Salahaddin University-Erbil
College of Science
Computer Science & IT Department

Online Shopping with Multi-level Filter

A project submitted to the Computer Science & IT Department
Salahaddin University – Erbil

In the Partial Fulfillment of the Requirement for the Degree of Bachelor of Science Computer Science & IT

Prepared By:

Ahmad Omar Mohammad

Ismail Ibrahim Anwar

Ahmed Salih Qadir

Supervised By:

Mr. Sanhareb I. Benyamin

(2022-2023)

Dedicated To:

To our family, who has always supported and encouraged us to pursue our dreams. Also, we would like to express our deepest gratitude to our supervisor for their invaluable guidance and dedicate to him.

Certificate

I certify that the project titled “**Online Shopping with Multi-level Filter**” was done under my supervision at the Computer Science and IT Department, College of Science - Salahaddin University – Erbil. In the partial fulfillment of the requirement for the degree of Bachelor of Computer Science and IT.

Supervisor Signature:

Mr. Sanhareb I. Benyamin

Date: /   /2023

Abstract

This mobile application developed using Dart language and framework is an online shopping application for electronic devices. The application provides a user-friendly interface for customers to browse and purchase products from various categories of electronic devices. The payment system in the application supports payment via credit cards and Visa cards that is the easiest way to pay. To use the application, both shop owners and customers need to register and authenticate themselves by Gmail and Facebook account. Registered shop owners can create their online store and upload their product catalog, while customers can browse and purchase products from multiple stores on the platform. The app also includes product descriptions, price, and stock availability to help users make informed purchasing decisions. With the ability to support multiple stores, users can access a vast array of electronic devices available in one place, providing convenience and accessibility to users. Overall, the application aims to simplify the process of online shopping for electronic devices while providing a secure and reliable payment system for users.

Table of Contents

Chapter **Page**

Table of Figures

Chapter One

Introduction

1.1. Introduction

This research report aims to present a study on the development of a mobile application for electronic devices with multi-level filter. The app is designed to enable customers to shop for electronic devices from several shops, with easy payment options and a user-friendly interface. With the increasing popularity of electronic devices, the demand for an efficient and user-friendly shopping platform is on the rise. This app offers an innovative solution to this problem and promises to make the shopping experience hassle-free and convenient for the customers. The report will present the features and functionalities of the app, as well as its potential impact on the electronic device market.

1.2. Aims and objectives

The aims of an online shopping application of electronic devices can vary depending on the specific application and the goals of the business. Also aims include:

- Providing a convenient and accessible platform for customers to browse and purchase electronic devices from anywhere at any time.
- Offering a wide selection of electronic devices with detailed descriptions, and specifications to help customers make informed purchase decisions.
- Offering competitive prices and promotions to attract and retain customers.

Overall, the aim of an online shopping application of electronic devices is to provide a user-friendly and efficient platform for customers to easily find and purchase the electronic devices they need while providing a positive shopping experience.

1.3. Related works

Electronic Mall The oldest electronic online shopping application is considered to be the Electronic Mall in 1984, which was created by the CompuServe Corporation. This online shopping platform allowed users to purchase goods and services using their personal computers and a modem to connect to the CompuServe network. The Electronic Mall offered a range of products, including clothing, books, and electronics, and was the first online platform to use encryption technology to protect users' personal and financial information. Although the Electronic Mall was a groundbreaking development in electronic commerce, it was limited by the technology available at the time and did not gain widespread popularity until the 1990s, when the internet became more widely accessible to the general public.

AliExpress is another of the most popular online shopping apps for electronic devices. AliExpress is a global online retail marketplace that offers a wide variety of electronic devices at competitive prices from numerous sellers across the world. The app allows users to easily browse through various electronic devices and purchase them from different vendors, providing customers with an abundance of product options to choose from. AliExpress offers secure payment methods, fast delivery, and excellent customer service, making it a popular choice for consumers worldwide. The app's popularity is largely due to its affordability, vast selection of products, and customer-friendly policies.

Difference between Prior Projects and Online shopping application Project

Online shopping app is distinguished by the way that products are not specific with one shop also are collections of several shops compared to previous projects that own the products themselves

Chapter Two

Methodology

Methodology

2. Front End & Back End Technologies

2.1. Front End Technologies

Description About the front-end technologies that we used in our project:

2.1.1 Dart

Dart is a modern, object-oriented programming language developed by Google in 2011. It is designed to be easy to learn, efficient, and suitable for a wide range of applications, from web development to mobile and desktop applications. In Dart, data types are checked during compilation, rather than during runtime, which is known as static typing. This helps identify errors earlier in the development process. One of the key features of Dart is its support for both just-in-time (JIT) and ahead-of-time (AOT) compilation. JIT compilation allows for faster development and debugging, while AOT compilation enables Dart code to run efficiently on a variety of platforms without the need for an interpreter or virtual machine. Dart is also designed to work seamlessly with other web technologies, such as JavaScript, HTML, and CSS, making it a popular choice for building web applications. It has its own package manager called Pub, which provides access to a wide range of libraries and tools for web development. In addition to web development, Dart is also used for mobile development with Google's Flutter framework. Flutter allows developers to build high-performance, cross-platform mobile applications for both iOS and Android using a single codebase.

2.1.2 Flutter

Flutter is an open-source mobile application development framework developed by Google. It was first released in May 2017 and has since gained popularity among developers due to its ability to build high-quality, fast, and beautiful apps for iOS, Android, web, and desktop platforms. Flutter uses the Dart programming language, which was also developed by Google, to build mobile applications. Dart is a statically-typed language that compiles to native code for both iOS and Android, making it easier to write and maintain high-performance apps. Flutter also includes a rich set of pre-built widgets and tools, which can be easily customized to create beautiful and responsive user interfaces. One of the key features of Flutter is its hot reload capability, which allows developers to see changes in real-time as they are making modifications to their code. This feature helps speed up the development process and allows developers to quickly iterate on their code. Flutter also offers an extensive set of libraries and packages, which makes it easier for developers to add new features and functionality to their applications. This includes support for features such as in-app purchases, location-based services, and push notifications, among others. Flutter has been used to build a number of popular apps, including Google Ads, Alibaba, and many more. It has also been recognized by industry leaders such as Apple, which awarded Flutter the title of "Fastest-Growing Skill" on its developer training platform, and Microsoft, which has integrated Flutter into its Visual Studio Code IDE. In summary, Flutter is a powerful and versatile framework for mobile application development that offers a wide range of features and benefits to developers. Its popularity continues to grow, and it is likely to remain a popular choice among developers for years to come.

