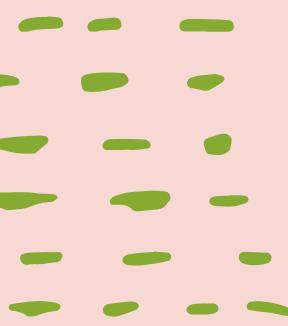
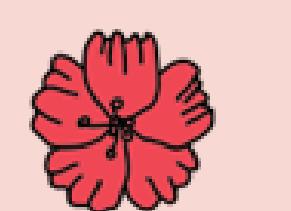




Team: The Misfits (OIRPZJ)





# Pink<sup>+</sup> is a platform dedicated to four types of users



## Breast Cancer Survivors

They'll share personal experiences and guide patients in support groups that, in turn, will help others on a similar journey.

## Breast Cancer Patients

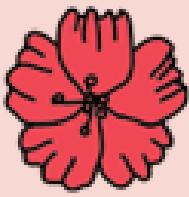
In addition to imparting symptom logging and risk assessment services, Pink+ also provides Machine Learning-based diagnosis using Cytology Reports and screening examinations using Blood Test Reports.

## Medical and Research Experts/Professionals

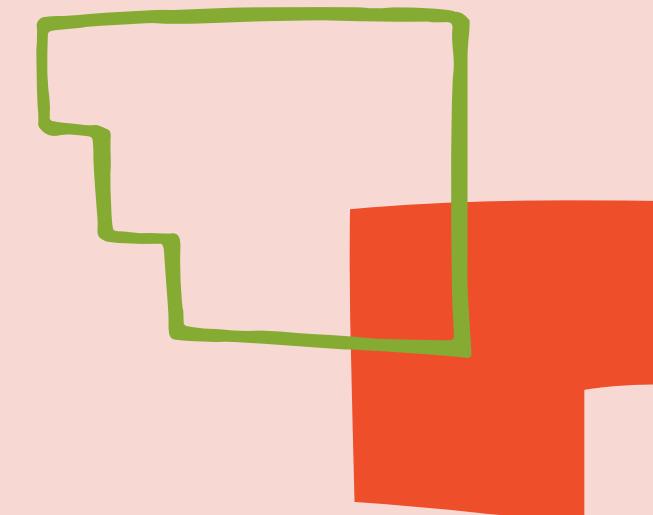
Experts have an option to create a new post in the Collaborate forum to share their recent findings, look for research partners or just to share their opinions. It serves a dedicated chat and discussion panel for each post in the section.

## General Public

Can use Symptom Logging to log their day-to-day health and share it with anyone, using any application of their choice, be it Mail or Instant Messaging.



# Tech Implementation



## Mobile Application

Built natively using Swift, the application runs on both iOS and iPadOS. Our Apple Watch tracker, also built using Swift is a separate application that communicates with the main app.

## Database

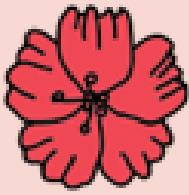
Google's Firebase Realtime Database is used for all data storage due to its easy integration. We use Apple's native WatchConnectivity for data sharing between watchOS and iOS.

## Risk Evaluator

Our implementation of a minified Gail model, which reports accuracy within 1% of BCRAT is written natively in Swift, giving the user complete control over their privacy and data sharing.

## ML Models

The three ML models which we use (Blood Test and Cytology Evaluation, Recurring Tumor detection) are all developed in Python. The app calls the Flask APIs deployed on Heroku.



