



DigiDerm

An Online Dermatology Application

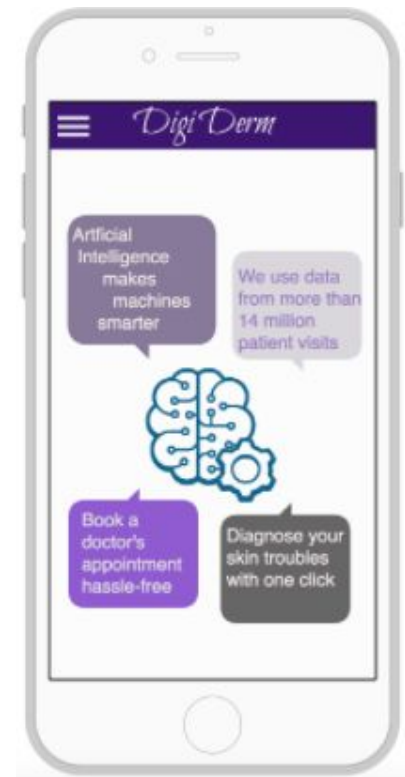
Team 5

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Guang Shi

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Vardan Gupta





Introduction

- **DigiDerm** is a dermatology mobile application

- Focus: Skin Problems

E.g. acne (chronic), cold sores (acute)

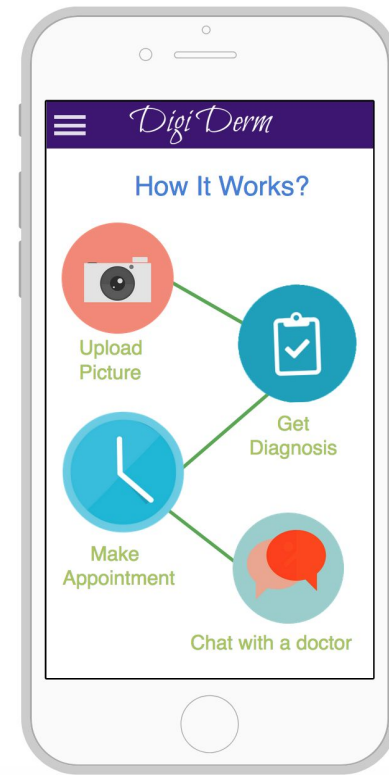
- Primary Function:

Provide Skin Problem Diagnosis



- Users Side:

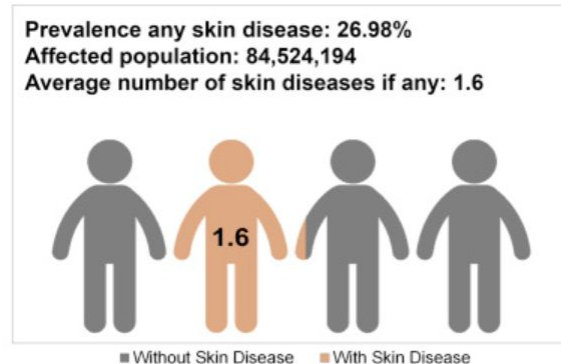
Upload Anonymous Photo of Ailing Skins



Why We Chose Skin Problems



- Each of our group members has experienced skin problems before
- Skin disease is one of the leading causes of global disease burden
- Around 27% of the total population is troubled by skin problems



“The burden of skin disease in the United States”, Journal of the American Academy of Dermatology, May 2017,

Volume 76, Issue 5, Pages 958-972.e2



Data Collection Approach

- **Questionnaire** - Total **26** questions:

1). **Demographic Info**: Age, Gender, Occupation, Parent or not

2). **Skin Problem Experience**: over the last two years

3). **Comfortability with AI & Anonymous Photos**

4). **Comfortability with Online Medical info & Mobile App**

5). **Detailed Preferences on Online doctors**:

Doctor profile, Appointment Waiting Time, Pay for Consultation

6). **Tendency towards Medicine and Pharmacy Advice**

Skin disease Diagnosis

We are developing a skin diagnosis application for diagnosing skin related issues. We want to create an application where the user just uploads a photo of the affected skin area, and our application diagnoses it in seconds. We are also conducting a survey for the same, to get a better understanding of user requirements. Please help us out by filling in the survey below.

1. What is your age?

Mark only one oval.

- ☐ 15-24
☐ 25-34
☐ 35-44
☐ 45-54
☐ 55-70

2. Which gender do you identify with?

Mark only one oval.

- ☐ Male
☐ Female
☐ Transgender
☐ Other

3. What is your occupation?

Mark only one oval.

- ☐ Student
☐ Teacher
☐ Business person
☐ Engineer
☐ Other: _____

4. Are you a parent?

Mark only one oval.

- ☐ Yes
☐ No

5. Have your kids ever had any skin problems like diaper rash etc?

Mark only one oval.

