



Linkers' Project:

Links on just one click

Submitted in Partial Fulfillment of Requirements
for the Degree of
Bachelor of Computer Applications

By

Krish Devendra Undre

Seat No: 31011221076

Guide

Ms. Leena Shewale



S K Somaiya College

Somaiya Vidyavihar University
Vidyavihar, Mumbai - 400 077

2021-24

Somaiya Vidyavihar University

S K Somaiya College

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Guide / Co-Guide

Programme Coordinator

Head of Department

Director

Date:

Place: Mumbai-77

Somaiya Vidyavihar University

S K Somaiya College

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Internal Examiner/ Guide

Date:

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Krish Devendra Undre
Name of the Student

31011221076
Seat No.

Date:

Place: Mumbai-77

Abstract

The Linkers project documentation is an extensive exploration of a web-based platform aimed at simplifying link generation, QR code creation, and anchor tag provision for various social media platforms. It delves into the background and objectives of the project, shedding light on its genesis and the pressing need it addresses in the digital marketing sphere. By offering a unified solution to streamline these essential tasks, Linkers seeks to enhance efficiency and productivity for marketers and content creators.

Through meticulous analysis and evaluation, this documentation thoroughly examines the feasibility, requirements, and design aspects of the Linkers project. It outlines the project's scope and advantages, elucidating its potential impact and applicability in diverse scenarios. Moreover, it provides valuable insights into the implementation and testing phases, showcasing the rigorous methodologies employed to ensure the platform's functionality and reliability.

In conclusion, the Linkers project documentation not only presents a detailed overview of the project's development and implementation but also offers valuable insights into its outcomes, limitations, and future prospects. By elucidating the project's significance and potential, this documentation serves as a valuable resource for stakeholders, researchers, and enthusiasts in the digital marketing and web development domains.

Key words: Data migration, Data automation, Technology

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Nomenclature

<i>Glossary of Terms</i>	A comprehensive list of terms and their definitions used throughout the project documentation.
<i>Sample Test Cases</i>	A collection of sample test cases used to verify the functionality of the project.
<i>Class Diagram</i>	A graphical representation of the classes, their attributes, and relationships in the project.
<i>Activity Diagram</i>	A visual representation of the workflow or process flow within the project.
<i>Code Snippets</i>	Code excerpts showcasing key implementations or functionalities within the project.
<i>User Interface Screenshots</i>	Screenshots of the user interface at various stages of interaction.
<i>Database Schema</i>	A schema diagram illustrating the structure of the database used in the project.
<i>Acknowledgments</i>	Acknowledgment of individuals or organizations that contributed to the project's success.
<i>Project Timeline</i>	A timeline depicting the key milestones and events during the project's development lifecycle.

Chapter – 1

Introduction

This chapter provides an overview of the Linkers project, including its background, objectives, and scope. It introduces the reader to the rationale behind the project and outlines the key areas of focus.

1.1 Introduction & background of the Project

Introduction of Project

The Linkers project represents a dynamic and innovative solution aimed at streamlining the process of link generation and management across various digital platforms. In an era dominated by social media and online communication, the ability to effectively share content and engage with audiences is paramount. Linkers seeks to address this need by providing users with a centralized platform where they can easily create, customize, and track their sharing links, QR codes, and anchor codes. By offering a comprehensive suite of tools and features, Linkers empowers users to enhance their online presence, drive engagement, and achieve their digital marketing objectives with efficiency and ease.

At its core, Linkers aims to simplify the complex task of managing links across multiple social media platforms and communication channels. By leveraging cutting-edge technologies and intuitive design principles, the platform enables users to generate custom links tailored to their specific needs and preferences. Whether it's sharing promotional content, directing traffic to a website, or engaging with followers on social media, Linkers provides users with the flexibility and functionality they need to achieve their goals effectively. Moreover, Linkers prioritizes user experience and accessibility, ensuring that individuals of all skill levels can navigate the platform with ease and confidence.

In addition to its robust link generation capabilities, Linkers also offers advanced features such as user authentication, data analytics, and performance tracking. By incorporating these elements into the platform, Linkers enables users to gain valuable insights into their link

engagement metrics, audience demographics, and campaign performance. This data-driven approach empowers users to make informed decisions, optimize their marketing strategies, and maximize their impact in the digital realm. Overall, Linkers represents a comprehensive solution for individuals and businesses seeking to harness the power of links and effectively connect with their target audience in today's fast-paced digital landscape.

Background of Project

The Linkers project was conceived as a response to the evolving landscape of digital communication and social media engagement. In today's interconnected world, individuals, businesses, and organizations rely heavily on social media platforms to disseminate information, connect with their audience, and promote their products and services. However, the process of managing and optimizing digital content across multiple platforms can be complex and time-consuming, requiring users to navigate through various interfaces and tools to achieve their desired outcomes.

Recognizing the growing demand for a streamlined solution that simplifies the generation of links and codes for social media platforms, the Linkers project was conceptualized with a clear vision: to empower users with an intuitive and efficient toolset for managing their digital presence. By leveraging the latest technologies and best practices in web development, the Linkers platform aims to revolutionize the way users create, customize, and share links and codes across different social media channels.

1.2 Objectives of project and Problem Statement

Objective of Project

The primary objective of the Linkers project is to address the existing gap in the market for comprehensive and user-friendly platform that offers a diverse range of features for managing digital content on social media platforms. Through extensive research and development, it was identified that while there are numerous tools and services available for generating links, QR codes, and anchor codes individually, there is a lack of a unified solution that integrates all these functionalities into a single platform.

The Linkers project aims to fill this void by providing users with an all-in-one solution for creating, customizing, and sharing links, QR codes, and anchor codes across various social media channels. By consolidating these features into a single, intuitive interface, Linkers seeks to streamline the process of managing digital content and empower users with the tools they need to enhance their online presence and engagement.

Problem Statement

Existing solutions often require users to navigate through multiple interfaces and tools, leading to inefficiencies, confusion, and frustration. Moreover, the lack of integration between different tools and services makes it challenging for users to maintain consistency and coherence in their online branding and communication efforts.

The Linkers project seeks to address these challenges by providing users with a unified platform that simplifies the process of creating and customizing links, QR codes, and anchor codes for social media platforms. By offering a comprehensive suite of features in a single, user-friendly interface, Linkers aims to empower users with the tools they need to optimize their digital presence and achieve their marketing objectives effectively.

1.3 Scope, Advantages and Applicability of Project

Scope of Project

The scope of the Linkers project encompasses the development and deployment of a comprehensive web-based platform that offers a range of features for managing digital content on social media platforms. Key components of the project include:

- **Link Generation:** Users can create custom links for sharing content on social media platforms such as Instagram, Facebook, Twitter, Gmail, and more.
- **QR Code Generation:** The platform allows users to generate QR codes for their links, enabling offline sharing and promotion.
- **Anchor Code Generation:** Users can generate anchor codes for embedding links in HTML documents, facilitating website integration.
- **User Authentication:** The platform includes user authentication functionality to secure premium features and user data.
- **Customization Options:** Users can customize the appearance and behavior of their links and QR codes to align with their branding and messaging.
- **Analytics and Reporting:** Linkers provides users with insights into link performance and engagement metrics to track the effectiveness of their campaigns.

Advantages of Project

- **Convenience:** Linkers offers a one-stop solution for link, QR code, and anchor code generation, streamlining the process of managing digital content.
- **Time-Saving:** By consolidating multiple functionalities into a single platform, Linkers saves users time and effort that would otherwise be spent navigating between different tools and services.
- **Enhanced Branding:** The customization options available in Linkers empower users to maintain consistency in their branding across various digital channels, enhancing brand recognition and credibility.

- **Data-driven Insights:** With built-in analytics and reporting features, Linkers provides users with valuable insights into the performance of their digital campaigns, enabling informed decision-making and optimization.
- **User Authentication:** The inclusion of user authentication ensures that premium features are accessible only to authorized users, enhancing security and privacy.