# AI

## Blood Test Analysis to detect Breast Cancer

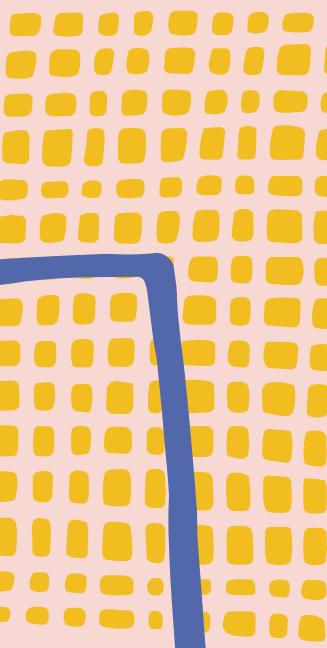
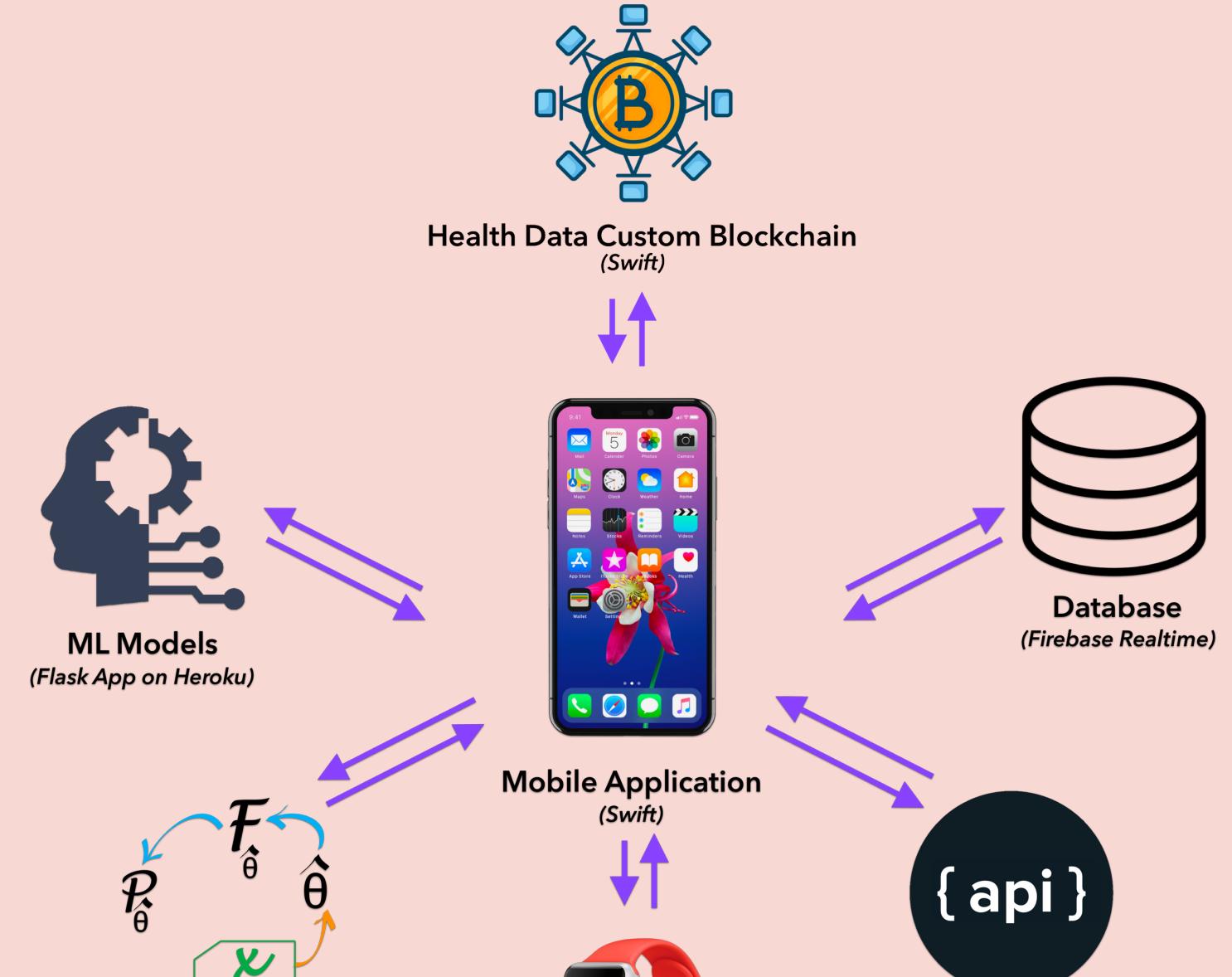
75% Accuracy [ F1 Score: 0.62 (Healthy) and 0.81 (Patients) ]

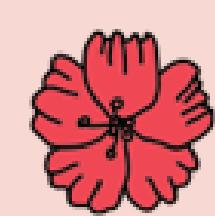
## Cytology Report Analysis to detect Breast Cancer

93% Accuracy [ F1 Score: 0.90 (Benign) and 0.95 (Malignant) ]

## Tumor Analysis to predict recurring events of Breast Cancer in the patient

85% Accuracy [ F1 Score: 0.86 (False Recurrence Events) and 0.83 (Recurrence Events) ]