2.2 Back End Technologies

Description of the Back-end technologies that we used in our project

2.2.1 Firebase Realtime Database

Firebase Realtime Database is a cloud-hosted NoSQL database from Google's Firebase platform. It allows developers to store and synchronize data in real-time between clients and servers. The database stores data in JSON format and can be accessed from any platform using a variety of APIs, including JavaScript, Android, iOS, and REST APIs. The Realtime Database uses a synchronization model called "eventual consistency," which means that changes made by different clients to the same data are synchronized over time. This approach allows for rapid and efficient data synchronization across multiple devices and clients. Firebase Realtime Database also provides a powerful set of features for querying and filtering data, handling complex data structures, and enabling offline data access.

2.2.2 Firestore Firebase

Cloud Firestore is a scalable, adaptable database from Firebase and Google Cloud for server, web, and mobile programming. Similar to Firebase Realtime Database, it uses real-time listeners to keep your data synchronized across client apps and provides offline support for mobile and web so you can create responsive apps that function regardless of network latency or Internet access. Cloud Functions and other Firebase and Google Cloud goods, such as Cloud Firestore, are also offered with seamless integration. Flexible, hierarchical data structures are supported by the Cloud Firestore data format. Organize your info into collections of documents. In addition to sub collections, documents can also hold intricately nested objects. (Moroney, L., 2017)

2.2.3. Json Server

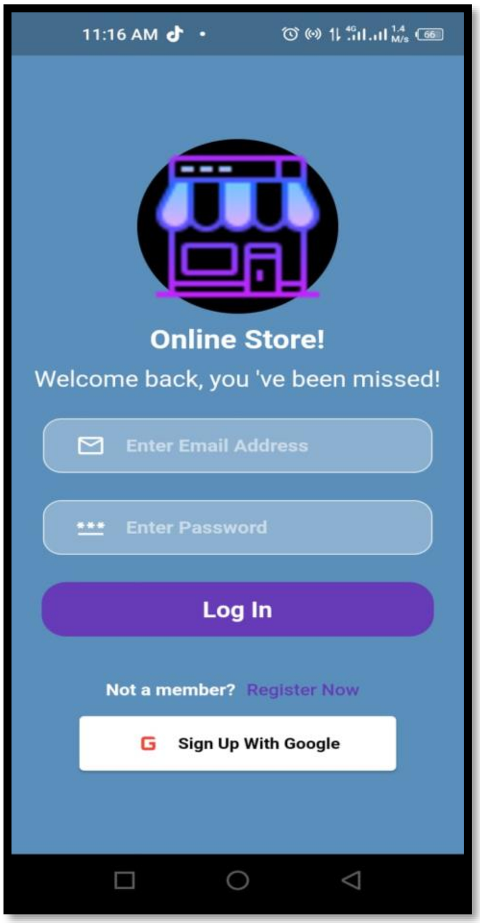
JSON Server is a npm package that lets you develop REST JSON web services that are backed up by a database. It's designed for front-end developers and allows them to do all CRUD activities without having to establish a backend prototype or structure. M. M(2020).

Chapter Three Analysis And Design

3. How the project works

3.1. Login page

On this page, users can log in by using an email and password or simply can use a google account to log in Appendix 1



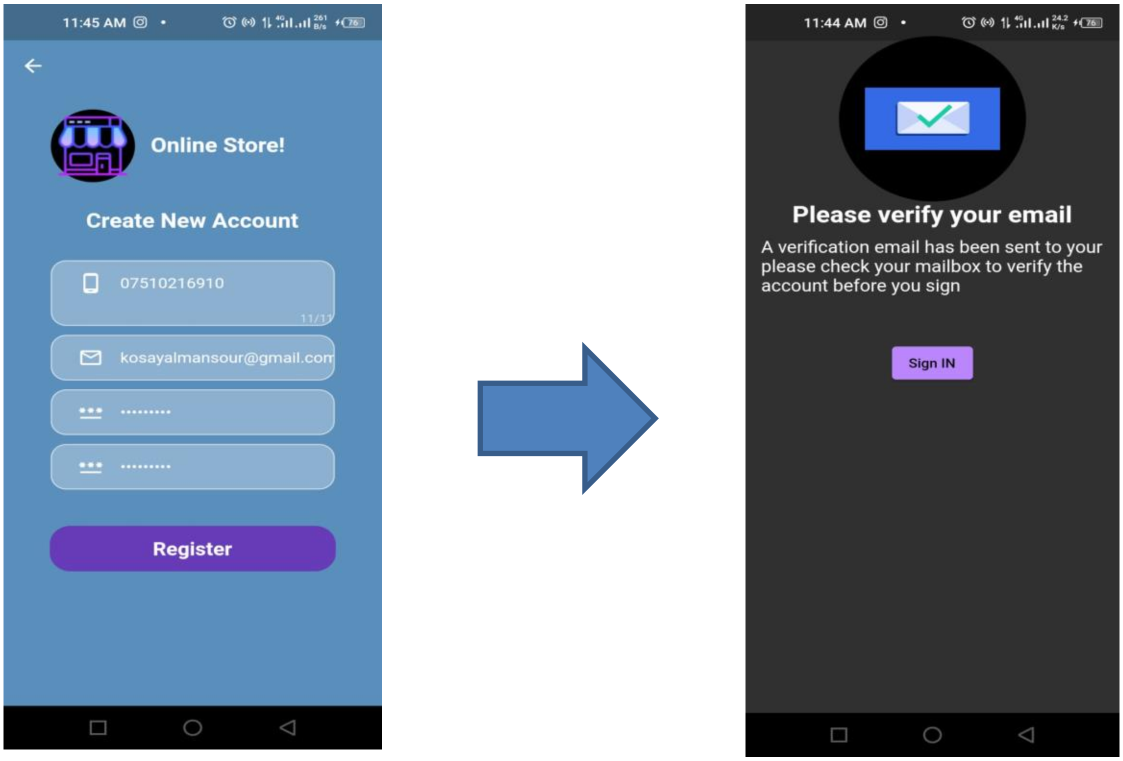
Online Store!