Applicability of Project

The applicability of the Linkers project spans across various industries and scenarios where effective digital communication and marketing strategies are essential. Here are some key areas where the project can find wide applicability:

- **Digital Marketing Agencies:** Digital marketing agencies can leverage Linkers to streamline their link management processes, track campaign performance, and generate custom links for their clients across different social media platforms. The platform's analytics and tracking features provide valuable insights into campaign effectiveness, enabling agencies to optimize their strategies for maximum impact.
- **E-commerce Platforms:** E-commerce platforms can integrate Linkers to enhance their product promotion and sales efforts. By generating custom links for product pages, special offers, and promotions, e-commerce businesses can drive traffic to specific landing pages, track referral sources, and analyze conversion metrics to improve their marketing ROI.
- **Content Creators and Influencers:** Content creators, bloggers, and social media influencers can use Linkers to create branded links for their content, track audience engagement, and monitor the performance of their promotional campaigns. The platform's customizable features allow influencers to maintain consistency in their branding and tailor their messaging to resonate with their audience.

- **Event Management Companies:** Event management companies can utilize Linkers to facilitate online event promotion, ticket sales, and attendee engagement. By generating custom links for event registration pages, promotional materials, and social media posts, event organizers can reach their target audience effectively and measure the success of their marketing efforts in real-time.
- **Small Businesses and Startups:** Small businesses and startups can benefit from Linkers' cost-effective solution for link management and digital marketing. The platform's user-friendly interface and affordable pricing make it accessible to businesses of all sizes, allowing them to establish a strong online presence, drive website traffic, and boost brand awareness without investing in expensive marketing tools or resources.

Overall, the applicability of the Linkers project extends to any organization or individual looking to optimize their digital marketing efforts, enhance their online visibility, and achieve their business objectives through effective link management and analytics.

1.4 Organization of the Report

This report is divided into 7 major chapters. Each chapter has various subchapters explaining in detail

- CHAPTER 1: INTRODUCTION
 - BACKGROUND OF THE PROJECT WITH EXISTING SCENARIO – This chapter elaborates the basis of the project along with existing applications present.
 - OBJECTIVES OF THE PROJECT – This chapter gives the readers an overview on the objectives of the project
 - SCOPE, ADVANTAGES AND DISADVANTAGES – This chapters presents the scope of the project along with advantages and disadvantages over other existing applications
- CHAPTER 2: SURVEY OF TECHNOLOGY
 - 2.1 TECHNOLOGY IMPLEMENTED FOR THE PROJECT – This chapter provides details about the technologies implemented in the project
- CHAPTER 3: REQUIREMENT AND ANALYSIS
 - 3.1 PROBLEM STATEMENT – This chapter elaborated the main objectives to be fulfilled during the implementation of this project along with details about the major stakeholders.
 - 3.2 FEASIBILITY STUDY – This chapter evaluates if the project is Feasible (extend of doability of the project) in terms of technical feasibility, schedule feasibility, and legal feasibility.
 - 3.3 REQUIREMENT SPECIFICATION – this chapter elaborated the functional and non - functional requirements of the project.
 - 3.4 SOFTWARE AND HARDWARE REQUIREMENT – This chapter entails the details about specific hardware and software requirements needed for the project to run smoothly on a client side and developer side
 - 3.5 PLANNING AND SCHEDULE – This chapter contains a gantt chart which specifies the activities conducted in relation with the time duration of it on a yearly base
 - 3.6 SDLC MODEL – This chapter describes the SDLC models used during the implementation of the project.

➤ CHAPTER 4: SYSTEM DESIGN

- 4.1 FLOW CHART – This diagram which depicts the system flow of the project
- 4.2 USE CASE DIAGRAM – This diagram provides a visual representation of how users interact with the system.
- 4.3 SEQUENCE DIAGRAM – This diagram illustrates the dynamic behavior of the system by showing interactions between various components.
- 4.4 DATA FLOW DIAGRAM - This diagram maps out how data is processed within the system
- 4.5 ER DIAGRAM – This diagram represents the relationship amount entities within a system.
- 4.6 DATA DICTIONARY – This diagram contains metadata, i.e., data about the database
- 4.7 CLASS DIAGRAM – This diagram depicts the static view of an application. It represents the types of objects in a system and the relationship between them.
- 4.8 PROJECT SYSTEM SCREENS – This contains a number of images which illustrate the actual screens of the project

➤ CHAPTER 5: IMPLEMENTATION AND TESTING

- 5.1 TESTING APPROACHES – This chapter describes the various testing methods used for testing the project.
- 5.2 TEST CASES WITH TEST RESULTS – This chapter contains a table describing the test cases, expected results, actual outcome and if the test was a success or not

➤ CHAPTER 6: RESULTS AND DISCUSSION

- 6.1 SUMMARY OF TEST REPORTS – This chapter contains a detailed analysis and summary of the test cases and results from the previous chapter.
- 6.2 DISCUSSION

➤ CHAPTER 7: CONCLUSION

- 7.1 CONCLUSION OF PROJECT – This chapter concludes the entire project. It provides details about if the project was completed successfully. If not, then what issues were faced and etc.
- 7.2 LIMITATIONS OF PROJECT – This chapter provides details about the limitations of the project.

- 7.3 THE FUTURE SCOPE OF THE PROJECT – This chapter entails the future vision for the project. It simply answers the question ‘Can this project be continued in the future’ and if new modules can be added to it.
- REFERENCES – This part of the documentation contains the references from which this project is implemented.

Chapter – 2

Survey of Technologies used During the Project Implementation

This chapter explores the existing technologies relevant to the Linkers project and discusses the technologies implemented during its development. It provides insights into the tools and frameworks utilized to build the platform.

2.1 Existing Technologies

Before the development of Linkers, users often faced several challenges when generating links and codes for social media platforms. Some common scenarios observed in existing practices include:

Manual Link Generation: Users had to manually construct links for their social media profiles or content, which was time-consuming and prone to errors. This process involved navigating through multiple interfaces and copying and pasting various components to create a functional link.

Limited Code Generation Options: Users lacked access to comprehensive tools for generating QR codes, anchor codes, and other types of codes for their social media presence. As a result, they had to rely on third-party websites or software with limited functionalities.

Security Concerns: Users expressed concerns about the security and reliability of third-party services for generating links and codes. Trusting external platforms with sensitive data raised apprehensions about privacy, data breaches, and potential misuse of personal information.

Lack of Customization: Existing solutions offered limited options for customizing links and codes according to user preferences. Users desired more flexibility in designing and branding their digital assets to align with their unique identities and branding strategies.

Authentication Requirements: Certain advanced features, such as premium link generation and code customization, required users to authenticate their identities through complex registration and login processes. This added friction to the user experience and deterred some users from accessing these features.

By addressing these objectives, Linkers endeavours to become the go-to platform for individuals, businesses, and organizations seeking efficient and reliable solutions for managing their digital presence on social media.

2.2 Technology implemented for the Project

In the project implementation phase, various technologies were surveyed and selected based on their suitability for different aspects of the development process. Here's an overview of the technologies used:

❖ Frontend Technologies:

- **HTML (Hypertext Markup Language):**
HTML5, the latest version of HTML, was utilized to create semantic and structured web pages, ensuring accessibility and compatibility across different browsers and devices.
- **CSS (Cascading Style Sheets):**
Advanced CSS features such as Flexbox and Grid layouts were employed to build responsive and visually appealing designs. CSS preprocessors like Sass or LESS might have been used to enhance maintainability and code organization.
- **JavaScript:**
Modern JavaScript frameworks/libraries like React.js, Vue.js, or AngularJS might have been incorporated to facilitate component-based development, state management, and improved code organization. Additionally, asynchronous programming techniques with Promises or async/await were employed for efficient handling of asynchronous tasks.

❖ Backend Technology:

- **MySQL:**
MySQL was chosen as the backend database management system (DBMS) for storing and managing structured data efficiently. It offers robust features for data manipulation, retrieval, and maintenance, making it suitable for a wide range of applications.

❖ Version Control System:

- **Git:**
Git, along with platforms like GitHub, was utilized for version control, collaborative development, and code repository management. GitHub provided additional features such as issue tracking, project management tools, and pull request workflows, enhancing collaboration and code review processes. Advanced Git features like

branching, merging, and rebasing were leveraged to streamline development workflows and maintain code quality. Continuous integration (CI) and continuous deployment (CD) pipelines might have been integrated with GitHub Actions to automate testing, build, and deployment processes directly from the GitHub repository.

