Project Documentation

Date	3 November 2023
Team ID	NM2023TMID09736
Project Name	How to create a Reel using Canva

Problem Statement

How To Create A Reel Design Using Canva

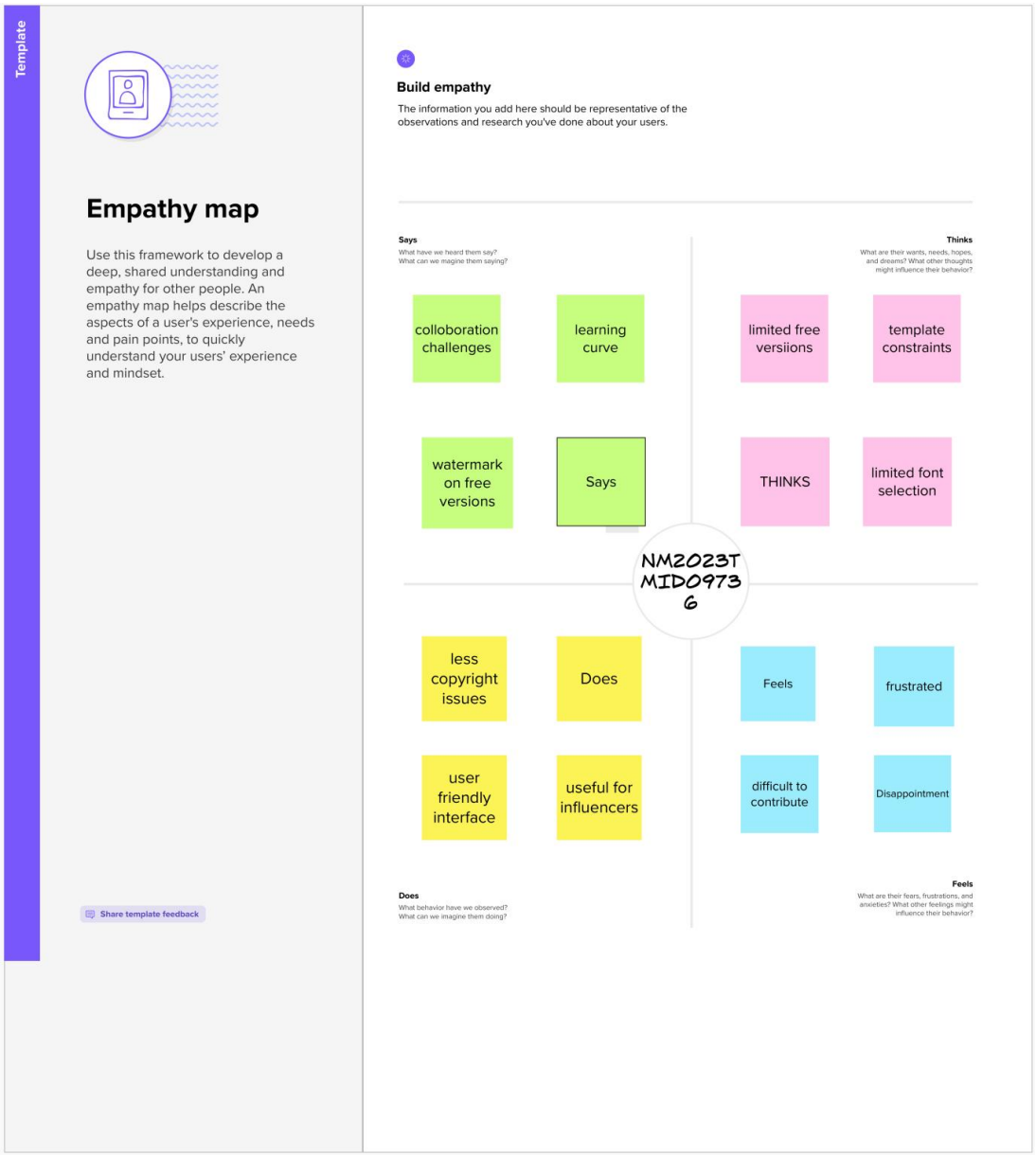
Users may encounter slow loading times, crashes, or unresponsiveness, especially when working on complex or large projects. Free users often have their designs watermarked by Canva, which can make them unsuitable for professional or commercial use. Users may find certain design elements challenging to customize to their exact specifications, limiting creative freedom.

Problem Statement (PS)	**I am (Customer)**	**I'm trying to**	**But**	**Because**	**Which makes me feel**
Performance issues	Content creator	Post a video	it encounters slow loading times	It is a large file	frustrated
Subscription cost	student	Find templates for my project	There are limited free templates	The premium versions are costly	Disappointed
Version control	Professional	Work on my new project	It needs collaborative work	It has Limited versions	Difficult to contribute

Empathy Map

Empathy Map Canvas:

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes. It is a useful tool to helps teams better understand their users.Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.

