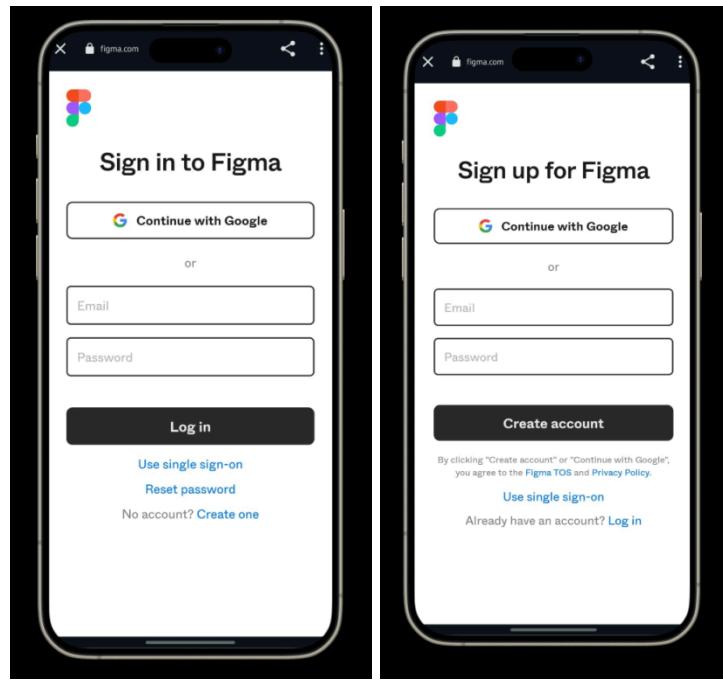
**Procedure:**

1. Create a file
2. Add The First Frame
3. Add Shapes
4. Add Text
5. Create The Second Frame
6. Add Prototyping

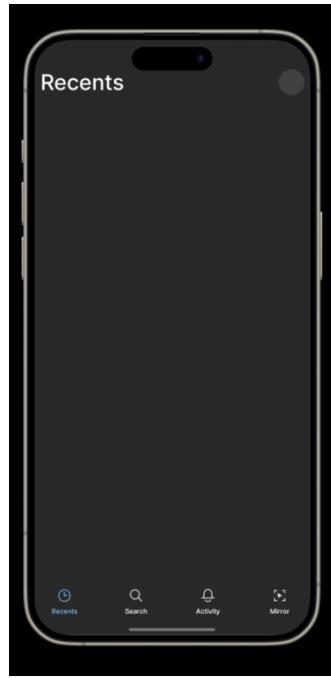
**Step By Step Procedure :****Interface Of Experiment:****Next Page:**



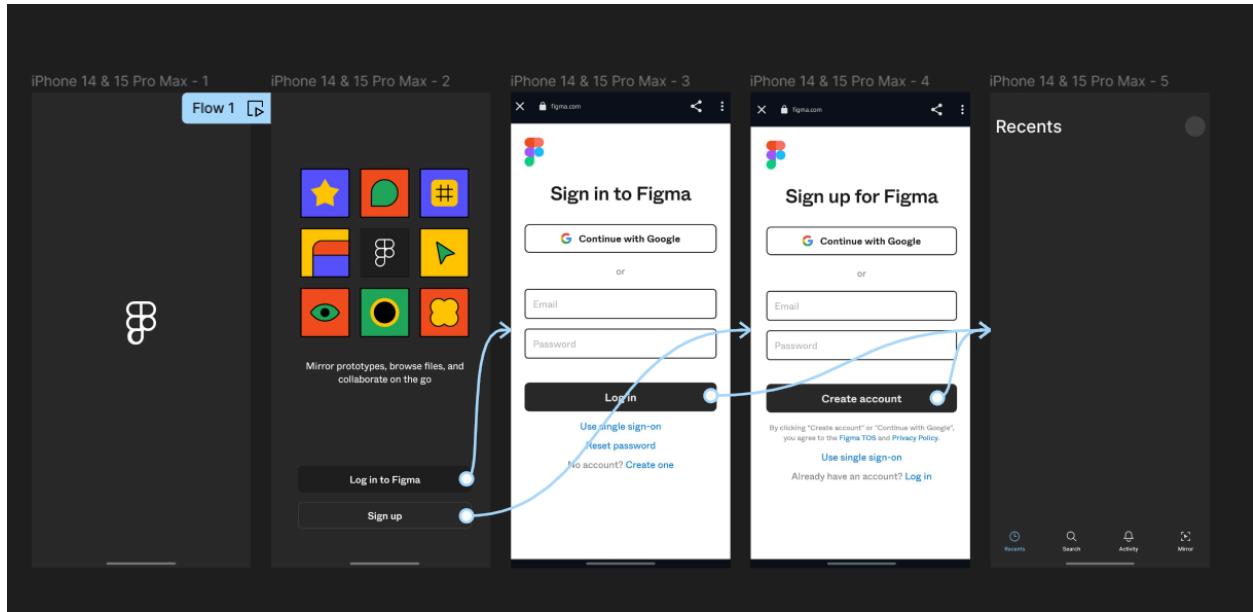
### Login And Signup Page:



### Final Step:



## Prototype:



## Result:

Hence the Develop a user interface prototype for an Android application created and executed successfully

## 20) Design a wireframe in Figma for a mobile application showcasing power management approaches.

### Aim:

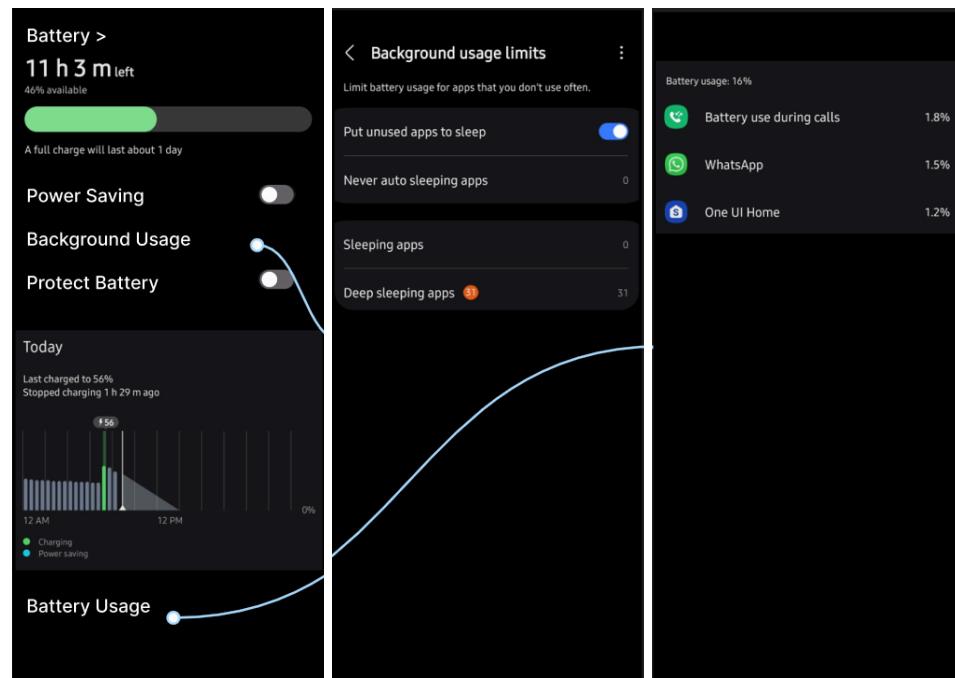
Design a wireframe in Figma for a mobile application showcasing power management approaches.

### Procedure:

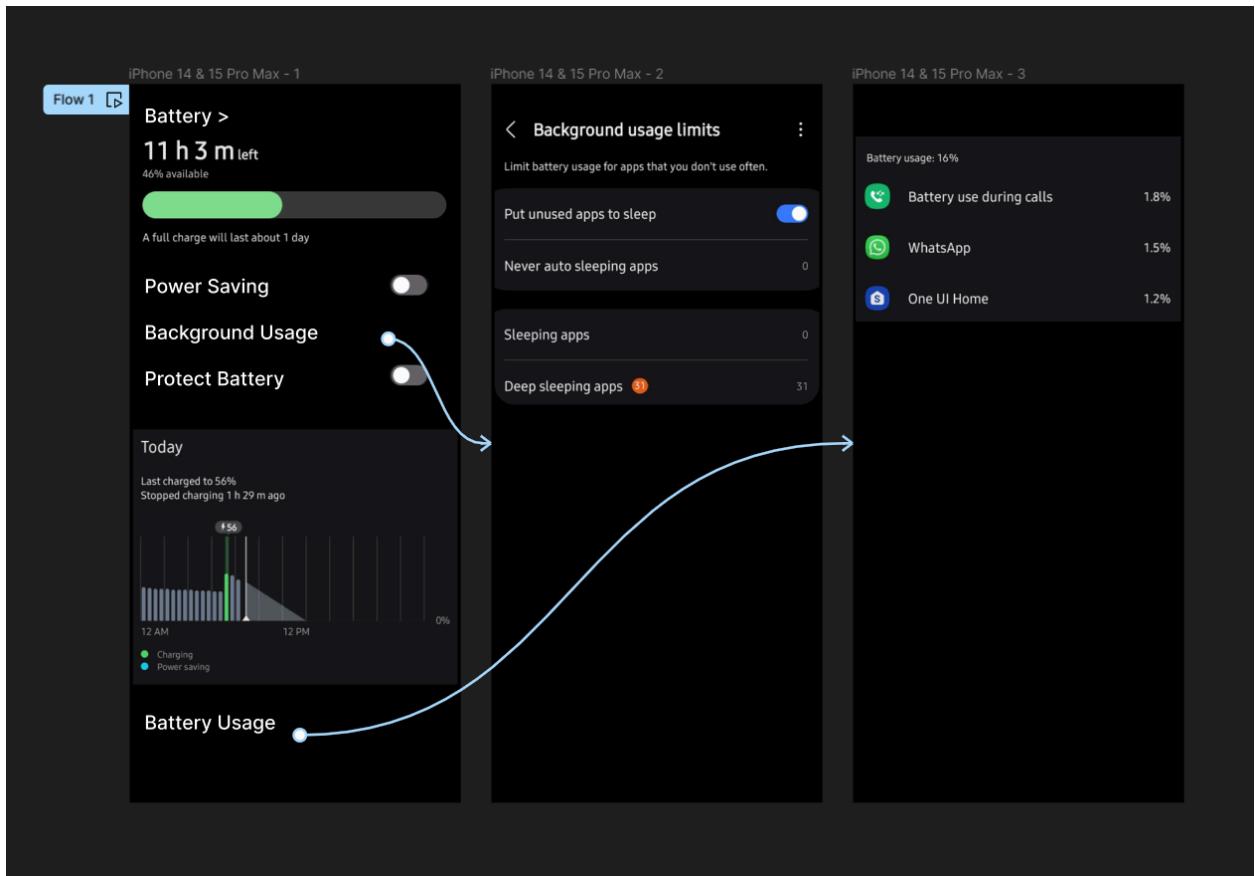
1. Create a file
2. Add The First Frame
3. Add Shapes
4. Add Text
5. Create The Second Frame
6. Add Prototyping

### Step By Step Procedure :

#### Interface Of Experiment



## Prototype:



## Result:

Hence the mobile application showcasing power management is created and executed successfully.

