

A Project Report On

True Card

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

Master of Computer Applications
(MCA)

Academic Year 2025 – 26

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Internal Guide

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Marwadi
University
Marwadi Chandarana Group





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Faculty of Computer Applications (FoCA)

Certificate

This is to certify that the project work entitled
True Card
submitted in partial fulfillment of the requirement for
the award of the degree of
Master of Computer Applications (MCA)
of the
Marwadi University
is a result of the bonafide work carried out by
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during the academic year 2025-26

Faculty Guide

HOD

Dean

DECLARATION

We hereby declare that this project work entitled True Card is a record done by us.

We also declare that the matter embodied in this project is genuine work done by us and has not been submitted whether to this University or to any other University / Institute for the fulfillment of the requirement of any course of study.

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ACKNOWLEDGEMENT

It is indeed a great pleasure to express our thanks and gratitude to all those who helped us. No serious and lasting achievement or success one can ever achieve without the help of friendly guidance and co-operation of so many people involved in the work.

We are very thankful to our guide **Jaypalsinh Gohil**, the person who makes us to follow the right steps during our project work. We express our deep sense of gratitude to for his /her guidance, suggestions and expertise at every stage. A part from that his/her valuable and expertise suggestion during documentation of our report indeed help us a lot.

Thanks to our friend and colleague who have been a source of inspiration and motivation that helped to us during our project work.

We are heartily thankful to the Dean of our department **Dr. R. Sridaran** sir and HoD **Dr. Sunil Bajaja** sir for giving us an opportunity to work over this project and for their end-less and great support to all other people who directly or indirectly supported and help us to fulfil our task.

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1. Introduction

In the current digital economy, credit cards are an essential component of personal finance and consumer spending. As the variety of credit card options in the market grows, selecting the best credit card can become a daunting challenge for consumers. Every credit card provides distinct advantages and rewards in different spending areas like groceries, fuel, online purchases, travel, bill payments, and food delivery. Nonetheless, the absence of tailored advice frequently causes people to choose cards that are incompatible with their spending patterns, leading to lost rewards or increased fees.

To tackle this problem, our initiative introduces **True Card a Credit Card Recommendation System** – a smart solution aimed at suggesting the best credit card aligned with a user's unique spending habits. The platform enables users to enter their monthly expenditures in different categories like Groceries & Essentials, Online Shopping, Fuel, Food Delivery and Dining, Travel (flights, IRCTC, cabs), Bill Payments (electricity, mobile, WiFi), and others. With this information, the system evaluates the user's preferences and contrasts them with the rewards and benefit frameworks of different credit cards to provide a tailored suggestion.

This project's aim is to streamline the credit card choice process by providing data-informed recommendations that enhance advantages for the user. The recommendation system can rely on established rules, such as aligning significant fuel expenditures with cards that provide fuel surcharge exemptions and cashback, or it can be advanced by employing machine learning methods to analyze previous users and their contentment with the cards selected.

This system is useful for new credit card owners, seasoned users aiming to enhance their cards, and for anyone wanting to improve their credit utilization. It enhances financial decision-making, saves time, minimizes research effort, and guarantees that users make knowledgeable choices.

As the focus on tailored financial solutions increases, this initiative represents progress in automating and improving user experiences within the financial technology sector. By integrating actual user feedback with credit card functionalities, our system seeks to provide intelligent, effective, and advantageous recommendations personalized for each individual.

2. Preamble

2.1 Module description:

Module 1: User Input Module

The User Input Module is responsible for collecting essential personal and financial information from the user to personalize credit card recommendations. This module is the first point of interaction and plays a critical role in tailoring suggestions based on the user's profile. The data collected includes name, email address, phone number, date of birth (DOB), annual income, and employment status.

To ensure privacy and faster access, all the collected data is stored locally on the user's device using local storage mechanisms such as SharedPreferences. This also removes the need for authentication, allowing the app to function offline for input and recommendation. The local storage approach keeps user data secure and private while still enabling the app to make intelligent suggestions.

The input fields are validated in real-time to ensure data consistency (e.g., valid email format, number limits for income, etc.). This module also allows for easy updates to the user's details if they wish to modify their inputs later. It acts as the foundation for generating credit card matches in the next stages of the application.

Module 2: Firebase Offer Database Module

The Firebase Offer Database Module serves as the centralized backend for storing and managing predefined credit card offers. Each credit card entry includes structured data such as the card name, cashback or reward rate, applicable spending categories (e.g., food, travel, shopping), platform-specific benefits (e.g., Zomato, Swiggy), and eligibility conditions like minimum annual income or employment type.

All offer data is stored in Firebase Firestore enabling fast and scalable access. This module allows seamless querying and retrieval of cards that match user criteria, and it also supports dynamic updates to the offer list without requiring an app update. For security and flexibility, admin access can be implemented later to modify offers through a backend panel.

The modular design ensures that card offers are decoupled from the app logic, making it easy to maintain and scale the database. This module acts as the core data provider for generating recommendations in the following stages.

Module 3: Card Recommendation Logic Module

The Card Recommendation Logic Module is responsible for intelligently matching user inputs with the best-suited credit cards from the Firebase database. Once the user data is collected (name, income, category-wise spending, etc.), this module compares the user profile against the predefined card offers to generate personalized suggestions.

