SHRINATH JI INSTITUTE FOR TECHNICAL EDUCATION, MEERUT

(SESSION - 2020-2021)

PROJECT REPORT

Your Store

Online Shopping Application Project

(Using Flutter and Firebase)

—

Submitted in partial fulfillment of the requirements for the award of the degree

Of

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

By:

Bhaskar Sharma
Roll Number: 1748810003

UNDER THE ABLE AND EFFICIENT GUIDANCE OF
Mr. Sandeep Bharti

Candidate's Declaration

It is certified that the work which is being presented in the Bachelors of Technology Major Report entitled "**YOUR STORE** - Online Shopping Application'' in partial fulfillment of the requirements for the award of the degree of **BACHELOR OF TECHNOLOGY** and submitted in the **Department of Computer Science and Engineering** of **Shrinathji Institute For Technical Education, Meerut (Affiliated to Dr. A. P. J. Abdul Kalam Technical University)** is an authentic record of my work carried out during the period of my final semester term under the guidance of Mr. Sandeep Bharti.

This is to certify that the above statement made by the candidate is correct to the best of my knowledge. He is permitted to appear in the External Major Project Examination.

The Bachelors of Technology Major Project Viva - Voce Examination of **Bhaskar Sharma (1748810003)** has been held on :

Signature of External Examiner:

Acknowledgment

In the present world of competition, there is a race of existence in which those who have the will to come forward succeed. A project is like a bridge between theoretical and practical working. With this willingness, I joined this particular project. First of all, I would Like to thank the supreme power of the Almighty God who is the one who has always guided me to work on the right path in life. Without his grace, this project could not have become a reality. Next to him are my parents, whom I am greatly indebted to. I was brought up to this stage with love and encouragement. I am feeling obliged to take the opportunity to sincerely thank Dr. R. K. Saxena (Director of Shrinathji Institute of Technical Education), Mr. Ratnesh Yadav (Head of Department of Computer Science and Engineering), and special thanks to my worthy teacher of Computer Science and Engineering Mr. Sandeep Bharti. Moreover, I am highly obliged in taking the opportunity to sincerely thank all the staff members of the Computer Science and Engineering department for their generous attitude and friendly behavior. Last but not least I am thankful to all my teachers and friends who have been always helping and encouraging me throughout the year. I have no valuable words to express my thanks, but my heart is still full of the favors received from every person.

Contents

1. Introduction

Mobile phones play an important role in our daily life. Anything we want we can get only with one mouse click. The speed, reliability, and accuracy of the mobile make it a powerful tool for different purposes. A very important and basic need of today's modern business world is the quick availability and processing of information using mobiles. One can easily get the type of required information within a fraction of a second. The project that I have taken is also in this category; which is used in our daily life whenever we want to purchase some items, we can easily get them at our home.

2. Objective

The objective of the project on Online Shopping Application is to develop a GUI-based, automated system, which will cover all the information Related to all products which are used in our daily life. For example – Mobiles, Phones, Laptops, Clothes, Books, Electronic Items, and many more. For now, I have only uploaded some shoes in the application but the application can be further modified and more products can be uploaded. So by this GUI-based automated system a user wants to purchase something then it is only a click away to purchase these products.

3. Need of Online Shopping Application

The "**YOUR STORE - Online Shopping Application**" is developed according to the current needs in different fields. This is an online shopping mobile application that provides a facility for purchasing Mobiles, Laptops, Cameras, and many more items. So by using this Online Shopping Portal users who want to purchase some products will first Register/Create an account on this portal and then log in through their Username and Password, and then Select items which they want to purchase and add them to the cart, and finally checkout by giving payment details. So by using this portal users can easily purchase products from their homes.

There was a need for this application because COVID-19 has hit hard in all parts of the world. Especially in India, the conditions have become worse lately and this has affected the smaller market of people who used to earn for their daily living. This application will help them to sell their products online and earn and live happily in these risky circumstances too.

This application was also designed keeping in mind those people who are not able to go shopping due to their busy schedules in the office or even at work from home. They will get easy access to the products from their local and favorite stores in just one click.

4. Profile of the Problem

One must know what the problem is before it can be solved. The basis for online shopping applications is to buy products online and save the timing. The customers, who want to buy any product of their need, have to contact different Shoppers, before deciding upon a particular product that best suits his needs, requirements, and satisfaction. Moreover, most of the work involved in this development process has to be done manually which is very time-consuming and cumbersome, and also reduces efficiency, accuracy. To know the facts and understanding of the problem in detail, ***System Analysis*** is carried out. It is the process of studying the business processes and procedures, generally referred to as business systems, to see how they can operate and whether improvement is needed.

5. Structure of the Project

- Before Login
  - Login
  - Register/Create a new ID
  - Forget Password
  - Administrator Login

- After Administrator Login
  - After User Login
  - Surf the Products
  - Search Page
  - Saved Page
  - Choose the right product for you
  - Add to cart
  - Settle Payment
  - My Cart
  - My Shoppings
  - Checkout
  - Logout

6. Software Development Life Cycle

The software development life cycle, as outlined by Edward Yourdon in his book Modern Structured Analysis (1989), has been followed in this project with minor modifications. The modified life cycle is shown overleaf:-

The activities in the life cycle are explained in brief below:

1) SURVEY PROJECT SCOPE AND FEASIBILITY

This activity is also known as the feasibility study. It begins with a request from the user for a new system. It involves the following:

- Identify the responsible user for a new system
- Clarify the user request
- Identify deficiencies in the current system
- Establish goals and objectives for the new system
- Determine the feasibility for the new system
- Prepare a project charter that will be used to guide the remainder of the Project

2) SYSTEMS ANALYSIS

The objective of the system analysis activity is to develop structured system specification for the proposed system. The structured system specification should describe what the proposed system would do; independent of the technology, which will be used to implement these requirements. The structured system specification will be called the essential model (also known as logical model).

The essential model may itself consist of multiple models, modeling different aspects of the system. The data flow diagrams may model the data and their relationships and the state transition diagram may model time-dependent behavior of the system. The essential model thus consists of the following:

- Context diagram
- Leveled dataflow diagrams
- Process specification for elementary bubbles
- Data dictionary for the flow and stores on the DFDs.

3) PRELIMINARY DESIGN

The activity deals with certain design issues, which are to be finalized in consultation with the user. The two most important design issues of relevance to the user are the automation boundary and the human-machine interface. The output of the activity is the user implementation model. The major part of the user implementation model is the specification for the user interface of the proposed system. The user implementation model is also referred to as the physical model of the proposed system. The user implementation model is also referred to as the physical model of the proposed system. The model, in addition to the essential model, defines the following for the proposed system:

- Automation boundary
- Report layouts
- Layouts of the source documents
- Screen layouts for the data entry forms
- Menu

4) SYSTEM DESIGN

System design involves the transformation of the user implementation model into software design. The design specification of the proposed system consists of the following:

- Database scheme
- Structure charts
- Pseudo codes for the modules in structure charts

5) IMPLEMENTATION

This activity includes programming, testing and integration of modules into a progressively more complete system. Implementation is the process of collecting all the required parts and assembling them into a major product.

6) TEST GENERATION

This activity generates a set of test data, which can be used to test the new system before accepting it. In the test generation phase, all the parts are to be tested to ensure that the

system does not produce any errors. If there are some errors then we remove them and further it goes for acceptance.

7. Problem Analysis

Product definition

Online Shopping Application is an online solution to the various problems faced by the product buyer and seller wishing to outsource their software development work to a provider at an economical cost, thus achieving high performance, accuracy, reliability, and high speed of data retrieval.
In this system, there is a registration process each for the product buyer and seller. The administrator of the site verifies the provider after his registration and if satisfied, assigns him a user name and password.

Our app can be used by anyone who is searching for products whether he/she is the first time visiting our app. Our app also provides some discounted products like you get in any shop.

The software covers the following point while keeping in mind the user's requirement-:

- Fast online access to information about various products.
- Search Products by keywords like functional area, experience, and also by initials of the Product's name.
- The administrator will maintain the database and perform all processes.

There are 2 categories of users-

1. General User
2. Registered Users

Feasibility Analysis

The feasibility study of this project comprises of the following

- **Economic Feasibility**

The cost centers in the system development, as well as operation, are trivial. The major can be network, internet, and the software required for coding. The software used for the development of the proposed system is Flutter and Firebase. In terms of wallet, our product is well within the reach of our pocket.

- **Technical Feasibility**

Technical feasibility centers on the current system and to what extent it can support the proposed system. It includes current computer system specifications such as hardware, software, etc., it also involves financial considerations to accommodate the technical enhancements. If the budget is a serious constraint then the project is judged not feasible.

Though the system is developed in the generalized form, which covers all the procedures and operations carried out in an internet-based solution. The version used in the system is Flutter and Firebase.

Firebase can manage large amounts of data and is simple and secure. Using Flutter helps us to design the look of our application.

- **Operational Feasibility**

In this, we determine what change will be brought into the system, new skills required, and other human organization and political aspects.

Each user can easily use our application. However, the user should have a basic knowledge of the mobiles.

Without making any changes in the rules and regulations of the existing system, the proposed system can easily be adopted.

8. Project Plan

DEFINING A PROBLEM

- Define a problem.
- Justify the need for a computerized solution.
- Identify the functions to be provided by the systems along with the constraints.
- Determine the goals and requirements of the system.
- Establish the high-level acceptance criteria.