## 21) In Figma, design a mobile app interface that prioritizes user connectivity and convenience. Highlight key elements.

### Aim:

To design a mobile app interface that prioritizes user connectivity and convenience. Highlight key elements.

### Procedure:

1. Create a file
2. Add The First Frame
3. Add Shapes

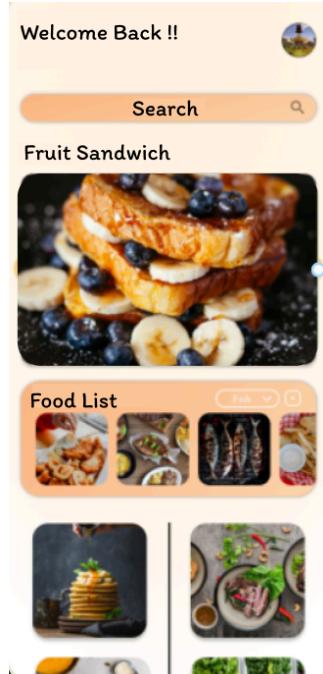
4. Add Text
5. Create The Second Frame
6. Add Prototyping

**Step By Step Procedure :**

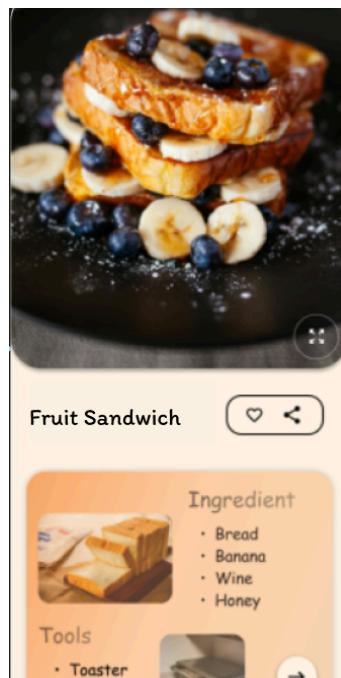
**Interface Of Experiment**



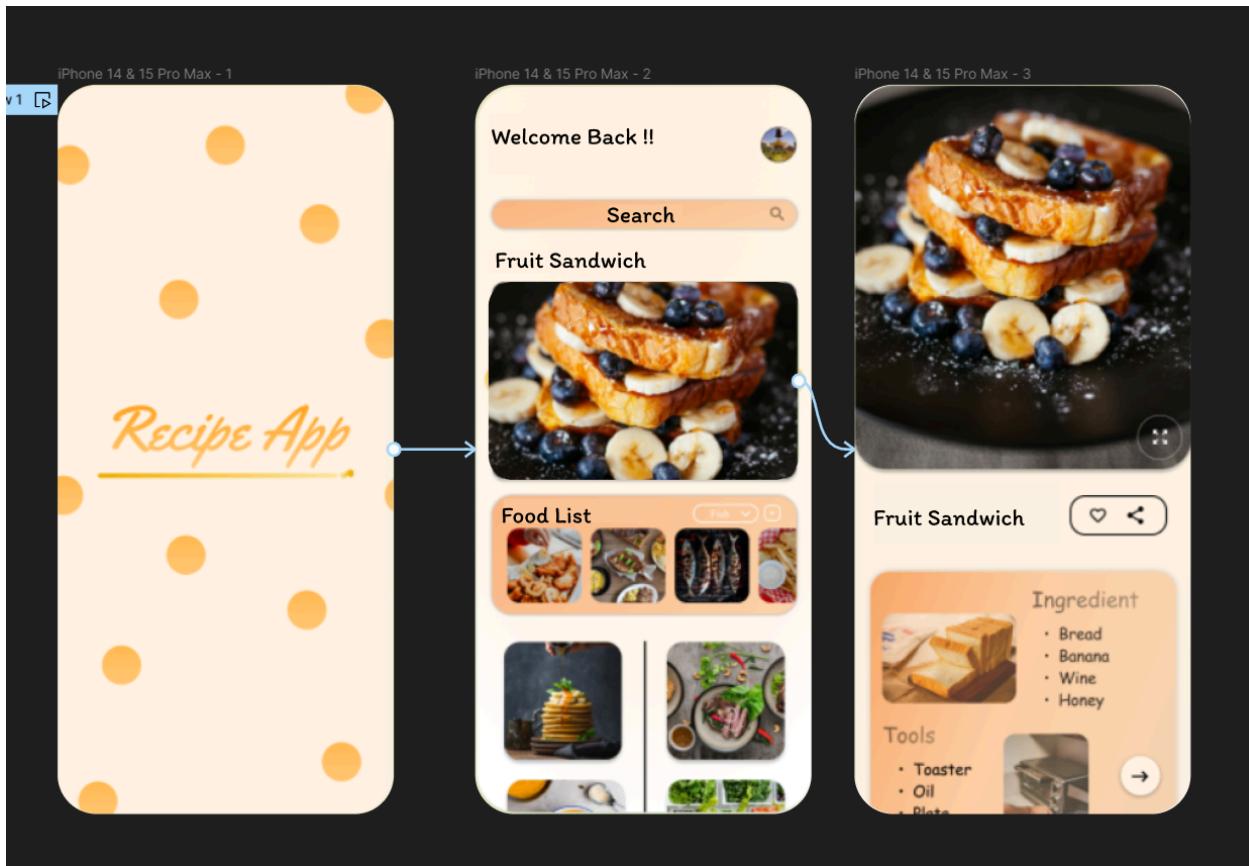
**Menu Page:**



**Final Step:**



**Prototype:**



### Result:

Hence the mobile app interface that prioritizes user connectivity created and executed successfully.

## 22) Create wireframes illustrating how localization features can be integrated into a mobile app, ensuring a user-friendly design in Figma.

**Aim:** Wireframes illustrating how localization features can be integrated into a mobile app using Figma

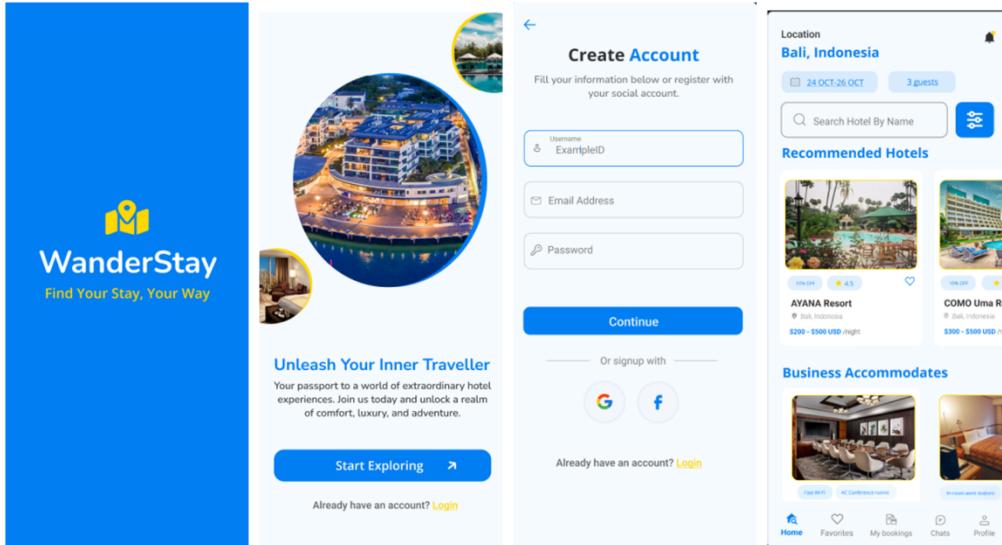
### Procedure: -

1. Open Figma
2. Create a new file
3. Select the Frames
4. Design Visual Elements
5. Make it Interactive
6. Add icons on the Frame
7. Incorporate Multimedia
8. Storyboard Animation

9. Review and edit the Prototype

10. Save and Share

### Design:



**Location**  
Bali, Indonesia

Search Hotel By Name

**Recommended Hotels**

**Sort By**  
\$ - \$5 Price Lower to Higher

**Ratings**  
1 ★ 2 ★ 3 ★ 4 ★ 5 ★

**Price Ranges**  
\$90-\$350

**Facilities**

**APPLY**

**Hotel Details**

**AYANA Resort**  
10% OFF 4.5 (120 Reviews)

Description  
Nestled in the lush tropical landscape of Jimbaran, Bali, AYANA Resort and Spa offers a variety of accommodations perfect for couples seeking luxury, relaxation, and breath-taking ocean views. [Read more](#)