Welcome back, you 've been missed!

Figure (3.1): Login Page

3.2. Sign Up Page

On this page, users can Sign Up by using an email and creating a password, if the user already has an account can simply click on Sign In and shows the Login page. The Code of the Sign-Up page is in Appendix 2.



07510216910 11/11

kosayalmansour@gmail.com

•••••••••

•••••••••

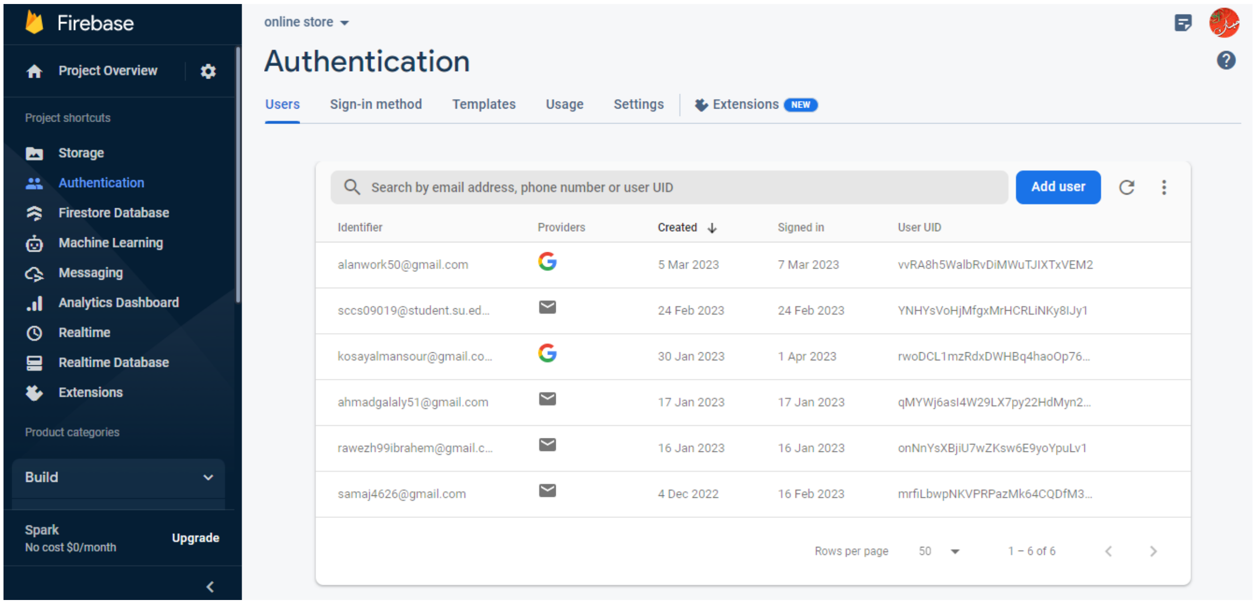
Please verify your email

A verification email has been sent to your please check your mailbox to verify the account before you sign

Figure (3.2): Sign Up Page

3.3. Firebase user management

We can easily manage users with a firebase real-time database as we can see in the figure (3,6) this table help us to manage users we can reset the password of any account, disable any account or delete the account in the table also we can add a user by the button of the top of the table. The Code of the Firebase user management is in Appendix 4.



Identifier	Providers	Created ↓	Signed in	User UID
alanwork50@gmail.com	G	5 Mar 2023	7 Mar 2023	vvRA8h5WalbRvDiMWuTJIXTxVEM2
sccs09019@student.su.ed...	✉	24 Feb 2023	24 Feb 2023	YNHYsVoHjMfgxMrHCRLiNKy8IJy1
kosayalmansour@gmail.co...	G	30 Jan 2023	1 Apr 2023	rwoDCL1mzRdxDWHBq4haoOp76...
ahmadgalaly51@gmail.com	✉	17 Jan 2023	17 Jan 2023	qMYWj6asI4W29LX7py22HdMyn2...
rawezh99ibrahem@gmail.c...	✉	16 Jan 2023	16 Jan 2023	onNnYsXBjiU7wZKsw6E9yoYpuLv1
samaj4626@gmail.com	✉	4 Dec 2022	16 Feb 2023	mrfiLbwpNKVPRPazMk64CQDfM3...

Rows per page 50 1 – 6 of 6

Figure (3.4): Firebase user management

3.4. Home Page

As we can see in Figure (3,1) the home page has a at the "Appbar" there have four buttons first button displays the menu bar and the second button signs out and goes to the page sign-in, the third button is used for searching for products in the shop, the fourth button using for switching between dark mode and lighting mode; the body part screen consists of fourth-part; the first part is a select the category, second part scroll bar that displays the online shopping advertisement, and the third part displays the products in the store, the last part using for switching between the home page and the cart screen.