The logic involves filtering cards based on the user's income eligibility and mapping their spending patterns to categories that offer the highest rewards or cashback. For example, if a user spends most on food delivery and meets the income requirement, a card like HDFC Pixel with 5% cashback on Zomato will be recommended.

Designed for extensibility, this logic can be enhanced in the future to include multi-category matching, scoring algorithms, or even AI-based recommendation systems. It forms the intelligence layer of the platform, ensuring that each suggestion maximizes value for the user.

Module 4: Card Display & Result Module

The Card Display & Result Module is responsible for showcasing the final list of recommended credit cards based on the user's input and backend matching logic. Each recommended card is presented in an appealing card-like UI that mimics a real credit card layout. This includes a photo of the credit card, its name, and a summary of key features to help users make informed decisions.

Along with the visual card and its benefits, this module displays critical financial details such as the joining fee and annual fee. This helps users evaluate not just the rewards but also the cost of owning the card. For convenience, each card also includes an "Apply Now" button that, when clicked, redirects the user to the official application page on the respective bank's website, ensuring safe and legitimate redirection.

3. REVIEW OF LITERATURE

3.1 Credit Card Recommendation Systems: An Overview

Credit card recommendation systems match people with suitable credit cards based on their spending habits and preferences. They use financial data, like monthly spending on groceries and dining, to help users gain rewards and reduce fees. Early systems relied on simple rules, recommending cards based on specific spending. Newer systems use machine learning to adapt to changing spending habits, using methods like clustering and regression to predict the best credit card for each user.

3.2 The Role of Personalization in Credit Card Recommendations

By utilizing detailed user profiles, including spending habits and credit history, organizations can improve satisfaction compared to generic offers. Key findings indicate that behavioral segmentation aligns heavy spenders with appropriate cashback cards, while dynamic learning from transaction data allows continual adaptation of suggestions, aligning with changing user lifestyles and preferences, thus optimizing rewards and enhancing the user experience.

3.3 Credit Card Recommendation Algorithms

Various algorithms are used for recommendations, each with advantages and disadvantages. Collaborative Filtering analyzes similar users' preferences, assuming shared spending patterns indicate similar credit card interests. Its drawback is the need for substantial user data, posing challenges for new users with limited information. Conversely, Content-Based Filtering suggests cards based on user profiles compared to card attributes. Hybrid Approaches merge both methods, addressing individual limitations and enhancing recommendation accuracy.

3.4 Integration of Financial and Credit Scoring Data

Credit card recommendation systems improve accuracy by factoring in users' credit scores, income, and financial health. Incorporating these elements increases eligible card suggestions, reduces rejections, and enhances satisfaction. Key findings highlight the importance of credit scores and debt-to-income ratios in promoting responsible credit utilization and ensuring realistic qualifications.

3.5 Challenges and Limitations of Existing Systems

Challenges in credit card recommendation systems include data privacy and security concerns, as users are reluctant to share sensitive financial information. Maintaining personalized experiences while protecting data is crucial. Additionally, inconsistencies in transaction categorization can hinder the system's accuracy, affecting its ability to provide reliable recommendations.

4. TECHNICAL DESCRIPTION

4.1 Hardware Requirements

Processor	1GHz dual-core or quad-core
Ram	2GB Minimum
Storage	500MB Minimum
Display	Good Resolution
Internet connection	Stable Internet Connection

Table 4.1 Hardware Requirements

4.2 Software Requirements

OS	Android Version 7+
SDK	Android SDK
Internet Access	Allowed Apps To Use Internet

Table 4.2 Software Requirements

5. SYSTEM DESIGN AND DEVELOPMENT

5.1. Algorithm:

An algorithm diagram illustrates the step-by-step procedure to arrive at a solution. For **True Card**, the algorithm might look something like:

- 1. Input User Data:** Collect user spending data (categories: groceries, travel, fuel, etc.).
- 2. Identify Relevant Credit Cards:** Match cards offering rewards in the highest spending categories.
- 3. Evaluate Reward Frameworks:** Compare the rewards and benefits of relevant cards.
- 4. Recommendation Engine:** Generate a suggestion based on maximum benefit for the user.
- 5. Display Result:** Present the recommended credit card to the user.