Contact Info  
John Mail Personalized

Gallery  
\$350 USD / night **BOOK NOW**

**Booking Summary**

| Booking Date | 1-Oct-2023  |
|--------------|-------------|
| Check-in     | 24-Oct-2023 |
| Check-out    | 26-Oct-2023 |
| Guests       | 3           |
| Room(s)      | 1           |
| Amount       | \$350 x 2   |
| Tax          | \$30        |
| Total        | \$730       |

**CONTINUE TO PAYMENT**

**Payment**

**Total Price**  
**\$750.00**  
5% vst included

**Payment method**

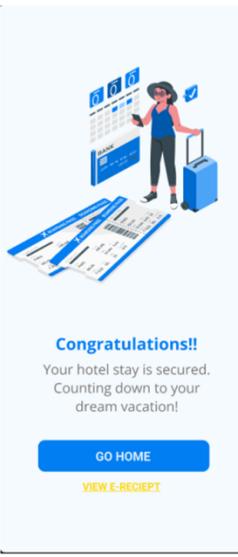
Card Holder Name  
Your Name

Card Number  
\*\*\*\*\*

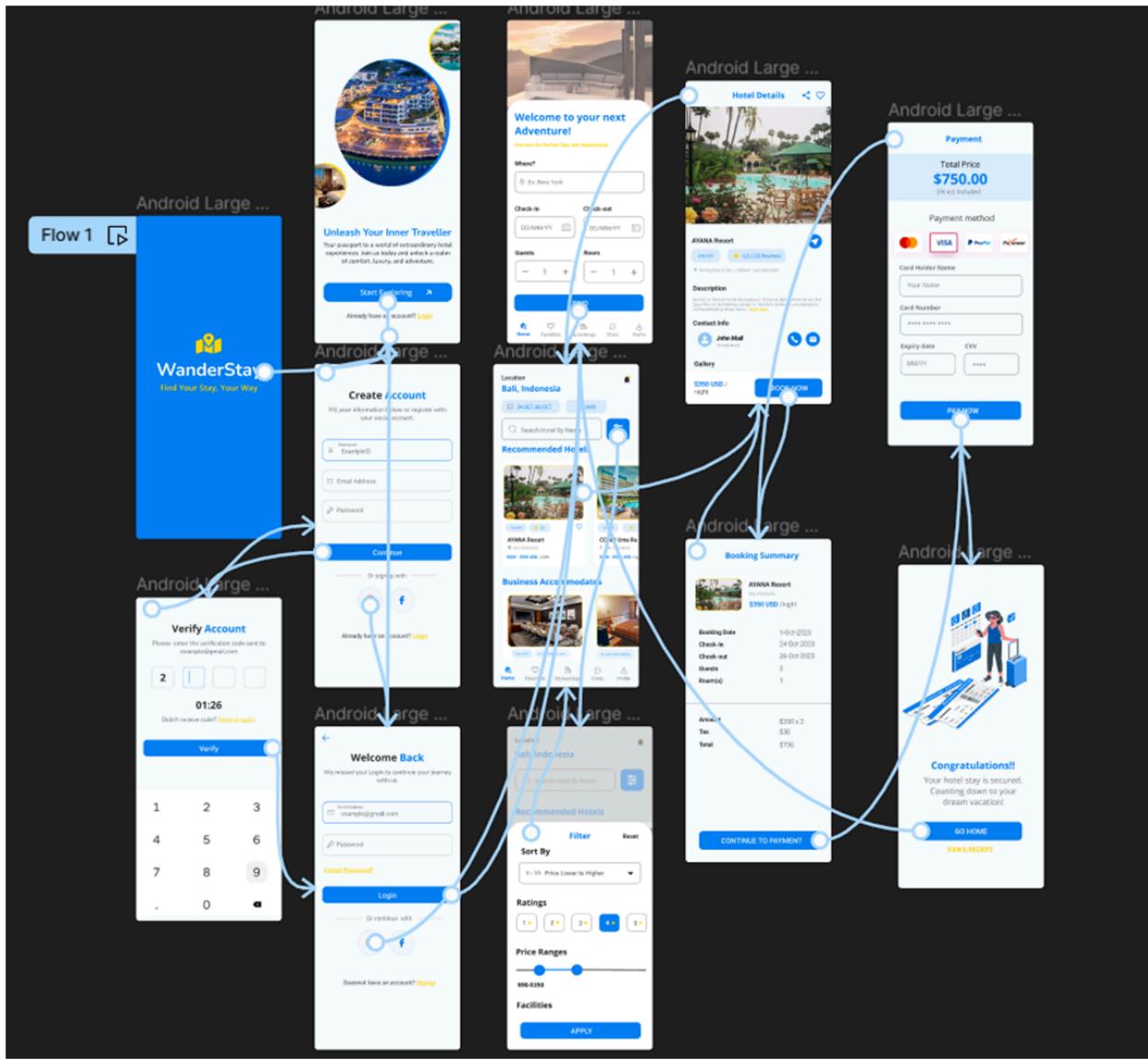
Expiry date  
MM/YY

CVV  
\*\*\*\*

**PAY NOW**



## Prototype: -



## Result: -

Hence the localization features can be integrated into a mobile app is created and executed successfully

### 23. Develop a user interface prototype in Figma showcasing security measures for a mobile app. Emphasize the intuitive design for user personalization.

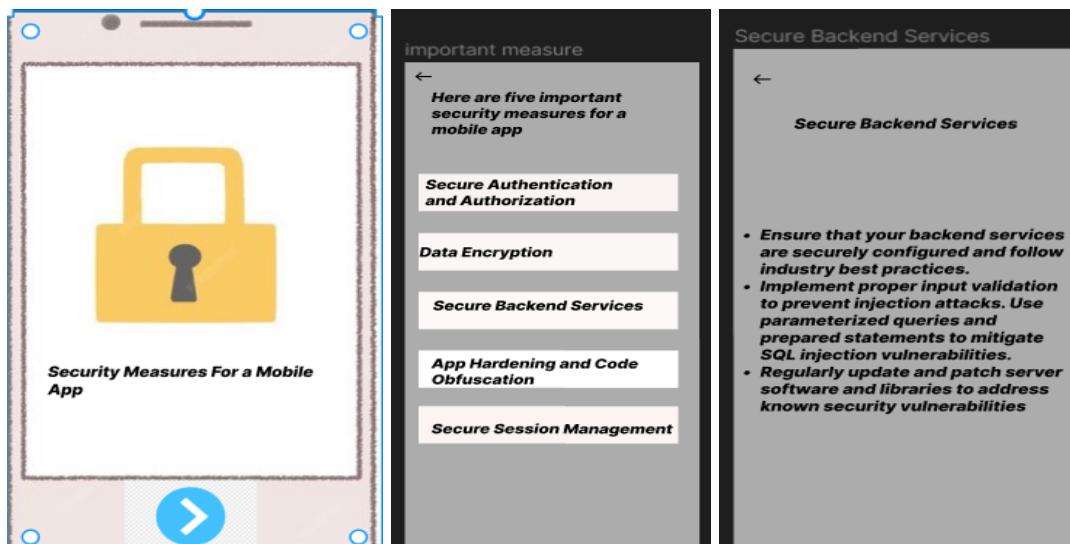
#### Aim:

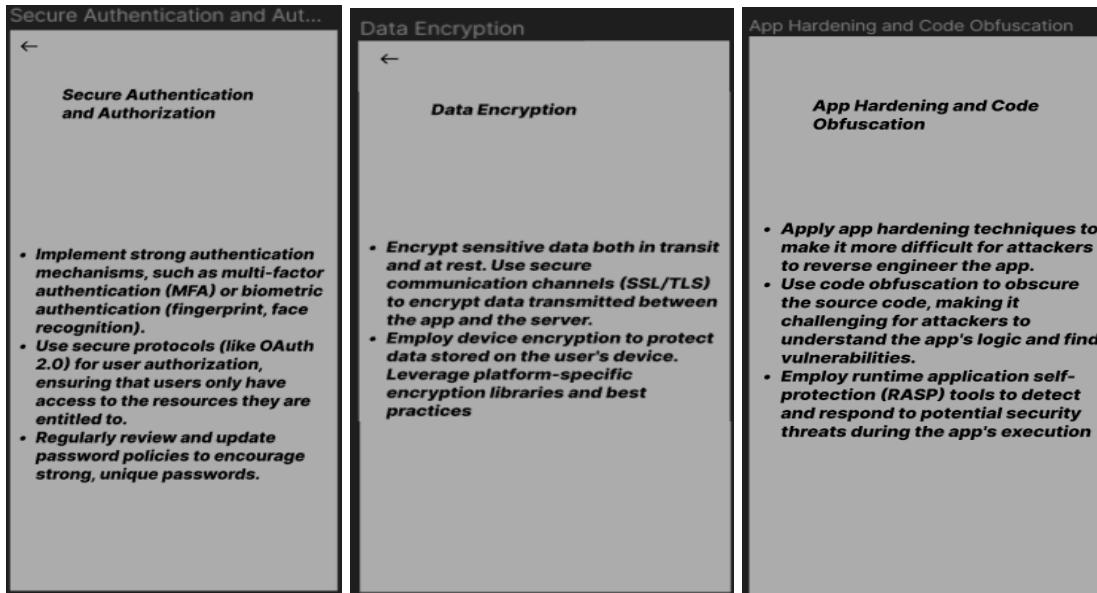
Developing a user interface prototype in Figma showcasing security measures for a mobile app.