❖ **Other Supporting Technologies:**

➤ **APIs (Application Programming Interfaces):**

RESTful APIs were designed and implemented to expose backend functionality, allowing seamless communication between the frontend and backend components. Authentication mechanisms such as OAuth 2.0 or JSON Web Tokens (JWT) might have been employed to secure API endpoints and control access to resources.

➤ **Web Servers:**

Web servers like Apache or Nginx could have been utilized to host the web application and serve HTTP requests from clients.

Overall, the selection of these technologies was driven by considerations such as scalability, performance, ease of development, community support, and compatibility with project requirements and objectives.

Chapter – 3

Requirements & Analysis

This chapter presents a detailed analysis of the requirements of the Linkers project, including the problem statement, feasibility study, and software requirement specification. It outlines the major modules and functionalities of the system.

3.1 Problem Statement

The Linkers project addresses the following key challenges:

- **Fragmented Link Generation Process:** Currently, users often rely on separate tools or manual methods for generating links, QR codes, and anchor codes across different social media platforms and messaging services. This fragmented approach leads to inefficiencies and inconsistencies in the link management process.
- **Lack of Unified Platform:** There is a lack of a unified platform that offers comprehensive link generation functionalities for multiple social media platforms and messaging services. Users struggle to find a single solution that caters to their diverse link generation needs, leading to frustration and time wastage.
- **Security and Privacy Concerns:** Many existing link generation tools may compromise user privacy or expose sensitive information due to inadequate security measures. Users are hesitant to use such tools for generating links and QR codes, especially for sharing personal or confidential content.

The stakeholders involved in the Linkers project include:

- **End Users:** Individuals and organizations who utilize the link generation platform to create and manage links, QR codes, and anchor codes for various purposes, including social media marketing, content sharing, and digital communication.
- **Developers and Designers:** The team responsible for designing, developing, and maintaining the Linkers platform. This includes frontend developers, backend developers,

UI/UX designers, and system administrators who collaborate to ensure the platform's functionality and performance.

- **Business Owners and Administrators:** Entities or individuals who own and operate the Linkers platform, overseeing its strategic direction, business model, and revenue generation strategies. Business owners are invested in maximizing user engagement, satisfaction, and profitability.
- **Third-Party Service Providers:** Providers of external services and APIs integrated into the Linkers platform, such as social media APIs, analytics services, and authentication providers. These stakeholders play a crucial role in enabling key functionalities and enhancing the user experience.

3.2 Feasibility Study

Key aspects to consider in the feasibility study for the Linkers project:

- ✓ **Market Feasibility:** This involves analyzing the demand for a link management platform like Linkers in the target market. Market research should identify potential users, their needs, and existing solutions in the market. Understanding market trends, competition, and potential growth opportunities is crucial for determining the project's market feasibility.
- ✓ **Technical Feasibility:** Assessing the technical feasibility involves evaluating whether the proposed system can be developed within the constraints of technology, resources, and expertise available. This includes evaluating the scalability, security, and compatibility of the platform with different devices and browsers. It also involves assessing the availability of required technical skills and resources for development and maintenance.
- ✓ **Financial Feasibility:** Financial feasibility examines the project's cost estimates, revenue projections, and potential return on investment (ROI). It involves estimating development costs, operational expenses, and revenue streams such as subscription fees, advertising, or premium features. A thorough financial analysis helps determine whether the project is financially viable and can generate sufficient returns to justify the investment.
- ✓ **Operational Feasibility:** Operational feasibility examines whether the proposed system aligns with the organization's goals, processes, and workflows. It involves assessing the ease of implementation, user acceptance, and impact on existing systems and operations. Conducting user surveys, stakeholder interviews, and usability testing can help evaluate operational feasibility and identify potential challenges.

3.3 Software Requirement Specialization

The Linkers project aims to meet the diverse needs of users by providing a comprehensive set of features and functionalities. The following requirements have been identified based on user feedback and project objectives:

❖ User Authentication and Authorization:

- Users should be able to create accounts and log in securely to access the platform's features.
- Authentication mechanisms should ensure user privacy and protect sensitive information.
- Role-based access control should be implemented to manage user permissions and privileges.

❖ Link Generation and Management:

- Users should be able to generate links for various social media platforms and messaging services, including Instagram, Facebook, Twitter, Gmail, and WhatsApp.
- The platform should support dynamic link parameters, allowing users to customize link URLs, titles, descriptions, and other metadata.
- Users should have the ability to manage and organize their generated links, including editing, deleting, and categorizing them for easy retrieval.

❖ QR Code Generation:

- Users should be able to generate QR codes corresponding to their generated links for offline sharing and scanning.
- QR codes should be customizable in terms of size, color, error correction level, and branding options.

❖ Anchor Code Generation:

- Users should have the option to generate anchor codes or anchor tags for embedding links within HTML content, such as webpages or email newsletters.
- Anchor codes should support custom attributes and styling options for seamless integration with existing content.

❖ Premium Features and Subscriptions:

- The platform should offer premium features such as detailed analytics, link tracking, A/B testing, and advanced customization options.
- Users should have the option to subscribe to premium plans with tiered pricing based on feature availability and usage limits.

3.4 System Software Requirements

❖ Web Browser:

- Users will need a modern web browser such as Google Chrome, Mozilla Firefox, Apple Safari, or Microsoft Edge to access the Linkers project website.
- The browser should be updated to the latest version for optimal performance and compatibility with web standards.

❖ Internet Connection:

- A stable internet connection is required to access the Linkers project website and its features.
- High-speed broadband or cellular data connectivity is recommended for smooth browsing and interaction.

❖ JavaScript Enabled:


- Users must have JavaScript enabled in their web browser settings to enable dynamic and interactive functionalities on the Linkers project website.
- JavaScript is essential for features such as form validation, DOM manipulation, and asynchronous data loading.

❖ Text Editor or IDE (Optional):

- Users interested in exploring or modifying the project source code may use a text editor or integrated development environment (IDE) for code editing.
- Recommended text editors/IDEs include Visual Studio Code.

3.5 Project Scheduling

Task	Start Date	End Date	Duration
Requirements gathering and analysis	2023-10-12	2023-10-16	5 days
System design	2023-10-17	2023-10-23	7 days
API development	2023-10-24	2023-10-30	7 days
Frontend development	2023-10-31	2023-11-06	7 days
Testing and debugging	2023-11-07	2023-11-13	7 days
Deployment	2023-11-14	2023-11-20	7 days

 Export to Sheets

The choice of Software Development Life Cycle (SDLC) model depends on the specific requirements, complexity, and nature of the project. Based on the scope of the Linkers Project described, an Agile SDLC model would be a suitable choice. Here's why:

- **Flexibility and Iterative Development:** Agile allows for flexibility and iterative development, enabling you to adapt to changing requirements and incorporate user feedback at different stages. This approach is particularly beneficial for projects where requirements are not fully known or may evolve over time.

- **Continuous User Involvement:** Agile emphasizes continuous collaboration with stakeholders and end-users. Given that the Linkers Project involves user interactions and experience, having regular feedback loops ensures that the product aligns closely with user expectations and needs.
- **Early and Incremental Delivery:** Agile promotes the delivery of working software in small, incremental iterations. This approach allows you to demonstrate functionality early and frequently, providing stakeholders with tangible progress updates. For a project like Linkers, where user interaction and feedback are vital, this incremental delivery can lead to faster validation of concepts and features.
- **Quick Adaptation to Changes:** Agile methodologies, such as Scrum or Kanban, are well-suited for accommodating changes even in the later stages of development. As user needs or market demands shift, Agile allows your team to quickly adapt the project scope and priorities without causing significant disruptions.
- **Improved Quality:** Agile practices, including continuous testing and integration, contribute to better software quality. By addressing issues promptly and conducting regular testing, you can ensure a reliable and stable product, which is crucial for a project involving user interactions like the Linkers Project.

