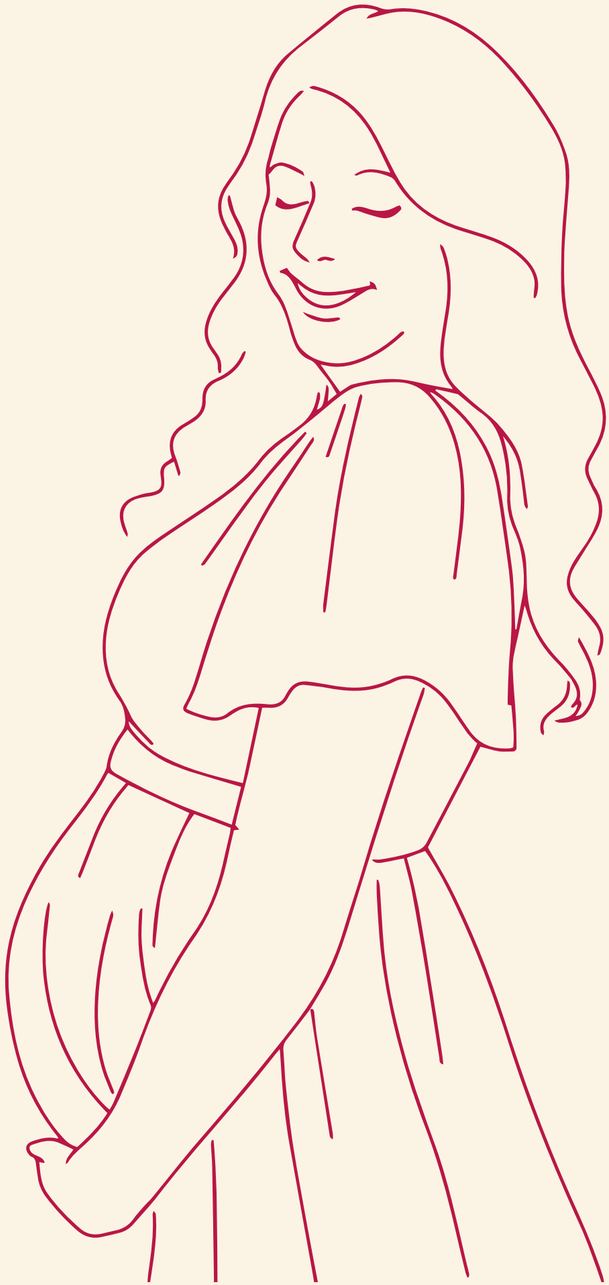
ST JOSEPH
ENGINEERING COLLEGE
MANGALURU

AN AUTONOMOUS INSTITUTION

AIKHYA

LET'S WALK TOGETHER