5.2 Flow Chart

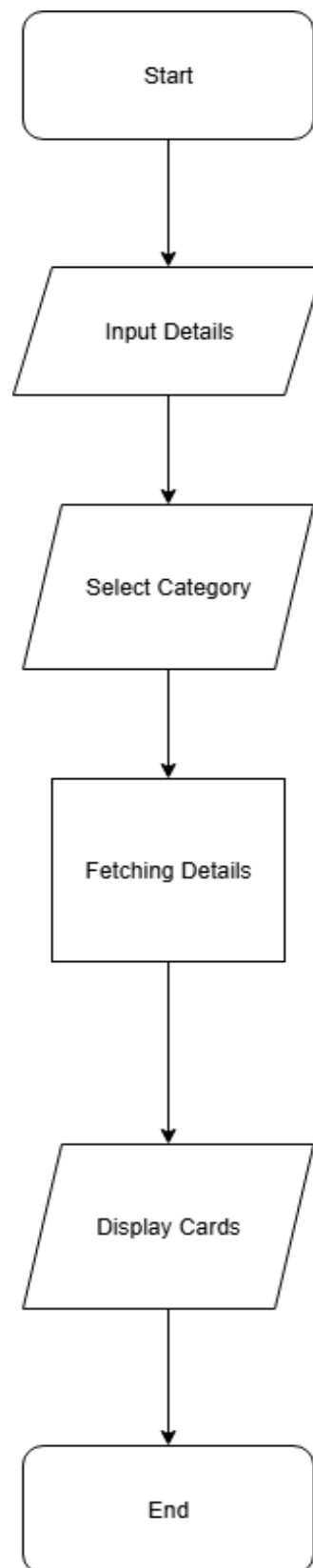


Figure 5.1 Flow Chart

5.3 Data Flow Diagram

5.3.1: Context DFD

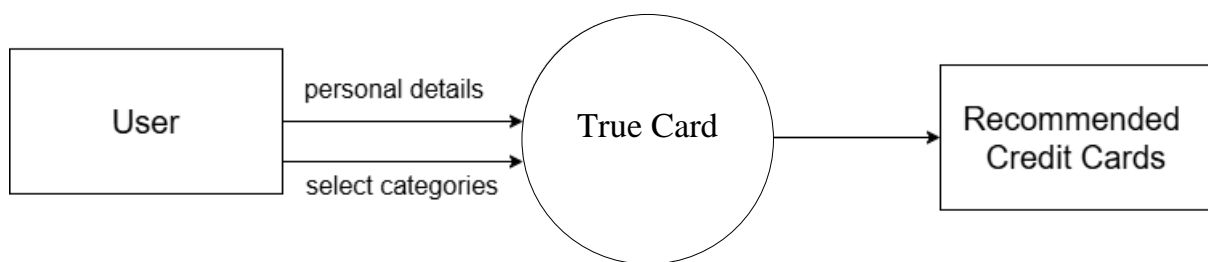
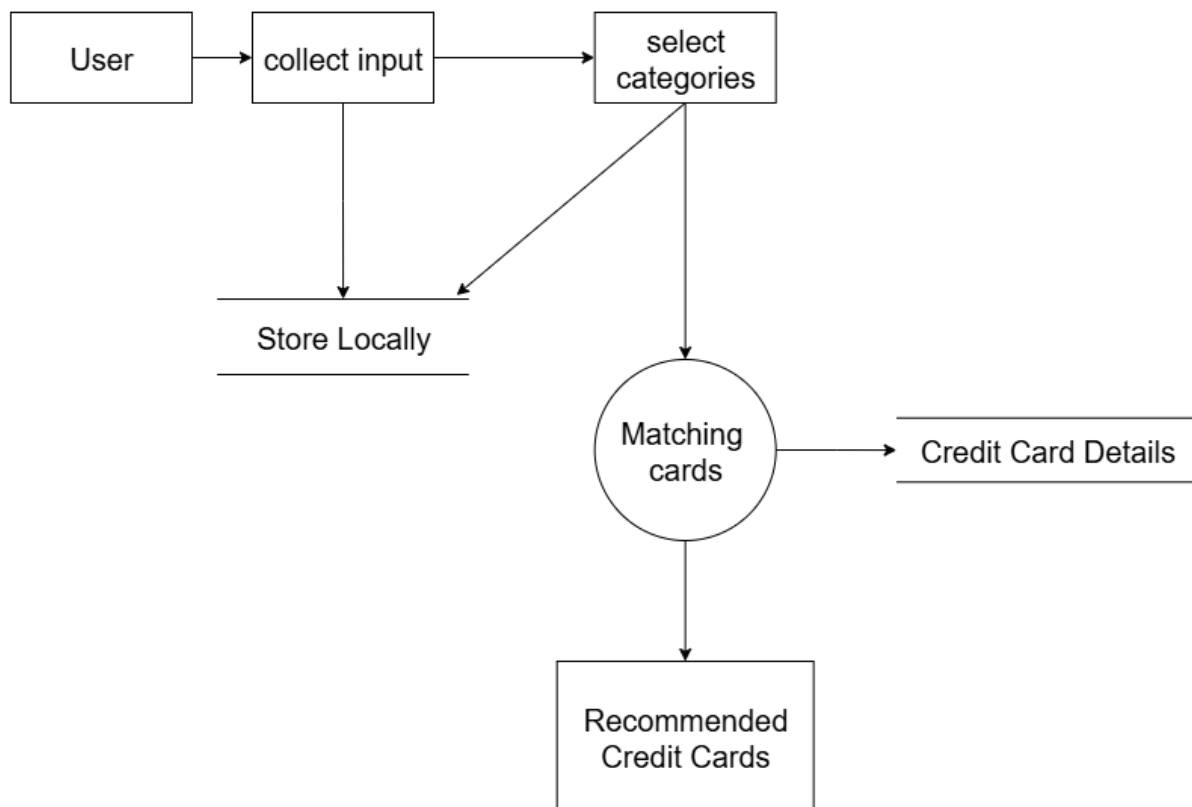