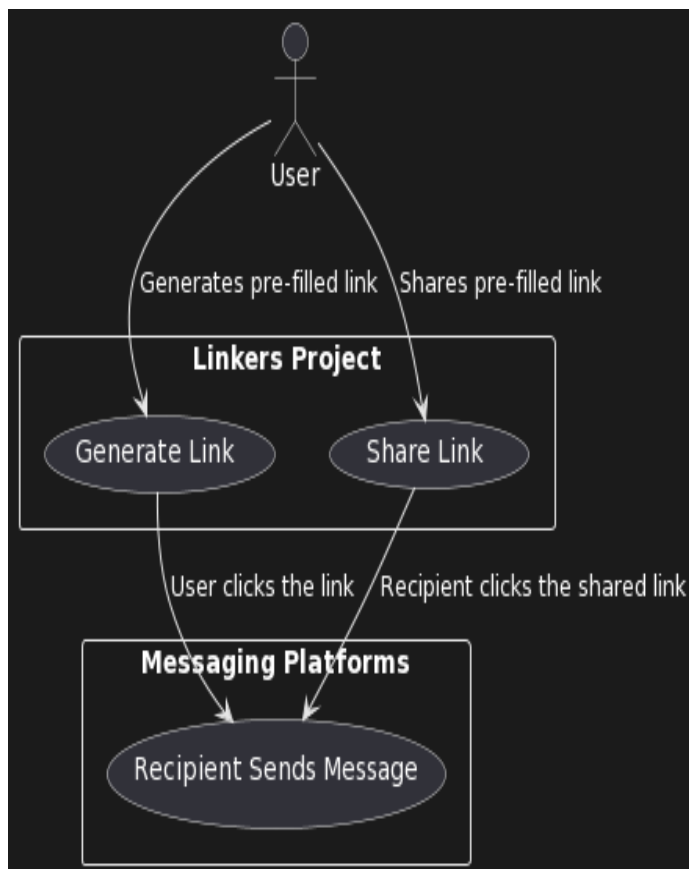
Given these factors, Agile offers the right balance of flexibility, user involvement, and adaptability, making it a suitable choice for the Linkers Project. However, it's essential to assess your team's expertise, project size, and specific requirements before finalizing the SDLC model.

Chapter – 4

System Design

This chapter delves into the design phase of the Linkers project, featuring diagrams such as use case diagrams, data flow diagrams, and entity-relationship diagrams. It provides a visual representation of the system's architecture and workflow.

4.1 Use case

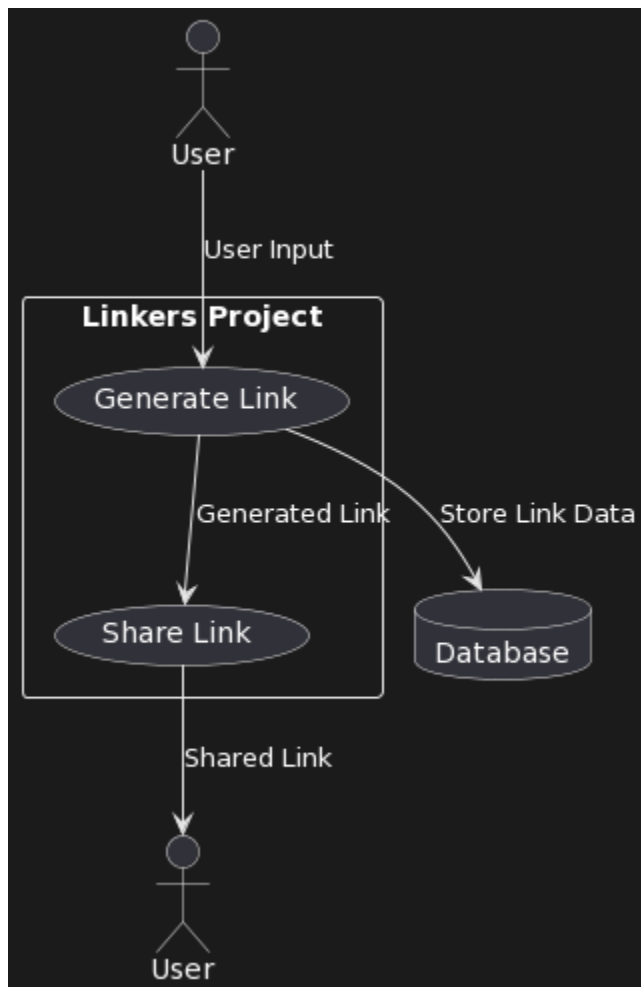


In this diagram:

- User (U): Represents the user of the Linkers Project.
- Generate Link: Use case where the user generates a pre-filled link.
- Share Link: Use case where the user shares the generated link.
- Recipient Sends Message: Represents the action taken by the recipient when they send the message after clicking the pre-filled link.

The arrows indicate the flow of events. Users generate pre-filled links using the "Generate Link" use case. They can then share these links, and recipients, represented by "Recipient Sends Message," interact with the messaging platforms after clicking the shared links.

4.2 Data flow diagram

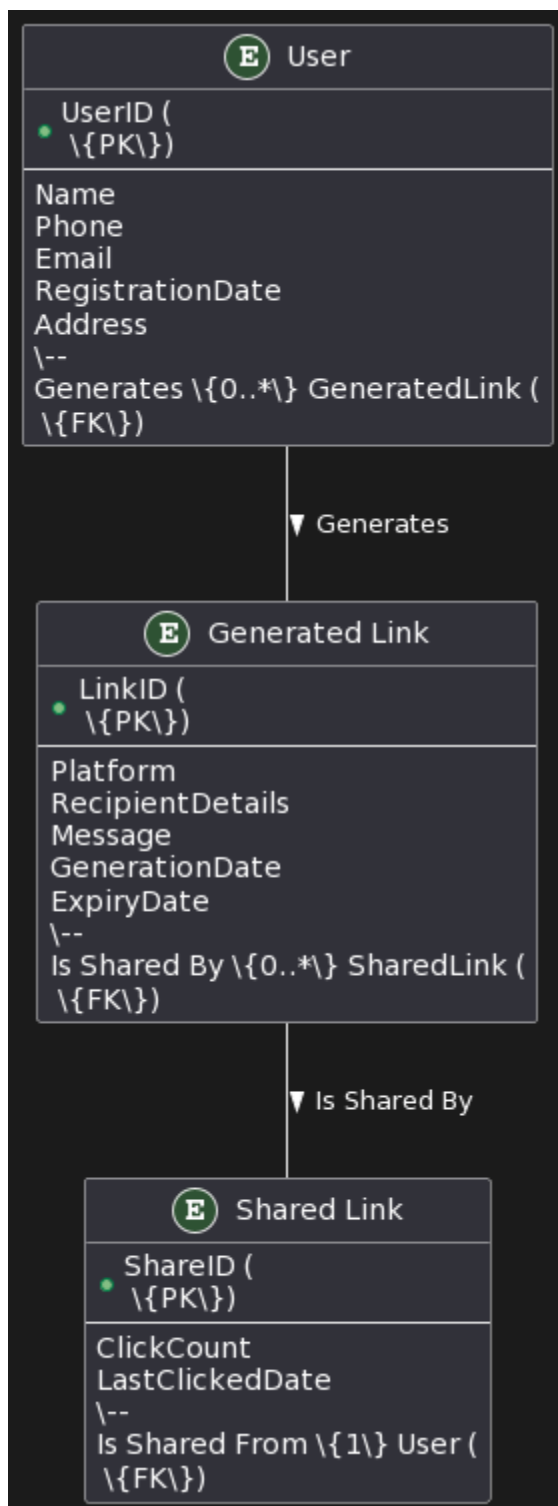


In this DFD:

- User (U): Represents the external entity interacting with the system.
- Generate Link: Represents the process of generating a pre-filled link.
- Share Link: Represents the process of sharing the generated link.
- Database (DB): Represents the data storage component where link data is stored.

The arrows indicate the flow of data between processes and entities. Users provide input to the "Generate Link" process, which stores the link data in the database. The generated link and associated data flow to the "Share Link" process, which then delivers the shared link back to the user.