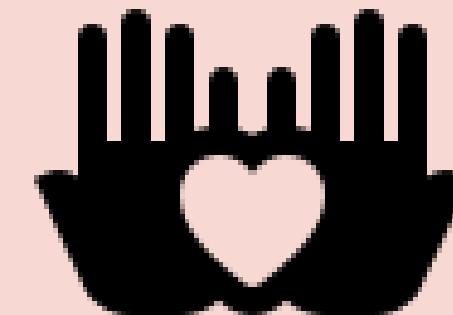




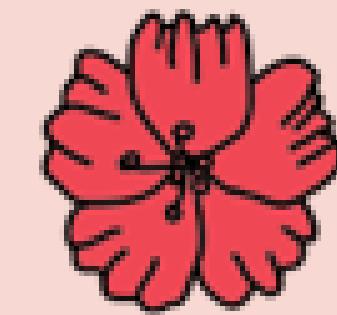
# App Structure



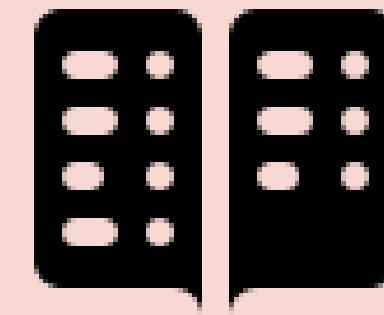
Wellness



Support Groups



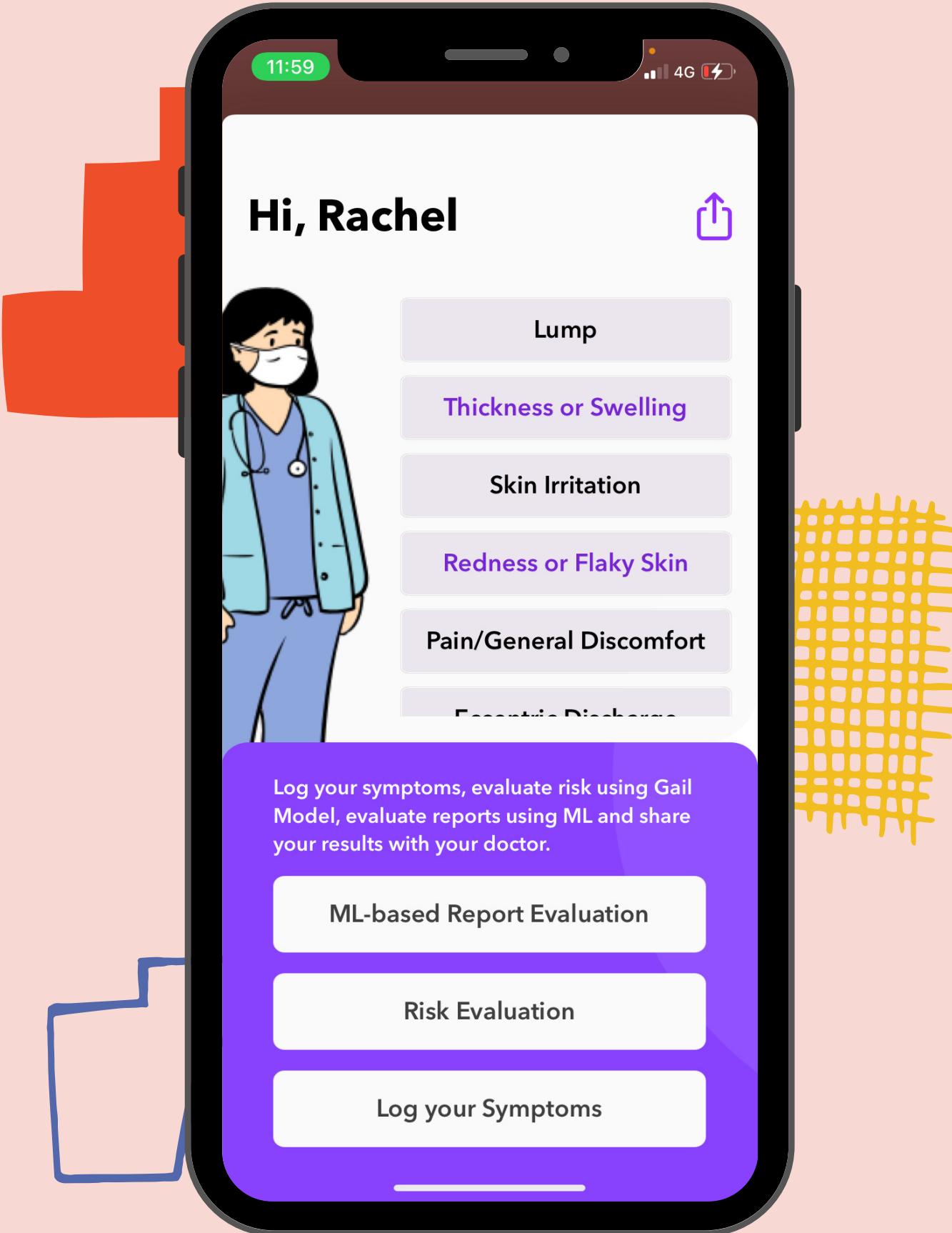
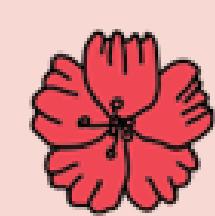
Survivor Stories