Figure 5.2 Context Diagram

5.3.2: DFD Level 1:**Figure 5.3 Data Flow Diagram Level 1**

5.4 Use case

5.4.1 User Side:

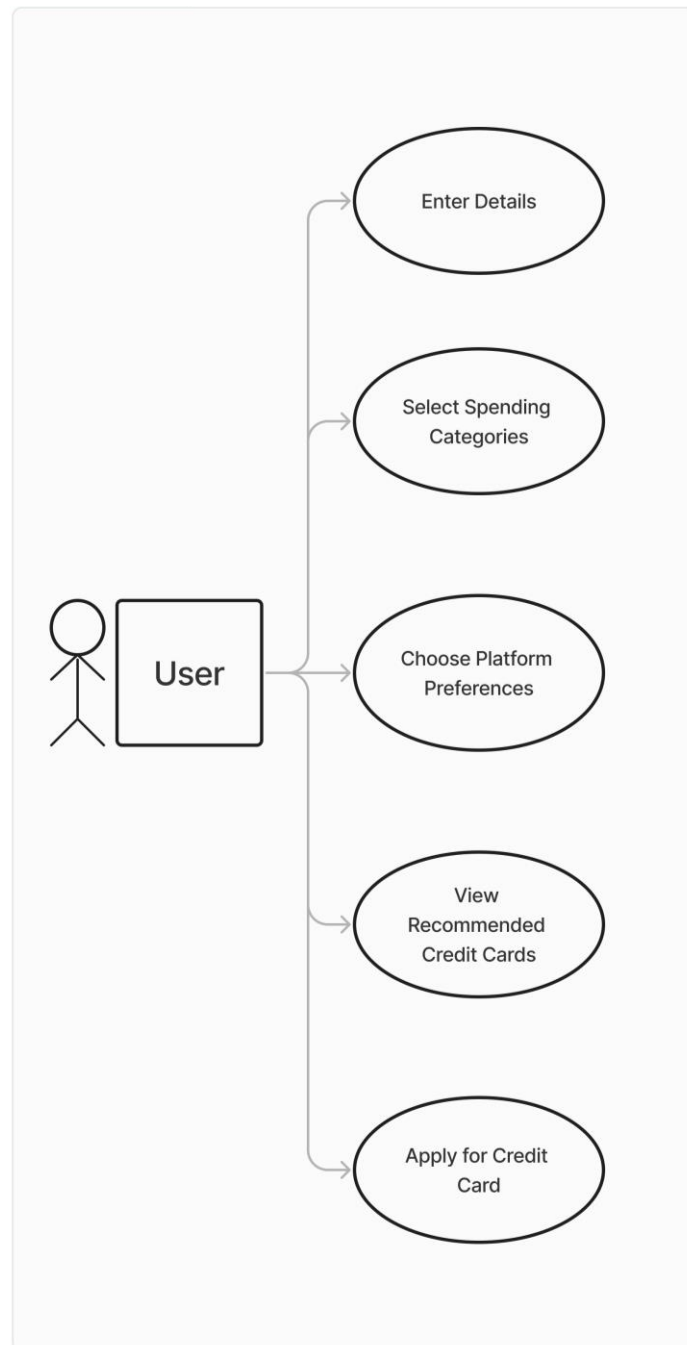


Figure 5.4 Use Case: User Side

5.4.2 System / Admin Side:

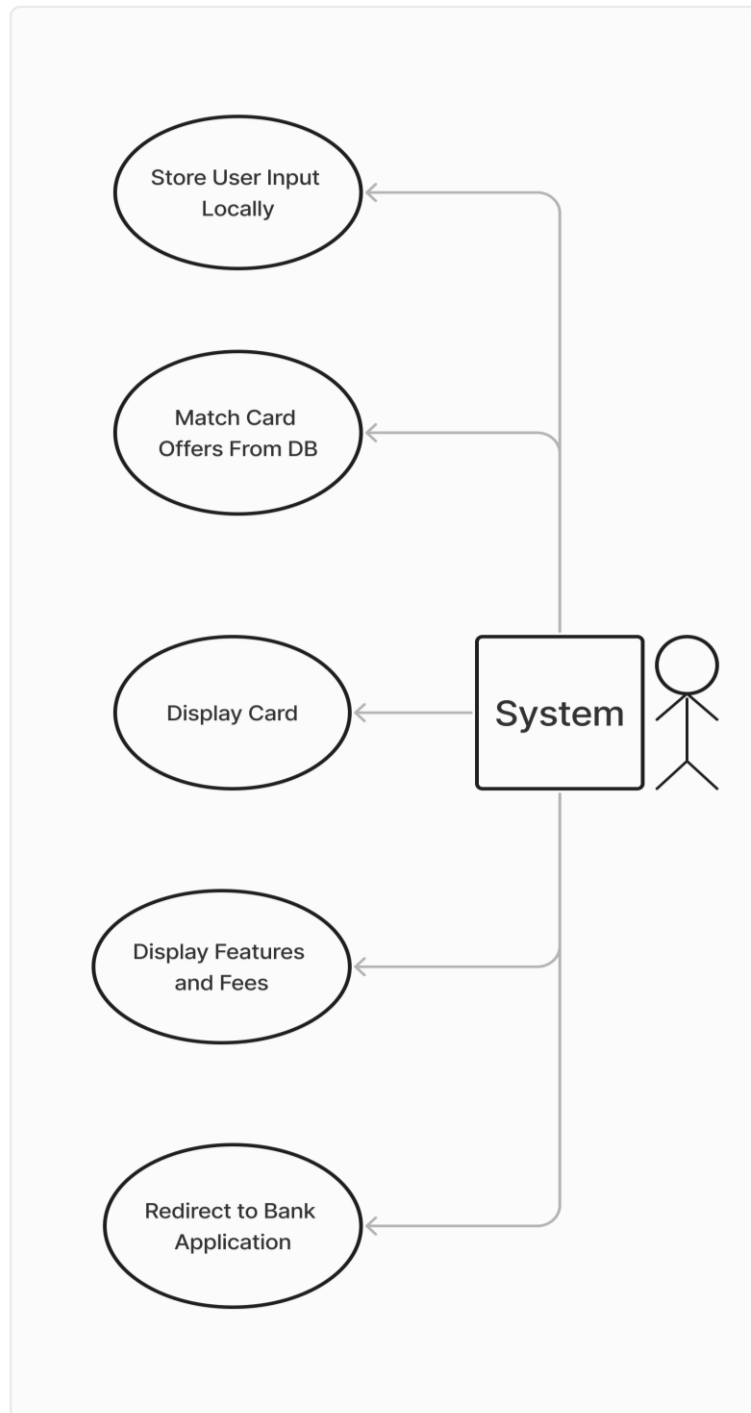


Figure 5.5 Use Case: Admin/System Side

5.5 Sequence Diagram

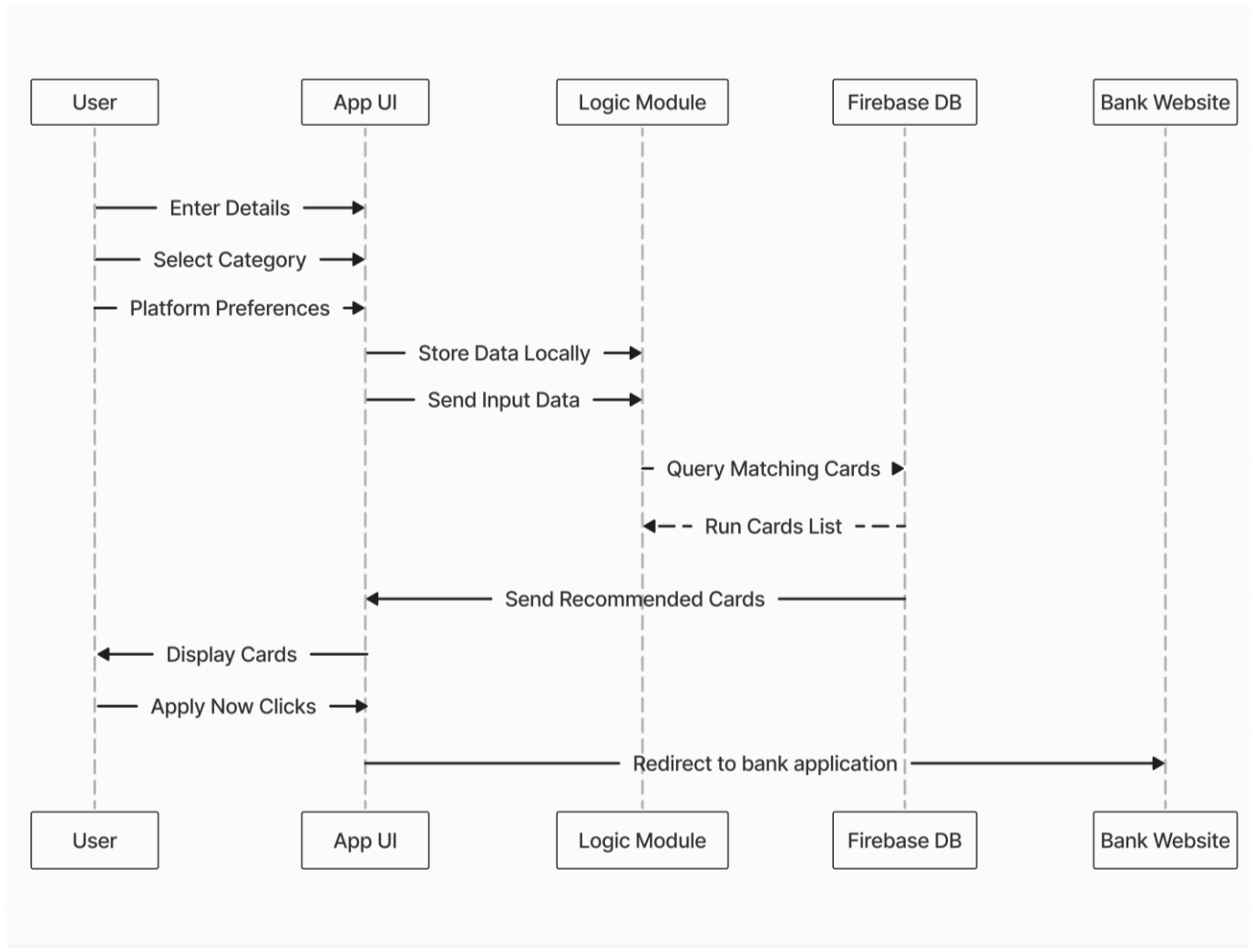


Figure 5.6 Sequence Diagram

5.6 Activity Diagram

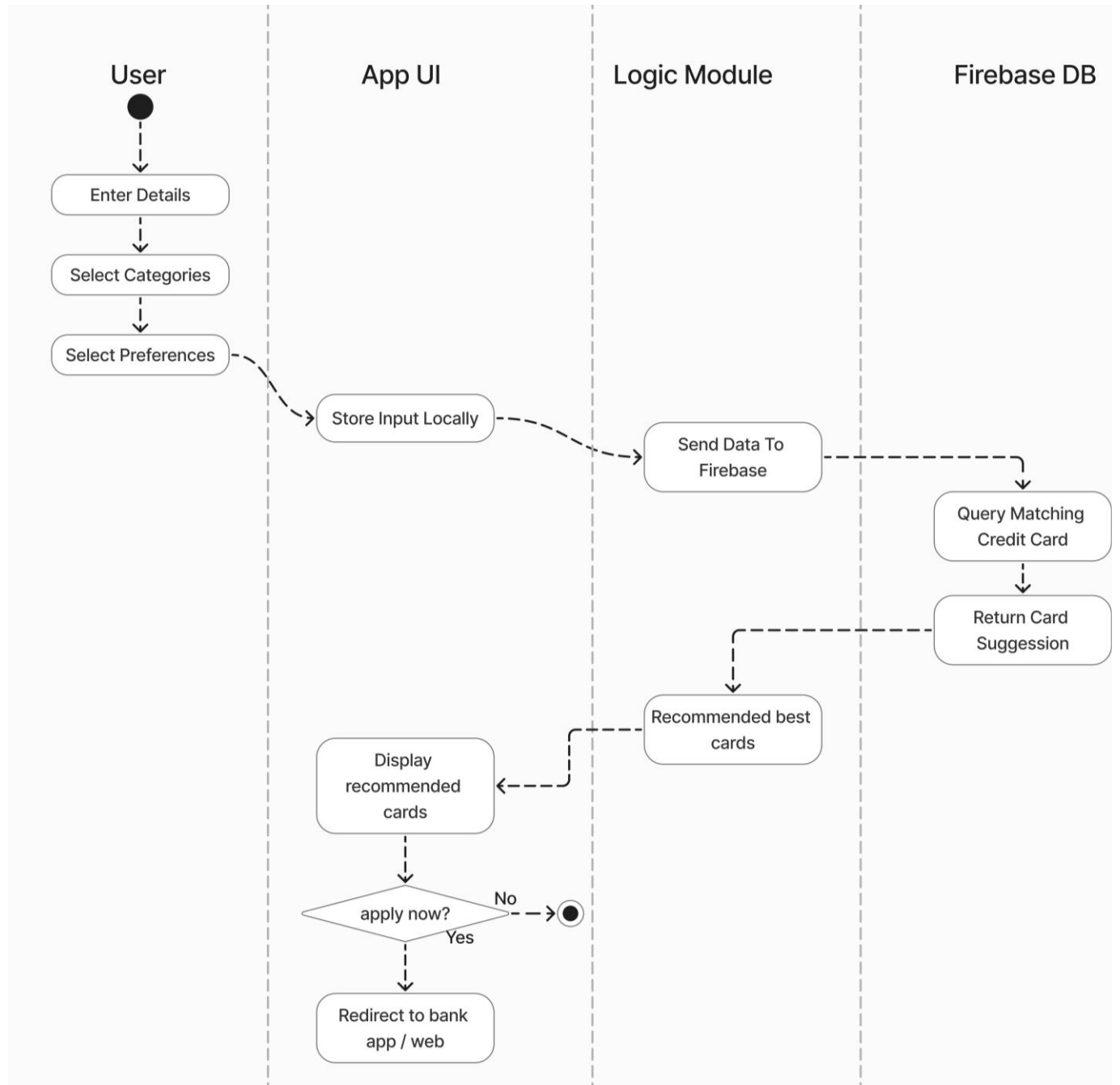


Figure 5.7 Activity Diagram

5.7 Class Diagram

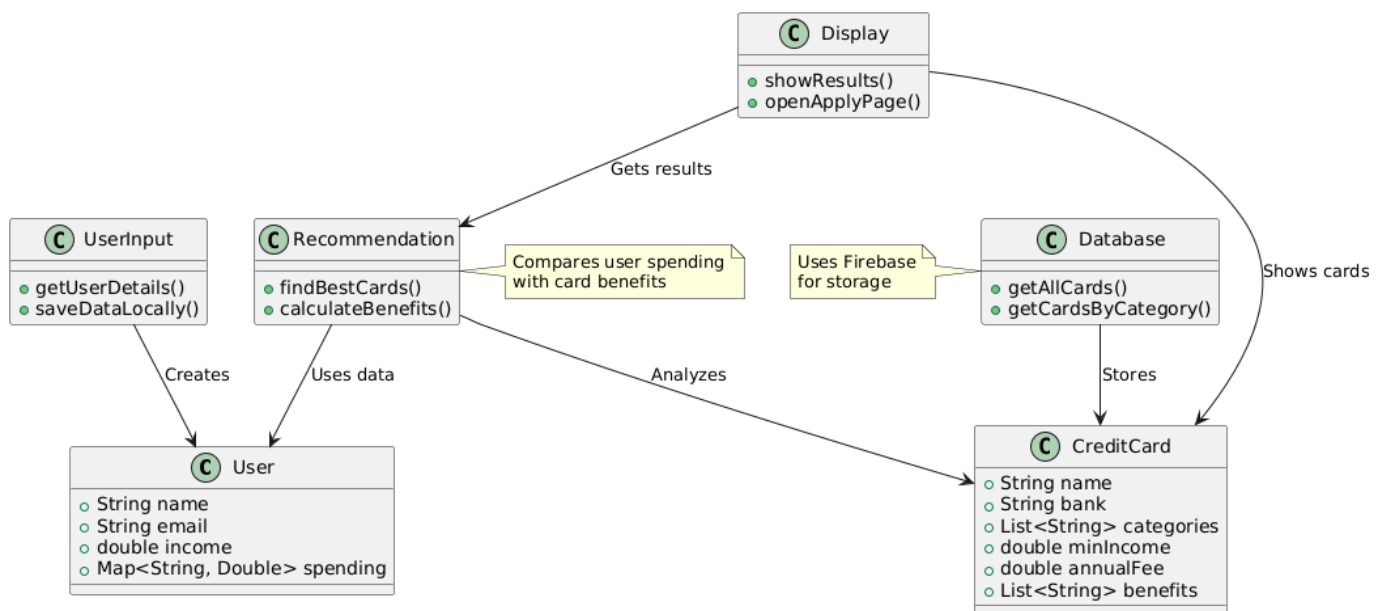


Figure 5.8 Class Diagram

5.8 Database Design / File Structure

Collection name : credit_card

```
{  
  "id": "int",  
  "cardName": "string",  