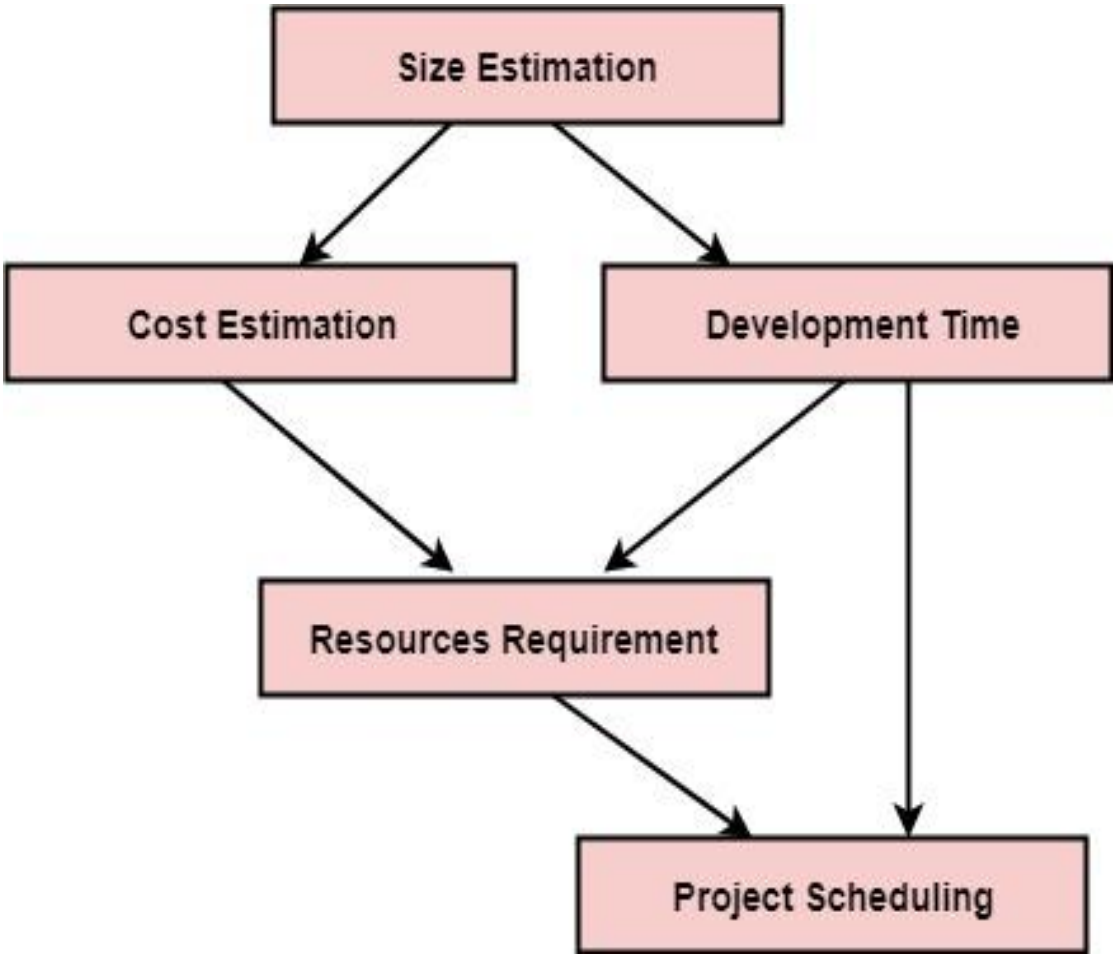
DEVELOPING A SOLUTION STRATEGY

- Outline several solution strategies. Do not consider constraints for the time being.
- Conduct a feasibility strategy, including why the other strategies are rejected.
- Develop a list of priorities for the product characteristics.

PLANNING THE DEVELOPMENT PROCESS

- Define a life cycle model and an organizational structure for the project.
- Plan the configuration management, quality assurance, and validation activities.
- Establish the preliminary cost estimates, the schedule, and the staffing estimates for System development.
- Develop preliminary estimates for the computing resources required to operate and maintain the system.

9. Activities During Software Project Planning



SIZE ESTIMATION

The estimation of size is a very critical and difficult area of project planning. It has been recognized as a crucial step from the very beginning. The difficulties in establishing units for measuring size lie in the fact that the software is essentially abstract; it is difficult to identify the size of the system. Many attempts have been made at establishing a unit for measure size. They are given as:

1. **Lines Of Code**

A line of code is any line of a program that is not a comment or blank line, regardless of the number of statements or fragments of statements on the line. This specifically includes all lines containing the program header, declarations, and executable and non-executable statements.

2. **Function Count**

It measures functionally from the user point of view, i.e., based on what the user requests and receives in return. Therefore it deals with the functionality being delivered, and not with lines of code, source modules, etc. Measuring size in this way has the advantage that size measure is independent of the technology used to deliver the functions.

COST ESTIMATION

For any software project, it is necessary to know how much it will cost to develop and how much development time it will take. These estimates are needed before development is initiated. In many cases, estimates are made using experience as the only guide. Several techniques have been developed and are having the following attributes in common:

- Project scope must be established in advance.
- Software metrics are used as a basis from which estimates are made.
- The project is broken into small pieces which are estimated individually.

10. Hardware and Software Requirements

At Developer Side

During system development, I have to design both static and dynamic application interfaces, create application functions and a database system, edit photos and pictures, so it has a set of software and hardware requirements.

Hardware Requirements	Software Requirements
O.S - windows 10	Android Studios/Vs Code
AMD Ryzen 7 3750H with Radeon Vega Mobile Gfx 2.30 GHz	Flutter(Dart)
RAM - 8.00 GB	Firebase(Database)
1 TB HDD/ 256 GB SSD	AdobeXd/Figma

At System Users Side

The following are the requirements for the system users including members and administrators.

Hardware Requirements	Software Requirements
2 GB Ram(Mobile)	Android version 5.0 or above
Access to Phone Storage	Internet Connection

11. Frontend Details

The Front End tool is used to give a Graphical user interface to the system. By this, we can make a system user-friendly and more capable. I have chosen Flutter as the front-end tool because it is an Open Source Technology, freely available and more familiar with any type of database.

About Flutter

Flutter is a cross-platform UI toolkit that is designed to allow code reuse across operating systems such as iOS and Android, while also allowing applications to interface directly with underlying platform services. The goal is to enable developers to deliver high-performance apps that feel natural on different platforms, embracing differences where they exist while sharing as much code as possible.

During development, Flutter apps run in a VM that offers a stateful hot reload of changes without needing a full recompile. For release, Flutter apps are compiled directly to machine code, whether Intel x64 or ARM instructions or to JavaScript if targeting the web. The framework is open-source, with a permissive BSD license, and has a thriving ecosystem of third-party packages that supplement the core library functionality.

This overview is divided into several sections:

1. The layer model: The pieces from which Flutter is constructed.
2. Reactive user interfaces: A core concept for Flutter user interface development.
3. An introduction to widgets: The fundamental building blocks of Flutter user interfaces.
4. The rendering process: How Flutter turns UI code into pixels.
5. An overview of the platform embedders: The code that lets mobile and desktop OSes execute Flutter apps.
6. Integrating Flutter with other code: Information about different techniques available to Flutter apps.
7. Support for the web: Concluding remarks about the characteristics of Flutter in a browser environment.

Why Flutter?

When it comes to choosing the best cross-platform mobile app development frameworks, many app owners and developers are wondering why we have chosen Flutter over various mobile frameworks like React Native, Angular Js, or Xamarin.

Some features are:

1. Flutter Surpasses the Traditional Limitations of Cross-Platform Approaches
2. Faster App Development With Hot Reloading
3. Fast Code Writing and App Testing
4. Easy To Understand Development Language
5. Multiple IDE Support

12. Backend Details

The back-end part of a system is more important because it controls all the internal processes of a system. I have chosen the Oracle database as the back end because it is the world's Most Capable relational database and provides more security than others.