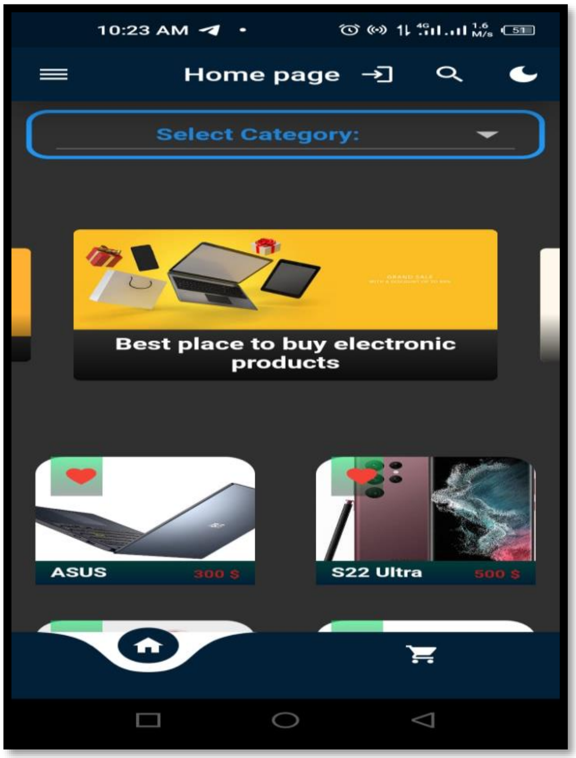
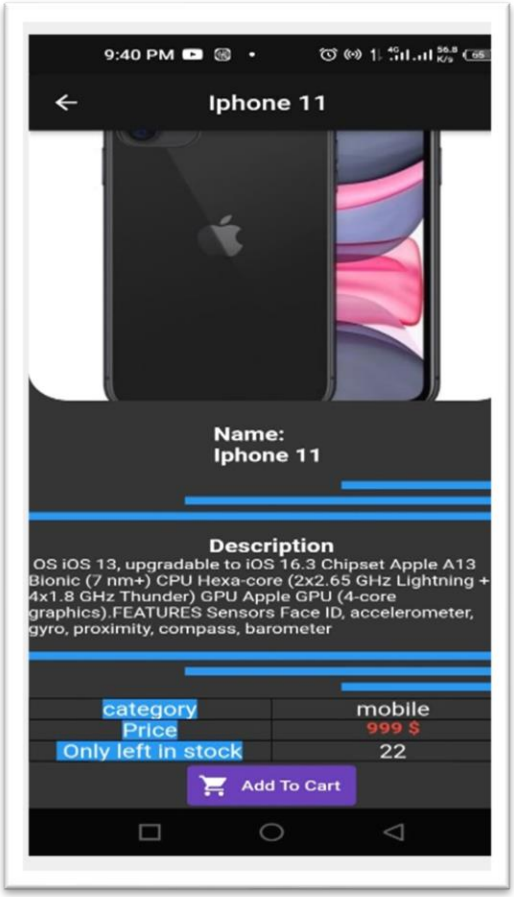


Figure (3.4): Home Page

3.5. Add Product to Cart

This page shows the product picture, product name, description of the product and product price. finally you have button that using for adding product to cart screen before buying.



Iphone 11

Name:
Iphone 11

Description

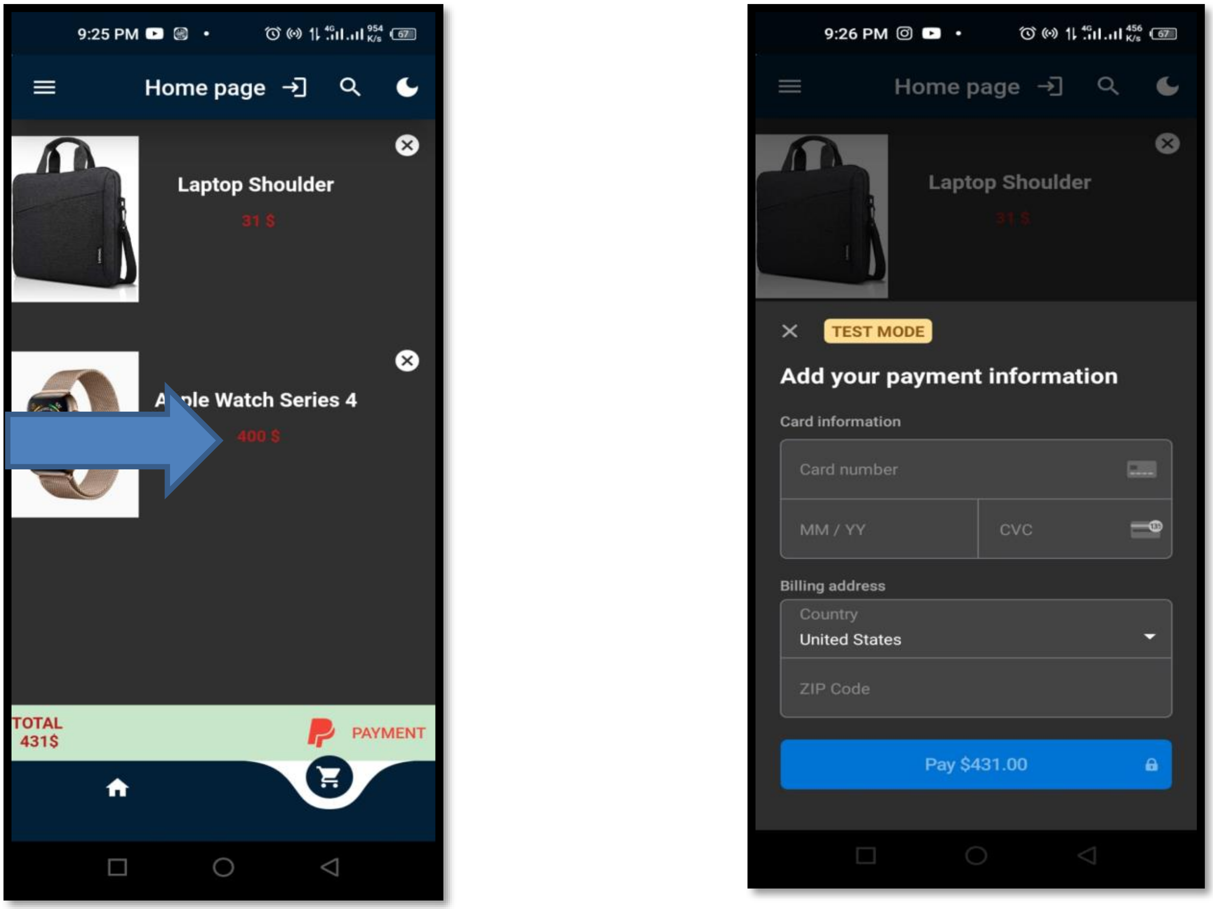
OS iOS 13, upgradable to iOS 16.3 Chipset Apple A13 Bionic (7 nm+) CPU Hexa-core (2x2.65 GHz Lightning + 4x1.8 GHz Thunder) GPU Apple GPU (4-core graphics).FEATURES Sensors Face ID, accelerometer, gyro, proximity, compass, barometer