  "bank": "string",  
  "category": ["List of string"],  
  "minIncome": int,  
  "joiningFee": int,  
  "annualFee": int,  
  "features": ["List of string"],  
  "imageUrl": "location_url ",  
  "applyUrl": "bank_url"  
}
```


5.9. Screen Design

Home screen

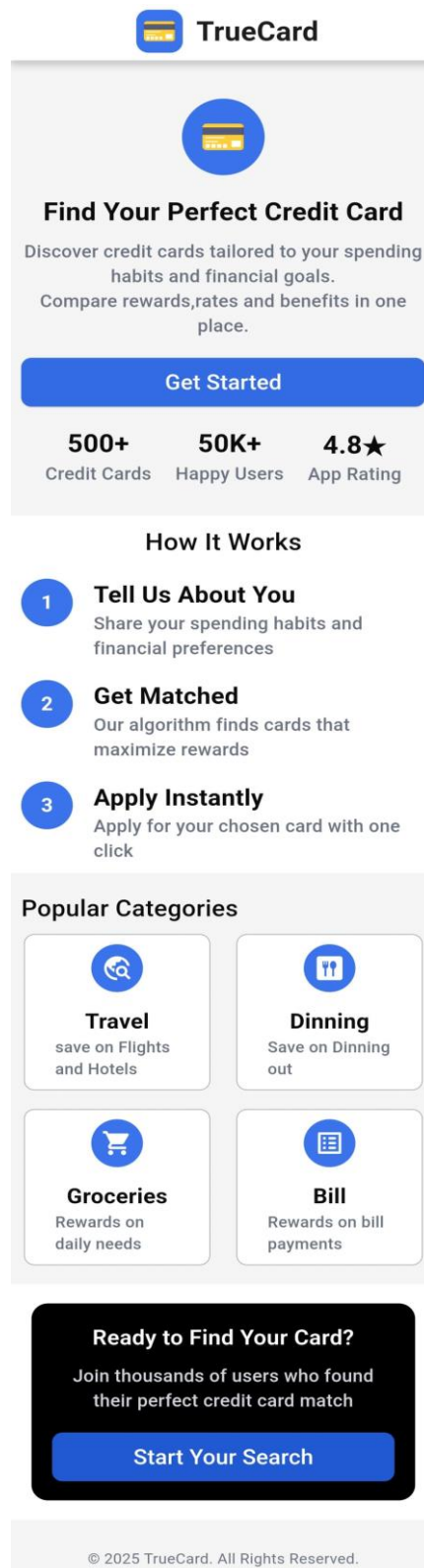



Figure 5.9 Home Screen

Welcome Back Screen


 TrueCard

Welcome Back!




Based on your preferences, here are your personalized credit card recommendations.

[Start New Selection Process](#)

Your Past Matches


**Hdfc Pixel**

Dining & Cashback




-  5x rewards on Zomato
-  2x points on Swiggy
-  1% cashback on Dinning

Annual Fee ₹ 500 Joining Fee ₹ 0

[Apply Now](#)