Breast Cancer  
Education



Campaign



# Wellness

## Symptom Logging and Self Diagnosis

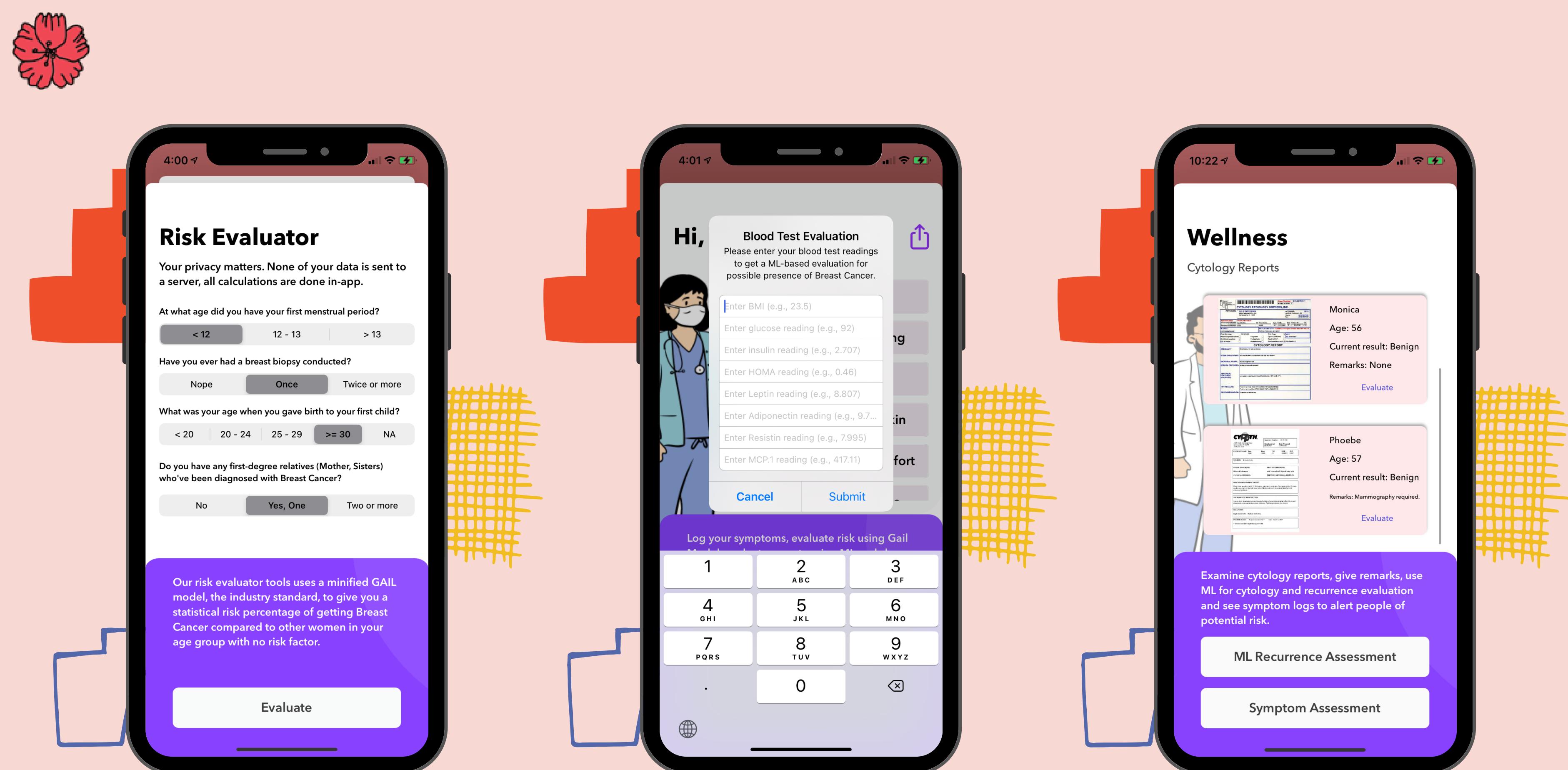
Patients can log their symptoms and upload their cytology reports which can be viewed by medical experts and auto-examined using Machine Learning.