- ☐ Yes
☐ No



Data Collection Approach



- Questionnaire

- *Questionnaire posted on social media platforms*



Facebook



Twitter



WhatsApp



WeChat

- *Total **173** feedbacks*



2nd

Data Collection Approach

- Interviews

- Interviewed **8** people
- **4** male, **4** female
- **4** working individuals, **2** students, **2** full-time parents
- Questions focus on:

Demographic info, Past skin problems experience, Parents or not,

Prefer doctor or online diagnostic app



Comfortability Level with AI

Willingness to share skin condition with others



Like Discussion Forum Idea



Data Analysis Results

- **Demographic Summary**

- Ages: 15 - 54 years old
- Gender: 58% female, 41.4% male and 0.06% transgender
- Occupation: majority of them are students and engineers
- Family Status: $\frac{1}{3}$ of the respondents are married with kids



Data Analysis Results



Feasibility

- Skin Problem Prevalence
 - More than one third (**33.1%**) of the participants had skin problems during last two years
 - **2/3** of the participated parents have been bothered by skin problems with their kids
- Potential User Technology Comfort Level
 - More than half (**59.7%**) of the participants feel comfortable with AI
 - **70.6%** of the participants are using smartphones to get health info
 - **41.2%** of the participants with skin problems tried searching symptoms online
 - **79.2%** of the participants like the idea of skin problem diagnostic app
 - **62.2%** of the participants feel safe to upload anonymous pics of ailing skins
- Preliminary Conclusion

Skin problem is quite common and there is a large potential market for a skin problem diagnostic app

POSSIBLE ☒
IMPOSSIBLE ☐

A hand with a white sleeve pointing to the 'POSSIBLE' checkbox.

GOOD CHOICE

A group of hands holding up large red letters that spell out 'GOOD CHOICE'.

Data Analysis Results



- **Key Features**

Mobile App:

- 1). Users rely on mobiles to search for medical info
- 2). Easier to upload photo of ailing skin

Pre-Diagnosis Stage:

- **Info about AI:** enhance user's confidence about the diagnostic result
- **Two User Types:** Registered User & Guest User
 - 1). Personal Information Stored for Registered Users
 - 2). Medical History Stored for Registered Users
 - 3). Medical History Input Suggested for Guest User



Data Analysis Results



- **Key Features**

Diagnosis Stage:

- **Multiple Pictures Upload Allowed**
- **Skin Problem Diagnosis by AI Provided**
- **Online Doctor Consultation**
 - 1). Registered Users Only
 - 2). Doctor's Profile Available
 - 3). ≤ 10 mins Waiting Time
 - 4). Consultation Fee Charged

Post-Diagnosis Stage:

- Diagnostic Results Sent on Request
- Over-the-counter Medicine Advice Available
- Pharmacy Advice Available
- Discussion Forum Available
- Advertisement Spots Available



Requirements Engineering



1. Identified System Boundaries

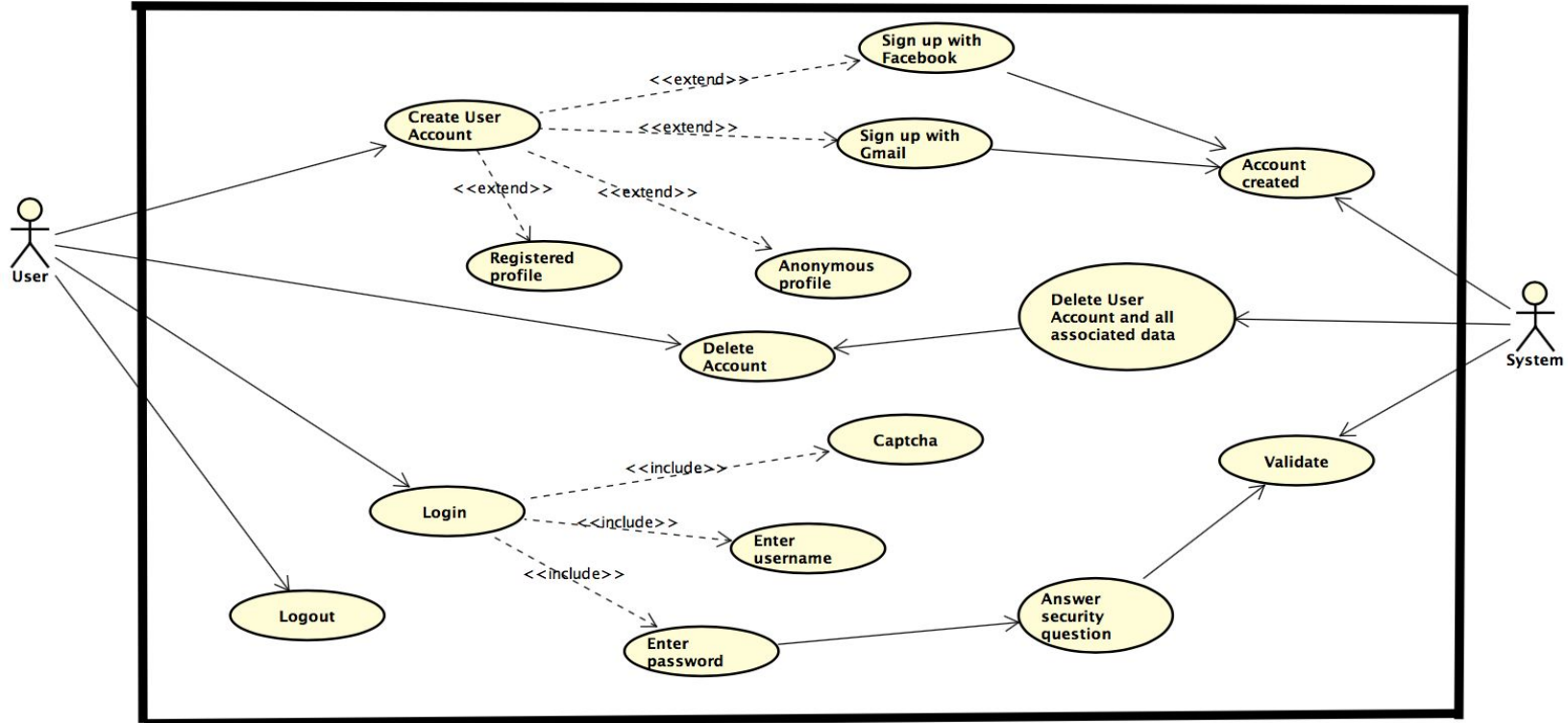
- a. Validated most of our claims
- b. Preliminary planned to have an app and web portal
- c. Upon analyzing the data gathered, decided to primarily focus on an app