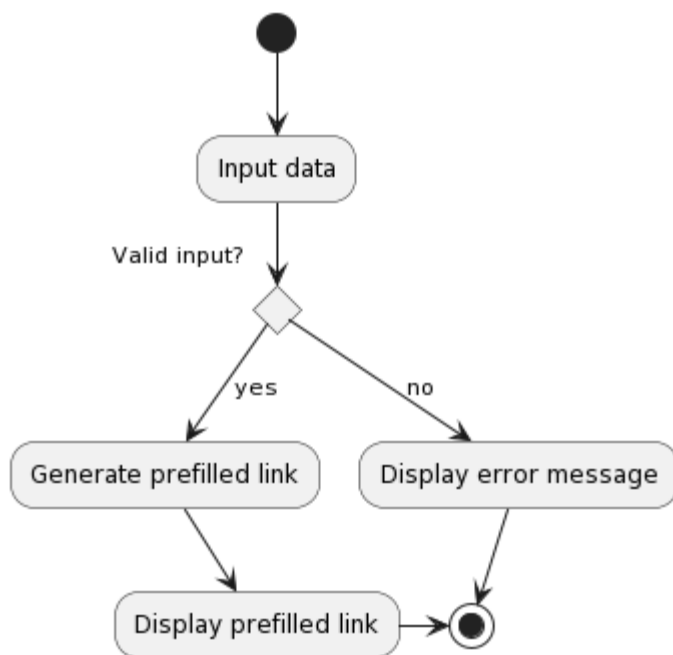
4.3 ER diagram



In this detailed ER diagram:

- User: Represents the users of the Linkers Project. Each user has a unique UserID (Primary Key) and attributes such as Name, Phone, Email, RegistrationDate, and Address. The "User" entity generates zero or more "Generated Link" entities.
- Generated Link: Represents the pre-filled links generated by users. Each generated link has a unique LinkID (Primary Key) and attributes including Platform, RecipientDetails, Message, GenerationDate, and ExpiryDate. Each generated link can be shared multiple times, forming a relationship with the "Shared Link" entity.
- Shared Link: Represents instances when a generated link is shared. Each shared link has a unique ShareID (Primary Key) and attributes like ClickCount and LastClickedDate.

4.4 Activity diagram

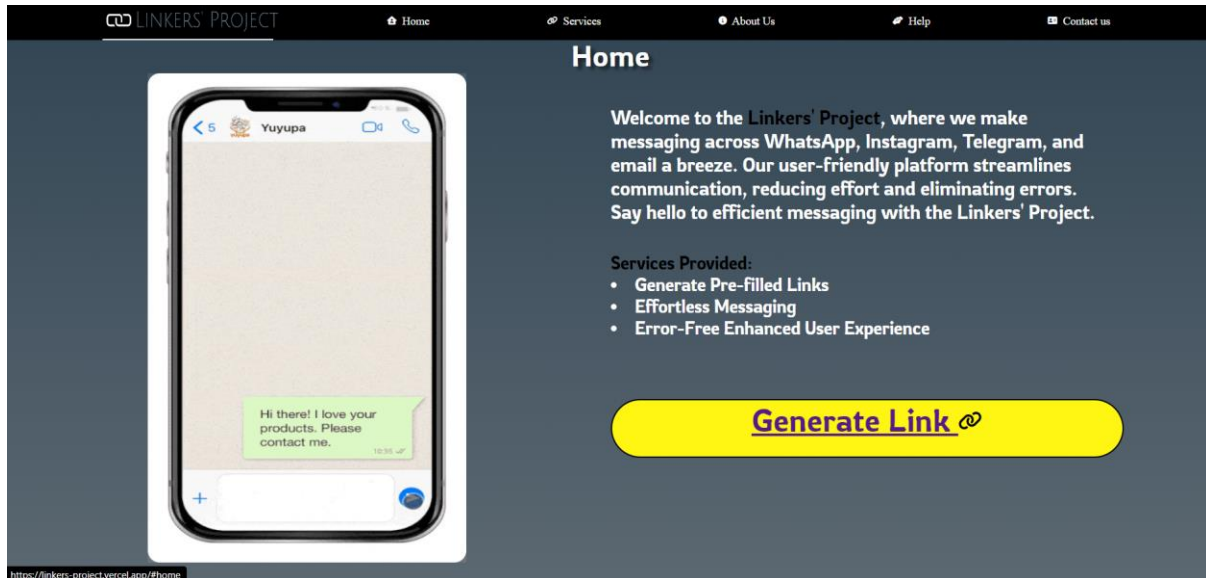


- Input Data: The process starts with the user inputting data into the system, which could be any required information for generating a prefilled link.
- Valid Input?: After receiving the input, the system checks whether the input is valid or not.
- Valid Input (Yes): If the input is valid, the system proceeds to generate a prefilled link based on the input data.
- Generate Prefilled Link: In this step, the system generates a prefilled link using the provided input data.
- Display Prefilled Link: After generating the prefilled link, the system displays it to the user for further action or use.
- Invalid Input (No): If the input is not valid, the system takes an alternative path and displays an error message to the user.

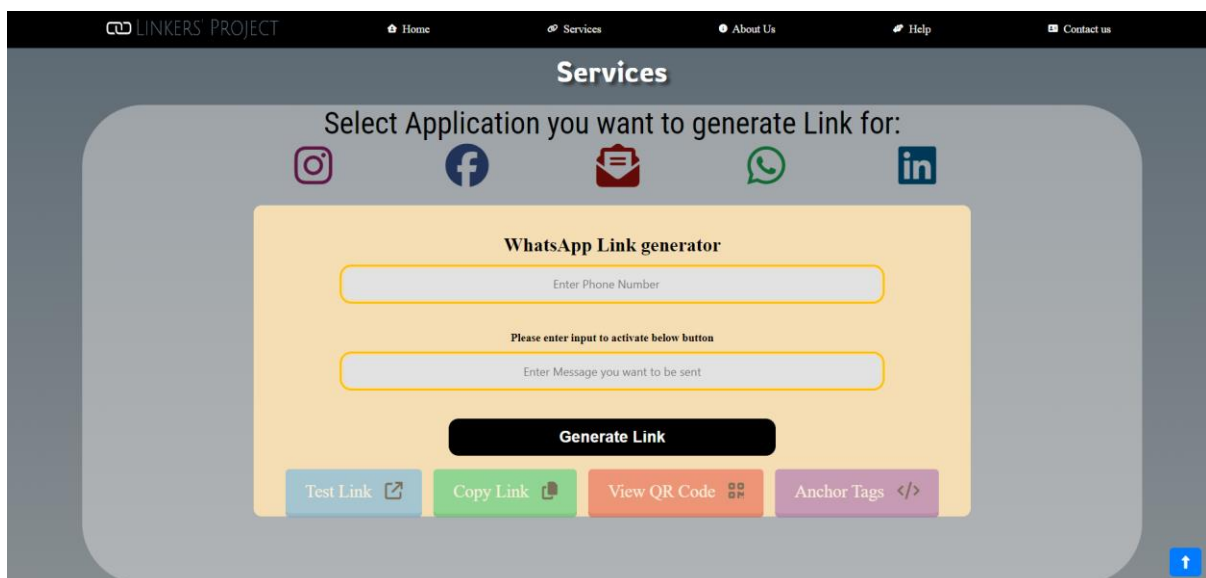
- Display Error Message: In case of invalid input, the system displays an error message indicating that the input provided by the user is not acceptable or needs correction.
- Loop Back: After completing the generation and display of the prefilled link or showing the error message, the system loops back to the initial state to await further input from the user.
- This activity diagram illustrates the flow of actions and decisions involved in the process of inputting data, validating it, generating a prefilled link, and providing feedback to the user based on the validity of the input.