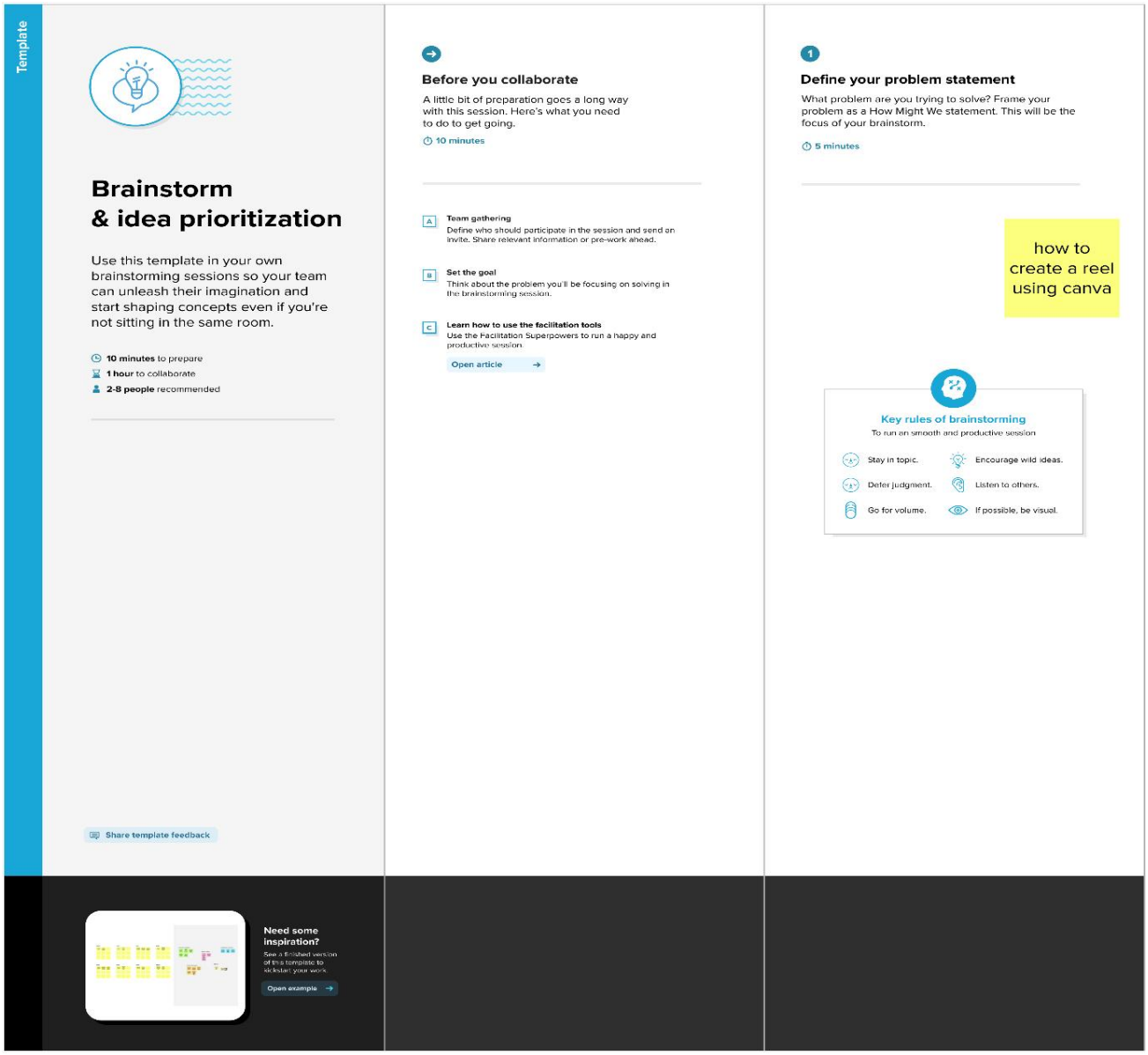


Brainstorm & Idea Prioritization

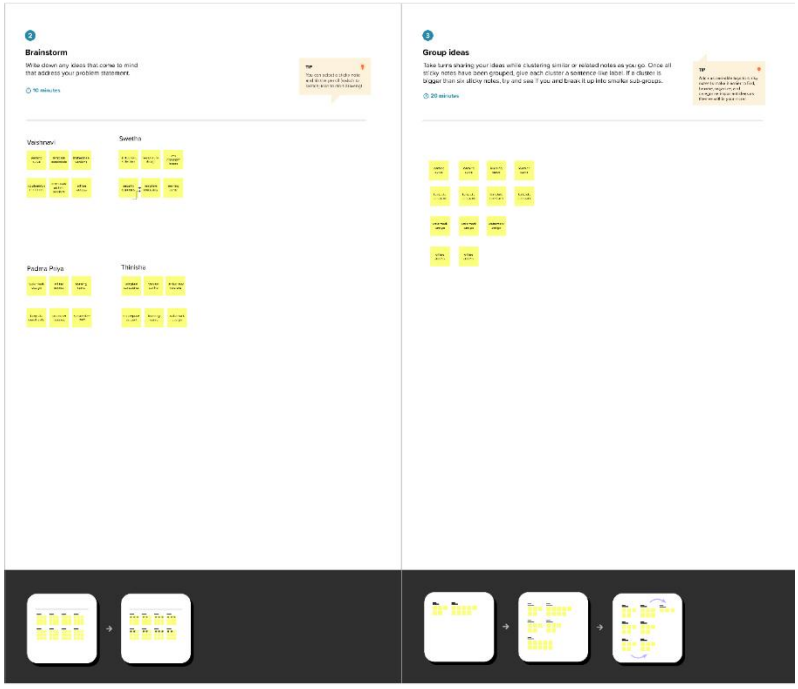
Brainstorm & Idea Prioritization Template:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