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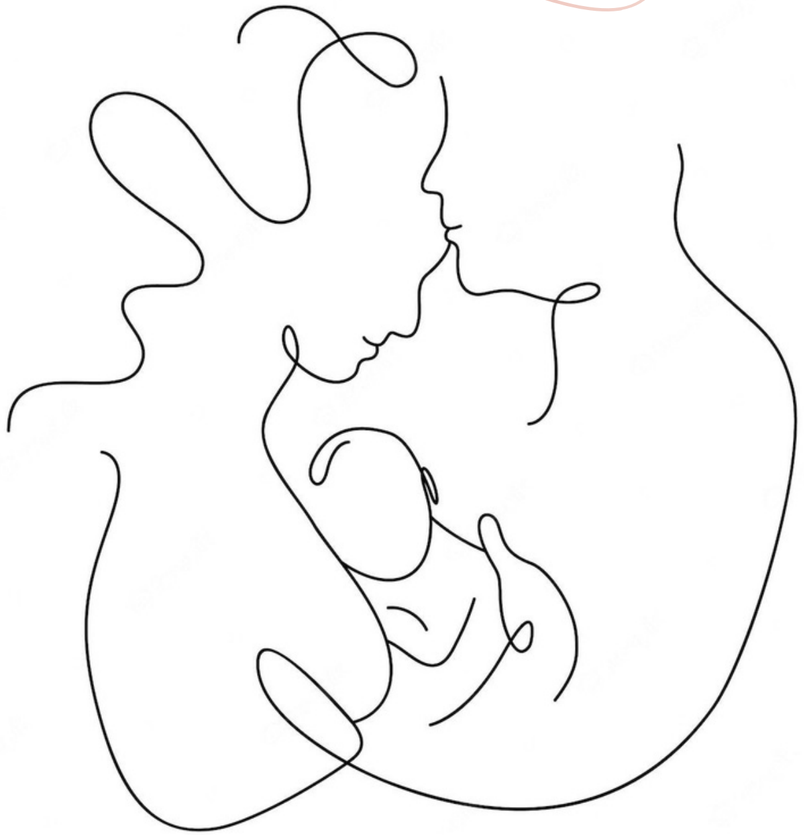
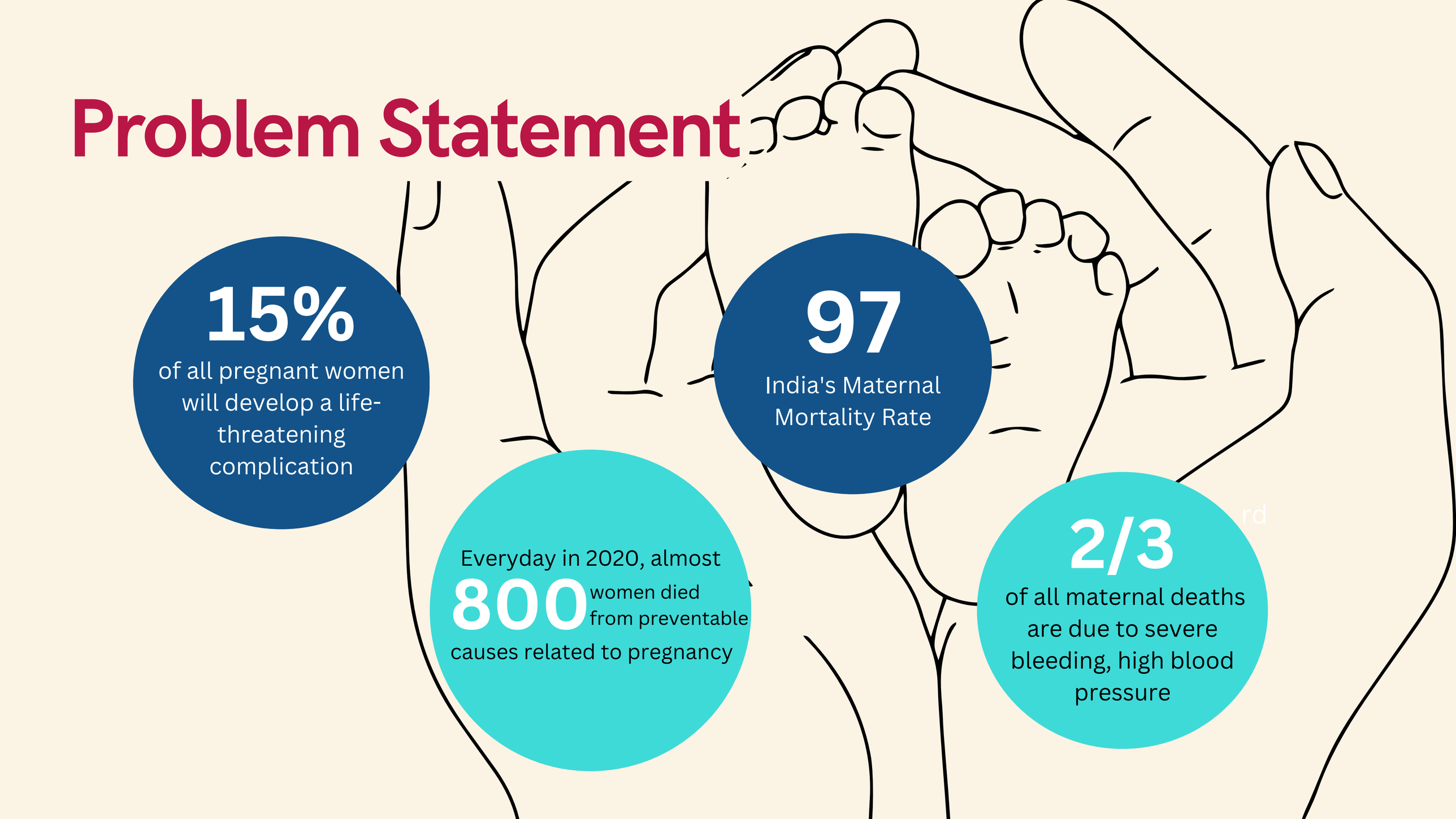