About Firebase

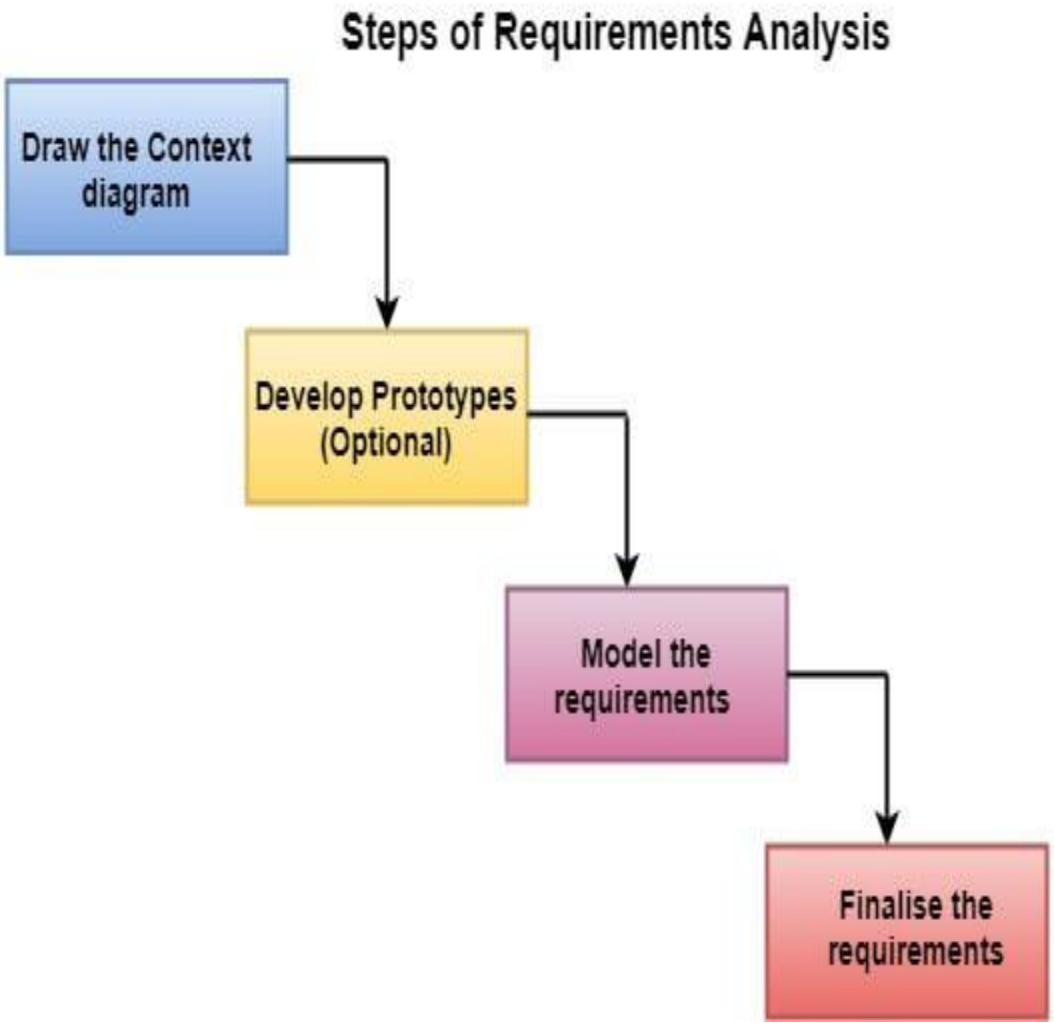
Firebase is a toolset to “build, improve, and grow your app”, and the tools it gives you cover a large portion of the services that developers would normally have to build themselves, but don’t want to build, because they’d rather be focusing on the app experience itself. This includes things like analytics, authentication, databases, configuration, file storage, push messaging, and the list goes on. The services are hosted in the cloud and scale with little to no effort on the part of the developer.

Why Firebase?

Some features are:

1. Create Application without a backend server
2. No need for extra money spent on the backend server
3. Sync real-time data in the application
4. Quick display data in the application
5. No SQL database so it is faster
6. Faster than any backend web services
7. You can provide any social networking login with very few lines of code
8. Push notification
9. Analytics
10. Crash reports
11. Cloud storage
12. Test Lab

13. Requirement Analysis Steps



Draw Context Diagrams

The context diagram is a simple model that defines the boundaries and interfaces of the proposed system with the external world. It identifies the entities outside the proposed system that interact with the system.

Development Of Prototype

One effective way to find out what the customer wants is to construct a prototype, something that looks and preferably acts as a part of the system they want.

Model The Requirement

This process consists of various graphical representations of functions, data entities, external entities, and the relationship between them. The graphical view may help to find incorrect, inconsistent, missing, and superfluous requirements.

Finalize The Requirements

After modeling the requirements we will have a better understanding of the system behavior. The inconsistencies and ambiguities have been identified and corrected.

14. Functional Requirements

Functional requirements define the fundamental actions that must take place in the software in accepting the inputs and in processing and generating the outputs. These are listed as “shall” statements starting with “The system shall….”

Login Module – This module is provided for administrators and users such as product buyers and sellers who have registered themselves in the system. These logins are provided according to the needs of the systems.

- **Input –** User id and password
- **Process** – After entering the user id and password by the user, a process of validation occurs to identify whether the user id and password are available in the database or not.
- **Output** – Registered users can access the website and can use the services.

Administrator Module – The administrator is provided with a password and login-id with which he/she can access the system. The administrator is provided with the right of maintaining the database, verifies registered users.

- **Input** – Login id and password.
- **Process** – Process of validation will occur.
- **Output** – The administrator will maintain the database and will perform the Product seller process.

Search Module – In this module, we are going to provide a facility for Product buyers to search for Products according to their specified categories so that users can search for Products easily.

- **Input-** Initial letter of Product, with the help of keywords and with the help of Brand name.
- **Output-** Information about Products.

User Module – As users are the main visitor of the site, the following facilities are available through this module.
Can search the Products according to their need
Can order online books and pay via credit or atm card or PayPal.
Can get information about Products.

- **Input** – User Id and password
- **Process** – Process of validation will occur.
- **Output** – Only genuine users can access services provided by the website.

15. Non-Functional Requirements

Performance Requirement

The performance of the product mainly depends on the speed of the Internet connection. If the user wants a hard real-time response, then this is not the product to go for.

Safety Requirements

The electrical connection to the devices is critical and should be done according to the standards to avoid any short circuits.

Security Requirements

We aim to provide high-security features like encryption to the user accounts to provide security from illegal hacking and gaining access to the system.

16. System Design

The most creative and challenging phase of the System Development Life Cycle (SDLC) is Software Design. SDS is a systematic documentation of design. A design process involves "conceiving and planning out in the mind" and "making a drawing pattern or sketch". The term "design" describes a final system and the process by which it is developed. It assists in catching potential errors before the implementation phase itself which had been very costly to remove otherwise.

System Design is a solution to how to translate the system requirement into a blueprint for constructing the software. The goal of SDS is not only to produce a correct design but the best possible one within the limitations imposed by the requirements and the physical and social environment in which the system will operate.

The system architecture description found in this document provides the reader a clear sense of how the system will be organized, how the components will interact, and how the users will interface with the running software.

17. Design Notations

The DFD is also known as the Bubble Chart is a simple graphical formalism that can be used to represent a system in terms of the input data to the system. Various processing is carried out on these data, and the output data generated by the system. The main reason why the

DFD technique is so popular is probably that DFD is a very simple formalism - it is simple to understand and use. A DFD uses a very limited number of primitive symbols to represent the functions performed by a system and the data flow among these functions. Starting with a set of high-level functions that a system performs, a DFD model hierarchically represents various sub-functions.

Two common systems of symbols are named after their creators:

- Yourdon and Coad
- Yourdon and DeMarco
- Gane and Sarson

One main difference in their symbols is that Yourdon-Coad and Yourdon-DeMarco use circles for processes, while Gane and Sarson use rectangles with rounded corners, sometimes called lozenges. There are other symbol variations in use as well, so the important thing to keep in mind is to be clear and consistent in the shapes and notations you use to communicate and collaborate with others.

Using any convention's DFD rules or guidelines, the symbols depict the four components of data flow diagrams.

External entity

It's an outside system that sends or receives data, communicating with the system being diagrammed. They are the sources and destinations of information entering or leaving the system. They might be an outside organization or person, a computer system, or a business system. They are also known as terminators, sources, and sinks or actors. They are typically drawn on the edges of the diagram.

Process

It is any process that changes the data, producing an output. It might perform computations, or sort data based on logic, or direct the data flow based on business rules. A short label is used to describe the process, such as "Submit payment."

Datastore

Datastore files or repositories that hold information for later use, such as a database table or a membership form. Each data store receives a simple label, such as “Orders.”

Data flow

Data flow is the route that data takes between the external entities, processes, and data stores. It portrays the interface between the other components and is shown with arrows, typically labeled with a short data-name, like “Billing details.”

18. Product Function

The complete product is comprised of various functions-

Function available to the general user-

- Users can access information about various Products and Brands.
- Users can become a member of the application by registering themselves.
- Users can buy a Product online.

The registered user has some other function like-

- Log–in page to log into the application.
- Saved page to watch the products the user has saved.
- Search page to find a product fast and with ease.

Function available to Administrator

- The administrator will add or delete the products in the database.
- The administrator also provides the discount on the products.
- It enables or disables the user after filling the user registration form.

USER CHARACTERISTICS

This subsection of SRS should describe the characteristics of the eventual user of the product that will affect the specific requirement. Our website will be intended not only for authorized users but also for general users.

ADMINISTRATOR

- Administrators should know how to access the internet and must have good knowledge of English.
- He must be aware of how to respond to feedback and queries fired by the user.

GENERAL USER

- We assume that the user knows English & the user need not be a computer professional.
- Users should be aware of the internet.
- Users can access information through hyperlinks such as navigation of various pages.

CONSTRAINTS

Only administrators will be able to make entries in the database and can modify it.

19. Detailed Design

1. **Registration Page :**

The registration page will allow users to register themselves with the application. It will help users to create an account in the application. Through the help of that account created they can afterward log in to the account and use the application again.

2. **Login Page :**

The login page will allow the already registered users to log back into their accounts. The login page will fetch data from the database(Firebase) and check whether or not the user is an existing member of the application and after checking will respond accordingly by logging in if they are a member or by generating an error message that you're not an existing member.

3. **Home Page :**

On this application home, log-in the page will be the first page the user will interact with. The home page is a page where he/she can find all the products in the application and can scroll through them all by selecting the one he/she likes.

4. **Search Page :**

The search page is a page that is there in the application to save the time of users. Using this page the user can simply search a product by its name and can save time.

5. **Saved Page :**

The saved page shows all the products saved by the user. It allows users to save time too, again and again, go through all the products just to find that one product. They can simply save it and can buy it afterward.