category	mobile
Price	999 $
Only left in stock	22

Figure (3.5): product Page

3.6. Cart screen

on this page, showing the user what product was selected you want to buy
and showing the total price of all products finally you have a button for payment.



Country
United States

Figure (3.6): payment Page

3.7. Menu screen

Purchases: this tab it displays a list of items that a user has purchased This tab can provide users with easy access to their purchase history.

Favorite: this tab displays a list of items or content that a user has marked as their favorites.

Home page: return to home page.

Profile: this tab displays information about the user, such as their personal details, preferences, and activity within the application.

Connect us: this tab displays contact information and support options for users who need assistance or want to get in touch with the application's support team. This tab provides users with an easy and convenient way to contact the application's customer support.

Privacy policy: this tab displays information about how the application collects, uses, and shares user data and information. This tab provides users with transparency and clarity about the application's data practices and policies.

Admin Account: this tab is just for the admin.
Languages: this application is supporting three languages (English, Arabic, Kurdish) for users you can choose any language.

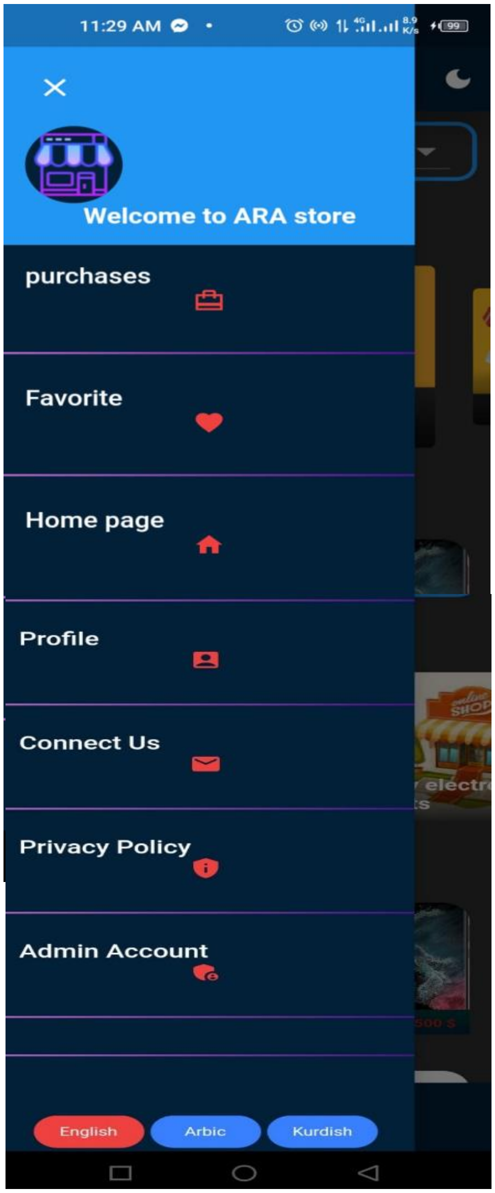


Figure (3.7): Menu Page

3.8. Admin screen

this screen is a section of the application's user interface that is accessible only to users with administrative privileges. This section allows the administrator to perform various administrative tasks, such as managing users, configuring settings, and viewing logs or reports.

In general, the admin screen is a critical part of any application that requires user management or administrative control, as it provides a secure and centralized location for managing sensitive information and performing critical tasks.