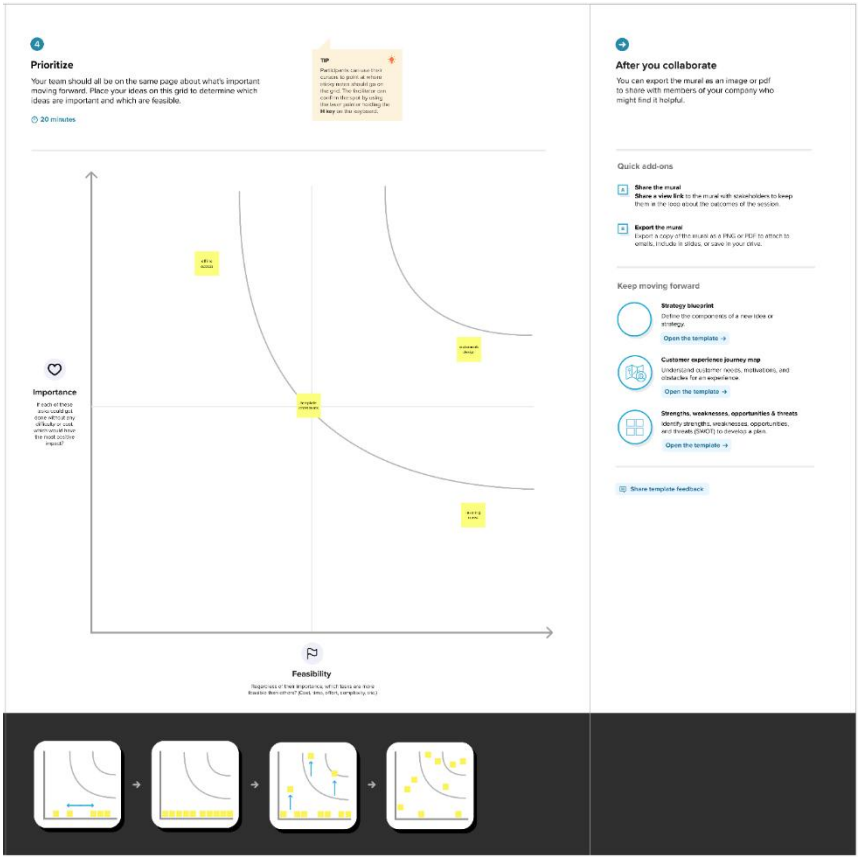
Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



Step-3: Idea Prioritization



Project Design Phase – Part 1

Proposed Solution

Proposed Solution Template:
Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Many individuals and businesses face challenges in designing visually appealing and engaging reel content for social media platforms like Instagram and TikTok using Canva. They struggle with finding the right design elements and templates to make their reels stand out.
2.	Idea / Solution description	The Reel Creator will provide a wide range of reel-specific templates, stickers, and design elements. These templates will be optimized for the dimensions and requirements of popular social media platforms like Instagram and TikTok. Users can easily choose templates that align with their content and customize them as needed.
3.	Novelty / Uniqueness	Canva's intuitive and user-friendly interface makes it accessible to individuals with varying design skills. It offers drag-and-drop functionality, allowing users to easily create professional-looking designs without a steep learning curve. Canva enables real-time collaboration, making it easy for teams to work together on design projects, which is a significant departure from traditional design software.
4.	Social Impact / Customer Satisfaction	Canva's extensive library of templates for various design purposes is highly valued by users. It allows them to save

		time and effort by starting with pre-designed templates that they can customize to their needs. Canva has been praised for its commitment to accessibility, including features like an automatic subtitle generator, which makes designs more inclusive and user-friendly.
5.	Business Model (Revenue Model)	Canva's business model is a combination of both a freemium model and a subscription-based model, with several revenue streams. Canva provides tailored solutions for larger organizations and enterprises. These solutions often include advanced administrative and branding features, custom templates, and support for large teams. Canva has affiliate and partner programs, allowing individuals and organizations to earn commissions by promoting Canva's paid plans.
6.	Scalability of the Solution	Canva has demonstrated a high degree of scalability in its solution, which has contributed to its widespread success and popularity. Canva's user base has grown exponentially since its inception. It has attracted millions of users worldwide, ranging from individuals to businesses of all sizes. The platform's scalability allows it to handle a large and diverse user base effectively. Canva is available to users in multiple languages, making it accessible to people around the world. Its internationalization efforts have played a crucial role in expanding its user base.

Solution Architecture

Solution Architecture:

Creating a solution architecture block diagram involves visually representing the components and interactions of a system or solution.

At the top of your diagram, include a title and a brief description to explain the purpose of the architecture.

Show any external interfaces that the solution interacts with, such as users, third-party services, or external systems. These are typically depicted as labeled arrows entering and exiting the diagram.

Example - Solution Architecture Diagram:

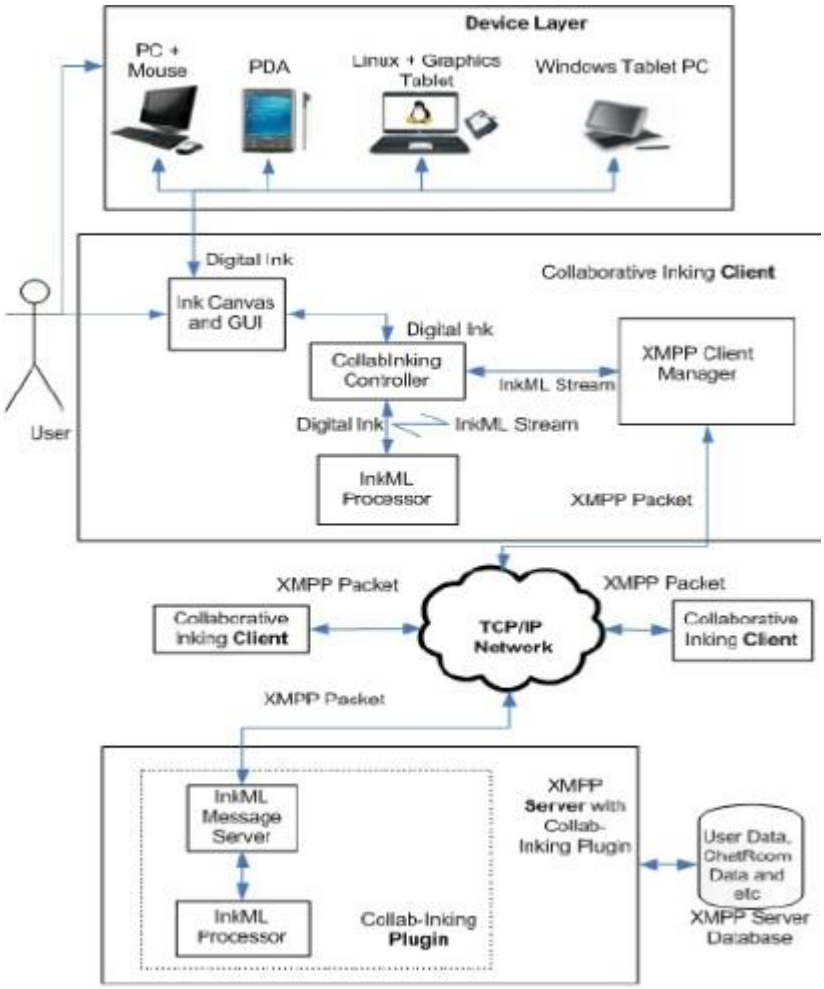
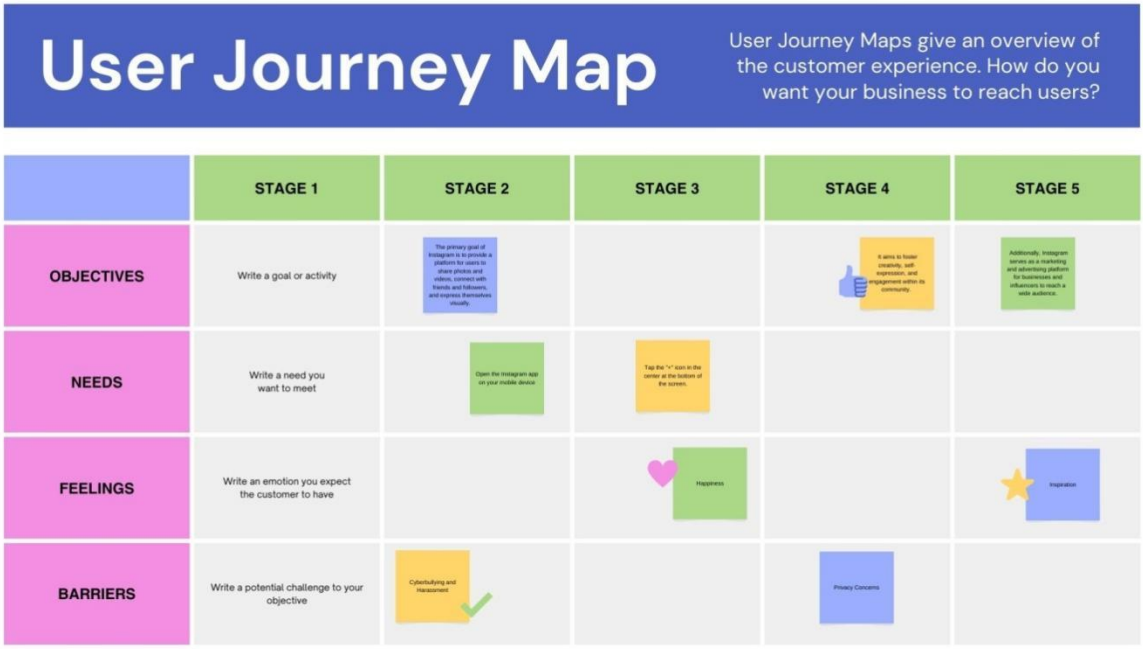


Figure 1: Architecture of canva

Project Design phase – Part 2

Determine the Requirement (Customer Journey Map)



Requirement Analysis

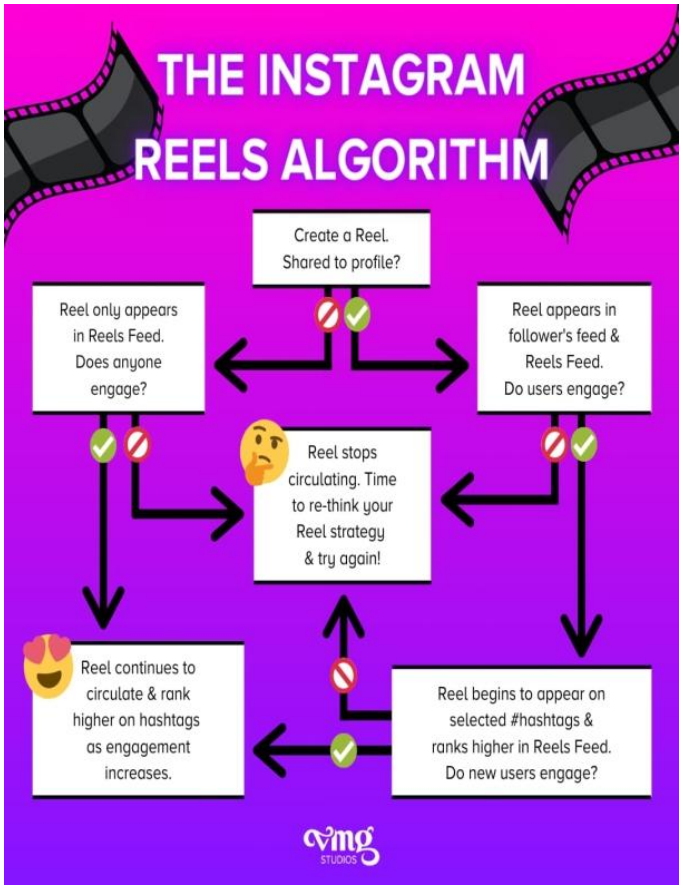
A. Functional Requirements:

FR No.	Functional Requirement	Sub Requirement(Story/Sub-Task
FR-1	Video Recording and Editing	Camera Access
FR-2	Duration Limit	Established Limit