20. Entity Relationship Diagram

Entity-relationship diagrams are a way to represent the structure and layout of a database. It is used frequently to describe the database schema. ER diagrams are very useful as they provide a good conceptual view of any database, regardless of the underlying hardware and software. An ERD is a model that identifies the concepts or entities that exist in a system and the relationships between those entities. An ERD is often used as a way to visualize a

relational database: each entity represents a database table, and the relationship lines represent the keys in one table that point to specific records in related tables.

ERDs may also be more abstract, not necessarily capturing every table needed within a database, but serving to diagram the major concepts and relationships. This ERD is of the latter type, intended to present an abstract, theoretical view of the major entities and relationships needed for the management of electronic resources. It may assist the database design process for an e-resource management system, but does not identify every table that would be necessary for an electronic resource management database.

OBJECTS

There are three main objects on an ER Diagram:

1. Entities
2. Relations
3. Attributes.

- **Entities**

  An entity is a concept or object in the database. Entities are concepts within the data model. Each entity is represented by a box within the ERD. Entities are abstract concepts, each representing one or more instances of the concept in question. An entity might be considered a container that holds all of the instances of a particular thing in a system. Entities are equivalent to database tables in a relational database, with each row of the table representing an instance of that entity.

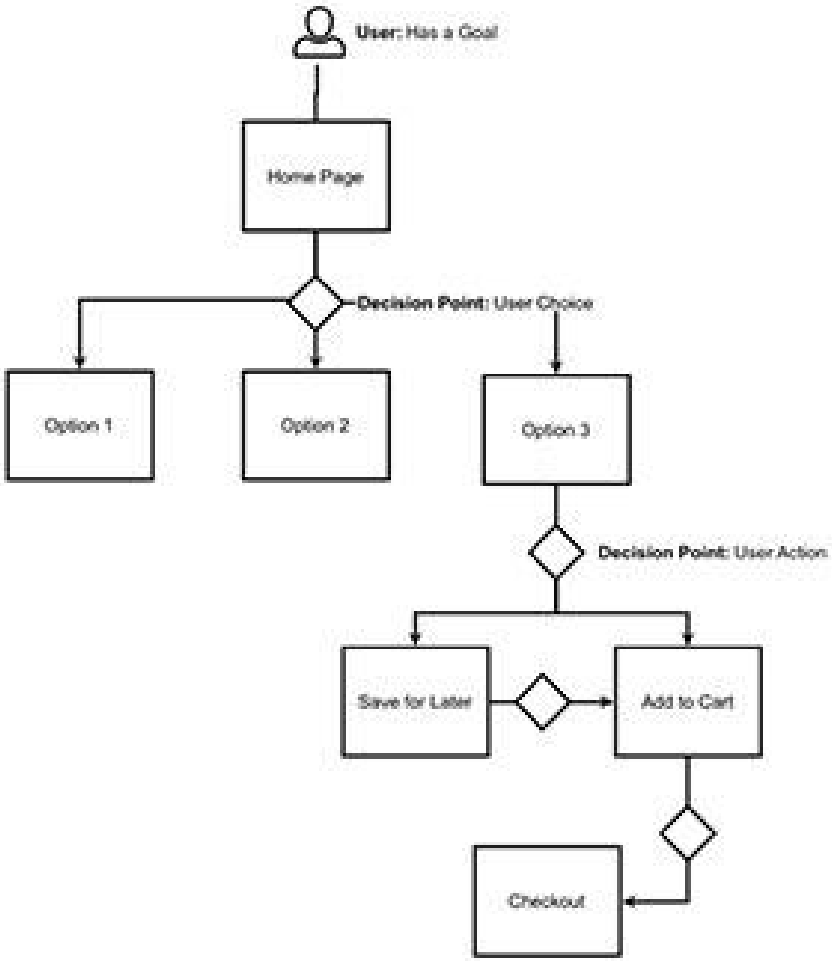
- **Attributes**

  Attributes are the Supplier Name, Supplier Address, Telephone Number, etc. A given attribute belonging to a given entity occurrence can only have one value. Therefore, if a supplier could have more than one address or telephone number then this should be determined before defining the attributes of that entity type. In this example the defined entity may require two or three address and/or telephone number

attributes. It is the maximum practical instances of a given attribute that should be catered for in the entity type definition.

- **Relationships**

  Relations are the connections between two or more entities. Relationship lines indicate that each instance of an entity may have a relationship with instances of the connected entity, and vice versa. Each entity type can always be described in terms of attributes, and these attributes will apply to all occurrences of that given entity type.



21. Testing

Testing is the process of executing a program with the intent of finding errors. Although software testing is itself an expensive activity, launching of software without it may lead to cost potentially much higher than that of testing, especially in systems where human safety is involved. Effective software testing will contribute to the delivery of higher quality software products, more satisfied users, and lower maintenance costs, more accurate and reliable results. Software testing is a necessary and important activity of the software development process.

STRUCTURAL TESTING

Structural Testing takes into account the internal mechanism of an android or ios mobile. Fatigue Testing is carried out with the objective of determining the relationship between the stress range and the number of times it can be applied before causing failure. So when your product's structural durability needs to be predicted, verified and validated, turn to DTB's Structural Testing and Fatigue Testing experts. We provide you with the necessary structural testing and fatigue testing equipment and personnel to test the design and manufacturing integrity of your product. Call upon our vast experience in commercial and military applications.

FUNCTIONAL TESTING

It is very useful and convenient in support of functional testing. Although JMeter is known more as a performance testing tool, functional testing elements can be integrated within the Test Plan, which was originally designed to support load testing. Many other load-testing tools provide little or none of this feature, restricting themselves to performance-testing purposes. Besides integrating functional-testing elements along with load-testing elements in the Test Plan, you can also create a Test Plan that runs these exclusively. In other words, aside from creating a Load Test Plan, it also allows you to create a **Functional Test Plan**. This flexibility is certainly resource-efficient for the testing project.

This will give a walkthrough on how to create a Test Plan as we incorporate and/or configure its elements to support functional testing. This created a Test Plan for a specific target web server. We will begin the chapter with a quick overview to prepare you with a few expectations; we will create a new Test Plan, only smaller. The Test Plan we will create and run at the end of this chapter will incorporate elements that support functional testing, exclusively.

22. Methodology used for Testing

ACCEPTANCE TEST GENERATION

The objective of this step is to produce a set of test data that may be used to test the system. Whenever a new system is developed it needs to be tested to confirm its validity and to determine whether it meets the user requirements. The system was also tested with some sample records. The records were entered into the system and various reports were generated to check the system.

System testing is a critical phase of implementation. Testing of the system involves hardware devices and debugging of computer programs and testing information processing procedures. Testing can be done with test data, which attempts to simulate all possible conditions that may arise during processing. The testing methods adopted during the testing of the system are unit testing and integration testing.

UNIT TESTING

Unit testing focuses on the modules independently locating the errors. This enables the tester to detect errors in coding. It is the process of taking a module and running it in isolation from the rest of the software product by using prepared test cases and comparing the actual result with the result redirected with the specifications and design of the module.

One purpose of testing is to find and remove as many errors in the software as practical. There are a number of reasons in support of unit testing-:

- The size of a single module is so small that we can locate an error fairly easily.
- The module is small enough that we can attempt to test it in some demonstrably exhaustive fashion.
- Confusing interactions of multiple errors in widely different parts of the software are eliminated.

There are problems associated with testing a module in isolation. How do we run a module without anything to call it, to be called by it, possibly to output intermediate values obtained during execution? One approach is to construct an appropriate driver routine to call it and simply stubs to be called by it, and to insert output statements in it. Stubs serve to replace modules that are subordinate to the module to be tested. A stub or dummy subprogram uses the subordinate module's interface, may do minimal data manipulation, prints verification of entry and returns.

INTEGRATION TESTING

This is a systematic technique for constructing the program structure while at the same time uncovering the errors associated with the interface. The objective is to take unit-tested modules and build a program structure that has been detected by designing. The main purpose of integration testing is to determine that the interfaces between modules are correct or not. One specific target of integration testing is the interface: whether parameter matches on both sides as to type, permissible ranges, meaning & utilization. There are 3 types of integration testing-

- **Top-Down Approach** - Top-Down integration proceeds down the invocation hierarchy, adding one module at a time until an entire tree level is generated.
- **Bottom-Up Approach** – The Bottom-up strategy works similarly from the bottom to up.
- **Sandwich Strategy** – A sandwich strategy runs from top and bottom simultaneously.

TEST DATA USED

The proper selection of the data is very important. If the test data is not appropriate or representative of the data to be provided by the user, the reliability of the output is susceptible.

Two different sources were during testing of the system-:

- **Using Live Test Data** – Live tests are those that are extracted from the organization files. The use of the live data makes testing easier by obtaining the most expected outputs and if it is found that the program can handle the entries processing of the system accurately.
- **Using Artificial Test Data** - Live data is difficult to obtain in sufficient amounts to conduct extensive testing. It does not test all the combinations of formats that can be done by entering into the system. Therefore artificial test data were used at the time of unit testing. Artificial test data was created solely for test purposes which provide extreme values for testing the limit of the candidate system.

TEST CASES

- **The system is properly linked or not -** Whether they are redirected to the desired page or not.
- **Information passed** – If a page passes some parameter to another page then it should be checked that the page gets the correct information, whatever is passed by the previous page.
- **The output should be correct** – Every functionality of the system should be checked properly whether it gives the right result or not. Generally, the test is performed with known results. If the output of the system is matched with that result the system is working fine.