4.5 Project system screens

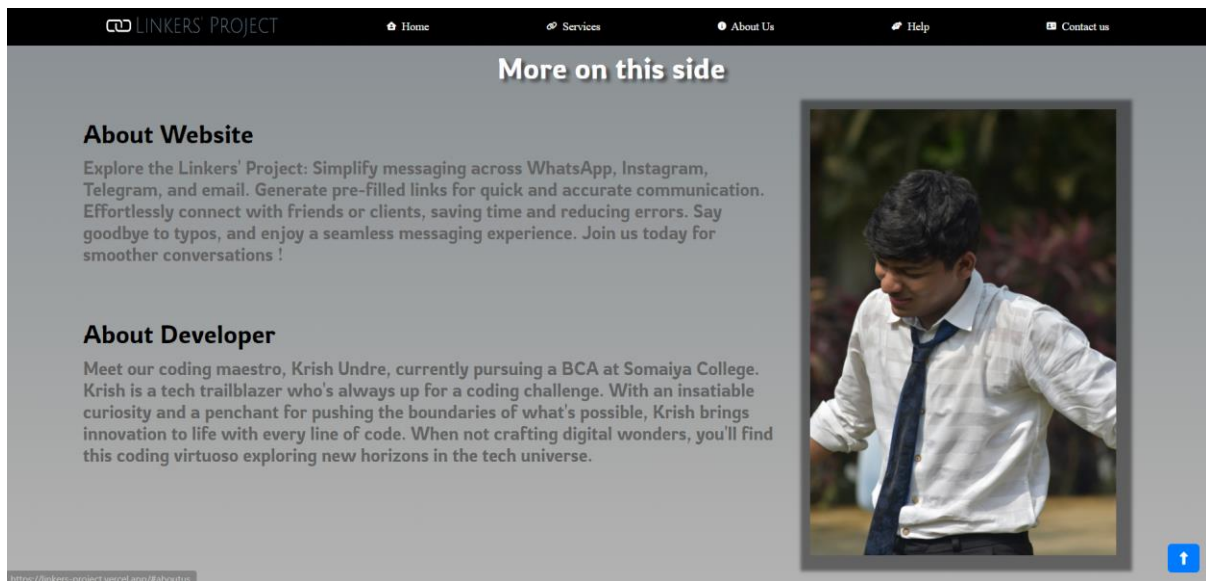
Home Section:



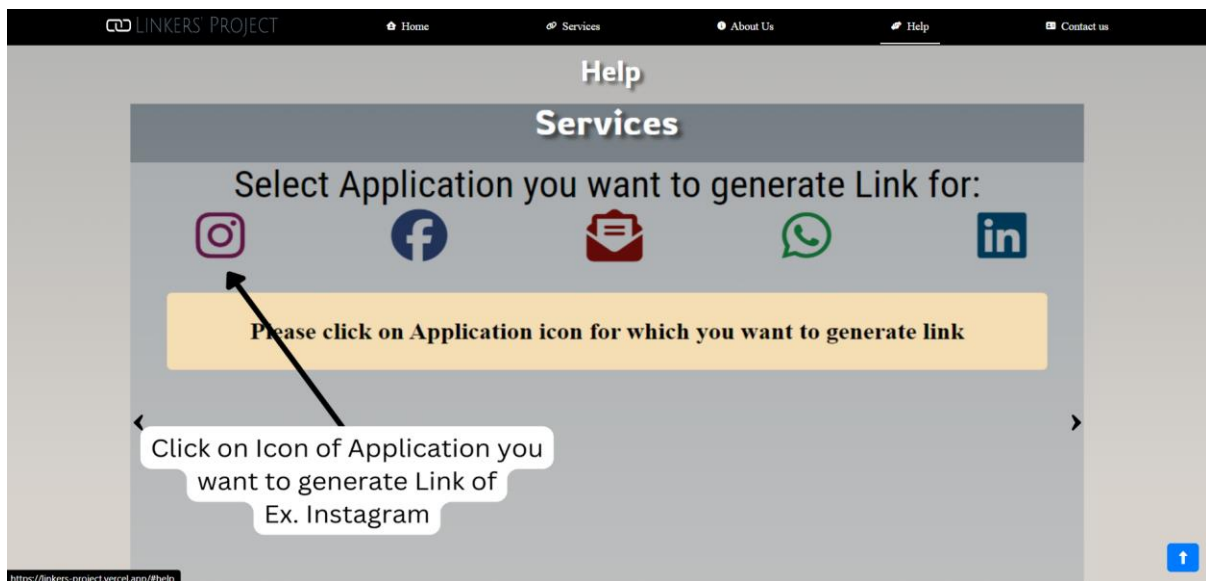
Services Section:



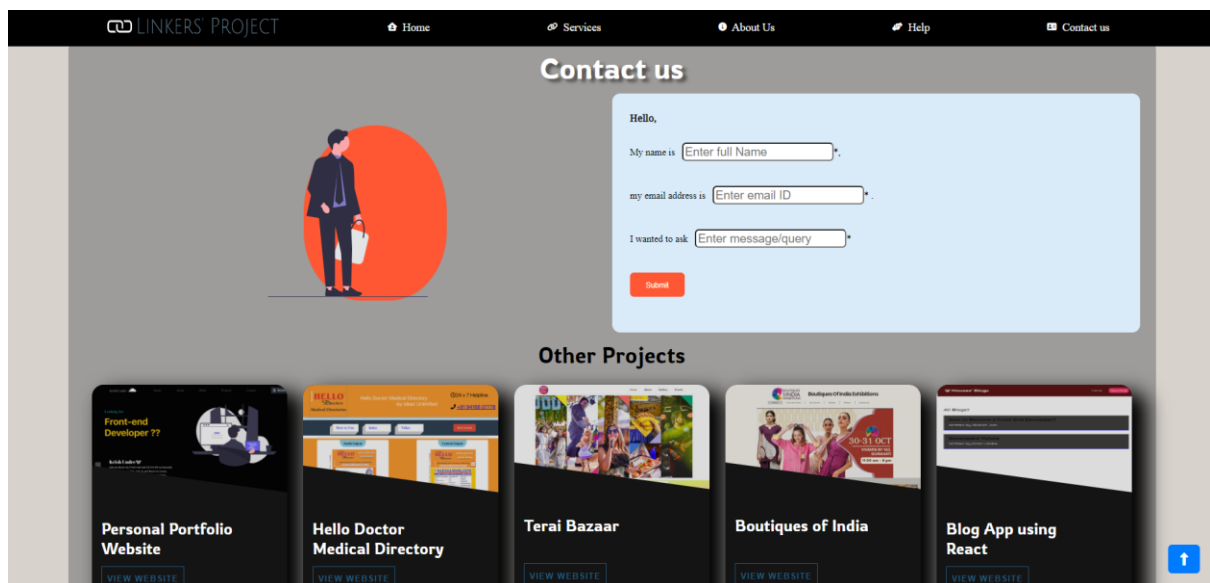
About Us Section:



Help Section:



Contact Section:



Chapter - 5

Implementation & Testing

This chapter discusses the implementation of the Linkers project, including algorithms, flowcharts, and major modules. It also covers testing approaches, test cases, and test results to ensure the quality and reliability of the system.

5.1 Algorithms & Flowchart along with Major Modules of the Project

Code Snippet for Display of Application:

```
<div class="fb_content" id="fbContent" style="display: none;">
  <!-- Title of the section -->
  <h1 id="app_name"> Facebook Link generator</h1>

  <!-- Input field for entering the URL -->
  <input type="text" placeholder="URL of that awesome thing you want to share"
name="text" class="inputFB" oninput="validateInputFB()" />

  <!-- Warning message for input validation -->
  <h3 id="input_warningFB" style="display: block;">Please enter input to activate below
button</h3>

  <!-- Button to generate the link -->
  <button class="btn2" id="generateBtnFB" onclick="generateLinkFB()">Generate
Link</button>

  <!-- Tray for buttons associated with various actions -->
  <div id="button_trayFB">
    <!-- Container for buttons -->
    <div id="buttons_holderFB" class="disabled-buttonsFB">
      <!-- Test Link button -->
      <a class="btn blue" id="testLinkFB" onclick="testLinkFB()" disabled>Test Link
&nbsp; <i class="fa-solid fa-arrow-up-right-from-square" style="color:
#000000;"></i></a>

      <!-- Copy Link button -->
      <a class="btn green" id="copyLinkFB" onclick="copyLinkFB()" disabled>Copy
Link &nbsp; <i class="fa-solid fa-copy" style="color: #000000;"></i></a>

      <!-- View QR Code button -->
      <a class="btn red" id="generateQRCodeFB" disabled
onclick="generateQRCode()">View QR Code &nbsp; <i class="fa-solid fa-qrcode"
style="color: #000000;"></i></a>
```



```
<!-- Anchor Tags button -->
<a class="btn purple" id="anchorTagsFB" disabled
onclick="anchorcode()">Anchor Tags &nbsp; <i class="fa-solid fa-code" style="color:
#000000;"></i></a>
</div>
</div>
</div>
```