INTRODUCTION

Predict the possible health issues in pregnant women

- Must be able to predict health risks in all the three trimesters according to the shared threshold values
- Factors to be also considered-BMI, BS, BP, Age, Heartrate, any existing health conditions or complications
- Track the sleep cycle based on the heartbeat and predict the need for corrective measures

Problem Statement



15%
of all pregnant women will develop a life-threatening complication

97
India's Maternal Mortality Rate

Everyday in 2020, almost **800** women died from preventable causes related to pregnancy

2/3
of all maternal deaths are due to severe bleeding, high blood pressure

rd

PROPOSED SOLUTION

AI based App/Website

based on the outcome:

Low Risk

- Diet
- Sleep Schedule
- Medication
- Exercise

Mid Risk

- Apply for Virtual consultation
- Plan a schedule as suggested by the doctor

High Risk

- Alert to the immediate family
- Book an appointment/ call for ambulance with consent

TECHNICAL DETAILS

- Factors like Bodymass index and temperature is recorded by sensors of the wearable device(watch).
- Other factors like blood sugar and past health conditions has to be manually entered into the app.

810 Women died per day in 2017

due to preventable causes related to pregnancy and childbirth

103 Maternal Mortality Rate in India

24K Maternal Deaths in 2020 in India

According to a survey by the United Nations

Mobile App

IOT Device

Predictive Model

AIKYA

WHAT DOES

AIKHYA

MONITOR?