TEST CASES

- **Login for the user**

Serial No	Description	Expected Result	Actual Result	Result
1.	This page contains 2 fields: username and password, and a login button to submit the information. The user is entering the correct information.	The user home page should open after successful login.	The respective user home page is opened after successful login by the user.	Passed
2.	If either username or password is filled incorrectly or left blank.	An error message should be displayed and the user should be asked to fill in the information again.	When wrong information is entered by the user then an error message is displayed.	Passed

- **User Registration Page**

Serial No	Description	Expected Result	Actual Result	Result
1.	The user registration page consists of details like username and password.	After submitting information User should get registered to the database and the home page should appear.	After submitting information User gets registered and the home page appears.	Passed
2.	If the information entered is already present the user gets an error.	An error message should be displayed and ask the user to try and log in.	An error message occurs if the information is present already and asks the user to log in.	Passed

23. Implementation

Implementation is the stage in the project where the theoretical design is turned into the working system and is giving confidence to the new system for the users i.e. will work efficiently and effectively. It involves careful planning, investigation of the current system and its constraints on implementation, design of methods to achieve the changeover, and evaluation of change over methods. Apart from planning, the major task of preparing the implementation is the education of users. The more complex system is implemented, the more involved will be the system analysis and design effort required just for implementation. An implementation coordinating committee based on policies of individual organizations has been appointed. The implementation process begins with preparing a plan for the implementation of the system. According to this plan, the activities are to be carried out; discussions regarding the equipment have to be acquired to implement the new system.

Implementation is the final and important phase. The most critical stage is in achieving a successful new system and in giving the users confidence that the new system will work and be effective. The system can be implemented only after thorough testing is done and if it is found to work according to the specification. This method also offers the greatest security since the old system can take over if errors are found or the inability to handle certain types of transactions while using the new system.

At the beginning of the development phase, a preliminary implementation plan is created to schedule and manage the many different activities that must be integrated into the plan. The implementation plan is updated throughout the Development phase, culminating in a changeover plan for the operation phase. The major elements of the implementation plan are the test plan, training plan, equipment installation plan, and conversion plan.

There are three types of implementation:

- ✔ **Implementation of a mobile system to replace a manual system.**
- ✔ **Implementation of a new mobile system to replace an existing system.**

- ✔ **Implementation of a modified application to replace an existing one, using the same mobile.**

Successful implementation may not guarantee improvement in the organization using the new system, but improper installation will prevent it. It has been observed that even the best system cannot show good results if the analysts managing the implementation do not attend to every important detail. This is an area where the systems analysts need to work with utmost care.

Conversion Methods

A conversion is a process of changing from the old system to the new one. It must be properly planned and executed. Four methods are common in use. They are Parallel Systems, Direct Conversion, Pilot systems and Phase-In method.

Parallel systems:

The most secure method of converting from an old to new system is to run both systems in parallel. This method is the safest one because it ensures that in case of any problem in using the new system, the organization can still fall back to the old system without the loss of time and money.

The disadvantages of parallel systems approach are:

- ➢ It doubles operating costs.
- ➢ The new system may not get a fair trial.

Phase –IN- method:

This method is used when it is not possible to install a new system throughout an organization all at once. The conversion of files, training of personnel or arrival of equipment may force the staging of the implementation over a period of time, ranging from weeks to months.

Post Implementation Review

After the system is implemented and conversion is complete, a review should be conducted to determine whether the system is meeting expectations and where improvements are needed. A post implementation review measures the systems performance against predefined requirements. It determines how well the system continues to meet the performance specifications.

24. A Database-driven Online Shopping Application

The shopping application that I have built for our store makes use of several advanced features such as the 'Cart' that contains all the selected products until checkout and 'My Shopping' by which users can track their previous shopping on this portal. For doing so shopping portal uses a Database by which all this information is stored in this database and when required then it is fetched from it. So I use Firebase Database in this project.

So this shopping portal contains dynamic effects by using this database. Some parts of this project which use database are following:

- Firstly when a user registers an account on this website the user gives their information which is stored in the database.
- Then when users want to login on this website then they give their username and password as they choose at registration time, if both are matched with the database's username and password then the user can successfully log in the website otherwise 'Access Denied'.
- The Objects which users can see on the homepage, after the login page, buy products page also comes from the database.
- In the 'Buy Products' Section, products and their prices are also fetched from the database. When the user selects a product and pushes 'Add to Cart', then items are added to the database's cart table.

- Then in the 'My Cart' section the products displayed which are in the cart table of the database followed by the user.
- 'Checkout' section takes the cart's item and their total price and then payment details are given by the user and these details are stored in a separate database table. After Successful entry in this table users cart empty automatically because all items purchased by him.
- In the 'Saved' section, the products a user saved are displayed.

25. Advantages of the Current System

The project Online Shopping Application System is a GUI based system so that it is easy to handle. It also increases the efficiency of the end user, because it will reduce the redundant job, which is tedious to complete. The Online System also has automated capability to complete the job, so it reduces the work manually.

Advantage of Online Shopping Application:

1. This online program will take less time and give better results.
2. It reduces the tedious jobs Like (Redundant work, long procedures, Up to Date Information).
3. It will improve the online shopping system, since all the information is available whenever required.
4. It provides quick processing thus helps in transaction and updating in Edit personal view can perform in a few seconds.
5. It provides accurate Output.
6. It gives fast answers to queries.
7. The amount of paperwork is reduced.
8. Better Control.

26. Deficiencies of the manual system

1) Lack of immediate retrieval of information

In manual system, a lot of time is wasted in retrieving information. Much searching is required before required information is found. This wastes a lot of time for the user as well as the person.

2) Lack of immediate information storage

In manual system, it is difficult to store information at the proper place at that very moment. This is because the person is unable to quickly locate the place where the information is to be stored.

3) Prompts updating not possible

Changes are quite natural in all walks of life. Information and stored data also changes from time to time. These changes should be incorporated in the working also to keep the information up to date. However, bringing about changes through the manual system is a slow and tedious process because of which inaccurate information storage occurs.

4) Unplanned working

The manual system lacks the element of planned working. Records are not properly maintained. This creates a lot of problems at times like during information retrieval and storage.

5) Insignificant generation of managerial and Strategic reports.

In manual system, reports for management are difficult to be generated and strategic reports are almost impossible. This is because for these reports proper storage of information, its retrieval and it's filtering (i.e. choosing information that meets criteria are very important and are very tough in a manual system.

6) Accuracy

The manual system lacks accuracy in working and a number of operations may be performed incorrectly. The computations that are done in the organization may be incorrect and whatever is generated in the system may be inaccurate.

7) Reliability

The reliability of a manual system is considered to be low because of the above given reasons including the fact that 'To error is human'. Any task that is performed by men, always contains the risk of errors.

8) Redundancy of information

In a manual system, particular information may be stored at a number of places, lending to redundancy. Redundancy of data or information creates a number of problems: storage space is wasted, changes at one place are to be made at a number of places and so on.

27. Goals of the Proposed System

1) Immediate retrieval of information

The main objective of the new system is to provide for quick and efficient retrieval of information. Any type of information would be available to the user whenever he requires. Facility would be provided for online queries to cut down on the response time greatly.

2) Immediate storage of information

In the proposed system, it will be easy to store information at any given time at the correct places. The location of storage would be easily available and users will face no difficulty.

3) Prompt updating of information

In the proposed system, the information will always remain up to date as the updating will be prompt and without any efforts. This factor will be of great importance in the proposed system as it determines the integrity of the information stored.

4) Fast computation of information

The computation of information will be quite fast in the proposed system. Not only mathematical calculations, but also logical comparisons will be quick in the new system.

5) Planned approach toward working

The working in the service center information system will be well planned and organized. The data will be stored properly in the data store, which will help in retrieval of information as well as in its storage.

6) Generation of managerial and strategic reports

The new system would provide for regular generation of reports, which would help the management in decision making work and in controlling the overall working of the organization. The generation of these reports would be possible only if the system is organized such that retrieval of information can be made on conditions.

7) Accuracy

The level of accuracy in the new proposed system would be higher. All operations and computations would be done correctly and this will ensure that whatever information is coming from the center, it is accurate.

8) Reliability

The reliability of the proposed system would be high due to the above stated reasons. The reason for the increased reliability of the system is that now there would be proper storage of information, its maintenance would be well managed and retrieval would be possible in the desired manner.

9) Non Redundant Information

In the new system, utmost care would be taken that no information is repeated, any usage of storage or otherwise. This would assure economic usage of storage or space and consistency in the data stored. This will also help make those changes easily as the change would have to be made only at that very place and nowhere else.

28. User Requirements

The user requires these features from the proposed system:

- Quick generation of data
- Quick processing of information
- Quick retrieval of data
- Quick and correct updating of data.
- Least storage requirements
- Secured and controllable data storage
- Full backups of data

Note: These are some of the basic requirements, which the system should provide, but additional Requirements can be different for other online programs.

29. Limitations

Although I have tried to do the best and try to do all the things that are possible in an online System, the system still contains some of the limitations.
The reason for these limitations is the time constraints. Time is the major problem. I have to deliver the project in a particular time period. That's why I have to leave some of the topics that I actually want to cover. I am still working on this software and my next goal is to remove these limitations and develop a more efficient and Elegant system.

Limitations of the System:

1. This project does not give the information about the stock (quantity) present within the shop.
2. This project does not create monthly, yearly Reports.

After removing these and other minor limitations I hope this project will be very efficient and effective.