## Risk Evaluation

We believe our ML based diagnostic tools, combined with the Gail model risk evaluator will help in the early detection of Breast Cancer.

## Blockchain Technology

Right to privacy is an integral part of our technological development, hence, we have incorporated a custom Blockchain for symptom logging which further strengthens data security.

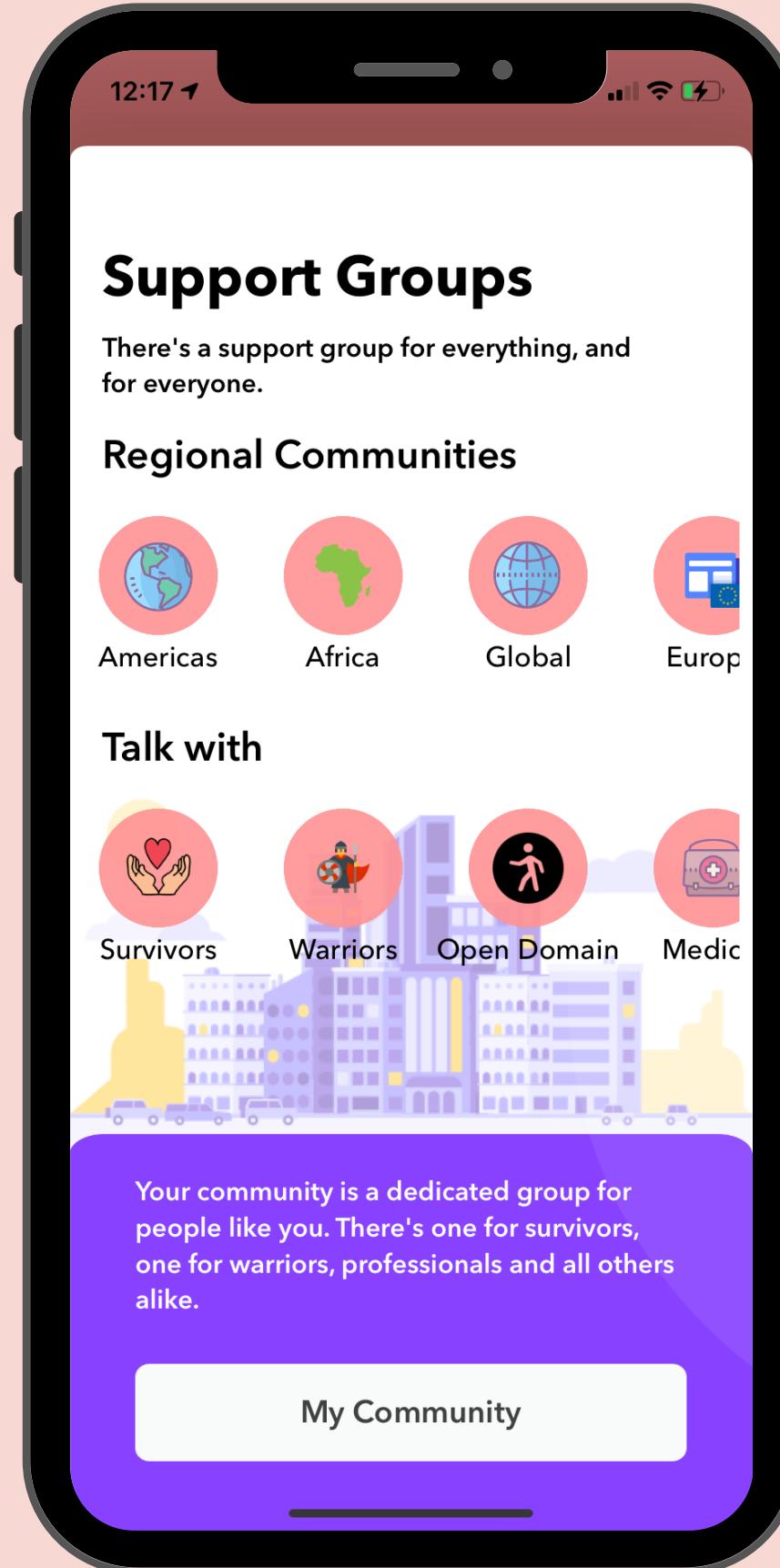