#### Procedure:

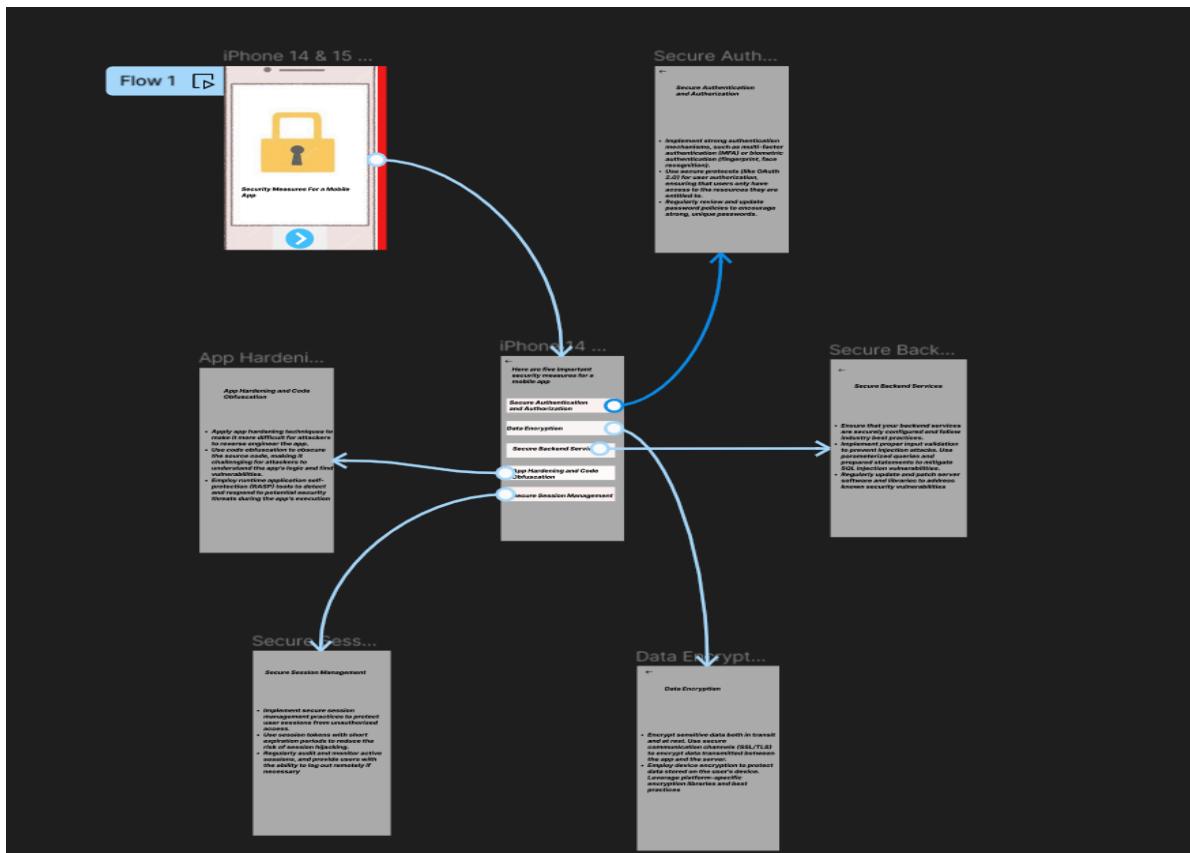
1. Define Presentation Structure
2. Create a Figma Project
3. Design Visual Elements
4. Make it Interactive
5. Add Annotations and Explanations
6. Incorporate Multimedia
7. Storyboard Animation
8. Test the Prototype
9. Collaborate and Gather Feedback
10. Finalize and Share

#### Design:





## Prototype:



## Result:

Hence an user interface prototype in Figma showcasing security measures for a mobile app have been created successfully

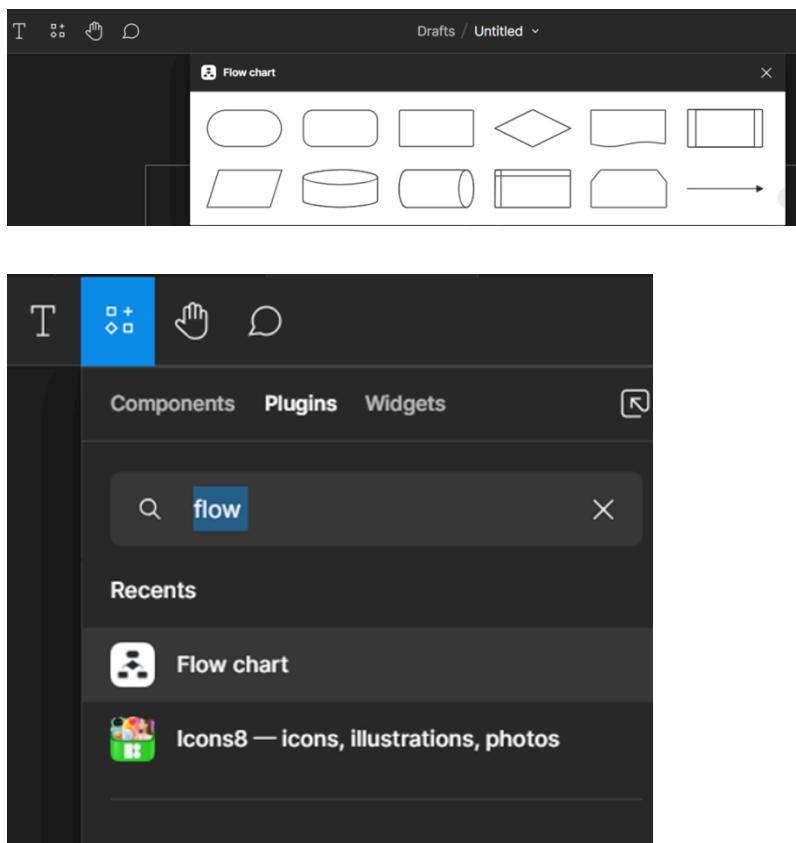
## **24 . Use Figma to design a flowchart demonstrating the lifecycle of an Android Intent, including explicit and implicit intents.**

**Aim :** Design a flowchart demonstrating the lifecycle of an Android Intent, including explicit and implicit intents.

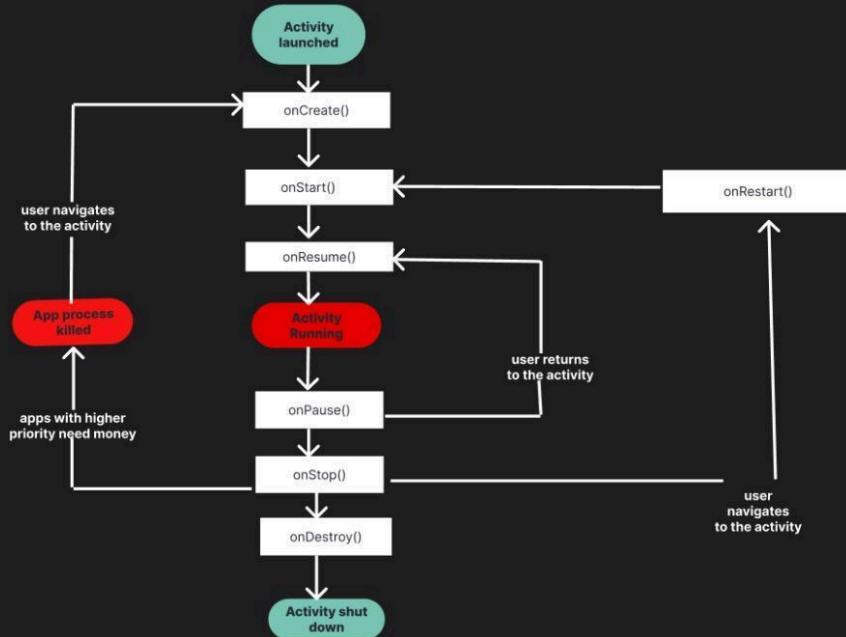
### **Procedure: -**

1. Open Figma
2. Create a new file
3. Click on the resources icon and click on the plugins
4. Search for the Flow Chart
5. Drag and drop the shapes on the screen
6. Now, enter the content on the shapes and connect them through Arrows.
7. Grouping and alignment
8. Review and edit
9. Save and share

### **Design :**



Flowchart demonstrating the lifecycle of an Android Intent, including explicit and implicit intents.



### Result :

Hence the flowchart in Figma explaining the lifecycle of an Android Intent, including explicit and implicit intents.

**25) Create a wireframe for an Android app that utilizes background services. Use Figma to illustrate the service interactions and data flow.**

#### Aim:

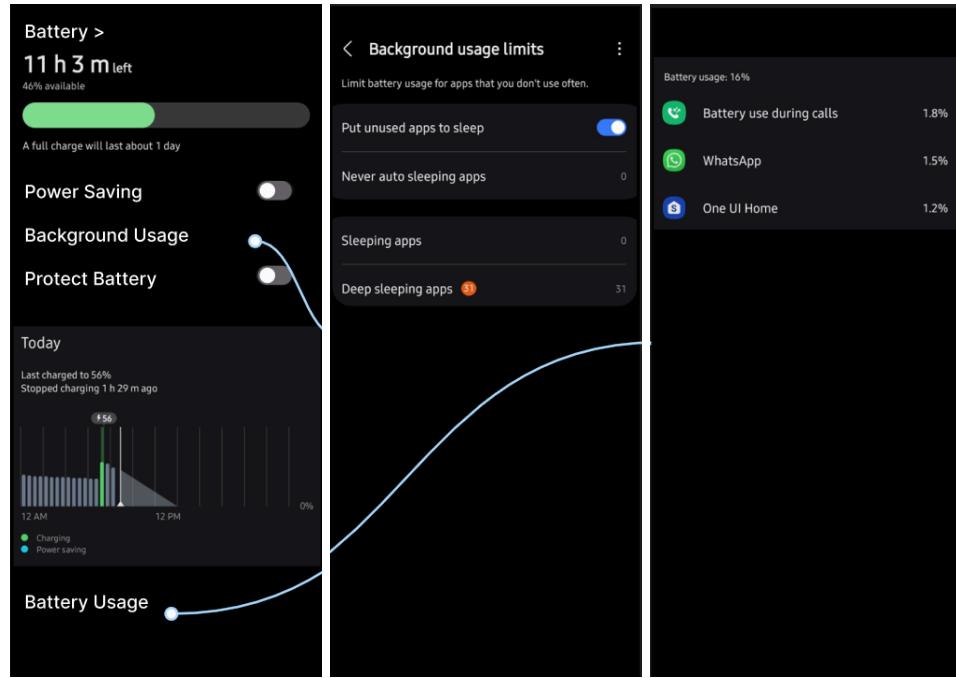
Create a wireframe for an Android app that utilizes background services using Figma