Heart Rate

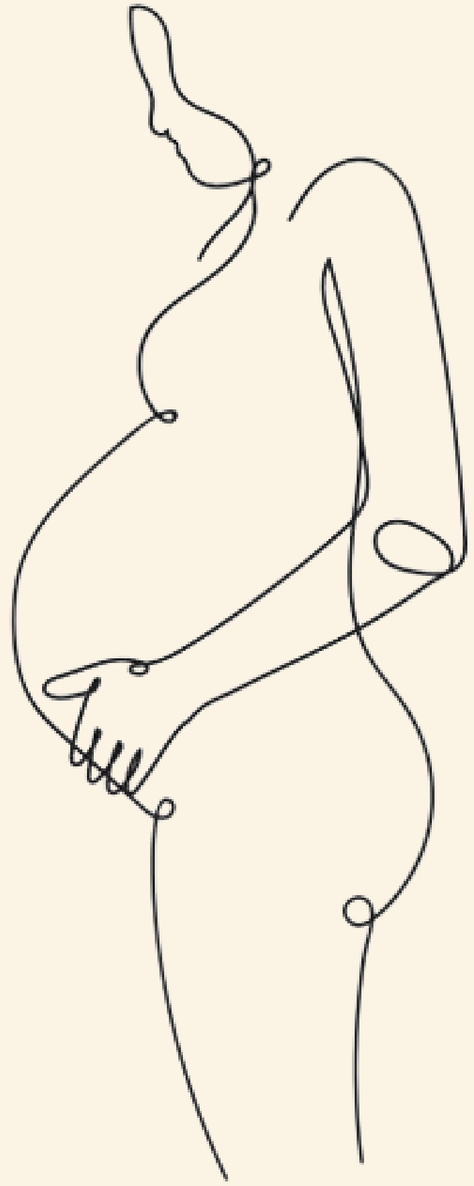
Oxygen Level

Sleep Cycle

Blood Pressure

Blood Sugar

Weight



ALGORITHMS

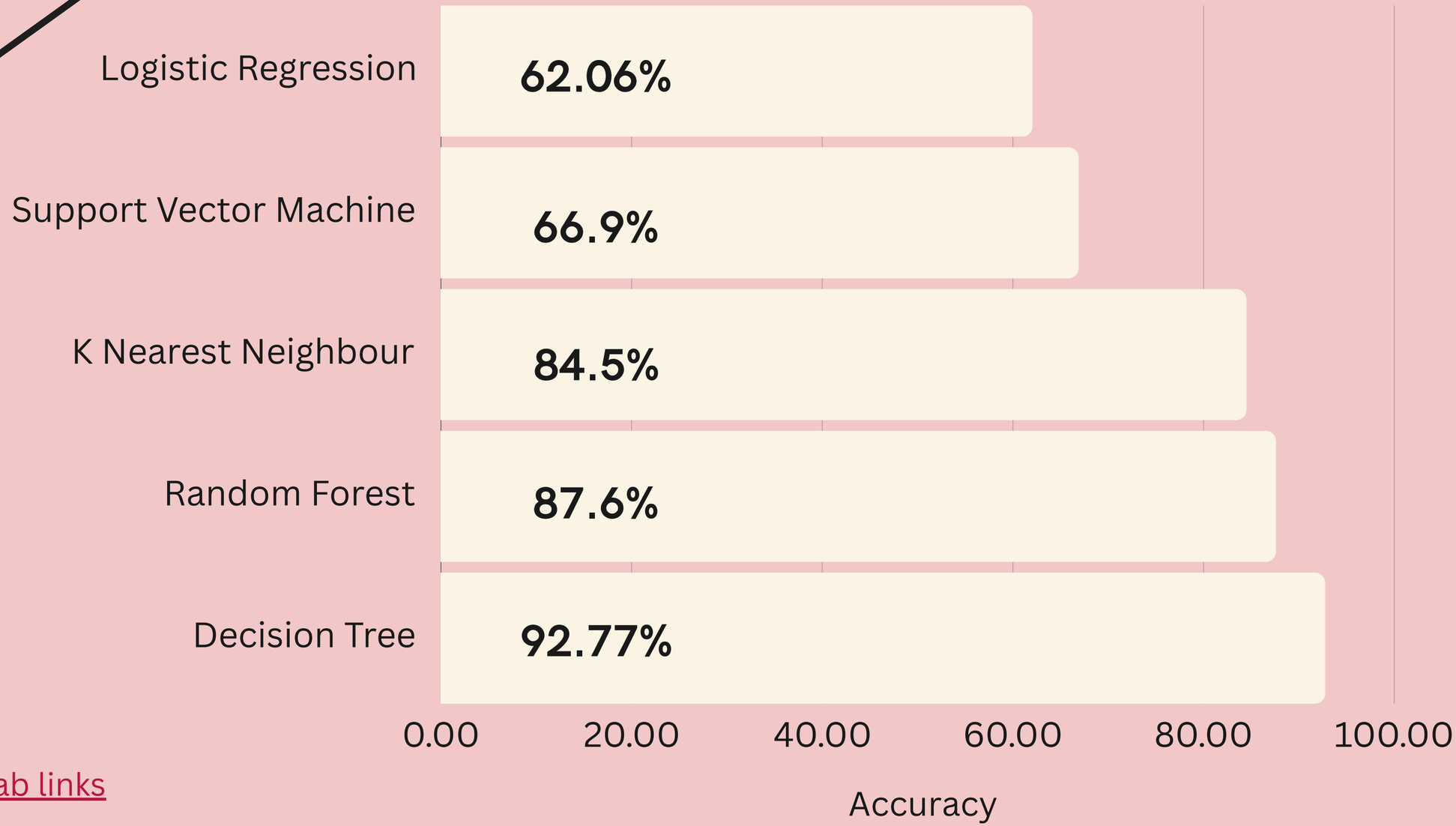
- Logistic Regression
- Support Vector Machine
- K-Nearest Neighbor
- Decision Tree
- Random Forest

CONTEXT ON USED DATASET

- Age: Age in years when a woman is pregnant.
- SystolicBP: Upper value of Blood Pressure in mmHg, another significant attribute during pregnancy.
- DiastolicBP: Lower value of Blood Pressure in mmHg, another significant attribute during pregnancy.
- BS: Blood glucose levels is in terms of a molar concentration, mmol/L.
- BodyTemp: Body Temperature in terms of Fahrenheit.
- HeartRate: A normal resting heart rate in beats per minute.
- Risk Level: Predicted Risk Intensity Level during pregnancy considering the previous attribute.