## Gail Risk Evaluator

## Blood Test Evaluation

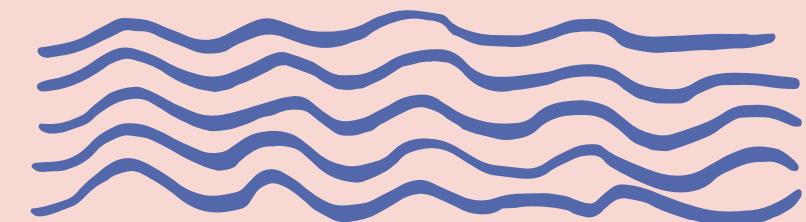
## Cytology Report Evaluation

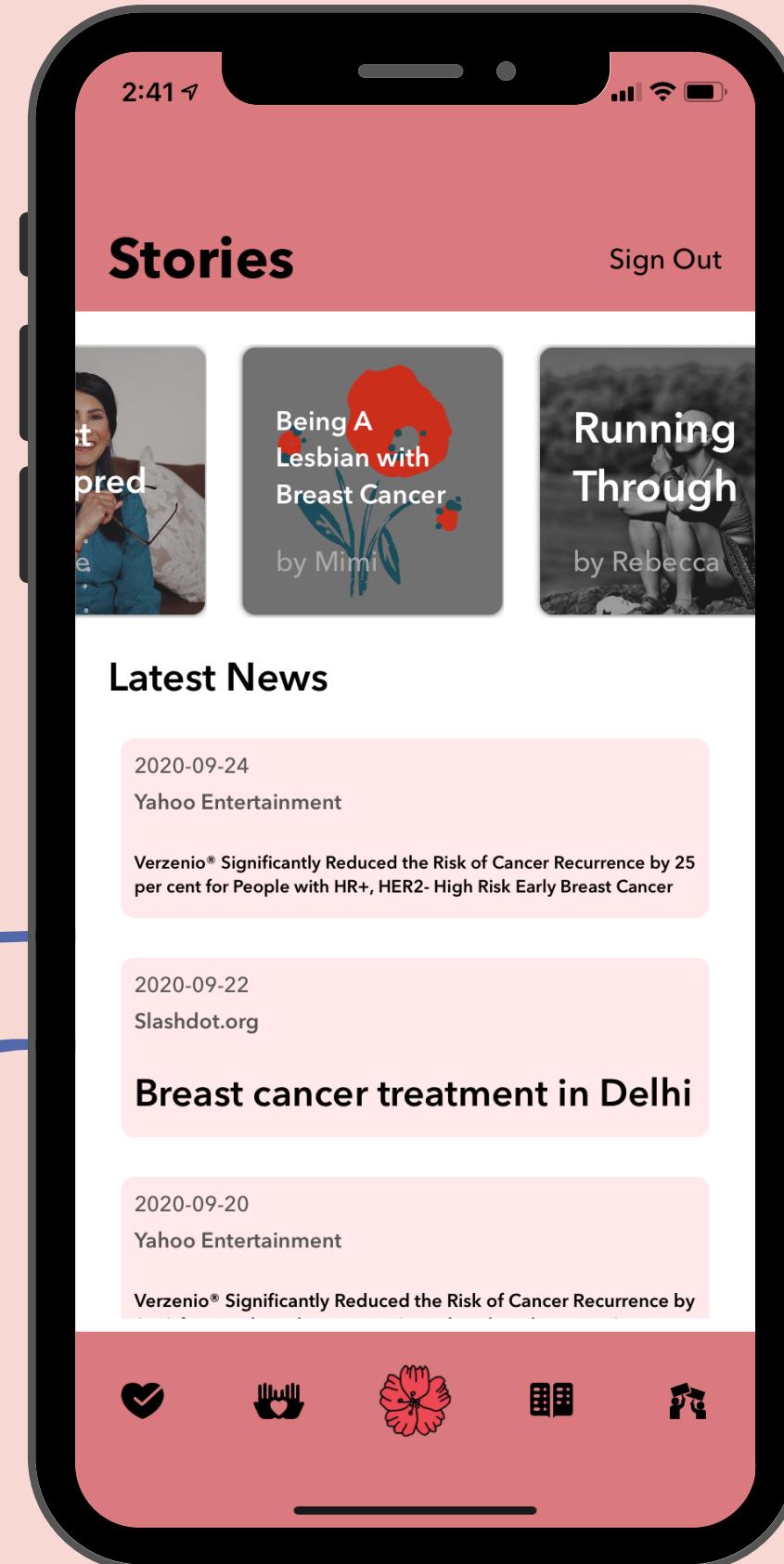
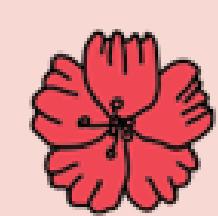
# Support Groups



Each support group has a dedicated chat which is distinct from others. Acting like de-facto Slack channels of their own, we have Support groups divided into regional communities and the categories of users.