#### Procedure:

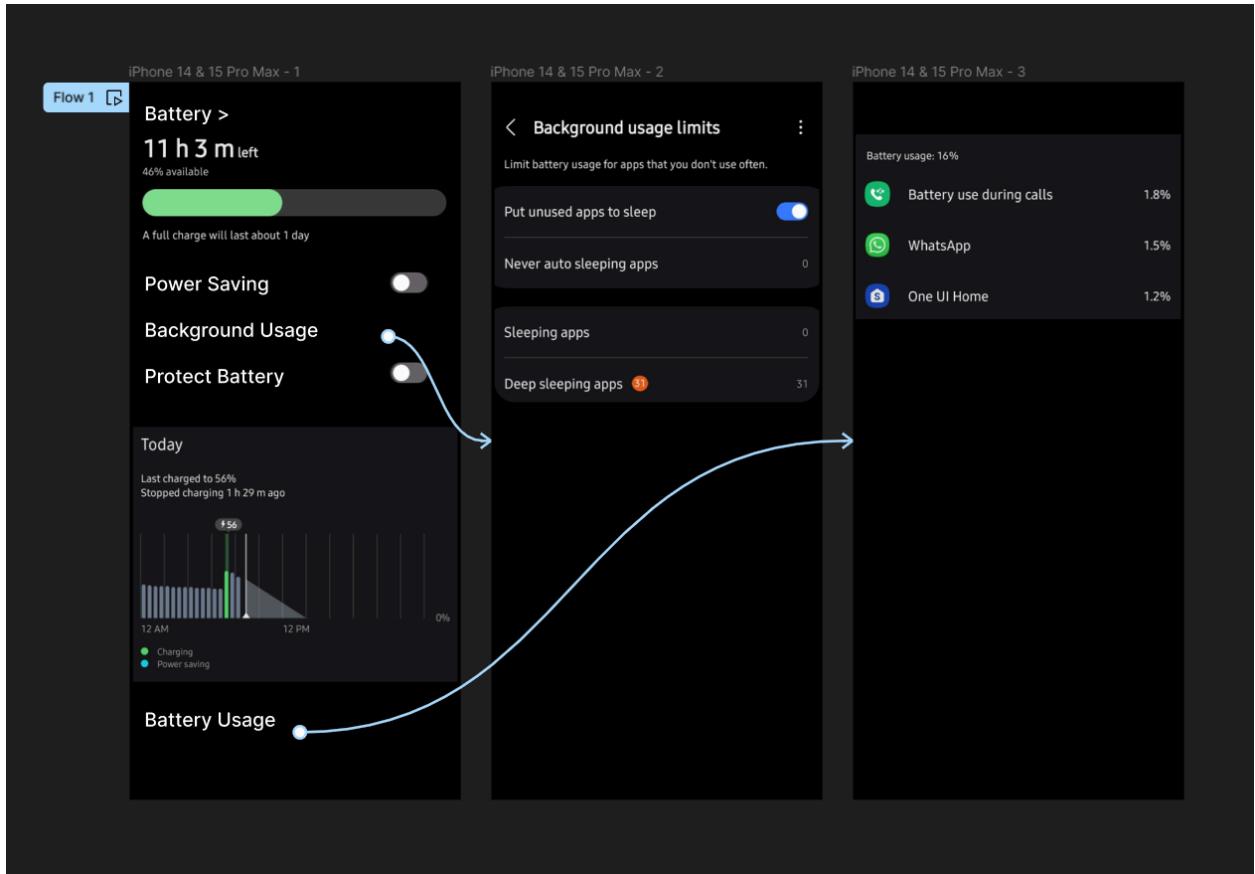
1. Open Figma
2. Create a new file
3. Select the Frames
4. Design Visual Elements
5. Make it Interactive
6. Add icons on the Frame
7. Incorporate Multimedia

8. Storyboard Animation
9. Review and edit the Prototype
10. Save and Share

## Design



**Prototype:**



## Result:

Hence a wireframe for an Android app that utilizes background services. Using Figma have been created successfully

**26) Design wireframes for a mobile app showcasing data replication techniques. Use Figma to demonstrate the synchronization process.**

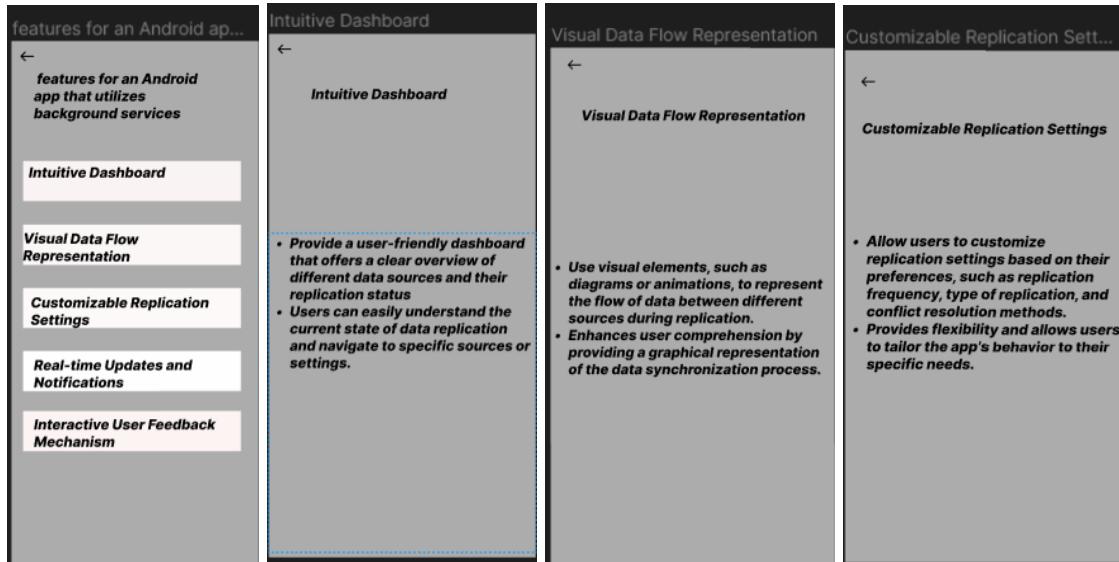
## Aim:

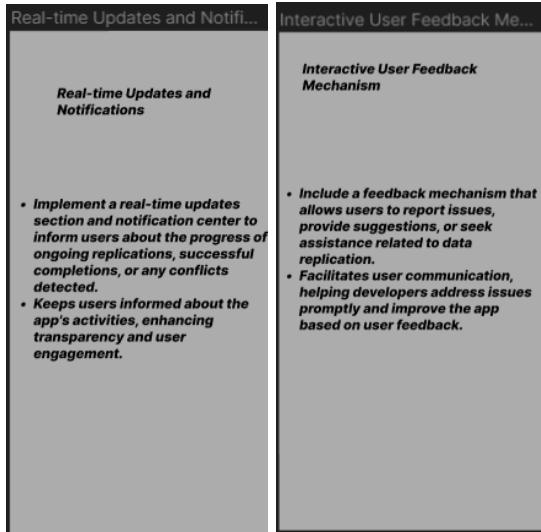
To Design a mobile app showcasing data replication techniques using figma

## Procedure:

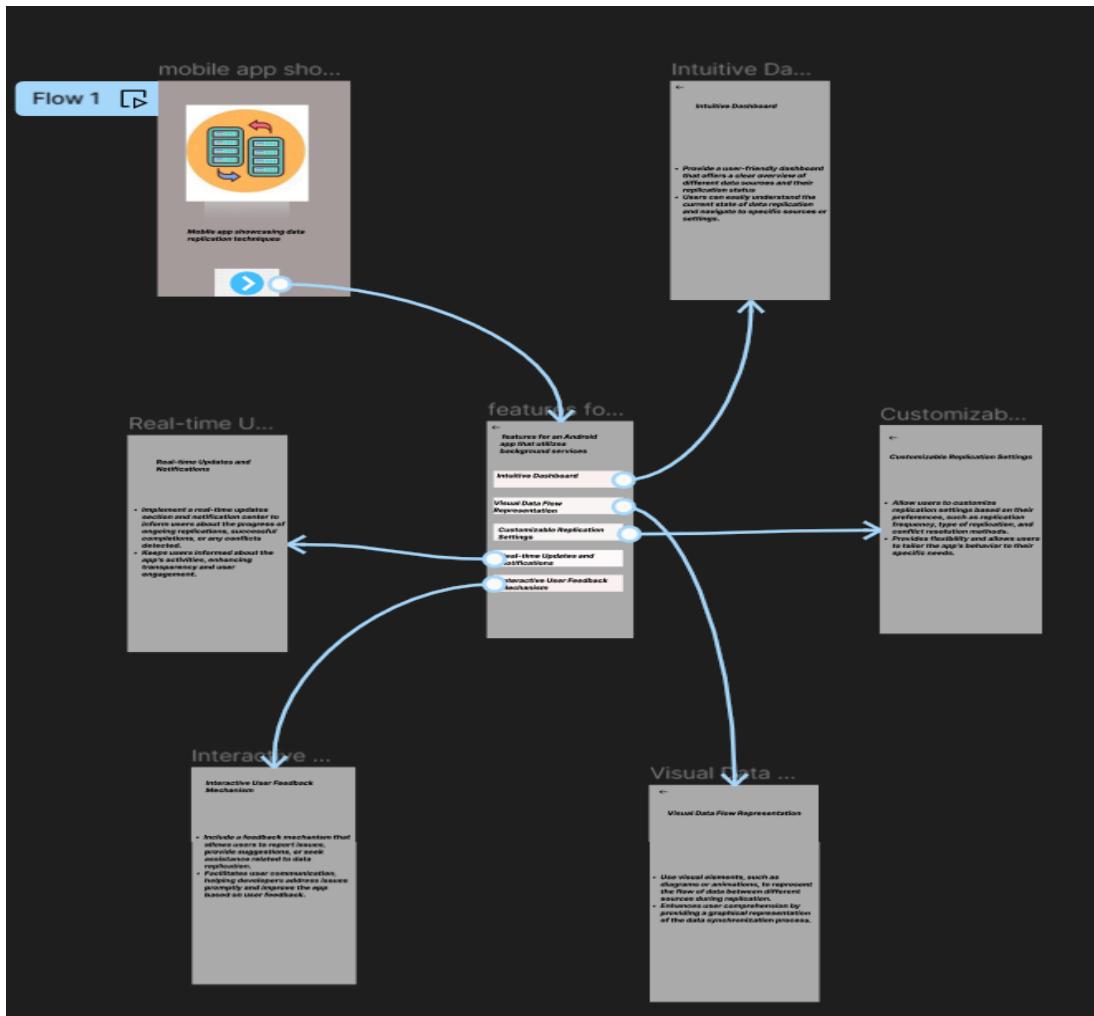
1. Open Figma
2. Create a new file
3. Select the Frames
4. Design Visual Elements
5. Make it Interactive
6. Add icons on the Frame
7. Incorporate Multimedia
8. Storyboard Animation
9. Review and edit the Prototype
10. Save and Share