2. Identified Stakeholders

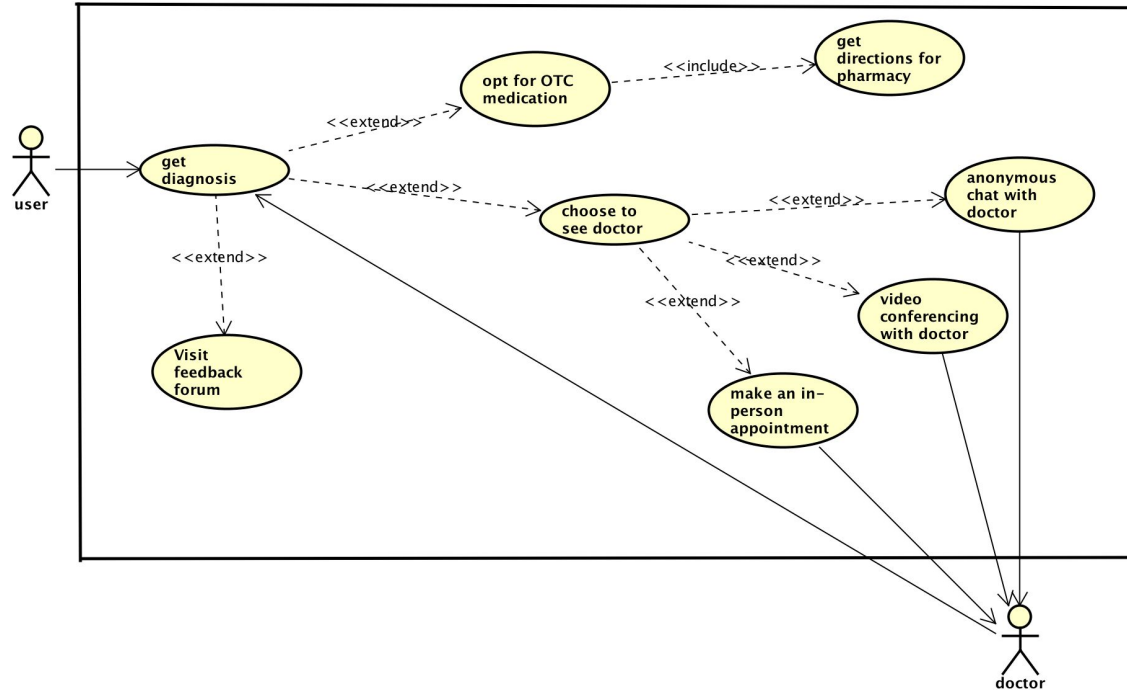
- a. Users
- b. Doctors
- c. Members of the team

3. Put together updated System Objectives and Goals with the help of RE Models.

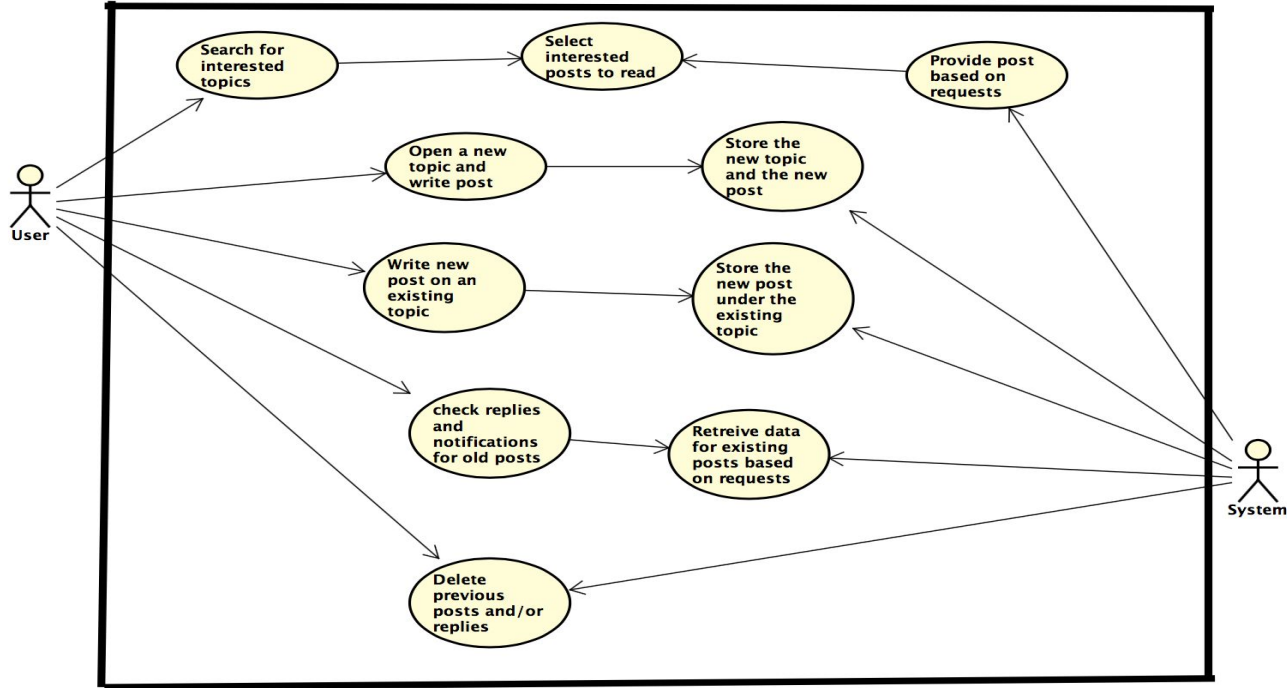
Requirements Engineering Models



Requirements Engineering Models



Requirements Engineering Models



Functional Requirements

1. Prediction based on data available

- a. Compares uploads with pictures available in database
- b. Uses Machine Learning methodologies to do so

2. A brief introduction of the working

- a. Provides brief idea of functionality on splash screen

3. Making an appointment with the doctor

- a. Will be made a premium feature in the future

4. Medicine Recommendation

- a. Over - the - Counter medication

5. Chatbot Integration

- a. Chat about queries without human intervention
- b. Will use Artificial Intelligence to generate responses to a user.