Explanation of Code Snippet:

This code snippet represents a section of HTML code for a Facebook link generator feature in a web application. Let's break down the elements and their functionality:

- ❖ `<div class="fb_content" id="fbContent" style="display: none;">`: This div contains the entire Facebook link generator section. It has a class of "fb_content" and an ID of "fbContent", with its initial display set to none, indicating that it's hidden by default.
- ❖ `<h1 id="app_name"> Facebook Link generator</h1>`: This heading element displays the title of the section, indicating that it's a Facebook link generator.
- ❖ `<input type="text" placeholder="URL of that awesome thing you want to share" name="text" class="inputFB" oninput="validateInputFB()" />`: This input field allows users to enter the URL of the content they want to share on Facebook. It has a placeholder text for guidance and is associated with a class "inputFB" and an oninput event that triggers the validateInputFB() function when the user inputs text.
- ❖ `<h3 id="input_warningFB" style="display: block;">Please enter input to activate below button</h3>`: This heading element serves as a warning message that prompts users to input something before activating the button below. Initially, it's displayed as a block-level element.

- ❖ `<button class="btn2" id="generateBtnFB" onclick="generateLinkFB()">Generate Link </button>`: This button, labeled "Generate Link," triggers the `generateLinkFB()` function when clicked. It has a class "btn2" and an ID "generateBtnFB".

- ❖ `<div id="button_trayFB">`: This div contains a tray for buttons associated with various actions related to the Facebook link generator.

- ❖ `<div id="buttons_holderFB" class="disabled-buttonsFB">`: This div holds the buttons for different actions such as testing the link, copying the link, generating QR code, and adding anchor tags. Initially, all buttons are disabled as indicated by the "disabled" attribute.

- ❖ `Test Link <i class="fa-solid fa-arrow-up-right-from-square" style="color: #000000;"></i>`: This anchor element represents the "Test Link" button. It triggers the `testLinkFB()` function when clicked, but it's initially disabled.

- ❖ `Copy Link <i class="fa-solid fa-copy" style="color: #000000;"></i>`: Similar to the "Test Link" button, this anchor element represents the "Copy Link" button. It triggers the `copyLinkFB()` function when clicked, but it's also initially disabled.

- ❖ `View QR Code <i class="fa-solid fa-qrcode" style="color: #000000;"></i>`: This anchor element represents the "View QR Code" button, which triggers the `generateQRCode()` function when clicked. It's initially disabled.

- ❖ `Anchor Tags <i class="fa-solid fa-code" style="color: #000000;"></i>`: This anchor element represents the "Anchor Tags" button, which triggers the `anchorcode()` function when clicked. It's initially disabled.

Code Snippet for Working of Application's Service:

```
function generateLinkIG() {  
    // Get the user input from the input field  
    var inputElement = document.querySelector(".input");  
    var userInput = inputElement.value.trim(); // Get user input  
  
    // Construct the full Instagram profile link with proper encoding  
    var generatedLink = "https://www.instagram.com/" + encodeURIComponent(userInput);  
  
    // Set the generated link as the value of the input field  
    inputElement.value = generatedLink;  
  
    // Enable buttons in the button_tray  
    var buttonTray = document.getElementById("buttons_holder");  
    buttonTray.classList.remove("disabled-buttons");  
  
    // Enable the copy link button  
    var copyLink = document.getElementById("copyLink");  
    copyLink.disabled = false;  
  
    // Log messages for debugging  
    console.log("Link generated!");  
    console.log("Buttons are open now");  
}
```

Explanation of Code Snippet:

This JavaScript function `generateLinkIG()` is responsible for generating an Instagram profile link based on user input. Here's a breakdown of what the code does:

1. It retrieves the user input from an input field with the class `.input`.
2. It constructs the full Instagram profile link by appending the user input to the base URL (`https://www.instagram.com/`) and encoding it properly using `encodeURIComponent()` to handle special characters.
3. It sets the generated link as the value of the input field, effectively displaying it to the user.
4. It removes the `disabled` attribute from the buttons in the `button_tray` element, enabling them for interaction.
5. It restores the scroll position to where it was before the link was generated.
6. It enables the copy link button by removing the `disabled` attribute from the button with the id `copyLink`.
7. It logs messages to the console for debugging purposes, indicating that the link has been generated and buttons are now open for interaction.

Overall, this function handles the generation of an Instagram profile link based on user input and enables associated buttons for further actions.

5.2 Testing Approach

- **Test Case:** User Registration
 - **Test Case ID:** TC-001
 - **Test Objective:** To verify that a user can successfully register on the "Linkers" website.
 - **Preconditions:**
 - The "Linkers" website is accessible.
 - The user has not registered previously.
 - **Expected Result:**

The user should be able to register successfully and should be redirected to the login page.
 - **Test Result:**
 - Actual Outcome: The user registration was successful.
 - Pass/Fail: Pass
 - Issues/Bugs: No issues encountered.
-
- **Test Case:** Invalid Login Credentials
 - **Test Case ID:** TC-002
 - **Test Objective:** To verify that the system does not allow login with invalid credentials.
 - **Preconditions:**
 - The "Linkers" website is accessible.
 - The user has a registered account.
 - **Expected Result:**

The system should display an error message indicating that the login credentials are invalid, and the user should not be logged in.
 - **Test Result:**
 - Actual Outcome: The system displayed an error message: "Invalid email or password."
 - Pass/Fail: Pass
 - Issues/Bugs: No issues encountered.

- **Test Case:** Generate QR Code
- **Test Case ID:** TC-003
- **Test Objective:** To verify that a user can generate a QR code for a given link on the "Linkers" website.
- **Preconditions:**
 - The user is logged in to the "Linkers" website.
 - The user has a link to generate a QR code for.
- **Expected Result:**
The system should display the generated QR code for the provided link.
- **Test Result:**
 - Actual Outcome: The system displayed the generated QR code for the provided link.
 - Pass/Fail: Pass
 - Issues/Bugs: No issues encountered.

- **Test Case:** Generate Link with Incomplete Details
- **Test Case ID:** TC-004
- **Test Objective:** To verify that the system displays an error message when a user tries to generate a link without filling in all the required details.
- **Preconditions:**
 - The user is logged in to the "Linkers" website.
 - The user navigates to the link generation page.
- **Expected Result:**
The system should display an error message indicating that all required details must be filled in to generate the link.
- **Test Result:**
 - Actual Outcome: The system displayed an error message: "Please fill in all required details."
 - Pass/Fail: Pass
 - Issues/Bugs: No issues encountered.

- **Test Case:** Copy Generated Link
- **Test Case ID:** TC-005
- **Test Objective:** To verify that the system successfully copies the generated link to the user's clipboard when they click on the "Copy Link" button.
- **Preconditions:**
 - The user is logged in to the "Linkers" website.
 - The user has generated a link on the website.
- **Expected Result:** The system should copy the generated link to the user's clipboard without any errors.
- **Test Result:**
 - Actual Outcome: After clicking on the "Copy Link" button, the system successfully copied the generated link to the user's clipboard.
 - Pass/Fail: Pass
 - Issues/Bugs: No issues encountered.