B. Non-functional Requirements:

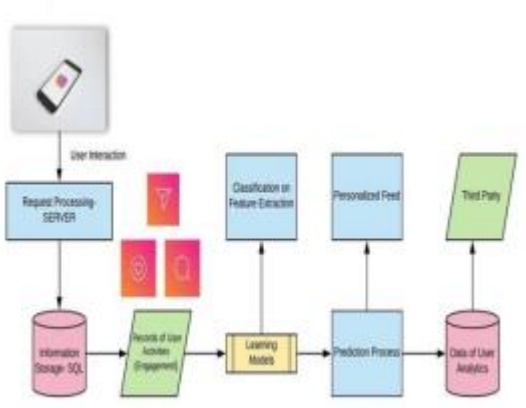
FR No.	Non-Functional Requirement	Description
NFR-1	Performance	Instagram Reels should load quickly, with minimal latency, to provide a seamless user experience. Videos should start playing promptly after being selected.
NFR-2	Scalability	The system should be able to handle an increasing number of users and content uploads without a significant decrease in performance.
NFR-3	Reliability	Instagram Reels should be available and accessible to users around the clock with a high uptime rate, minimizing service interruptions.
NFR-4	Security	User data and uploaded Reels should be encrypted to protect against unauthorized access.
NFR-5	Privacy	Instagram Reels should adhere to privacy regulations and maintain user privacy by protecting sensitive user data.

Flow Charts:


THE INSTAGRAM
REELS ALGORITHM
Create a Reel.
Shared to profile?
Reel only appears in Reels Feed. Does anyone engage?
Reel appears in follower's feed & Reels Feed. Do users engage?
Reel stops circulating. Time to re-think your Reel strategy & try again!
Reel continues to circulate & rank higher on hashtags as engagement increases.
Reel begins to appear on selected #hashtags & ranks higher in Reels Feed. Do new users engage?
vmg
STUDIOS

Technical Architecture

Instagram's mobile app (iOS and Android) and website serve as the primary frontends through which users access Instagram Reels.



Open Source Frameworks

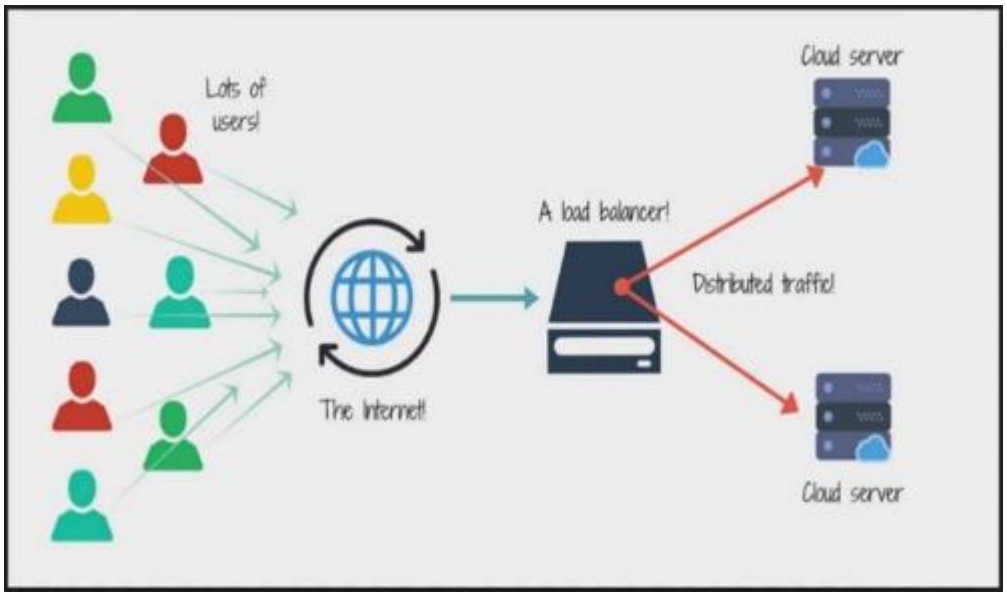
React: A JavaScript library for building user interfaces, which is widely used in many Facebook and Instagram products.
PyTorch: An open-source machine learning framework that has been used by Meta Platforms, Inc. for AI and machine learning research.
HHVM (HipHop Virtual Machine): A virtual machine designed for executing programs written in Hack, a language developed by Facebook.
Tornado: A Python web framework and asynchronous networking library used for building scalable and non-blocking web applications.
Cinder: A C++ library for creative coding, used in various creative and interactive projects.

Third-Party APIs

Instagram's policies and APIs have evolved over time, and they have periodically limited access to certain functionalities to maintain user privacy, data security, and content quality. Therefore, they not be a public third-party API for directly interacting with Instagram Reels.
If you are interested in incorporating Instagram-like video-sharing features into your application or platform, you may need to explore alternative video-sharing and social media APIs that offer similar functionalities. Additionally, you can consider creating your own video-sharing feature, adhering to the privacy and copyright policies that govern such services. Always ensure that your use of third-party APIs and user-generated content complies with legal and ethical standards.

Cloud Deployment

1. Load Balancing:Instagram employs load balancing services to distribute incoming traffic evenly across multiple servers to ensure high availability and scalability. Load balancers help in efficiently handling user requests.
2. Storage and Data Management: Instagram uses various cloud-based storage solutions for different types of data. Object storage: Cloud providers' object storage services (e.g., Amazon S3, Google Cloud Storage) are used to store images, videos, and other media shared on the platform. Databases: A combination of relational databases (e.g., PostgreSQL, MySQL) and NoSQL databases (e.g., Cassandra, MongoDB) may be used to store user data, profiles, Reel information, and engagement metrics.
3. Content Delivery:To ensure that images and videos load quickly for users around the world, Instagram utilizes Content Delivery Networks (CDNs) provided by cloud service providers. CDNs cache and deliver content from servers located closer to end-users.
4. Compute Resources: Cloud computing platforms offer virtual machines and containers for hosting and running Instagram's backend services, including API servers, data processing, and AI algorithms.