## Design:





Prototype:



**Result:** Hence a mobile app showcasing data replication techniques using Figma have been created successfully

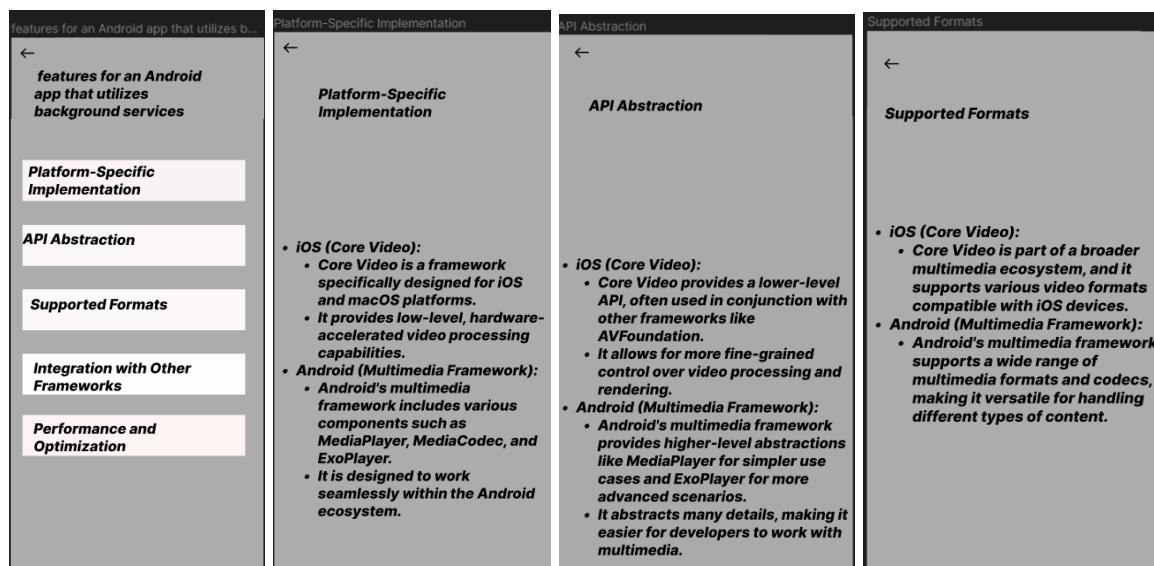
## 27. Use Figma to create an interactive presentation comparing the Core Video framework in iOS and the multimedia framework in Android.

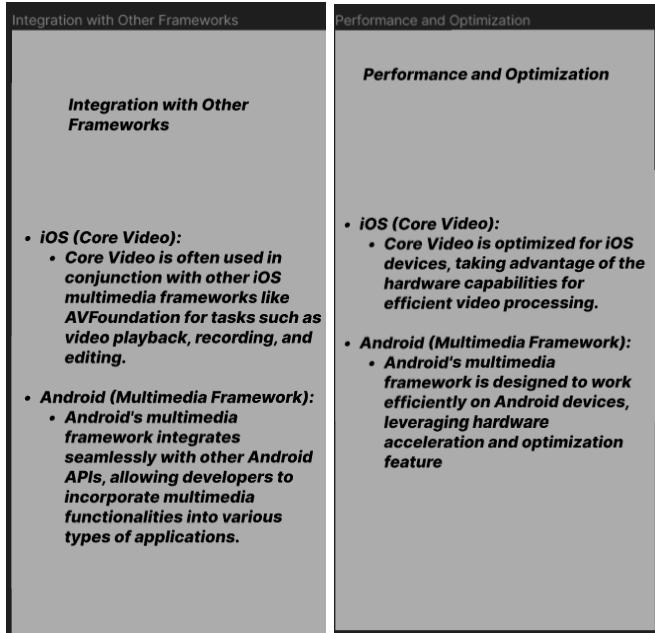
**Aim:** Create an interactive presentation comparing the Core Video framework in iOS and Android using Figma

### Procedure:

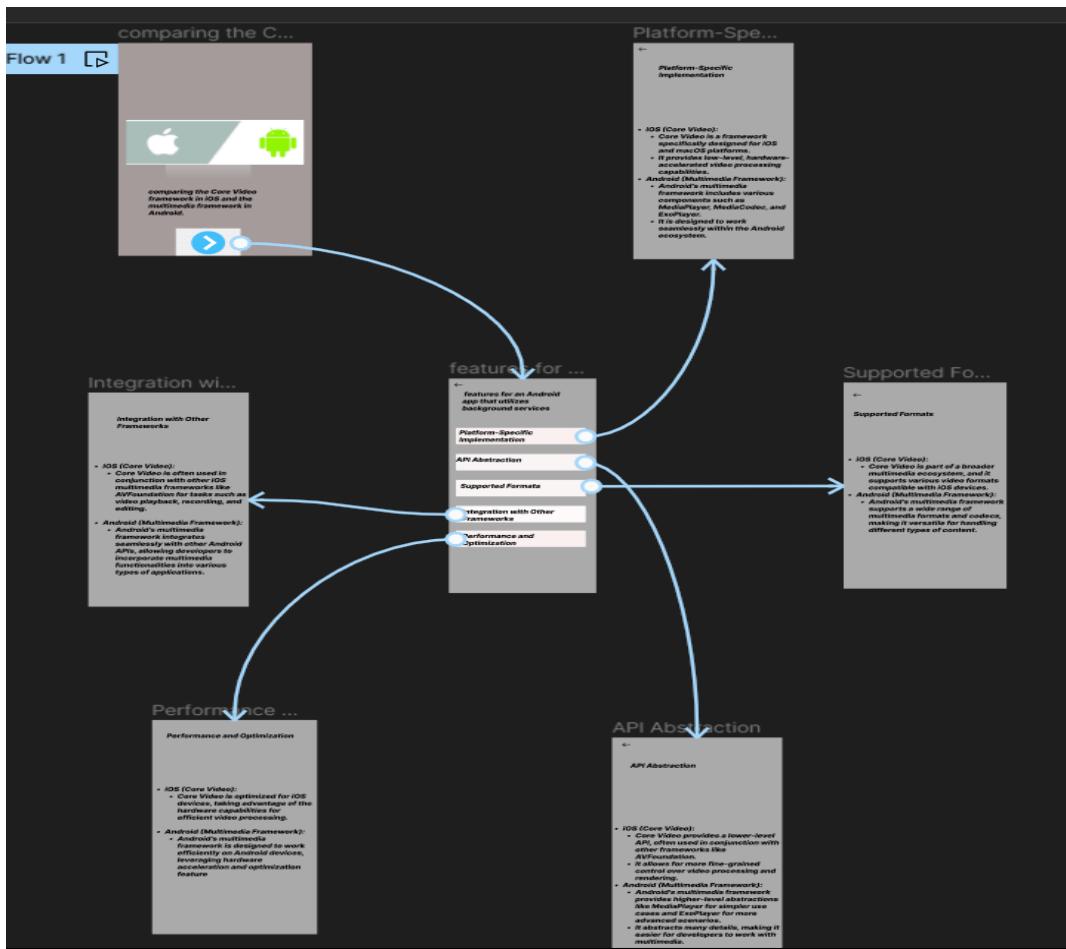
1. Define Presentation Structure
2. Create a Figma Project
3. Design Visual Elements
4. Make it Interactive
5. Add Annotations and Explanations
6. Incorporate Multimedia
7. Storyboard Animation
8. Test the Prototype
9. Collaborate and Gather Feedback
10. Finalize and Share

### Design:





Prototype:



**Result:** Hence an interactive presentation comparing the Core Video framework in iOS and Android using Figma have been created successfully

## 28. Design a wireframe in Figma for a multimedia-rich mobile app, incorporating elements from both Core Video and Core Media frameworks.

**Aim:** Design a wireframe for a multimedia-rich mobile app, incorporating elements from both Core Video and Core Media frameworks using figma

### Procedure:

1. Open Figma
2. Create a new file
3. Select the Frames
4. Design Visual Elements
5. Make it Interactive
6. Add icons on the Frame
7. Incorporate Multimedia
8. Storyboard Animation
9. Review and edit the Prototype
10. Save and Share

### Design:

multimedia-rich mobile app, incorporating elements from both Core Video and Core Media frameworks

important features for a multi...

← **features for a multimedia-rich mobile app on iOS that incorporates elements from Core Video and Core Media frameworks**

**Advanced Video Playback**

**Real-time Video Processing and Effects**

**Multimedia Capture and Editing**

**Multimedia Composition and Integration**

**Background Multimedia Tasks**

Advanced Video Playback

←

**Advanced Video Playback**

- Implement advanced video playback features using Core Media and AVFoundation. Allow users to play, pause, seek, and control playback speed. Support fullscreen mode and provide an immersive viewing experience
- Enhances user engagement by providing a smooth and feature-rich video playback experience within the app.