Link for accessing the Dataset:
https://drive.google.com/file/d/1s7digaZq2iotY-vm_Z5tPbdRcZfD4mCY/view?usp=share_link

WORK DONE SO FAR



Google colab links

Model Evaluvation

```
[20] # accuracy on training data
     X_train_prediction = model.predict(X_train)
     training_data_accuracy = accuracy_score(X_train_prediction, Y_train)

[21] print('Accuracy on Training data : ', training_data_accuracy)

     Accuracy on Training data :  0.5893958076448829

[22] # accuracy on test data
     X_test_prediction = model.predict(X_test)
     test_data_accuracy = accuracy_score(X_test_prediction, Y_test)

[23] print('Accuracy on Test data : ', test_data_accuracy)

     Accuracy on Test data :  0.620689655172413 8
```

Building a Predicting System

```
input_data= (42,130,80,18,98,70)

#change the input data to a Numpy array
input_data_as_numpy_array= np.asarray(input_data)

#Reshape the Numpy array as we are predicting only on instance
input_data_reshaped= input_data_as_numpy_array.reshape(1,-1)

prediction= model.predict(input_data_reshaped)
print(prediction)

['high risk']
/usr/local/lib/python3.8/dist-packages/sklearn/base.py:450: UserWarning: X does not have valid feature names, but LogisticRegression was fitted
```

Model Evaluation

Accuracy Score

```
[23] # accuracy score on the training data
     X_train_prediction = classifier.predict(X_train)
     training_data_accuracy = accuracy_score(X_train_prediction, Y_train)

[24] print('Accuracy score of the training data : ', training_data_accuracy)

     Accuracy score of the training data :  0.6596794081381011

     # accuracy score on the test data
     X_test_prediction = classifier.predict(X_test)
     test_data_accuracy = accuracy_score(X_test_prediction, Y_test)
```

+ Code + Text

```
[26] print('Accuracy score of the test data : ', test_data_accuracy)

     Accuracy score of the test data :  0.6699507389162561
```

Code + Text Connect

```
[ ] #Splitting Dataset into test and train

    X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.3)

    #selecting different Ks in range [1,12] and choose the one with high accuracy

    k_range = list(range(1,12))
    acc = []
    for i in k_range:

        knn = KNeighborsClassifier(n_neighbors=i).fit(X_train, y_train)
        y_pred = knn.predict(X_test)
        acc.append(metrics.accuracy_score(y_test, y_pred))

[ ] acc

    [0.8459016393442623,
     0.7836065573770492,
     0.7508196721311475,
     0.7377049180327869,
     0.7213114754098361,
     0.7180327868852459,
     0.7114754098360656,
     0.7114754098360656,
     0.6885245901639344,
     0.7016393442622951,
     0.7016393442622951]

[ ] knn = KNeighborsClassifier(n_neighbors=1).fit(X_train, y_train)
    y_pred = knn.predict(X_test)

[ ] metrics.accuracy_score(y_test, y_pred)

    0.8459016393442623
```

```
[20] model = RandomForestClassifier()

[21] model.fit(X_train, Y_train)

     RandomForestClassifier()

[22] # accuracy on test data
     X_test_prediction = model.predict(X_test)
     test_data_accuracy = accuracy_score(X_test_prediction, Y_test)

[23] print('Accuracy : ', test_data_accuracy)

     Accuracy :  0.8768472906403941

[24] input_data = (32,120,90,6.9,98,70)

     # changing the input data to a numpy array
     input_data_as_numpy_array = np.asarray(input_data)

     # reshape the data as we are predicting the label for only one instance
     input_data_reshaped = input_data_as_numpy_array.reshape(1,-1)

     prediction = model.predict(input_data_reshaped)
     print(prediction)

     ['mid risk']
     /usr/local/lib/python3.8/dist-packages/sklearn/base.py:420: UserWarning: X does not have valid feature names, but RandomForestClassifier was fitt
       warnings.warn(
```

```
'mid risk', 'low risk', 'low risk', 'high risk', 'low risk',
'low risk', 'high risk', 'mid risk'], dtype=object)

[11] y_test
```