Project Development Phase

Number Of Functional Features Included In The Solution

Photo and Video Sharing	Instagram allows users to share photos and videos with their followers. You can add captions, locations, and tags to your posts
Stories	Instagram Stories are short-lived posts that disappear after 24 hours. Users can add photos, videos, text, stickers, and various interactive elements to their Stories.
IGTV	Instagram's long-form video platform where users can upload and watch vertical videos, including series and content from creators
Reels	Short-form video content similar to TikTok, allowing users to create and discover entertaining videos
Explore	This feature helps users discover new content, accounts, and trends based on their interests and activity
Direct Messaging	Instagram has a built-in messaging system, allowing users to send text messages, photos, videos, and voice messages to each other

Code layout, Readability and Reusability

Creating an instagram reels layout involves a combination of code and design elements. Here's a high overview of how you can structure your code and design your layout for instagram reels creation:

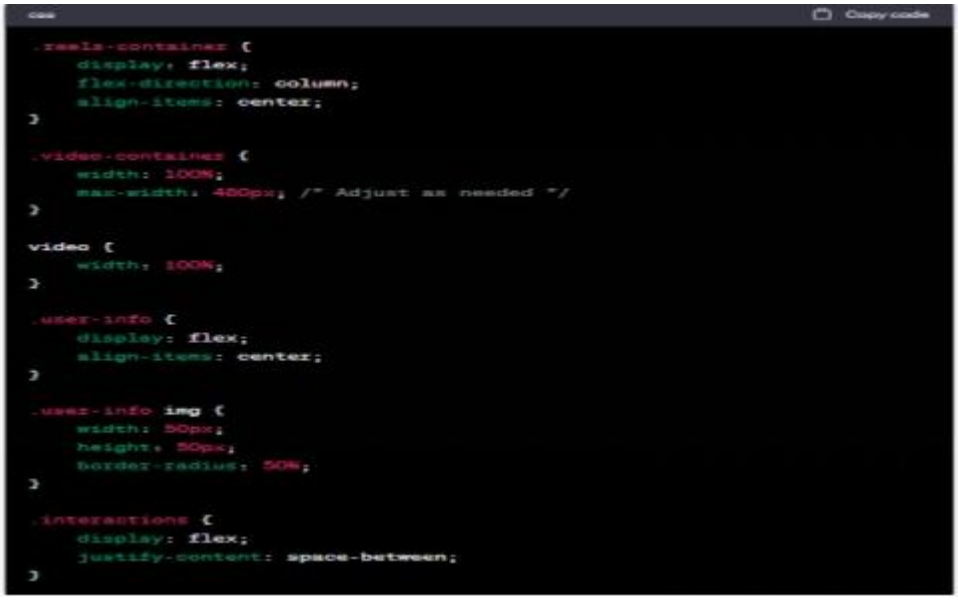
1. HTML Structure:

Create the HTML Structure for your instagram reels layout. You can use HTML, CSS, and javaScript to build your layout.

```html
<!DOCTYPE html>
<html>
<head>
    <link rel="stylesheet" type="text/css" href="styles.css">
</head>
<body>
    <div class="reels-container">
        <!-- Video Player -->
        <div class="video-container">
            <video id="reels-video" autoplay loop>
                <source src="your-video.mp4" type="video/mp4">
            </video>
        </div>
        <!-- User Information -->
        <div class="user-info">
            <img src="user-profile-pic.jpg" alt="User Profile Pic">
            <h2>Username</h2>
            <p>Caption or description</p>
        </div>
        <!-- Like, Comment, Share Buttons -->
        <div class="interactions">
            <button class="like-button">Like</button>
            <button class="comment-button">Comment</button>
            <button class="share-button">Share</button>
        </div>
    </div>
</body>
</html>
```

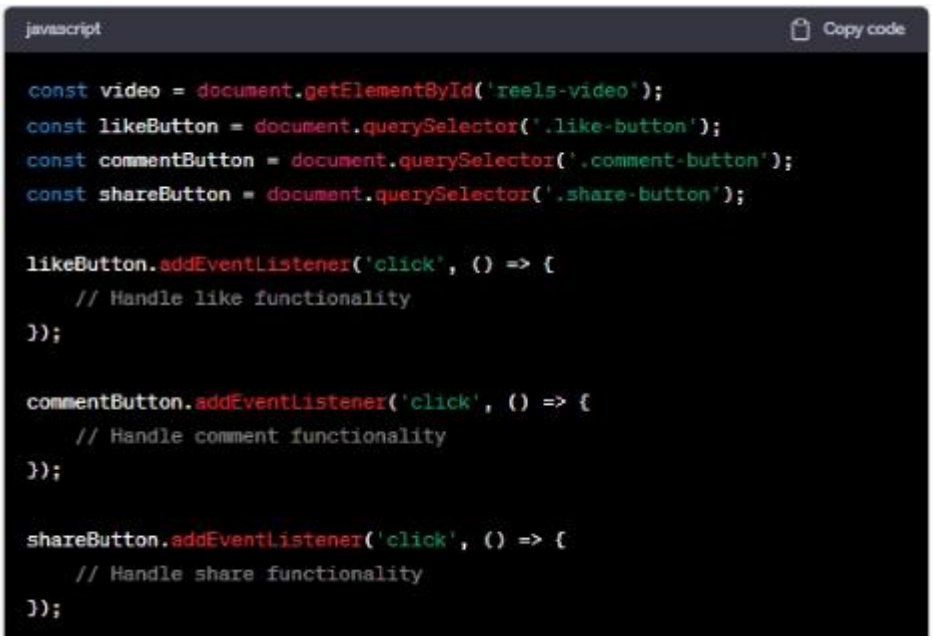
2. CSS Styling (styles.css):

Style the instagram reels layout using CSS to make it look like the instagram app. You'll need to define the sizes, colors, and positioning of various elements.