On this page can enter new products and delete products and report of purchases

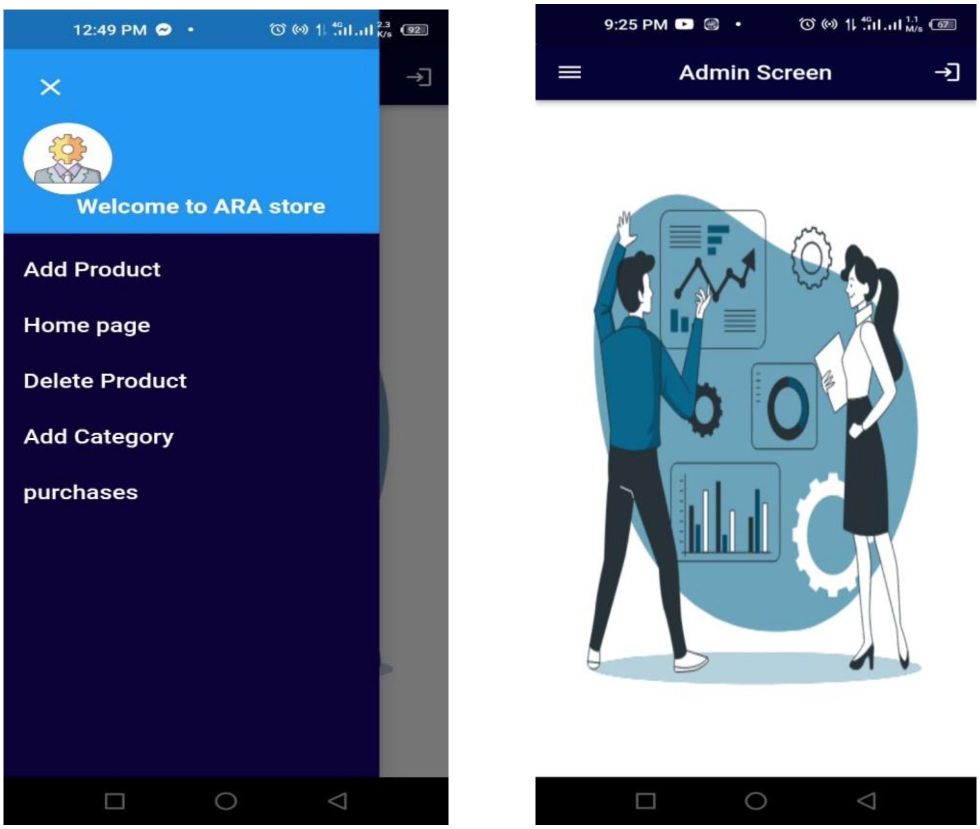
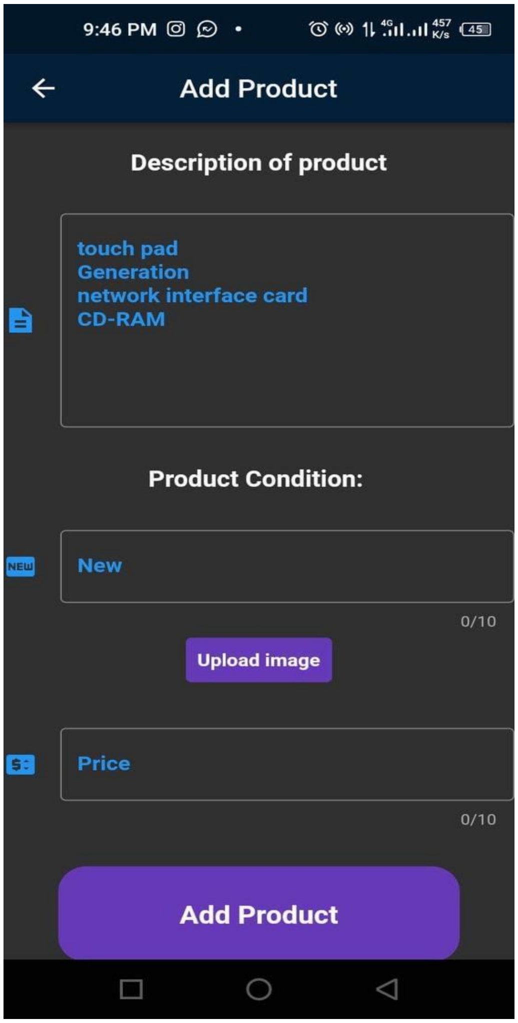