Functional Requirements

6. Video Conference and Text Feature

- a. Allows interaction between user and doctor through video
- b. Will also be premium feature in the future

7. Discussion Forums

- a. Place where users can find support and connect with each other

8. Dual Logins

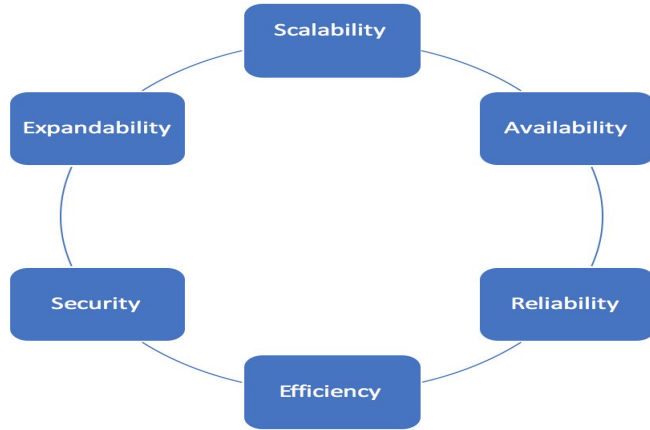
- a. User can login via a registered profile or as a guest user.

9. Send diagnosis to doctor

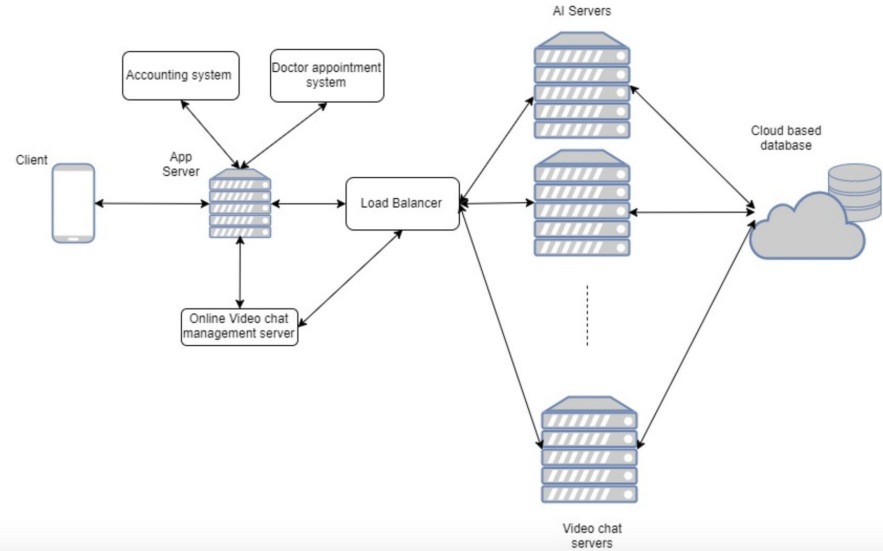
- a. Can send report to primary doctor



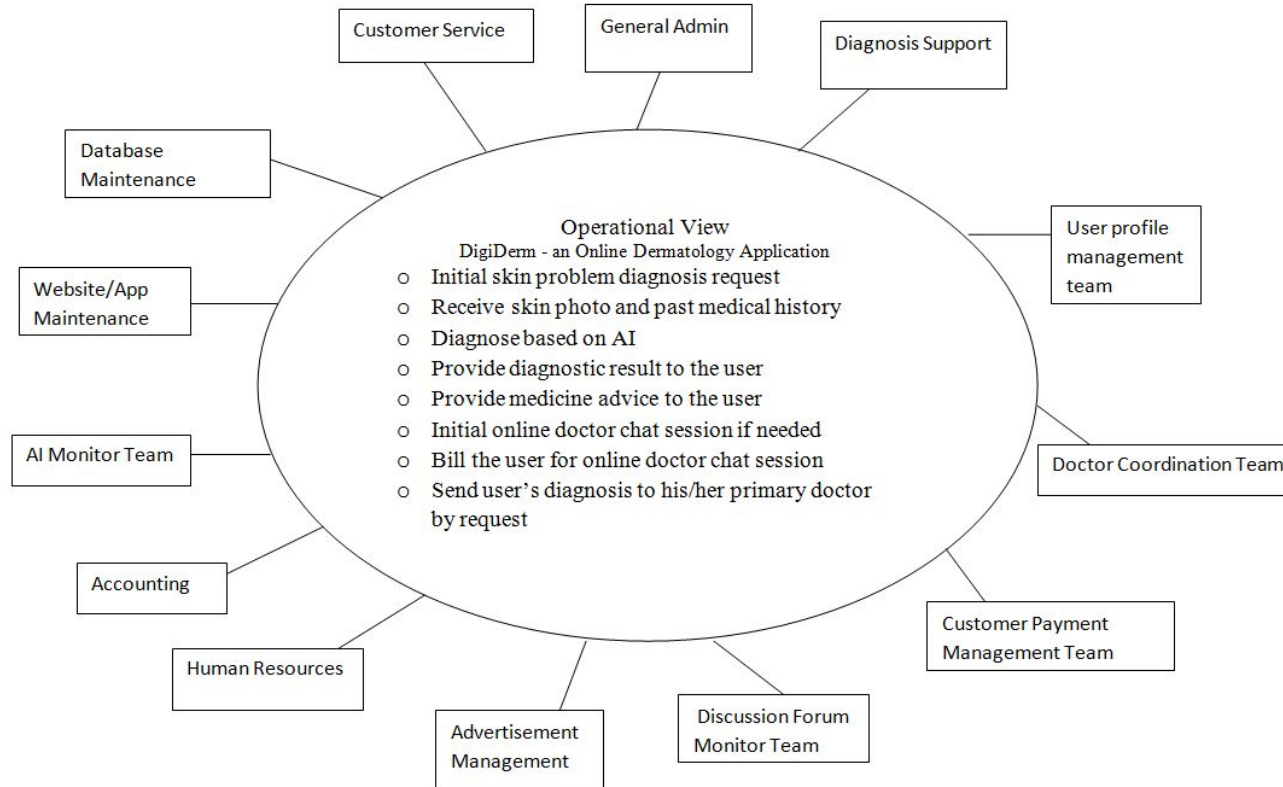
Non Functional Requirements



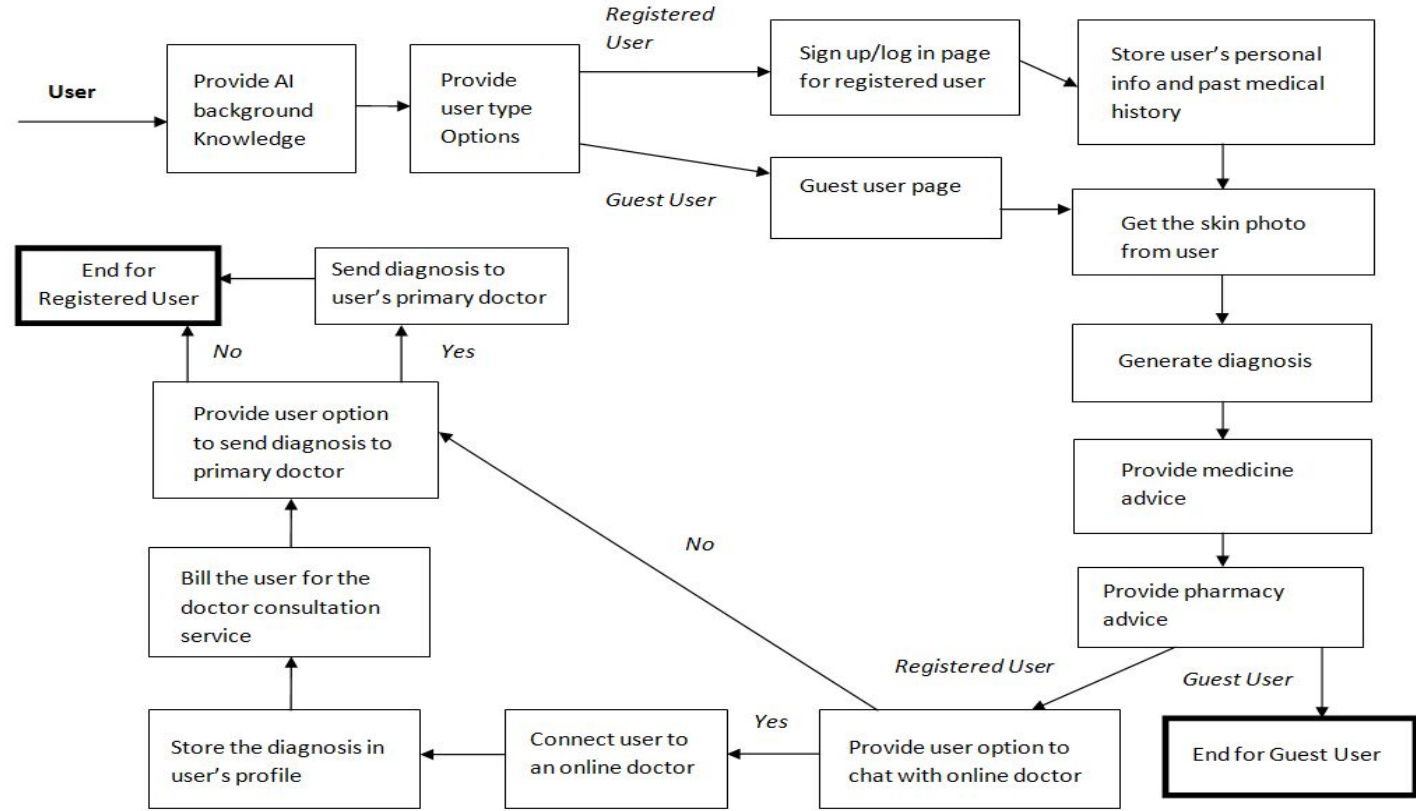
Resource View



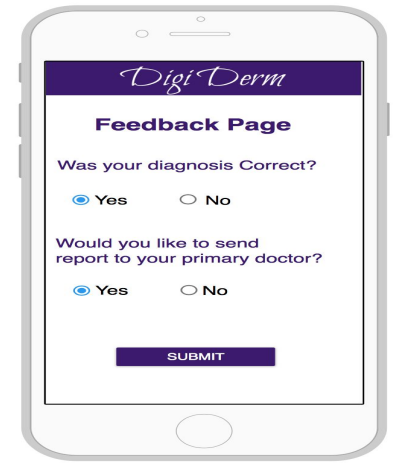
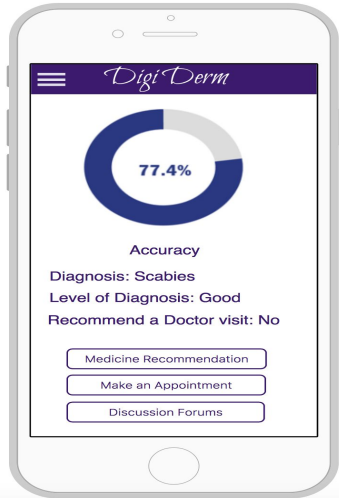
Architecture Model: Operational View