30. Project Legacy

Objective describes what the prospective users of the system want from the system. Being an important part of the system development process, preparation of the requirement specification has been done after studying the existing procedure and personal interaction with prospective users.

The Online Shopping Portal is an Intermediate between Product Buyers and Sellers. The purpose is to enable the Product Buyers to search for the Products from any remote location. The Product Buyer can search for the products from any remote location.

We are going to design an application which is beneficial for all those who want to do shopping from home. The main aim of this software is to provide Products according to their area of need. It also provides information about various companies to users and Products of those companies. The administrator will maintain the database and perform all updation and deletion processes.

31. User Manual

DEFINITIONS

- **Store**: A store of applications allowing you to download the application.

- **Database**: A database that stores data. It is a collection of interrelated data that contains information relevant to enterprise.

- **Firebase:** Firebase is a platform developed by Google for creating mobile and web applications.

- **Internet**: Worldwide networks of computers from where anyone can take information.

- **Homepage:** The first page when you go to a worldwide website on the internet.

- **Flutter**: Flutter is an open-source UI software development kit created by Google. It is used to develop cross platform applications for Android, iOS, Linux, Mac, Windows, Google Fuchsia, and the web from a single codebase.

- **Dart:** Dart is a programming language designed for client development, such as for the web and mobile apps.

- **Mobile Applications**: A mobile application, also referred to as a mobile app or simply an app, is a computer program or software application designed to run on a mobile device such as a phone, tablet, or watch.

32. Bibliography

This document contains provisions which, through reference in this text, constitute provisions of the present document.