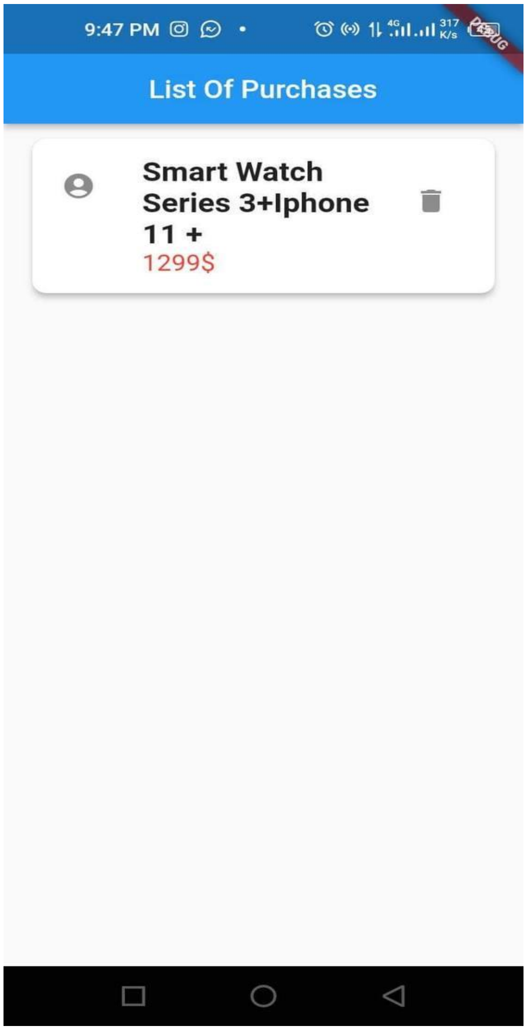
Figure (3.8): Admin Page



touch pad
Generation
network interface card
CD-RAM

New

Price



Smart Watch Series 3+Iphone 11 +
1299$

Figure (3.9): Admin Pages To adding and deleting products

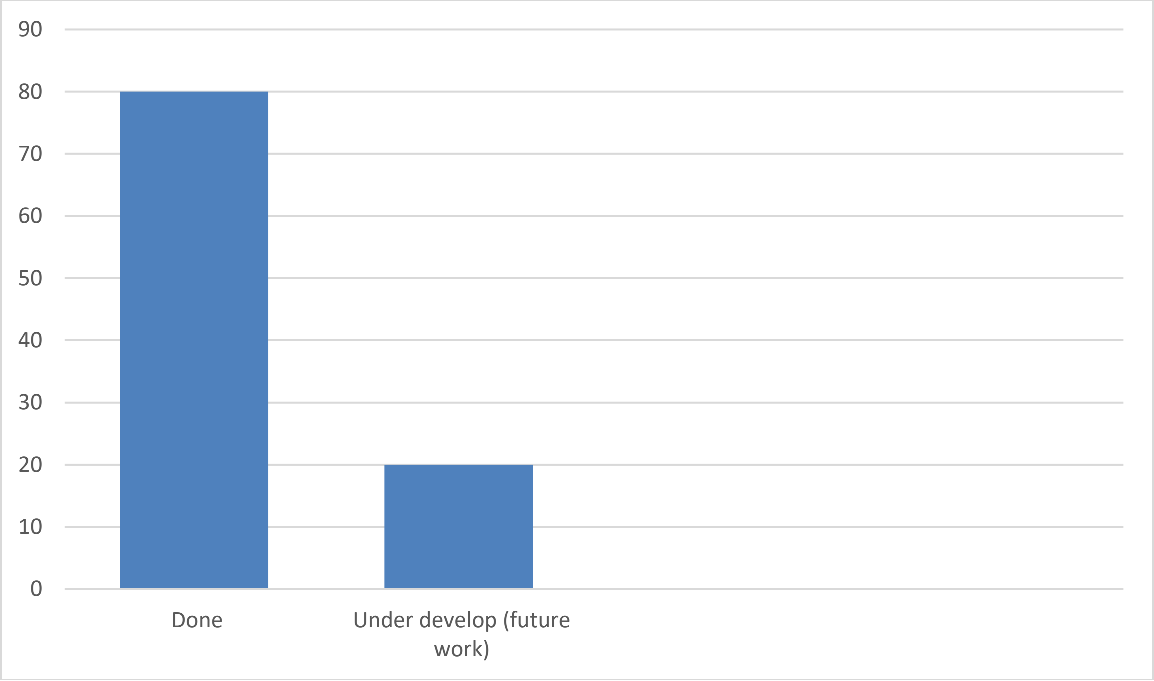
Chapter Four

Result And Discussion

4. Discussion

This is an application that works on the IOS and Android systems, as shopping at home has become popular in the world. It had a strong benefit during the Corona period. This is an application that does not exist in Iraq after the idea of a good follow-up, such as the Amazon website and the Alibaba website, as they became the best sites for buying via the Internet in terms of Through this application, we want to compete with this company or become local in Iraq. The first application allows you to buy via the Internet, as we have all methods available in the world, such as master card and visa card, which are common methods of paying via the Internet. When any problem occurs in the application, you can directly access BACKEND Where if you want to change anything in a database, it will be changed on every project.

4.1. Result



4.2. Future work

So far we have achieved most of our aims and the work of the project has been done well. However, there are some details and features that can be achieved in the future. The features we would like to achieve are:

- adding one of the payments ways like qi card or fast pay or zain cash for working better in Kurdistan
- adding offers for users
- adding notifications in the application if have any offers and adding new products to store
- Developing the application for the website.

4.3. Limitations of the project

All developed systems have restrictions and limitations. Here are the restrictions of this project.

- The application requires internet connection.
- The application is developed only for android.

Chapter Five

Conclusion

Conclusion

In conclusion, the online shopping application for electronic devices offers significant benefits for both consumers and retailers. With its ease of use and convenience, consumers can access a wide range of products at their fingertips and purchase them with just a few clicks. Additionally, retailers can expand their reach beyond physical stores and tap into a global customer base. However, it is important to note that the success of an online shopping application relies heavily on its user interface, security features, and customer service. Ensuring that these aspects are well-designed and functioning optimally is crucial in providing a positive experience for users and building trust with customers. Additionally, as the competition in the online marketplace continues to intensify, retailers must continue to innovate and differentiate themselves to stay ahead in the game. Overall, the online shopping application for electronic devices has revolutionized the way consumers shop and has opened up new opportunities for retailers. Its impact will only continue to grow as technology advances and more consumers adopt online shopping as their preferred mode of purchasing electronic devices.

The main reasons are:

- The application is faster and more efficient.
- The application reduces human errors.
- It's easy to order anything in the app and pay.
- The system requires only smartphones and the Internet to operate.
- It is easy and popular in the modern world.

References

References

1. "CompuServe's eMall: A Blast from the Past." The History of Online Shopping, The Balance Small Business, 13 May 2021, https://www.thebalancesmb.com/the-history-of-online-shopping-1141608.

2. "eMall: The First Online Shopping Mall." Ad Age, 12 June 2012, https://adage.com/article/digital/emall/234330.

3. Alessandro Biessek (2019). Flutter for beginners: an introductory guide to building cross-platform mobile applications with Flutter and Dart 2. Birmingham, Uk: Packt Publishing.

4. Anon, (2019). Adding the Firebase and Firestore Backend. Beginning Flutter®, pp.375–410. Available at: http://dx.doi.org/10.1002/9781119550860.ch14

5. ap Payne (2019). Beginning app development with Flutter: create crossplatform mobile apps. New York, Ny: Apress.

6. Ashok Kumar S (2018). Mastering Firebase for Android development: build real-time, scalable, and cloud-enabled Android apps with Firebase. Birmingham, Uk: Packt Publishing, Ltd.

7. Biessek, A. (2019). *Flutter for Beginners*.

8. Gilad Bracha (2016). The Dart programming language.

9. Moroney, L. (2017). Google Analytics for Firebase. The Definitive Guide to Firebase, pp.251–270. Available at: http://dx.doi.org/10.1007/978-1-4842-2943-9_14.

10. Napoli, M.L. (2020). Beginning flutter: a hands on guide to app development. Indianapolis: Wrox.

11. Statista. (2021). Number of digital shoppers worldwide from 2014 to 2024. Retrieved from https://www.statista.com/statistics/251666/number-of-digital-buyers-worldwide/

Appendix

Appendix

1. Part of the Home page code

```
Scaffold(
        bottomNavigationBar: CurvedNavigationBar(
          // height: 10.h,
          animationDuration: const Duration(milliseconds: 300),
          backgroundColor: Colors.white,
          color: const Color.fromARGB(255, 2, 32, 56),
          items: const [
            Icon(
              Icons.home,
            ),
            Icon(Icons.shopping_cart),
          ],
          onTap: (index) {
            setState(() {
              page = index;
            });
          },
        ),
        appBar: AppBar(
          actions: [
            IconButton(
```

2. Part of the login page code

```
} signin() async
;var formdate = _formKey.currentState


} if (formdate!.validate())
;()formdate.save

} try
final credential = await FirebaseAuth.instance
)signInWithEmailAndPassword.
;(email: email.text, password: password.text
;return credential
} (on FirebaseAuthException catch (e {
} if (e.code == 'user-not-found')
```

```
ignore:  //
avoid_single_cascade_in_expression_statements
)AwesomeDialog
,context: context
,animType: AnimType.scale
,dialogType: DialogType.info
)body: Center
)child: Text
```

