

# Predictive model to increase engagement on DSMES



*Time to change  
health care.*



# Agenda



## Part 1:

DSMES Program overview

## Part 2:

Project motivation

## Part 3:

Proposed solution

## Part 4:

Conclusion and recommendations

# DIABETES SELF- MANAGEMENT EDUCATION AND SUPPORT PROGRAM

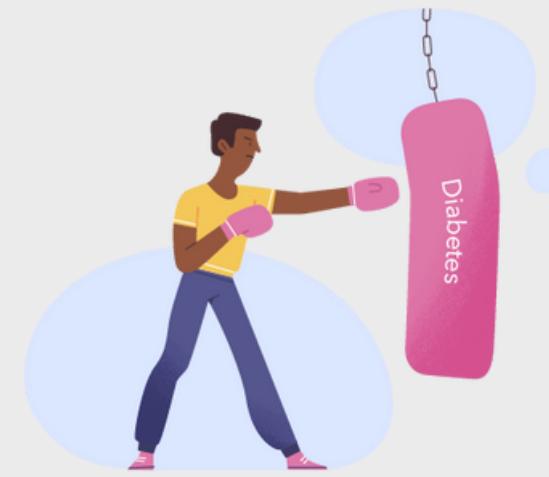
## Program's strategic goals

Prevent Type 2 diabetes in persons at high risk for developing the disease

### How to PREVENT?

-  **HEALTHY & BALANCED EATING**
-  **APPROPRIATE BODY WEIGHT**
-  **MODERATE PHYSICAL EXERCISE**  
(E.G. WALKING 30 MINUTES A DAY)

Prevent or delay complications in persons with diabetes



Assist persons who have diabetes in managing the disease and the complications that result if untreated



# PROJECT MOTIVATION

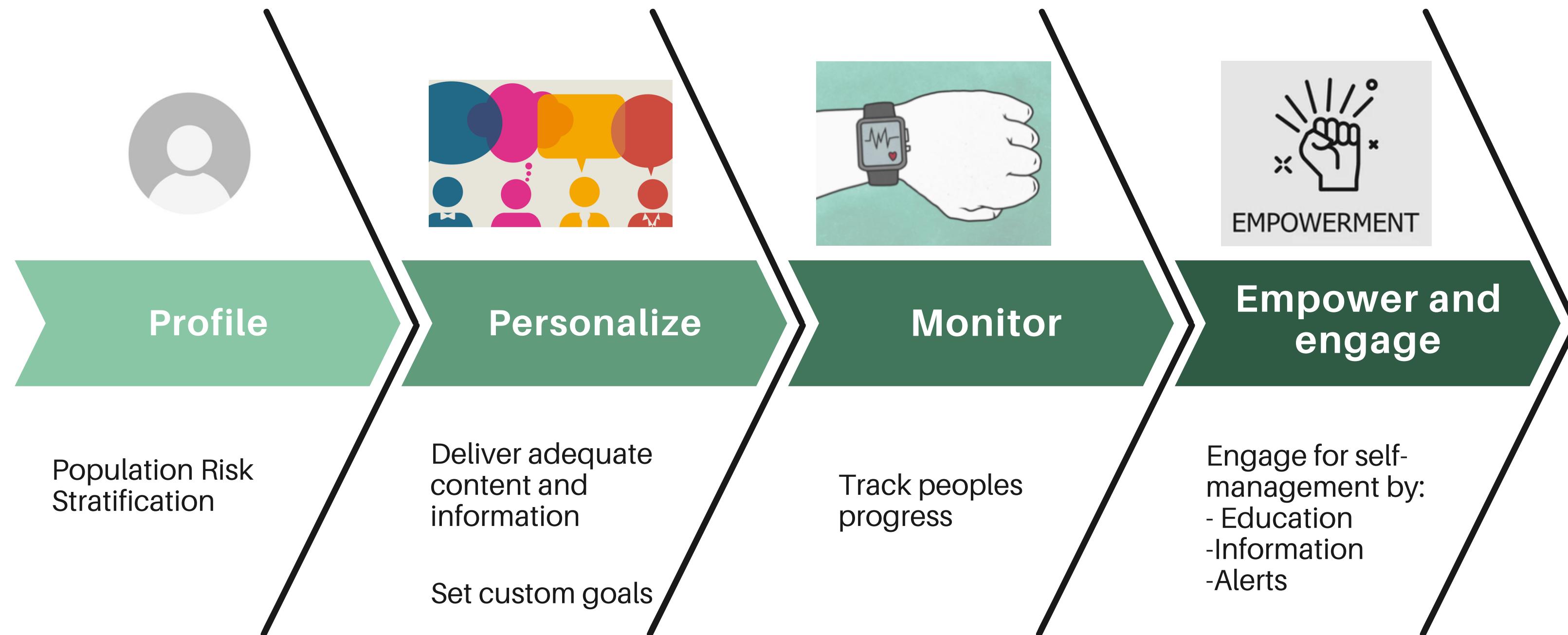
75% of consulted Care Organizations said that the **biggest barrier** on implementing DSMES is **getting clients to engage with and comply with the program**