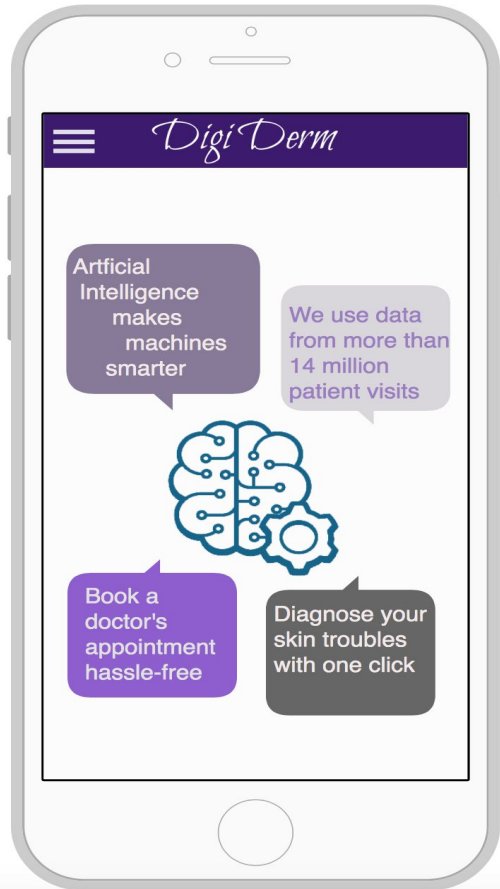
Architecture Model: Functional Block Diagram



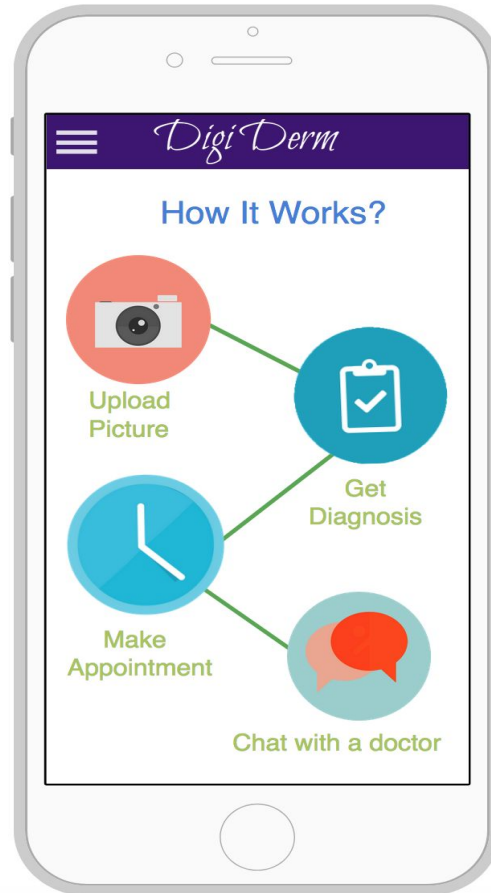
User Interface of DigiDerm



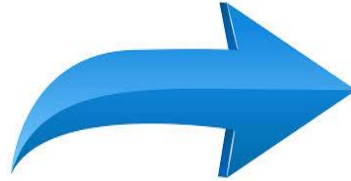
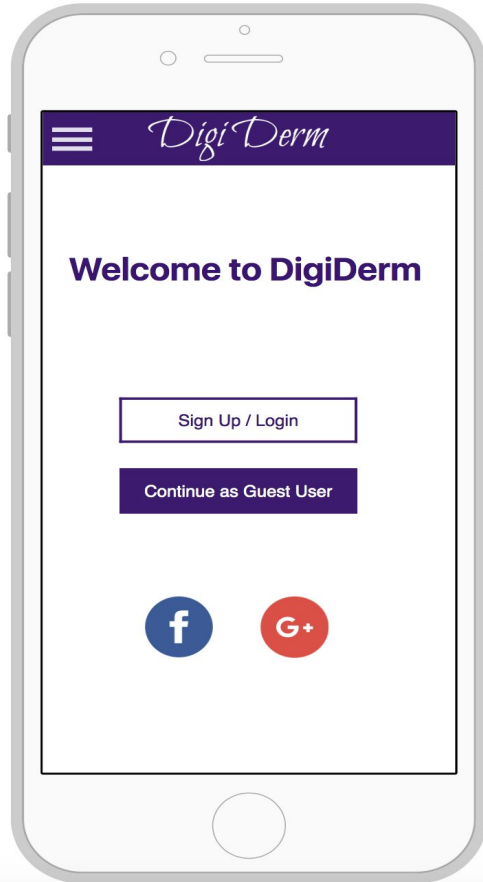
Splash Screen-1