3. Part of the cart page code

```
Scaffold(
      body: Column(
        children: [
          Expanded(
            // ignore: avoid_unnecessary_containers
            child: Container(
              child: ListView.separated(
                shrinkWrap: true,
                itemBuilder: ((context, index) {
                  // ignore: sized_box_for_whitespace
                  return Container(
                      height: 24.h,
                      child: Row(mainAxisAlignment:
MainAxisAlignment.spaceBetween,
                        children: [
                          // ignore: sized_box_for_whitespace
                          Container(
                              height: 20.h,
                              width: 30.w,
                              child: Image.network(
                                '${users1[index]['image']}',
                                fit: BoxFit.fill )),

                          Padding(
                            padding: const EdgeInsets.only( top: 50),
                            child: Column(
                              children: [
                                Text(
                                  '${users1[index]['name']}',
                                  style: TextStyle(
                                   fontSize: 15.sp,
                                   fontWeight: FontWeight.bold),
                                ),
                                SizedBox(
                                  height: 2.h,
                                ),
                                Text(
                                  '${users1[index]['price']} \$',
                                  style: TextStyle(
                                   fontSize: 12.sp,
                                   color: Colors.red[900],
                                   fontWeight: FontWeight.bold),
                                ),
                                SizedBox(
                                  height: 2.h,
                                )
                              ],
```

4. Part of the purchase page code

```
Scaffold(
   appBar: AppBar(
    title: Text('9'.tr),
    centerTitle: true,
   ),
   body: ListView.builder(
    scrollDirection: Axis.vertical,
    shrinkWrap: true,
    itemCount: users1.length,
    itemBuilder: (BuildContext context, int index) {
     final data = users1[index];
     Divider(
      color: Color.fromARGB(255, 232, 5, 5),
      thickness: 1,
     );
     return ListTile(
      title: Text(data['name'],),
      subtitle: Text(
        '\n\n description:\n ${data['description']},\n\n  price:\n
${data['price']}\$'),
     ); },
```

5. Part of the admin page code

```
Scaffold(
        appBar: AppBar(centerTitle: true,
          title: Text('List Of Purchases'),
        ),
        body: ListView.builder(
          itemCount: users1.length,
          itemBuilder: (BuildContext context, int index) {
            return Padding(
              padding: const EdgeInsets.symmetric(horizontal: 16.0, vertical: 8.0),
              child: Card(
                elevation: 4.0,
                shape: RoundedRectangleBorder(
                  borderRadius: BorderRadius.circular(10.0),
                ),
                child: ListTile(
                  contentPadding: const EdgeInsets.symmetric(horizontal: 20.0, vertical:
10.0),
                  leading: const Icon(Icons.account_circle),
                  title: Text(
                    users1[index]['name'],
                    style: TextStyle(fontSize: 18.sp, fontWeight: FontWeight.bold),
```

6. Part of the login page code

```
  body: Container(
        height: double.infinity,
        width: double.infinity,

        child: Form(
            key: _formKey,
            child: SingleChildScrollView(
              child: Column(
                mainAxisAlignment: MainAxisAlignment.center,
                children: [
                  Text(
                    'Name of the product:',
                    style:
                        TextStyle(fontSize: 15.sp, fontWeight: FontWeight.bold),
                  ),
                  SizedBox(
                    height: 4.h,
                  ),
                  TextFormField(
                    controller: nameproduct,
                    maxLength: 10,
```

7. Part of the Favorite page code

```
)child: Container
)child: ListView.separated
,shrinkWrap: true
} (itemBuilder: ((context, index
ignore: sized_box_for_whitespace //
)return Container
,height: 24.h
)child: Row
mainAxisAlignment:
,MainAxisAlignment.spaceBetween
] :children
ignore: sized_box_for_whitespace //
)Container
,height: 20.h
,width: 30.w
)child: Image.network
,'{users1[index]['image']}$'
,fit: BoxFit.fill
,((
)Padding
                          padding: const EdgeInsets.only(top: 50)
```

پوختە

ئەمە بەرنامەیەکی مۆبایلە بۆ کرین و فرۆشتنی ئامێرە ئەلیکترۆنیەکان کەوا کریار و فرۆشیار و دوکاندار بەیەکەوە دەبەستێتەوە بە شێوەیی ئۆنلاین کەوا ئەم بەرنامەیە رێگە دەدات کەوا کریار بگەرێ لەو بابەتانەیی کە ئارەزوویی و خواستی کرینیان دەکات بەپێی بەردەست بوونوە دەتوانێ زانیاری لەسەر بابەتە دڵخوازەکەیی ببینێت لەگەل وەرگرتنی زانیاری لەسەر نرخ و ژمارەیی بابەتی بەردەست.

وە ئەمەش هاوکاری کەسانی فرۆشیار و دوکاندار و کریار دەدا کەوا ئەمەش دەبێتە هۆی روودانی جمووجۆلێکی بازرگانی تەکنەلۆژیایی بچوک لەم بەرنامەیە بۆ frontend هەریەکە لە Flutterوە بۆ backend

Firebase بەکارهاتووە وە لەم بەرنامەیەدا کریار دەتوانێ لە رێگایی هەر یەکە لە cart Visa و Master Cart پارەکەیی حەواڵە بکا وە بە ٣ زمان بەردەستە (کوردی ، عەرەبی،ئینگلیزی)ئەم بەرنامەیە یارمەتی کەسانێک دەدات کە کاتیان کەمە وە کاتیان بۆ دەگەرێنێتەوە و یاخود لە شوێنە دوورە دەستەکانن توانایی گەیشتیان لە کاتێکی دیاریکراوە نیە یاخود هەنێک جار بە دەست کەوتنی بابەت بە داشکان و نرخی خوار بازار.