To ensure we still achieve our wider goal of catering to a global population, both kinds of divisions have a global room, accessible to all.



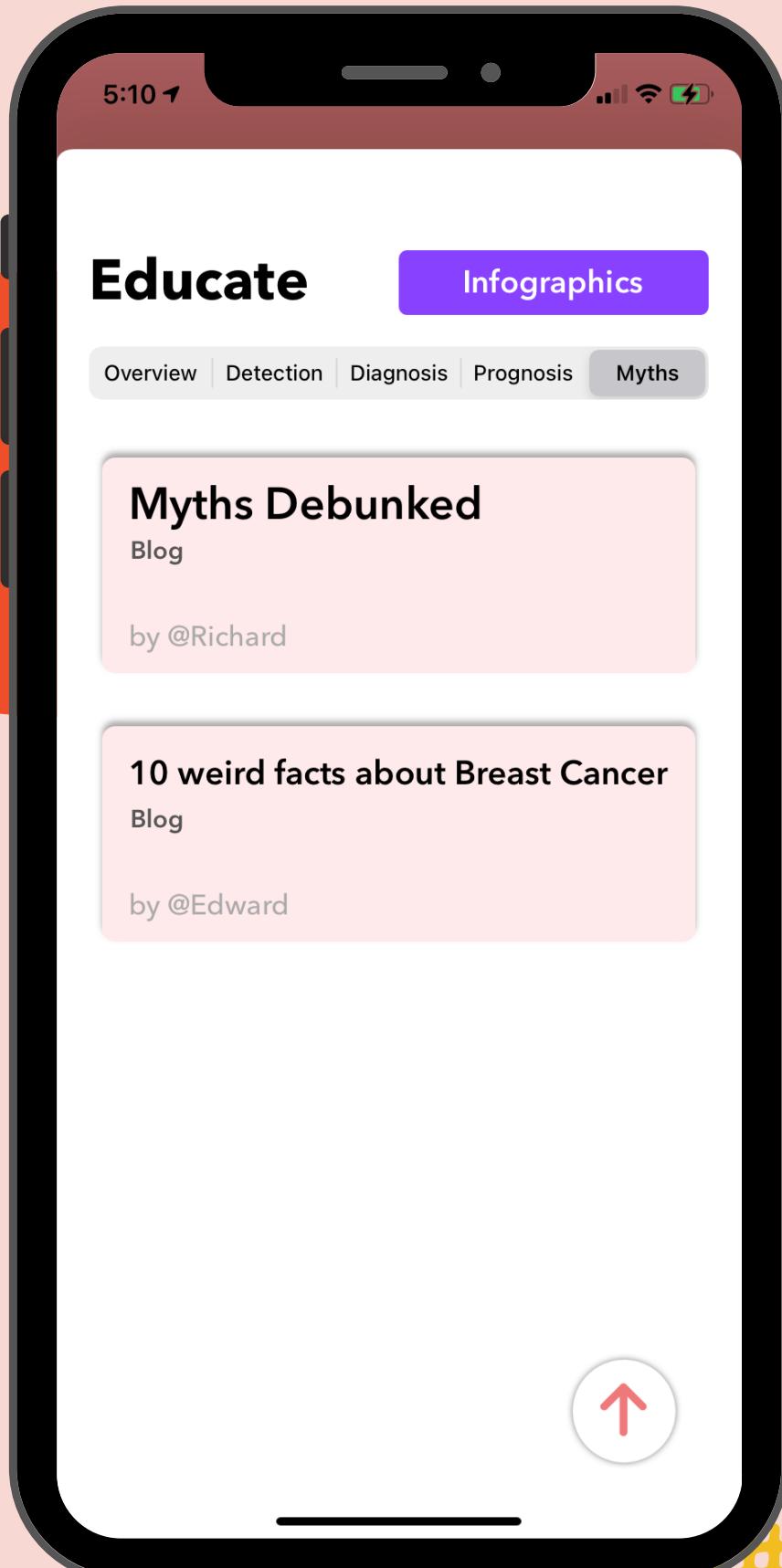
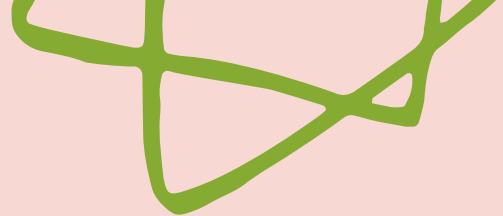
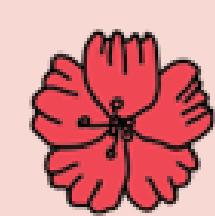