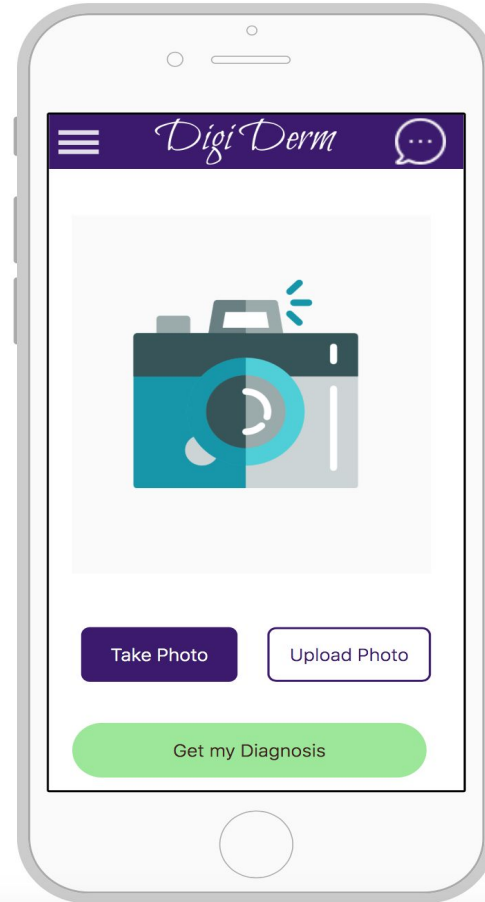
Splash Screen-2



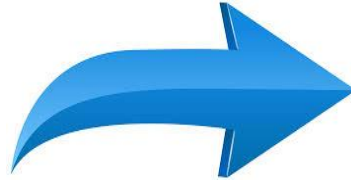
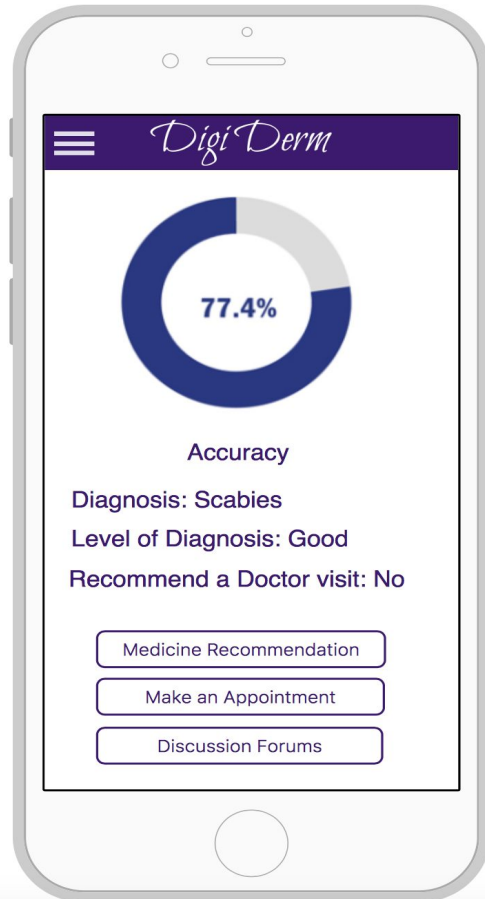
Login Page



Home Screen



Diagnosis Page



Feedback Page

The Feedback Page interface has a purple header with the 'DigiDerm' logo. The title 'Feedback Page' is centered. The first question is 'Was your diagnosis Correct?' with radio button options for 'Yes' (selected) and 'No'. The second question is 'Would you like to send report to your primary doctor?' with radio button options for 'Yes' (selected) and 'No'. At the bottom is a purple 'SUBMIT' button.

Feedback Page

Was your diagnosis Correct?

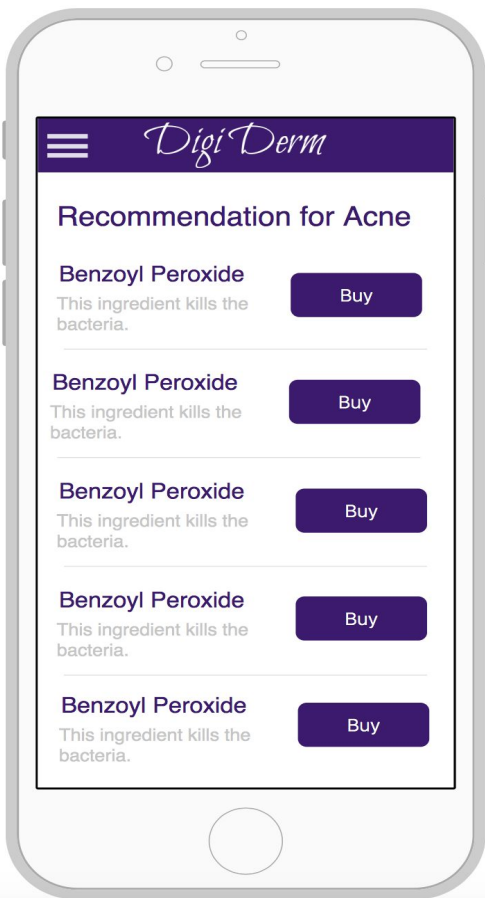
☒ Yes ☐ No

Would you like to send report to your primary doctor?