**SBI Cashback**

Dining & Cashback

-  3x rewards on Zomato
-  5x points on Swiggy
-  5% cashback on Dinning

Annual Fee ₹ 200 Joining Fee ₹ 0

[Apply Now](#)


Why These Cards?

- ✓ Match your travel spending category preferences
- ✓ Fit within your preferred annual fee range
- ✓ Offer competitive welcome bonuses

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Figure 5.10 Welcome Back Screen

Personal Details

 Personal Details

Step 1 of 3

33%

Tell us about yourself

We need some basic information to find the best credit card options for you.

Name


Email Address

Contact Number

Employment status

Select Category ▼

Annual Income


 Your information is secure and will only be used to find the best credit card matches for you.

Continue

All fields are required to continue

Figure 5.11 Person Details







Select Categories


 **Select Categories**

Step 2 of 3

67%

What do you spend on most?
Select the categories where you spend the most money. This helps us find cards with the best rewards for you.

 Travel Flights & Hotels	 Gas Fuel & Stations
 Dinning Restaurant & Food	 Groccessary Food & Essential
 E-commerce Online shopping & deals	 Utilites Bills & Services

 2 categories selected.

Continue

Select atleast 1 category to continue

Figure 5.12 Select Categories

Platform preference Screen

←


Platform Preferences


Step 3 of 3


100%


Where do you order food from?