3. JavaScript

Use javascript to add functionality to your instagram reels layout. You can implement features like play/pause, like, comment, and share functionality



Utilization of Algorithm, Dynamic programming, Optimal memory Utilization

The creation of Instagram Reels can benefit from the utilization of algorithms, dynamic programming, and optimal memory utilization, primarily in the context of video editing and content creation. Here's how these concepts can be applied:

1. Algorithm Utilization:

Content Recommendation Algorithms: Instagram uses recommendation algorithms to suggest music, hashtags, and effects for your Reels. These algorithms analyze the content and audience preferences to make suggestions that can enhance engagement and discoverability.

Real-time Video Enhancement: Some video editing software and apps use algorithms to enhance video quality in real-time. These algorithms can help improve video stabilization, reduce noise, and adjust color balance.

2. Dynamic Programming:

Video Compression: When creating Instagram Reels, it's essential to optimize video file size for faster uploads and smoother playback. Dynamic programming algorithms can be used for video compression to maintain video quality while reducing file size.

Editing Transitions: Dynamic programming can assist in creating smooth and visually appealing transitions between video clips. It can optimize the timing and effects to create engaging transitions.

3. Optimal Memory Utilization:

In-Memory Editing:To minimize the need for excessive storage and maintain smooth video editing, in-memory processing can be utilized. Algorithms can optimize memory usage to ensure that video data is efficiently processed and edited.

Cache Management: Instagram Reels may include various elements like effects, stickers, and audio tracks. Effective caching algorithms can be used to manage memory efficiently, ensuring that these elements are readily available for editing without causing memory bottlenecks.

Buffering for Seamless Playback: To ensure seamless playback for viewers, algorithms can be employed to manage memory buffers efficiently. This helps in preloading video segments and maintaining a smooth viewing experience, even on slower internet connections.

```html
<!DOCTYPE html>
<html>
<head>
    <link rel="stylesheet" type="text/css" href="styles.css">
</head>
<body>
    <div class="reels-container">
        <!-- Video Player -->
        <div class="video-container">
            <video id="reels-video" autoplay loop>
                <source src="your-video.mp4" type="video/mp4">
            </video>
        </div>
        <!-- User Information -->
        <div class="user-info">
            <img src="user-profile-pic.jpg" alt="User Profile Pic">
            <h2>Username</h2>
            <p>Caption or description</p>
        </div>
        <!-- Like, Comment, Share Buttons -->
        <div class="interactions">
            <button class="like-button">Like</button>
            <button class="comment-button">Comment</button>
            <button class="share-button">Share</button>
        </div>
    </div>
</body>
</html>
```

2. CSS Styling (styles.css):

Regen

Output:

Debugging and Traceability

Debugging and traceability for Instagram Reels creation involves identifying and resolving issues that may arise during the process of creating and publishing Reels. Here are some steps and tips to help you with this:

1. Plan Your Reel: Before you start creating a Reel, it's essential to plan your content, script, and any special effects or transitions you want to include. This will help you avoid issues during the creation process.
2. Equipment and Tools: Make sure your smartphone or camera is in good working condition. Check that you have enough storage space, and your battery is fully charged. Having a tripod or stabilizer can help maintain stability while shooting.
3. App Updates: Ensure that your Instagram app is updated to the latest version. Outdated apps can sometimes cause compatibility issues.
4. Internet Connection: A stable and fast internet connection is crucial for uploading and sharing Reels. Slow or intermittent internet can lead to problems while uploading or sharing your content.
5. Reel Creation Process:
   - Shoot your video in segments if it's a long Reel. This will make it easier to edit and manage.
   - Pay attention to lighting, sound, and composition while shooting to reduce the need for extensive post-processing.
6. Editing Software: Use video editing software to compile and edit your Reel. Popular options include Adobe Premiere Pro, Final Cut Pro, or even mobile apps like InShot or Adobe Rush.
7. Transitions and Effects: If you plan to use transitions or special effects, make sure you understand how they work and test them in your editing software before applying them to your Reel.
8. Music and Audio: When adding music or audio, ensure you have the necessary licenses or permissions to use the content. Instagram's content guidelines are quite strict, and using copyrighted music without permission can lead to issues.
9. Export and Compression: Export your final Reel with appropriate settings to meet Instagram's requirements for file format and size. Overly large files may cause problems during uploading.
10. Uploading and Sharing: Once your Reel is ready, try to upload it at a time when Instagram servers are less busy to avoid potential issues. Make sure your caption and hashtags are added correctly.
11. Debugging Issues: If you encounter issues during any of the above steps, here are some common problems and solutions:
   - If your video is not uploading, try a different internet connection.
   - If your Reel is stuck in processing, wait for some time, or try uploading again.
   - If there are issues with audio, double-check the permissions and format of the audio file.
   - For video quality issues, ensure your editing software settings are appropriate for Instagram.
12. Traceability: Maintain a log or documentation of your Reel creation process. Include details like shooting dates, editing software used, music sources, and any specific settings applied. This can be helpful for future reference or if you need to troubleshoot any issues.
13. Feedback and Testing: Before publishing, ask for feedback from others. Test your Reel on different devices to ensure it appears and sounds as intended.

By following these steps and staying organized, you can improve the debugging and traceability of your Instagram Reels creation process, making it easier to identify and resolve issues as they arise.

```html
<!DOCTYPE html>
<html>
<head>
    <link rel="stylesheet" type="text/css" href="styles.css">
</head>
<body>
    <div class="reels-container">
        <!-- Video Player -->
        <div class="video-container">
            <video id="reels-video" autoplay loop>
                <source src="your-video.mp4" type="video/mp4">
            </video>
        </div>
        <!-- User Information -->
        <div class="user-info">
            <img src="user-profile-pic.jpg" alt="User Profile Pic">
            <h2>Username</h2>
            <p>Caption or description</p>
        </div>
        <!-- Like, Comment, Share Buttons -->
        <div class="interactions">
            <button class="like-button">Like</button>
            <button class="comment-button">Comment</button>
            <button class="share-button">Share</button>
        </div>
    </div>
</body>
</html>
```