# Survivor Stories

Survivor stories can play a vital role in creating a sense of positivity and helping those in the woods. Sometimes they can work as inspirations and at times even replicate the solutions. Therefore, this section will act as a mirror that reflects sunshine.

To solve our issue with collecting latest news articles related to the topic, we used newsapi.org's NewsAPI, which allowed us to filter articles based on the keyword of our choice, i.e, 'Breast Cancer'.





# Breast Cancer Education



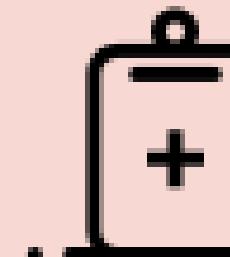
**Brief insights about  
Breast cancer**



**Early detection methods**



**Diagnosis**



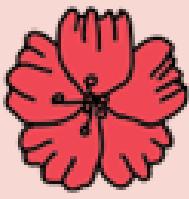
**Prognosis**



**Myths and Facts**

We can reduce the stigma of Breast cancer through enhanced cancer education. A salient feature available to the uploaders is to plug in photos and videos to make it more appealing and to convey their knowledge visually.

We leverage Data Analytics to boost awareness levels using infographics.



# CAMPAIGNS

To have comprehensive global coverage, we've chosen four ways to promote social awareness about Breast cancer prevention, precaution and remedies. Taking into account the current scenario, all of them will have an effective outreach and will raise awareness about detection, treatment, and the need for a reliable, permanent cure.



## Online Streaming

For content creators on YouTube, Pink+ provides a template for channel arts. The template is designed in accordance to YouTube's community guidelines and in-line with the specifications for channel arts. We intend to offer an extensive assortment of channel arts soon.



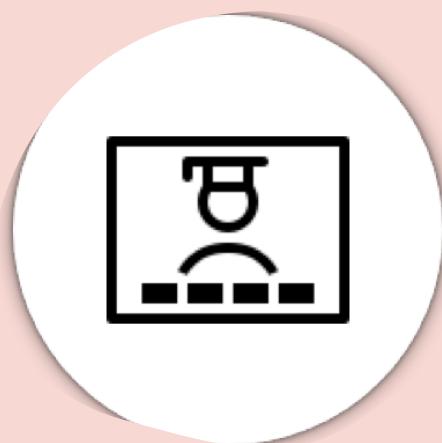
## Social Media

Users of Social Media platforms like Instagram can make use of our story templates, reflecting several taglines resonating with the campaign. Our in-house filter has been approved by Instagram and is now a part of the public gallery of filters on the app.



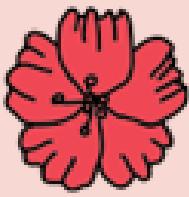
## Print Media

With India at the cusp of the digital revolution, print media still holds an edge over electronic media and can play a praiseworthy role in disseminating information to every nook and cranny of the country. Therefore, dedicating a pink page to Breast cancer education would do the needful.



## Online Classes

Educational institutions can introduce a new non-evaluative subject to imbibe basic knowledge about Breast cancer or they can invite specialised doctors to their classes to discuss the issue with students to answer their queries.



# FUTURE ROADMAP



## Fundraising

Collaborative scheme is one of the ways we shall raise funds.



## Mammography

Users can self-diagnose medical imaging of their mammography tests using our Deep Learning models.



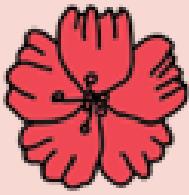
## Multi-platform extension

- Android App
- Website
- Multi-lingual support



## Additional Campaigns

One of the biggest industries in the world is the sports and gaming industry. This form of media can be a bewildering platform for spreading awareness to a large audience.



# Acknowledgements

ESTÉE  
LAUDER  
COMPANIES

Organisers

Our heartfelt gratitude to Rebecca,  
Tiana, Marie, Sanjay, Farida and  
Mimi for their stories.

Survivor Stories



Libraries, Tools and  
Frameworks