5.3 Test Case and Test Result

Test Case ID	Test Case	Expected Result	Test Outcome	Test Pass (Y/N)
TC-001	User attempts to generate a link without filling in the required details.	System should display an error message indicating that all required details must be filled in.	Error message is displayed prompting user to fill in all required details.	Y
TC-002	User fills in all required details and successfully generates a link.	System should generate a link based on the user's input data.	Link is successfully generated and displayed to the user.	Y
TC-003	User clicks on the "Copy Link" button after generating a link.	System should copy the generated link to the user's clipboard.	Generated link is copied to the user's clipboard without any errors.	Y
TC-004	User attempts to generate a QR code without generating a link first.	System should display an error message indicating that a link must be generated first.	Error message is displayed prompting user to generate a link first.	Y
TC-005	User clicks on the "View QR Code" button after generating a link.	System should display the QR code corresponding to the generated link.	QR code is displayed to the user showing the generated link.	Y

Chapter - 6

Result & Discussion

This chapter presents the outcomes of the Linkers project and provides a platform for discussion on its implications, limitations, and future directions. It reflects on the achievements and challenges encountered during the project lifecycle.

6.1 Summary of Test Reports

Here's a summary of the test cases conducted for the Linkers project:

1. **Test Case 1 (TC-001):** Validates the system's response when the user attempts to generate a link without filling in the required details. The test outcome confirms that the system appropriately prompts the user to fill in all necessary information.
2. **Test Case 2 (TC-002):** Ensures that the system successfully generates a link when the user fills in all required details. The test outcome confirms that the link is generated and displayed correctly to the user.
3. **Test Case 3 (TC-003):** Verifies the system's functionality to copy the generated link to the user's clipboard when the "Copy Link" button is clicked. The test outcome confirms that the link is copied to the clipboard without any issues.
4. **Test Case 4 (TC-004):** Tests the system's response when the user attempts to generate a QR code without generating a link first. The test outcome confirms that the system appropriately prompts the user to generate a link before proceeding.
5. **Test Case 5 (TC-005):** Validates the system's capability to display the QR code corresponding to the generated link when the "View QR Code" button is clicked. The test outcome confirms that the QR code is displayed correctly to the user, reflecting the generated link.

These test cases cover various scenarios and functionalities of the Linkers project, ensuring that the system behaves as expected and meets the specified requirements.

6.2 Discussion

Here's a discussion of the tests conducted for the Linkers project:

1. Test Case 1 (TC-001):

Test Objective: This test verifies the system's response when the user attempts to generate a link without providing all the required details.

Discussion: By intentionally leaving out essential information and trying to generate a link, the system appropriately prompts the user to fill in all necessary details before proceeding. This ensures that users are guided to provide the required inputs and prevents incomplete or erroneous link generation.

2. Test Case 2 (TC-002):

Test Objective: This test ensures that the system successfully generates a link when all required details are provided by the user.

Discussion: By inputting all necessary information and initiating the link generation process, the system generates and displays the link accurately. This test confirms that the system functions as intended and provides the expected output when users complete the required steps.

3. Test Case 3 (TC-003):

Test Objective: This test verifies the system's ability to copy the generated link to the user's clipboard upon request.

Discussion: When users click the "Copy Link" button, the system copies the generated link to their clipboard, allowing for easy sharing or pasting into other applications. This functionality enhances user experience and facilitates seamless interaction with the generated content.

4. Test Case 4 (TC-004):

Test Objective: This test examines the system's response when the user tries to generate a QR code without generating a link first.

Discussion: By attempting to view the QR code without generating a link, the system prompts the user to generate a link first, preventing any attempt to create a QR code without a valid link. This validation ensures that users follow the correct sequence of actions and prevents errors or inconsistencies in the system.

5. Test Case 5 (TC-005):

Test Objective: This test validates the system's capability to display the QR code corresponding to the generated link.

Discussion: When users request to view the QR code, the system displays the QR code accurately, representing the generated link. This feature enables users to access the link conveniently using QR code scanning applications, enhancing accessibility and usability.

Overall, these tests cover critical functionalities of the Linkers project, ensuring that the system operates smoothly, provides the expected outputs, and offers a satisfactory user experience.

Chapter – 7

Conclusion

This chapter concludes the Linkers project documentation, summarizing its key findings and highlighting opportunities for future enhancements and extensions. It offers insights into the project's impact and potential avenues for further research and development.

Conclusion of the Project

1. Summary of Project:

The project aimed to streamline the process of generating links, QR codes, and anchor codes for various social media platforms. By integrating frontend technologies like HTML, CSS, and JavaScript with MySQL as the backend database, the website provided users with a user-friendly interface to perform these tasks efficiently.

2. Achievements:

Significant milestones were achieved throughout the project, including the successful implementation of dynamic features like link generation and QR code creation. The project also demonstrated effective collaboration among team members and adherence to project timelines.

3. Technological Impact:

The project showcased the innovative use of frontend and backend technologies to address user needs effectively. By leveraging modern web development tools and techniques, the project demonstrated the potential for technology to enhance user experiences and simplify complex tasks.

4. User Benefits:

Users benefited from the project by gaining access to a comprehensive platform for generating links, QR codes, and anchor codes seamlessly. The website's intuitive interface and robust

functionality empowered users to create and share content effortlessly across various social media platforms.

5. Future Scope:

Potential future enhancements include the integration of additional social media platforms, improved user authentication mechanisms, and enhanced customization options for generated content. These enhancements would further enrich the user experience and expand the project's capabilities.

6. Acknowledgments:

We extend our gratitude to all team members, stakeholders, and mentors who contributed to the success of the project. Their dedication and support were invaluable in achieving our goals and delivering a high-quality product.

7. Conclusion Statement:

In conclusion, the project has made significant strides in simplifying link generation and enhancing user engagement on social media platforms. By leveraging cutting-edge technologies and fostering collaboration, the project has paved the way for future innovation and development in this space.

Future Scope of the Project

The project holds significant potential for expansion and enhancement in several key areas:

1. Feature Enrichment:

Continuously enriching the project with new features and functionalities can enhance its value proposition and attract a broader user base. Features such as advanced link customization options, integration with additional social media platforms, and real-time analytics can further differentiate the project from competitors.

2. Mobile Optimization:

Optimizing the project for mobile devices and developing dedicated mobile applications can extend its reach to users who primarily access the internet via smartphones and tablets. Mobile optimization can improve user experience, accessibility, and engagement, thereby increasing user retention and satisfaction.

3. Personalization and Customization:

Introducing personalized user experiences and customization options can enhance user satisfaction and loyalty. Implementing features such as user preferences, saved templates, and personalized recommendations based on user behavior and preferences can create a more tailored and engaging user experience.

4. Monetization Strategies:

Exploring diverse monetization strategies, such as premium subscriptions, advertising, affiliate marketing, and sponsored content, can generate additional revenue streams for the project. Developing strategic partnerships with brands, influencers, and advertisers can unlock new revenue opportunities while providing value to users.

5. Internationalization and Localization:

Expanding the project's reach to international markets by supporting multiple languages, currencies, and cultural preferences can facilitate global adoption and growth. Localization efforts, including translation, cultural adaptation, and region-specific features, can cater to diverse user demographics and preferences worldwide.

6. Continuous Improvement and Optimization:

Embracing a culture of continuous improvement and optimization through regular updates, bug fixes, and performance enhancements is essential for maintaining competitiveness and relevance in the dynamic digital landscape. Conducting regular usability testing, performance monitoring, and user feedback analysis can inform iterative improvements and ensure that the project evolves in line with user expectations and market trends.

By capitalizing on these future opportunities and embracing innovation and adaptability, the project can position itself for sustained growth, differentiation, and success in the ever-evolving digital ecosystem.

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Annexure

Annexure A: Glossary of Terms

HTML (Hypertext Markup Language): A standard markup language used to create and design web pages.

CSS (Cascading Style Sheets): A style sheet language used for describing the presentation of a document written in HTML.

JavaScript: A programming language that enables interactive web pages and is essential for web development.

MySQL: An open-source relational database management system used for storing and managing data.

Annexure B: Sample Test Cases

Test Case ID: TC001

Test Case: User inputs valid data and clicks on the "Generate Link" button.

Expected Result: The link is generated successfully, and the associated buttons are enabled.

Test Outcome: Pass

Test Pass: Y

Test Case ID: TC002

Test Case: User inputs no data and clicks on the "Generate Link" button.

Expected Result: A warning message is displayed prompting the user to enter input.

Test Outcome: Pass

Test Pass: Y

Annexure C: Class Diagram

Annexure D: Activity Diagram