Real-time Video Processing and Ef...

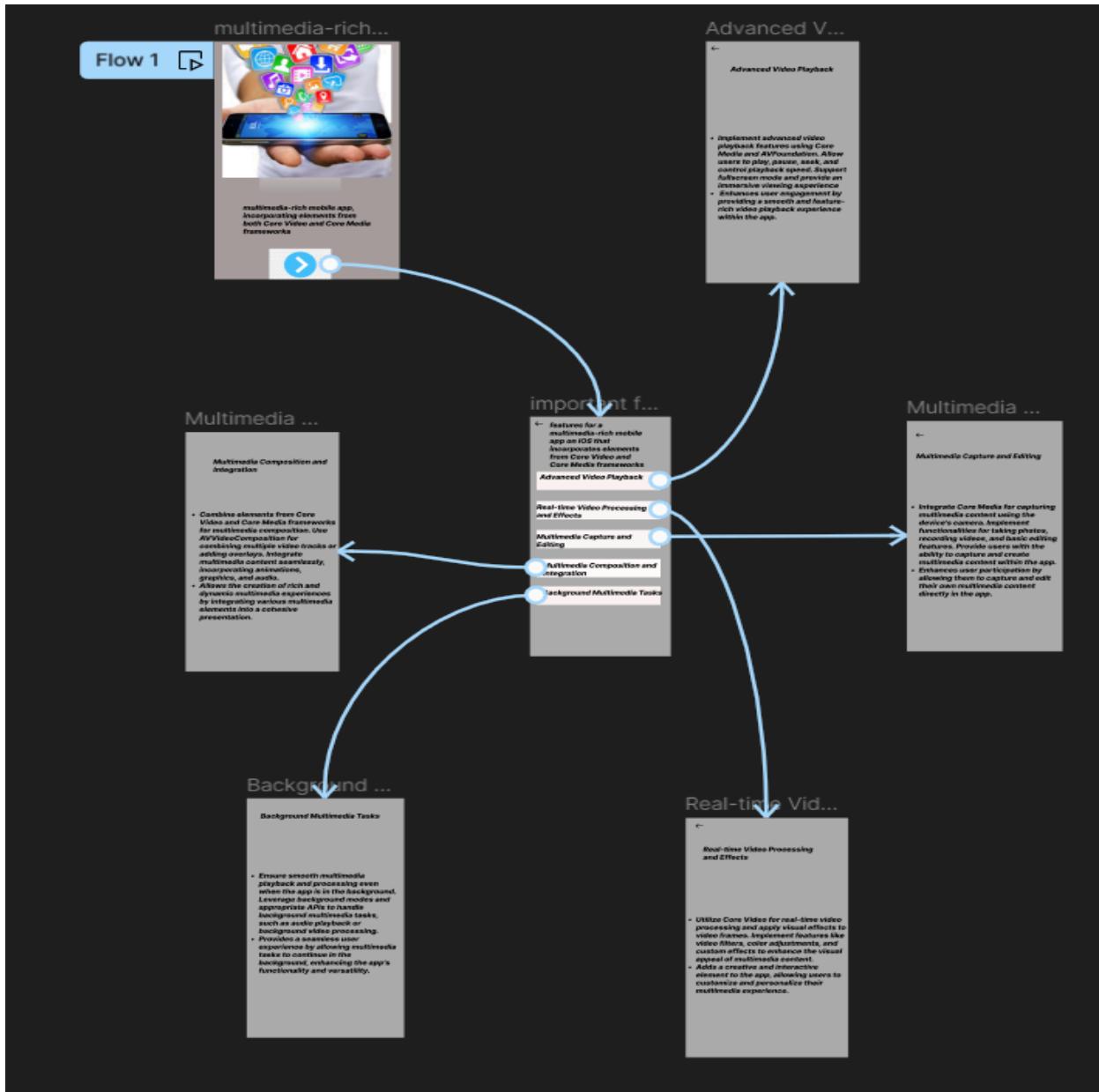
←

**Real-time Video Processing and Effects**

- Utilize Core Video for real-time video processing and apply visual effects to video frames. Implement features like video filters, color adjustments, and custom effects to enhance the visual appeal of multimedia content.
- Adds a creative and interactive element to the app, allowing users to customize and personalize their multimedia experience.

| Multimedia Capture and Editing  | Multimedia Composition and Int...   | Background Multimedia Tasks   |
|---|---|---|
| <p>←</p> <p><b>Multimedia Capture and Editing</b></p> <ul style="list-style-type: none"> <li>• Integrate Core Media for capturing multimedia content using the device's camera. Implement functionalities for taking photos, recording videos, and basic editing features. Provide users with the ability to capture and create multimedia content within the app.</li> <li>• Enhances user participation by allowing them to capture and edit their own multimedia content directly in the app.</li> </ul> | <p><b>Multimedia Composition and Integration</b></p> <ul style="list-style-type: none"> <li>• Combine elements from Core Video and Core Media frameworks for multimedia composition. Use AVVideoComposition for combining multiple video tracks or adding overlays. Integrate multimedia content seamlessly, incorporating animations, graphics, and audio.</li> <li>• Allows the creation of rich and dynamic multimedia experiences by integrating various multimedia elements into a cohesive presentation.</li> </ul> | <p><b>Background Multimedia Tasks</b></p> <ul style="list-style-type: none"> <li>• Ensure smooth multimedia playback and processing even when the app is in the background. Leverage background modes and appropriate APIs to handle background multimedia tasks, such as audio playback or background video processing.</li> <li>• Provides a seamless user experience by allowing multimedia tasks to continue in the background, enhancing the app's functionality and versatility.</li> </ul> |

## Prototype:



**Result:** A wireframe for a multimedia-rich mobile app, incorporating elements from both Core Video and Core Media frameworks using figma have been created successfully

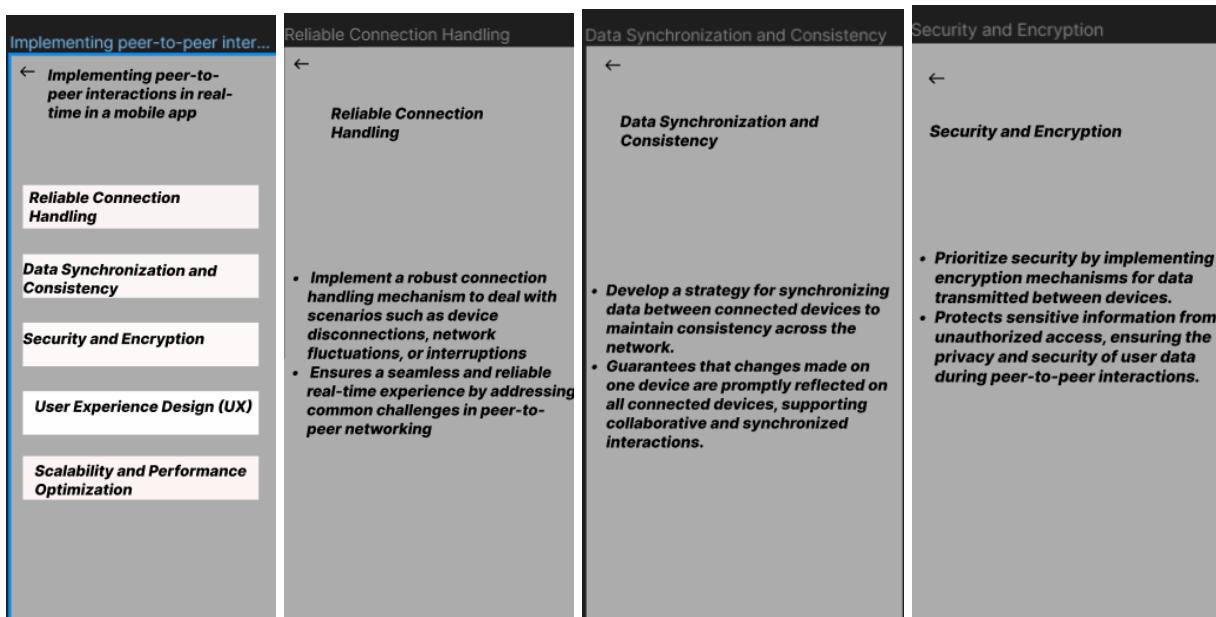
## 29.Create wireframes for a collaborative mobile app using Figma, showcasing the peer-to-peer interactions in real-time.