	RiskLevel
445	low risk
137	high risk
371	high risk
559	low risk
676	high risk
...	...
682	high risk
187	low risk
424	mid risk
274	high risk
240	high risk

203 rows × 1 columns

```
[12] clf.score(x_train,y_train)

     0.9272503082614056
```

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MARKET STRATEGY

Customer Segment

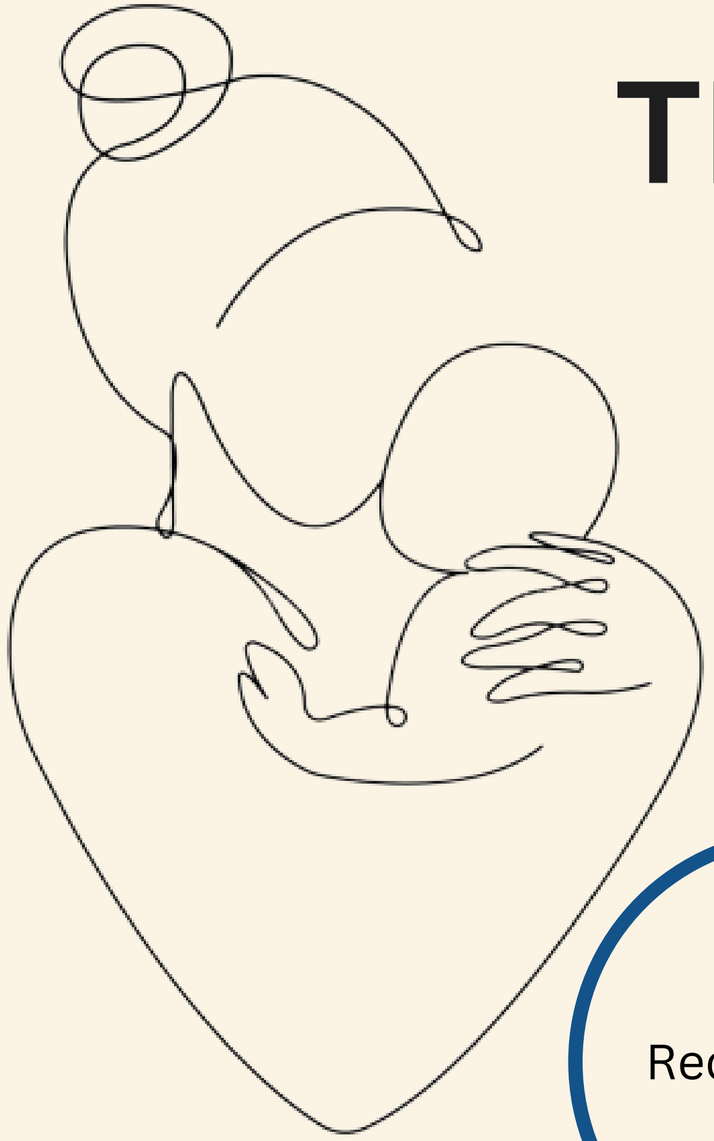
- Pregnant women /their family members
- Gynaecologists
- Counselors
- Scanning Centre's
- Medical Service providers
- Pregnancy product and baby product manufacturers

Channel

- Digital Marketing: Mobile Apps and websites
- Direct contact
- Consultant Gynaecologist
- Conferences and other professional events
- Awareness Camps.
- Online Promotion(social media)