1) Google Search Engine for various searching

2) You Tube

3) Stackoverflow

4) GitHub

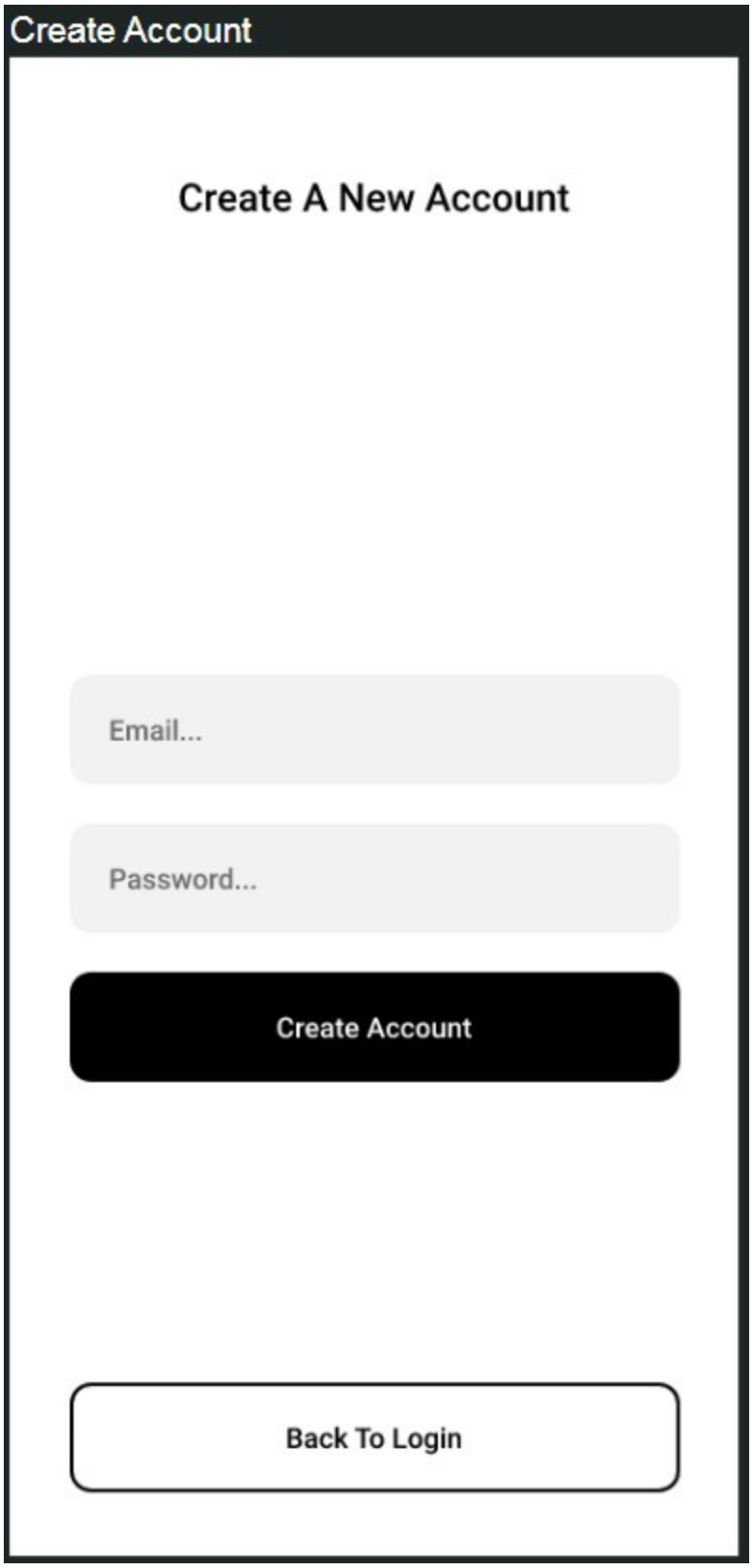
5) Online at https://dart.dev/

6) Online at https://flutter.dev/

7) Online at https://pub.dev/

33. Screen - Shots Of The Project

Some screenshots of the online application have been incorporated from the next page.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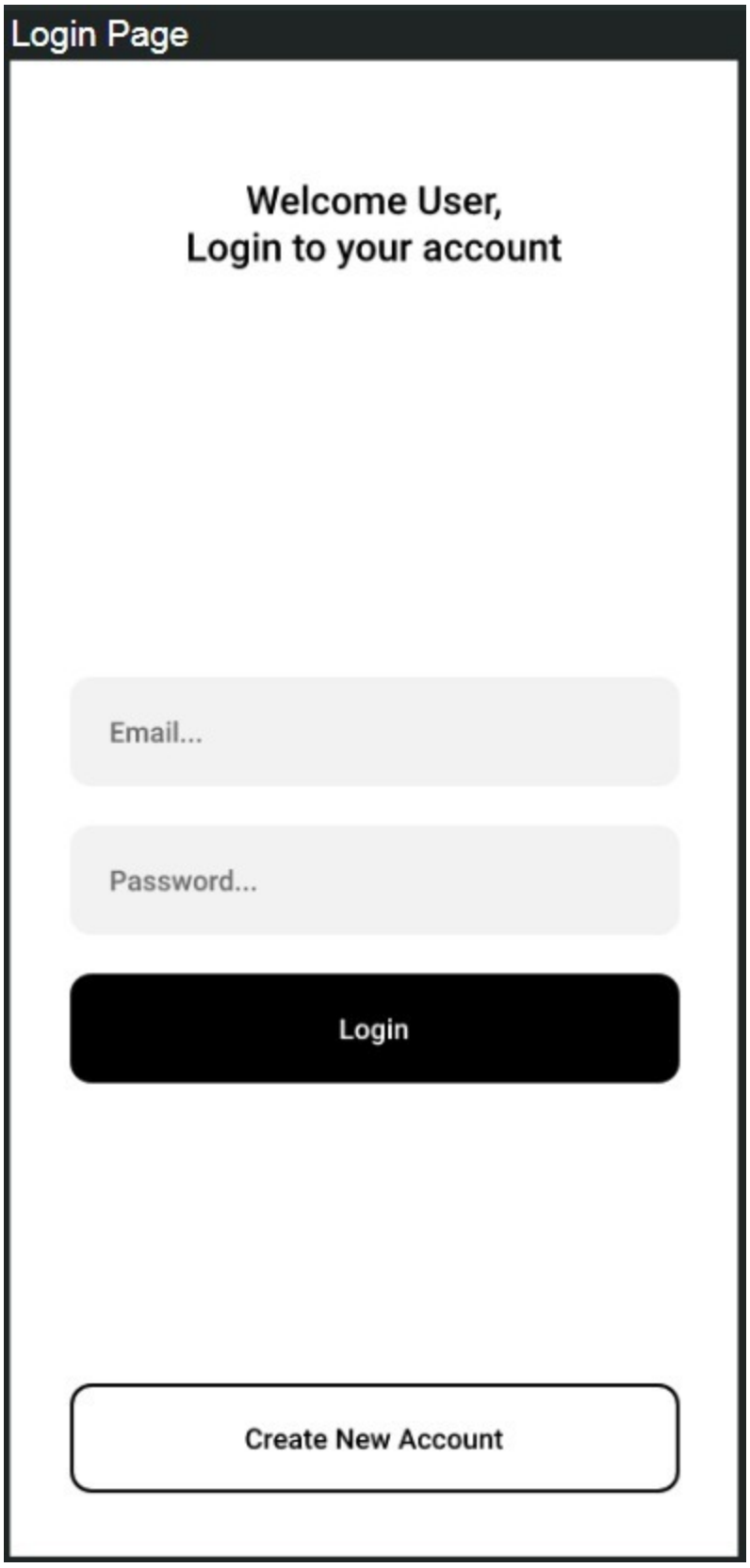
Create A New Account
Email...
Password...
Create Account
Back To Login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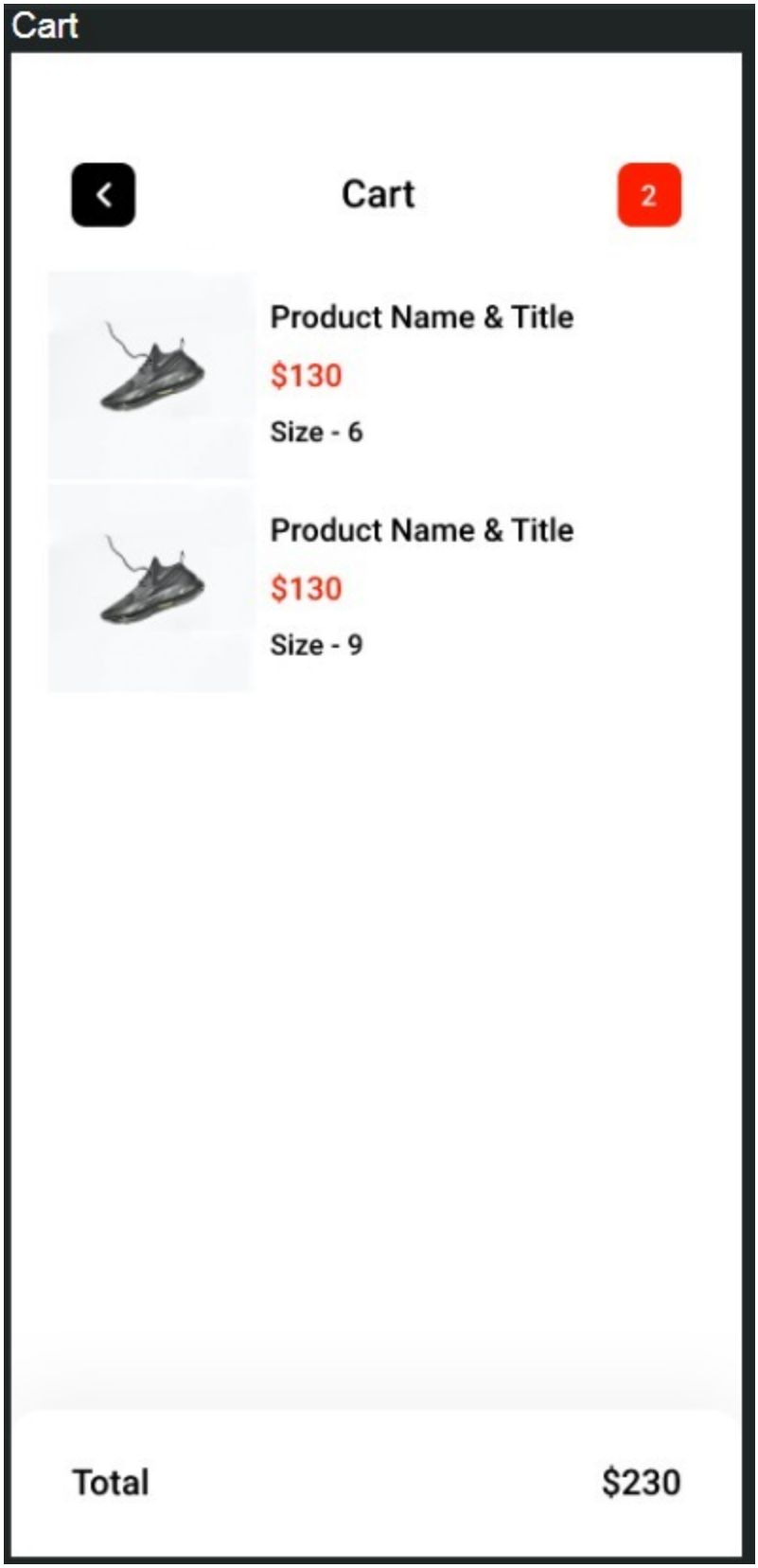
Welcome User,
Login to your account
Email...
Password...
Login
Create New Account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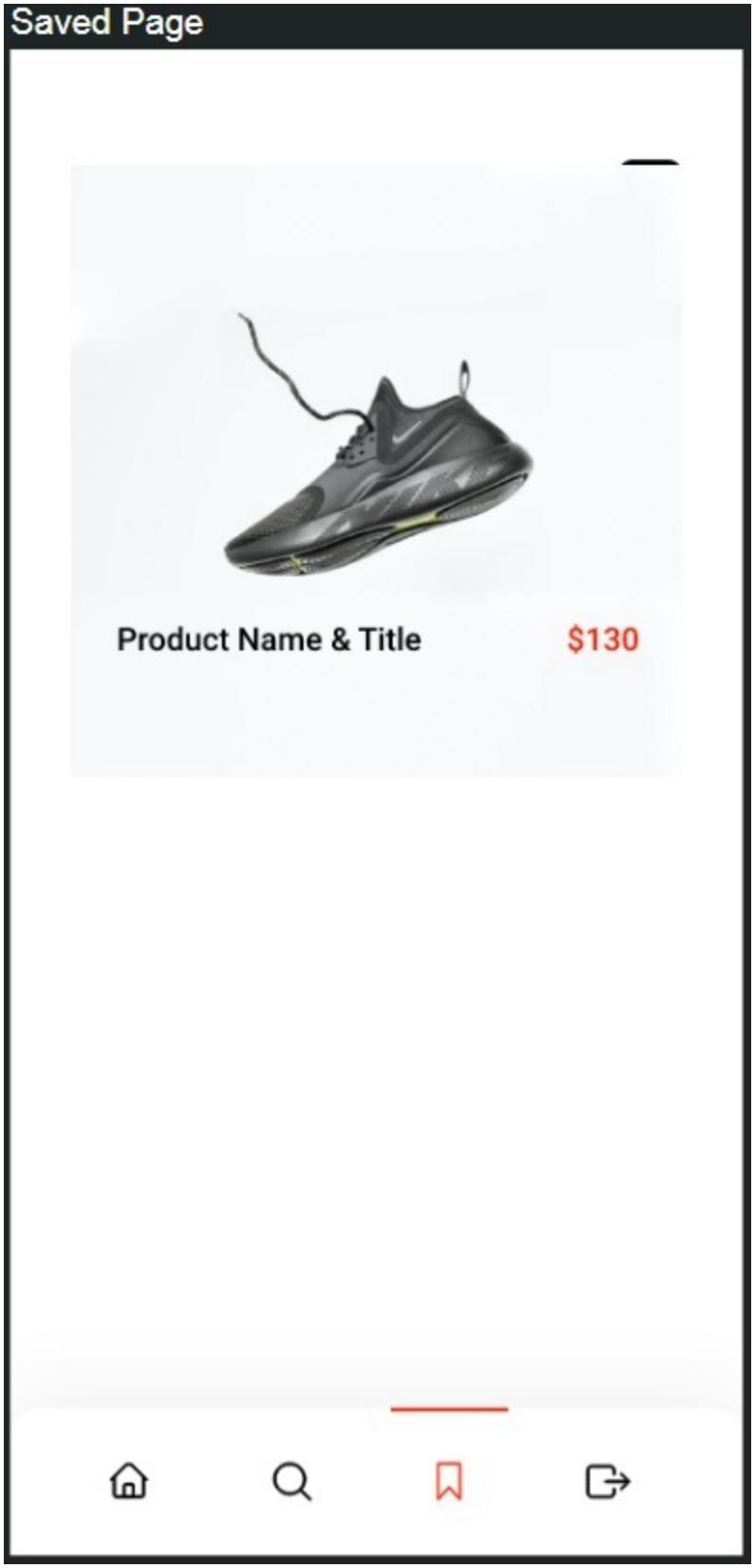
Size - 6
Product Name & Title
$130
Size - 9
Total
$230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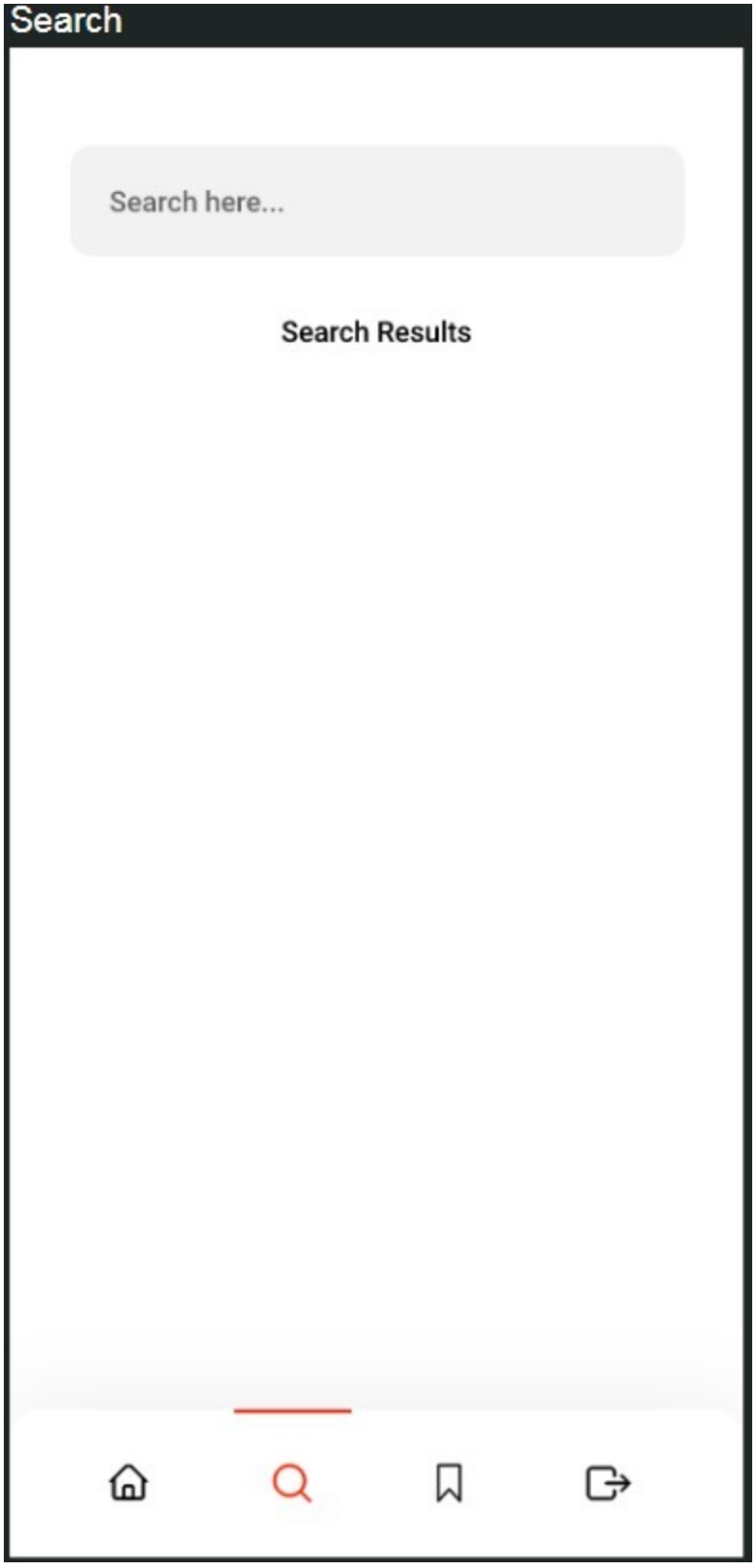
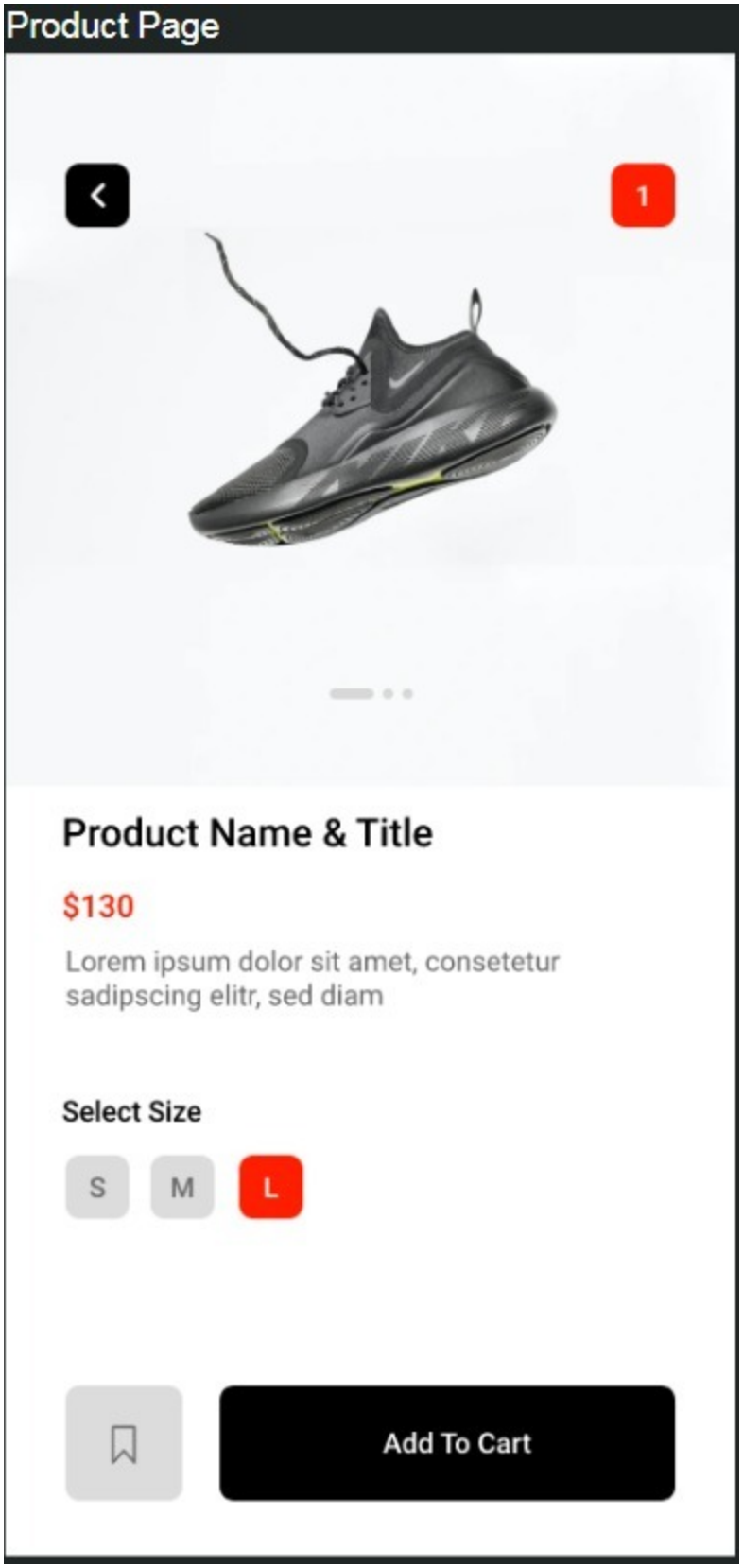