**Aim:** Wireframes for a collaborative mobile app, showcasing the peer-to-peer interactions in real-time using figma

**Procedure:**

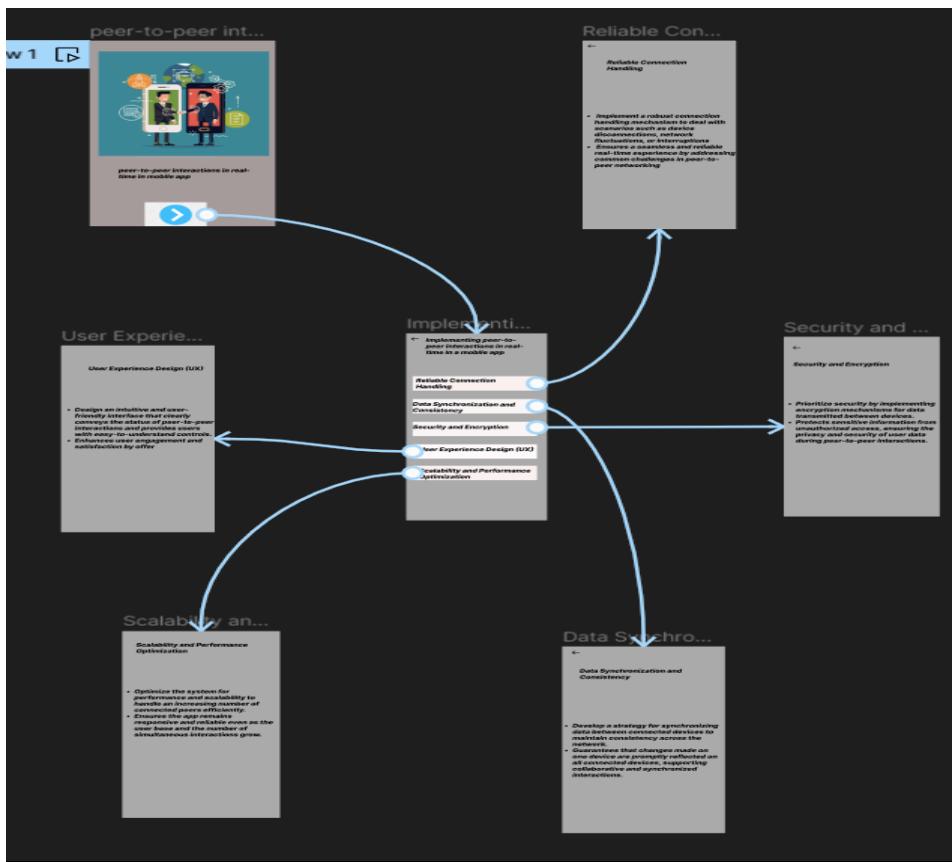
1. Open Figma
2. Create a new file
3. Select the Frames
4. Design Visual Elements
5. Make it Interactive
6. Add icons on the Frame
7. Incorporate Multimedia
8. Storyboard Animation
9. Review and edit the Prototype
10. Save and Share

## Design:





## Prototype:



**Result:**

Hence Wireframes for a collaborative mobile app, showcasing the peer-to-peer interactions in real-time using figma have been created successfully

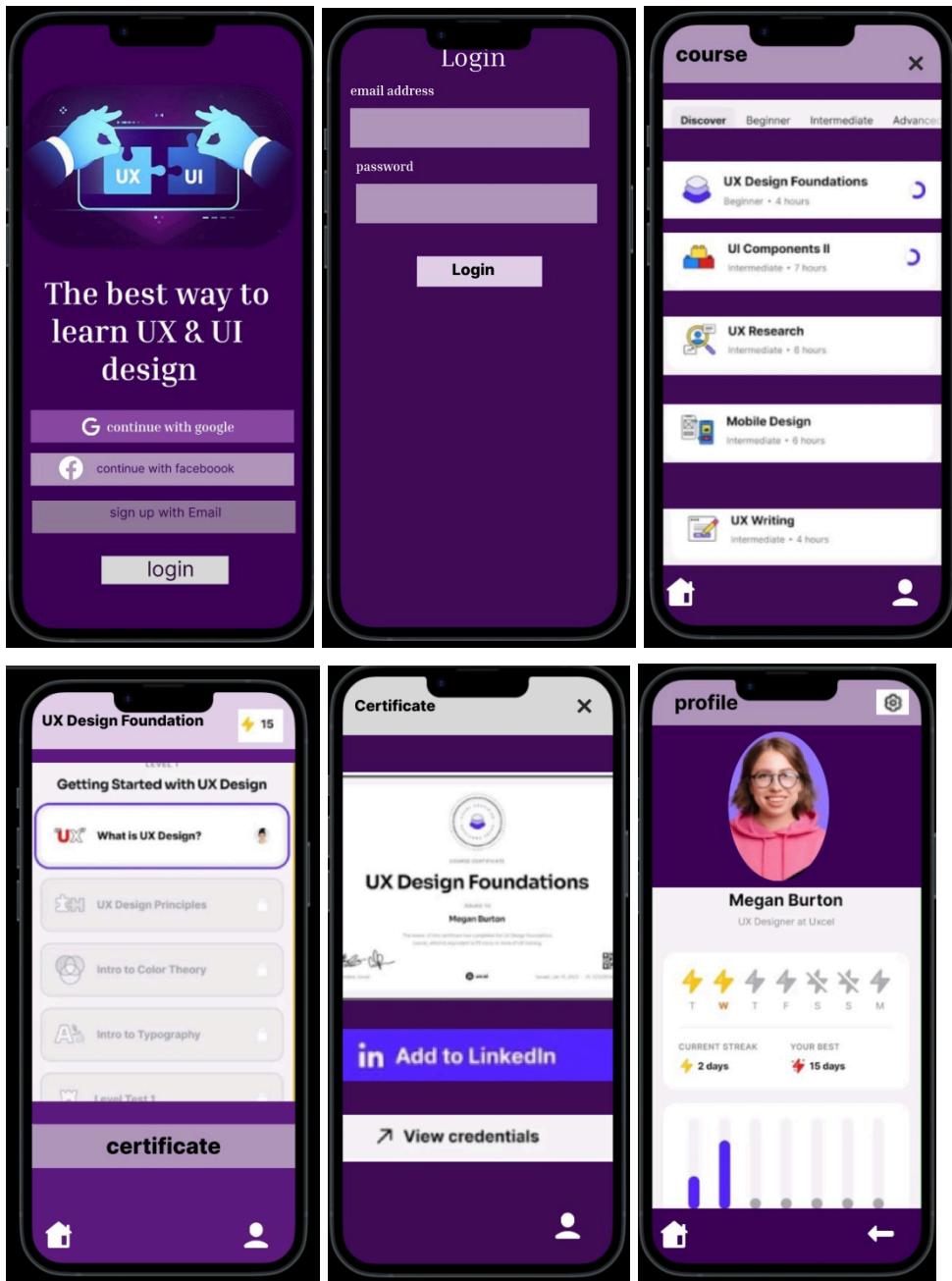
**30) Develop wireframes for a visually rich mobile app with optimized graphics and UI performance, using Figma to showcase the design principles.****Aim:**

To Develop wireframes for a visually rich mobile app with optimized graphics and UI performance, using Figma to showcase the design principles.

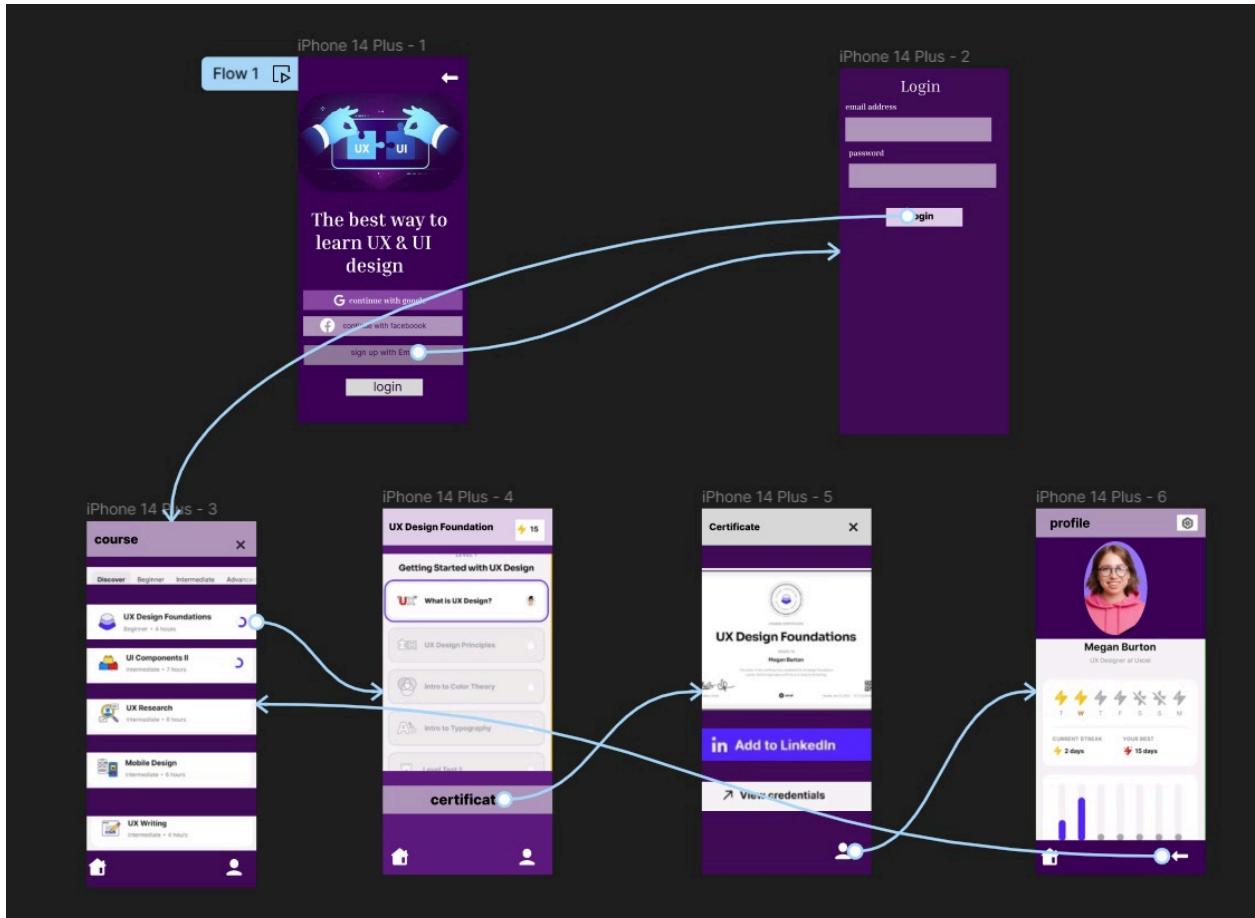
**Procedure:**

1. Open Figma
2. Create a new file
3. Select the Frames
4. Design Visual Elements
5. Make it Interactive
6. Add icons on the Frame
7. Incorporate Multimedia
8. Storyboard Animation
9. Review and edit the Prototype
10. Save and Share

**Design:**



**Prototype:**



## Result:

Thus The Develop wireframes for a visually rich mobile app with optimized graphics and UI performance is created and executed successfully.