Select the platforms and restaurants you use most frequently for dining and food delivery.


 **Zomato**
Food delivery & dining


 **Swiggy**
Food delivery service


 **Uber Eats**
Food delivery platform


 **Domino's**
Pizza delivery chain


 **McDonald's**
Fast food restaurant

 **KFC**
Fried chicken chain

 **Starbucks**
Coffee & beverages

 **Local Restaurants**
Neighborhood dining

 **Food Courts**
Mall & plaza dining

 2 platforms selected.

Continue

Select atleast 1 platform to continue

Figure 5.13 Platforms Preference

Final Screen



Recommended Cards

Based on your preferences..

Your Matches



Hdfc Pixel

Dining & Cashback

- 5x rewards on Zomato
- 2x points on Swiggy
- 1% cashback on Dining

Annual Fee

₹ 500

Joining Fee

₹ 0

Apply Now



SBI Cashback

Dining & Cashback

- 3x rewards on Zomato
- 5x points on Swiggy
- 5% cashback on Dining

Annual Fee

₹ 200

Joining Fee

₹ 0

Apply Now

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Figure 5.14 Final Screen

6. System Testing

Test Case ID	Test Case Description	Test Steps	Input Data	Expected Result	Actual Result	Pass/Fail	Remarks
TC001	Fetching Applicable Cards	1. Open application 2. Enter valid card 3. Fetch applicable cards	Valid Card	List of applicable cards	Display list of applicable cards	Pass	
TC002	Response Time Under Normal Load	1. Perform card fetch under normal conditions 2. Measure response time	Valid Card	Response in 5-10 seconds	Response in ~7 sec	Pass	Performance within acceptable range
TC003	Compatibility in Smartphone	1. Install application 2. Run on Android device	Android Device	Application should function properly	Application working fine	Pass	
TC004	Compatibility in iOS	1. Install application 2. Run on iOS device	iOS Device	Application should function properly	Application crashed / not working	Fail	Needs bug fix for iOS
TC005	Redirecting to Vendor Website	Fetch card And Click on vendor redirect link	After fetching card redirect action	Proper redirection without crash	Redirect successful, no crash	Pass	
TC006	Slow or No Internet Connectivity	Disconnect or slow down internet Try fetching card data	Limited /No Internet	Show error message, system should not crash	Application handled gracefully, no crash	Fail	

7. Conclusion

The TrueCard Credit Card Recommendation System represents a giant leap in personal financial technology in solving the most basic, everyday problem millions of consumers face - figuring out what credit card is best for the way they spend. We have solved this problem through our research, system design, and user-testing, and engaged, all to develop a solid solution and fundamentally change how people make credit card decisions.

A traditional review of credit cards can take a significant amount of time manually comparing up to dozens of cards with a variety of reward structures and fees - often times engineered to be purposefully misleading just to get you to sign up. In these cases, the card often provides the 'lesser' value or potentially costs money by choosing the wrong credit card. Our approach is to eliminate the manual effort and decrease the amount of consumer choice of a card through intelligent analysis of spending behaviour too match a card's feature.

The system operates through an orchestrated algorithm shopping process using several dimensions of user's spending behaviours that can be evaluated:

1. Analysis based on category spend (groceries, fuel, travel, bills, etc.)
2. Reward calculation based on the bank's reward structure and card features.
3. Ranking the cards, based on the user's personal spending behaviours, to maximize reward features offered under each card.
4. Screening to identify the cards that meet the user's personal conditions (e.g. earning intervals, duration, expectations).

By evaluating these issues at one time TrueCard is able to assess what hours of manual consuming research would not be able to accomplish within seconds.

8. Learning during project work

From a technical point of view, we felt that we have developed an understanding of the difficulties in financial product recommendation systems. Since we were processing payment data and reading through the spending pattern information, we also looked into the problems of the relationship between consumer behavior and credit card rewards.

We further learned that even slight differences in interpretations of a certain spending category would greatly affect the outcome, and this led us to consider separate algorithms for an iterative refinement process.

TrueCard has been a deeply learning experience for us in advancing our technical skill sets, teamwork, and financial knowledge. It builds upon our systems design abilities. These learnings will transcend the project to impact our approach to fintech design problems as we continue to develop mobile application software.

8.1 Future Enhancements

Several major feature additions could serve to enhance the utility and UX of TrueCard, building on our Flutter credit card recommendation tool we already have in place. True to Flutter's mobile-first paradigm, TrueCard could perhaps build in integrated real-time expenditure tracking by hooking into third-party financial aggregators such as Plaid or Razorpay, the app can parse users transaction history by itself instead of having to depend on manual input. This would give rise to live recommendations, continuously evolving with the users spending behavior.

Coming to the very recommendation engine, it also can grow with the help of Machine Learning. They could work on their own predictive models that forecast and predict not just relevance to current spending but future financial needs tied to spending trends and life events. Suggestions could then be communicated to the users proactively, recommending card upgrades or alternative products where it is in their best interest.

Not only relevance to current spending but future financial needs along with a tie to spending trends and life events can be done. Suggestions could then be communicated to the users proactively, recommending card upgrades or alternative products where it is in their best interest.

Another area with potential is user engagement-based features. A full-fledged reward tracker could be designed in the app, enabling users to keep track of their benefits and find ways to maximize them with all of their cards. Push notifications could be sent to the user for benefits about to expire or special

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