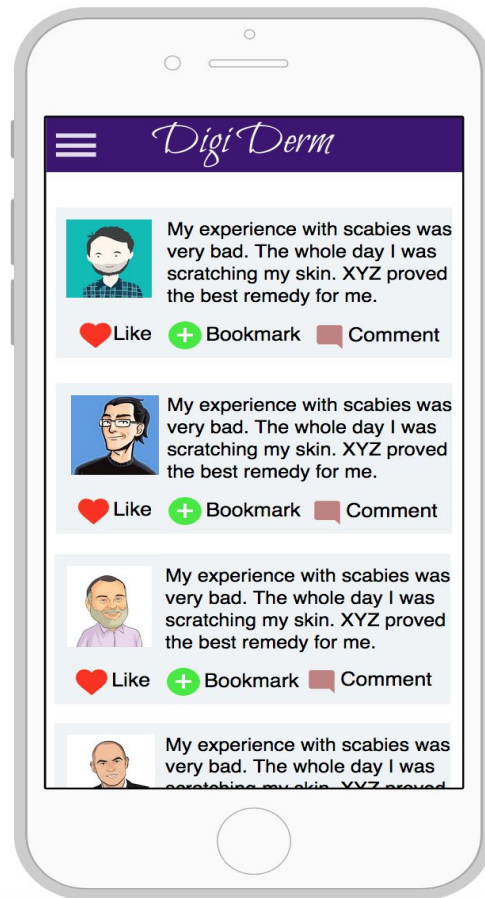
☒ Yes ☐ No

SUBMIT

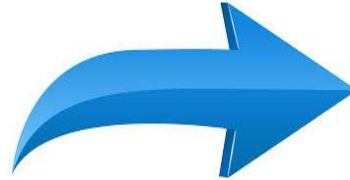
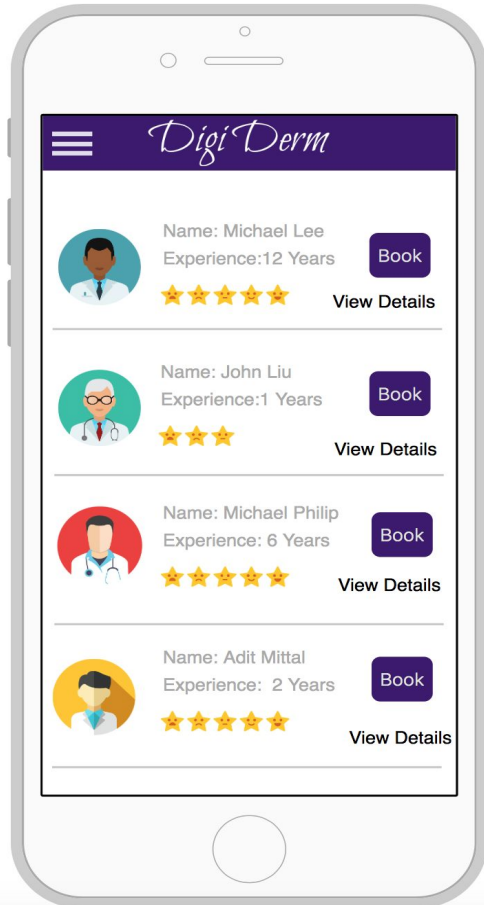
Recommendation Page



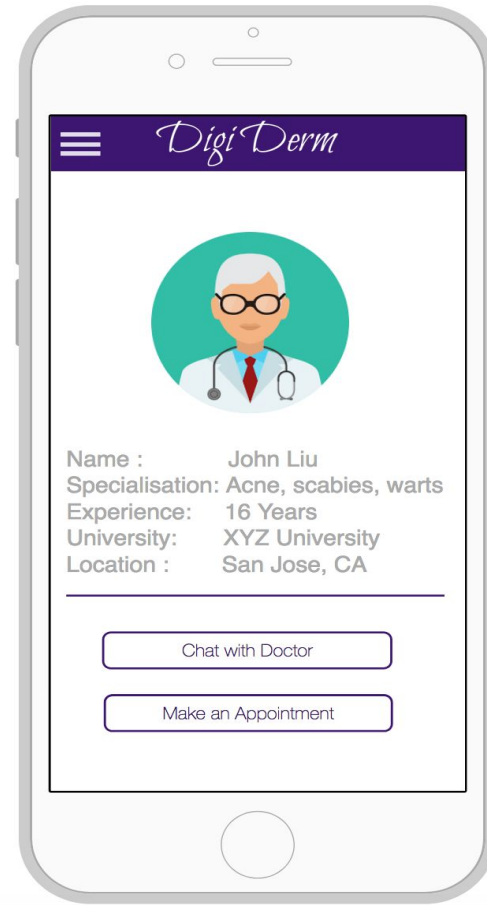
Discussion Forum



Doctor Selection Page



Doctor's Description Page



Payment Page

DigiDerm

Pay for your order: \$56

Credit Card Number:

Name on Card:

Expiry

 /

Pay Now

Chat Bot



Video Chatting Page



Lessons learned - Part I

- Topic selection
 - Everyone is capable of innovation. Just need to believe in yourself.
 - Product need to have big enough market to be viable.
- Tasks execution.
 - Partitioning the task is important.
 - Group meetings need to have clear goal and agenda.
 - Sub milestone helps in keeping project timeline incheck.
- Research approach
 - Background study need to happen before data collection.
 - Data collection is not one shot deal.

LESSONS
LEARNED



Lessons learned - part II

- Requirement and Architecture
 - Twin peak is the natural process.
 - Requirement and Architecture elicit each other and coevolve.
- Design
 - Aesthetics consideration
 - Compromisation during the design process.
 - Leveraging popular design ideas.



How Class knowledge Helping our Project - I

- Knowledge about general software engineering.
 - Help us to know where to start.
- Models.
 - Forcing us to think the project's different perspectives.
- Design processes
 - Giving a framework to systematically look at issues in hand.



How Class knowledge Helping our Project - II

- Requirement
 - Knowing all the data collection and research methods help in determining what is best for our project.
- Architecture
 - Using models to express ideas.
- Design
 - Keep traceability in mind throughout design phase.
 - Uniformity throughout the application





Thanks!