Link for **Financial Projection**

THE AIKYHA IMPACT



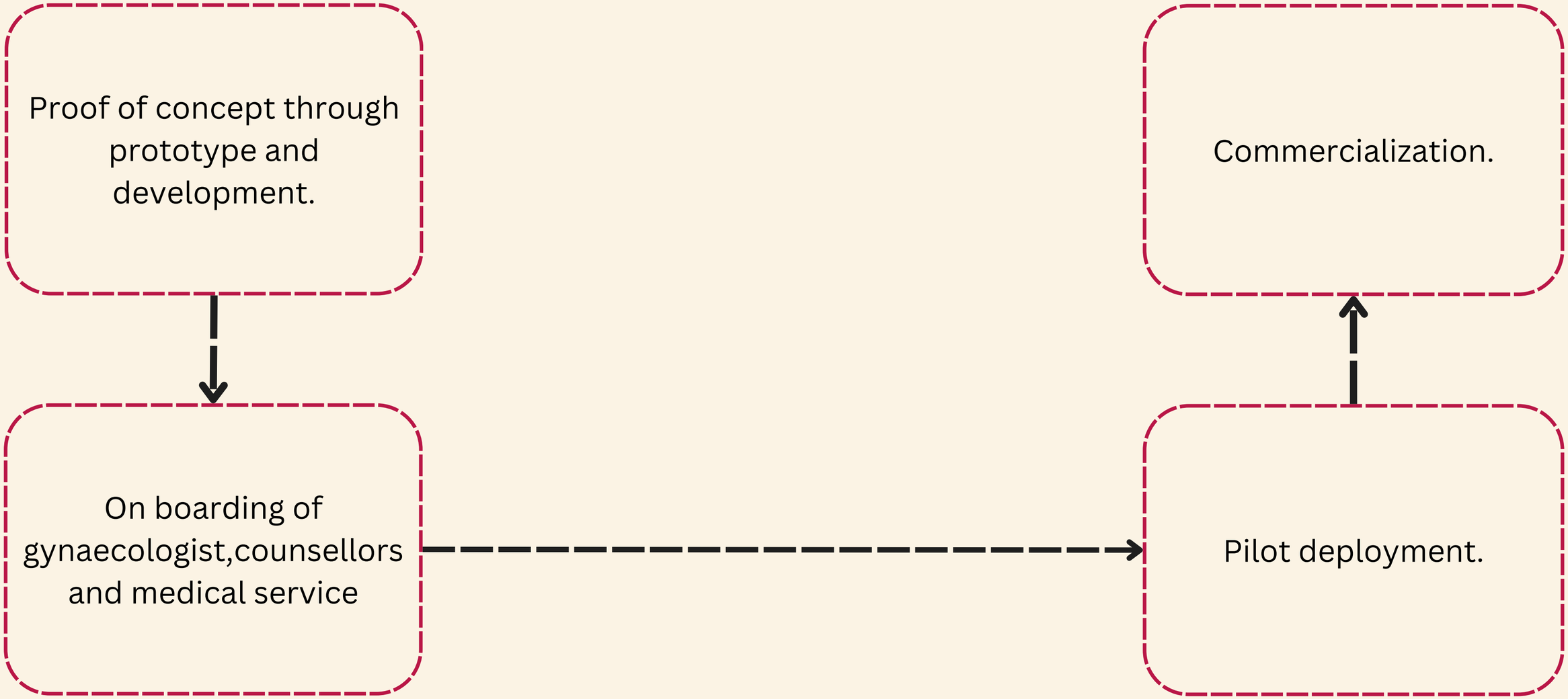
Reduce MMR

Affordable health care

Instant connect with health care providers

Improve health condition of mother and new born

PATH FROM IDEATION TO COMMERCIALIZATION



References

DATASET

KAGGLE

LOGICAL REGRESSION

Siddhardhan
(Heart Disease Prediction)

SUPPORT VECTOR MACHINE

Siddhardhan
(Diabetes Prediction)

K-NEAREST NEIGHBOUR

Code with Marcus
(Heart Attack Prediction)

RANDOM FOREST

Siddhardhan
(Wine Quality Prediction)

Let's walk together!

Thank you