2. CSS Styling (styles.css):

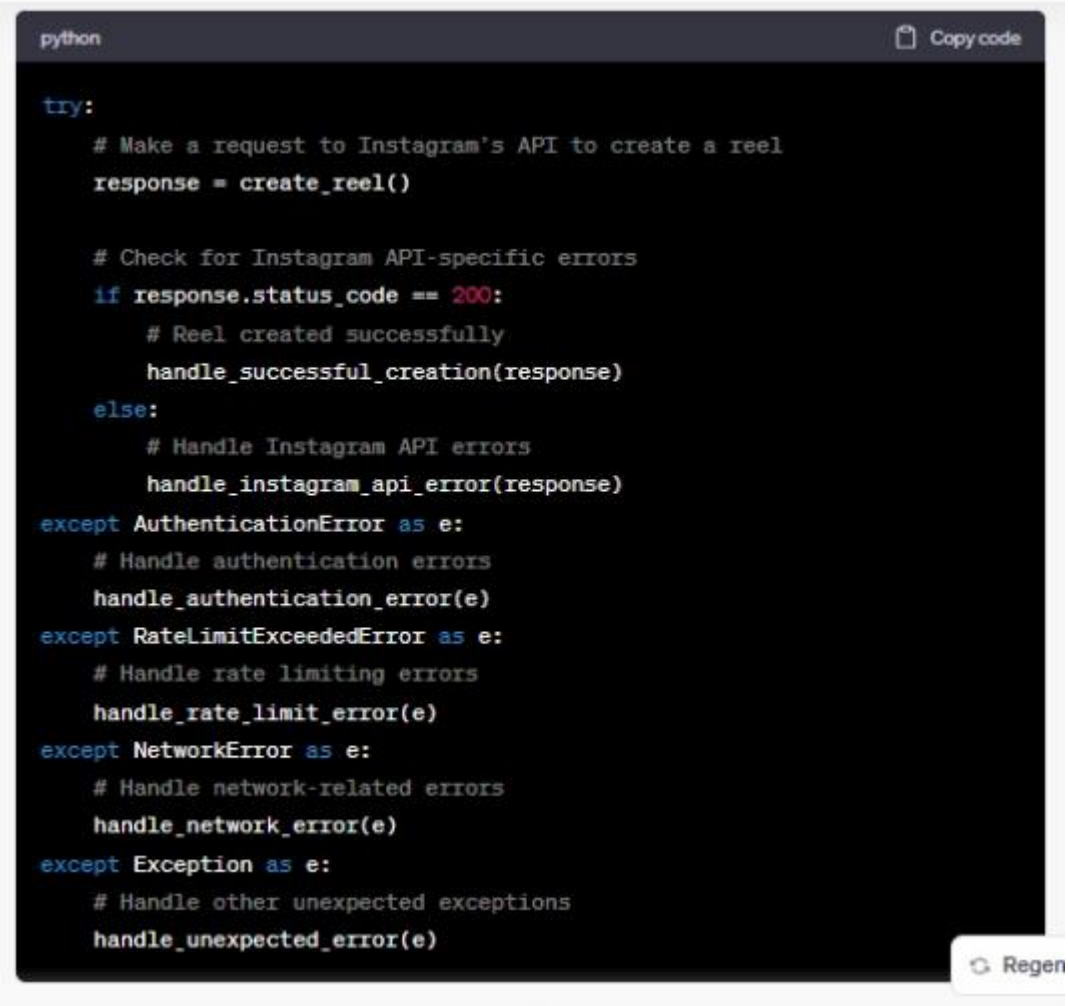
Regen

Exception Handling

Exception handling is an important aspect of software development, including when you're working with Instagram's API to create reels. Instagram's API may change over time, so be sure to refer to the latest documentation and error handling practices provided by Instagram. Here's a general outline of how you can handle exceptions when creating Instagram reels:

1. **Authentication and Authorization Errors**: Handle exceptions related to authentication and authorization, such as invalid access tokens or permission errors. These are crucial to ensure that your app can interact with Instagram's API.
2. **API Rate Limiting**: Instagram may impose rate limits on API requests to prevent abuse. Handle rate-limiting exceptions by respecting the limits and implementing retry mechanisms with backoff strategies if necessary.
3. **Network Errors**: Handle network-related exceptions, such as connection timeouts or request failures. You can use try-catch blocks to capture these exceptions and implement retry logic as needed.
4. **Validation Errors**: Ensure that the data you're sending to Instagram's API is valid. Handle validation errors by checking the data before making the request and responding appropriately if the data is invalid.
5. **Instagram API Errors**: Instagram's API may return specific error codes and messages. Handle these errors by checking the response from the API and taking appropriate actions based on the error code and message.
6. **Logging and Monitoring**: Implement comprehensive logging to record exceptions and errors, making it easier to diagnose and fix issues. Additionally, consider setting up monitoring and alerting systems to detect and respond to errors in real-time.
7. **Graceful Degradation**: In the event of an exception, implement a graceful degradation strategy. For example, if you're creating Instagram reels, you might queue failed requests for later retry, notify the user of the failure, or handle the situation in a way that doesn't disrupt the user experience.
8. **User Feedback**: Provide clear and helpful error messages to users when exceptions occur. This can help them understand the issue and take appropriate actions.

Here's a pseudo-code example of exception handling when creating an Instagram reel:



Remember that this is a simplified example, and you should tailor your exception handling to your specific use case and the Instagram API version you're working with. Always consult the latest API documentation for the most up-to-date information on error handling and best practices.

Model Performance Metrices

Model Performance Testing:

Project team shall fill the following information in the model performance testing template.

Parameter	Values	Screenshot
Metrices	Instagram reels video Execution time and output screenshot. Python,accuracy of prediction and output screenshot.	

Demo link:

https://drive.google.com/file/d/1Brex_Z88YQVhfZ7fS8VLgBPyvo8rvvl_/view?usp=drivesdk