Search
Search here...
Search Results


Product Page
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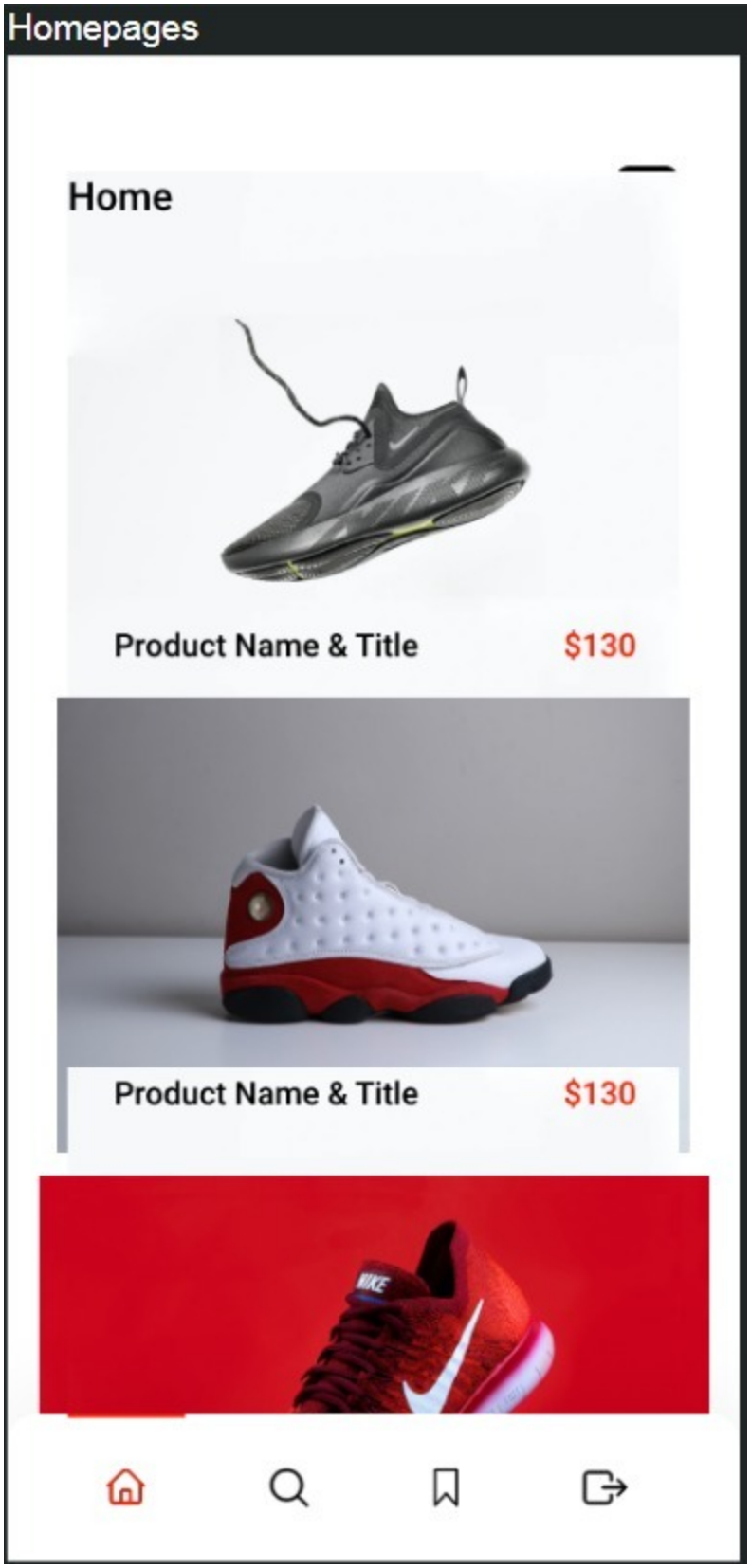
$130
Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam
Select Size
S
M
L
Add To Cart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