2019 SPRING MANAGED CARE ORGANIZATIONS SURVEY ON DSMES SERVICES

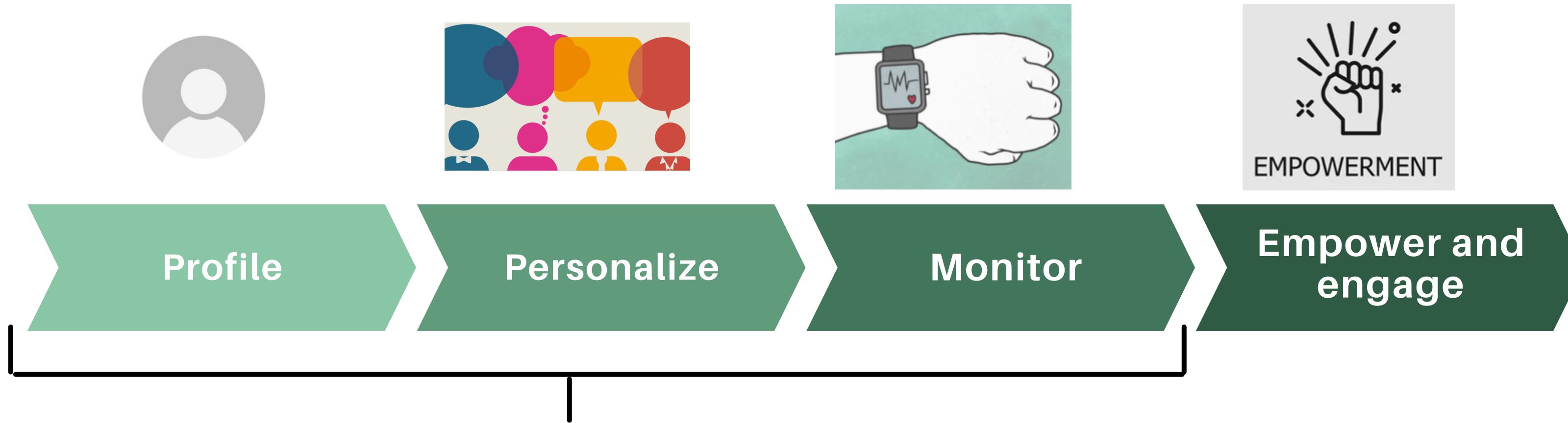
# HOW TO INCREASE PATIENTS ENGAGEMENT IN HEALTHCARE?

## Patient engagement

"Partnership between patients and the health organizations/professionals with whom they interact. Health care providers communicate with patients, and patients share in making decisions and managing their conditions."



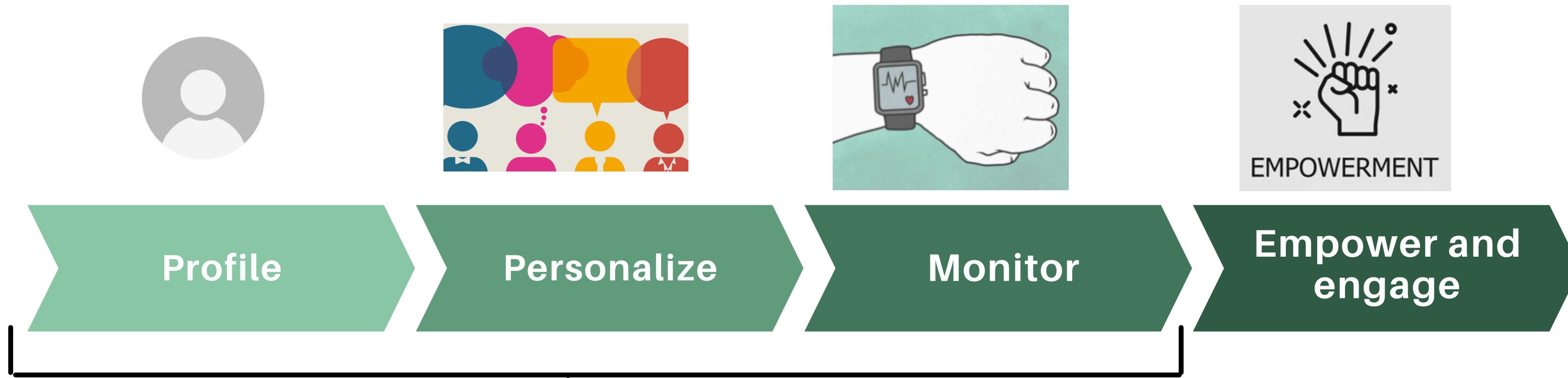
# HOW TO INCREASE PATIENTS ENGAGEMENT IN HEALTHCARE?



**NEEDS MECHANISM THAT ALLOWS US TO:**



# HOW TO INCREASE PATIENTS ENGAGEMENT IN HEALTHCARE?



**NEEDS MECHANISM THAT ALLOWS US TO:**



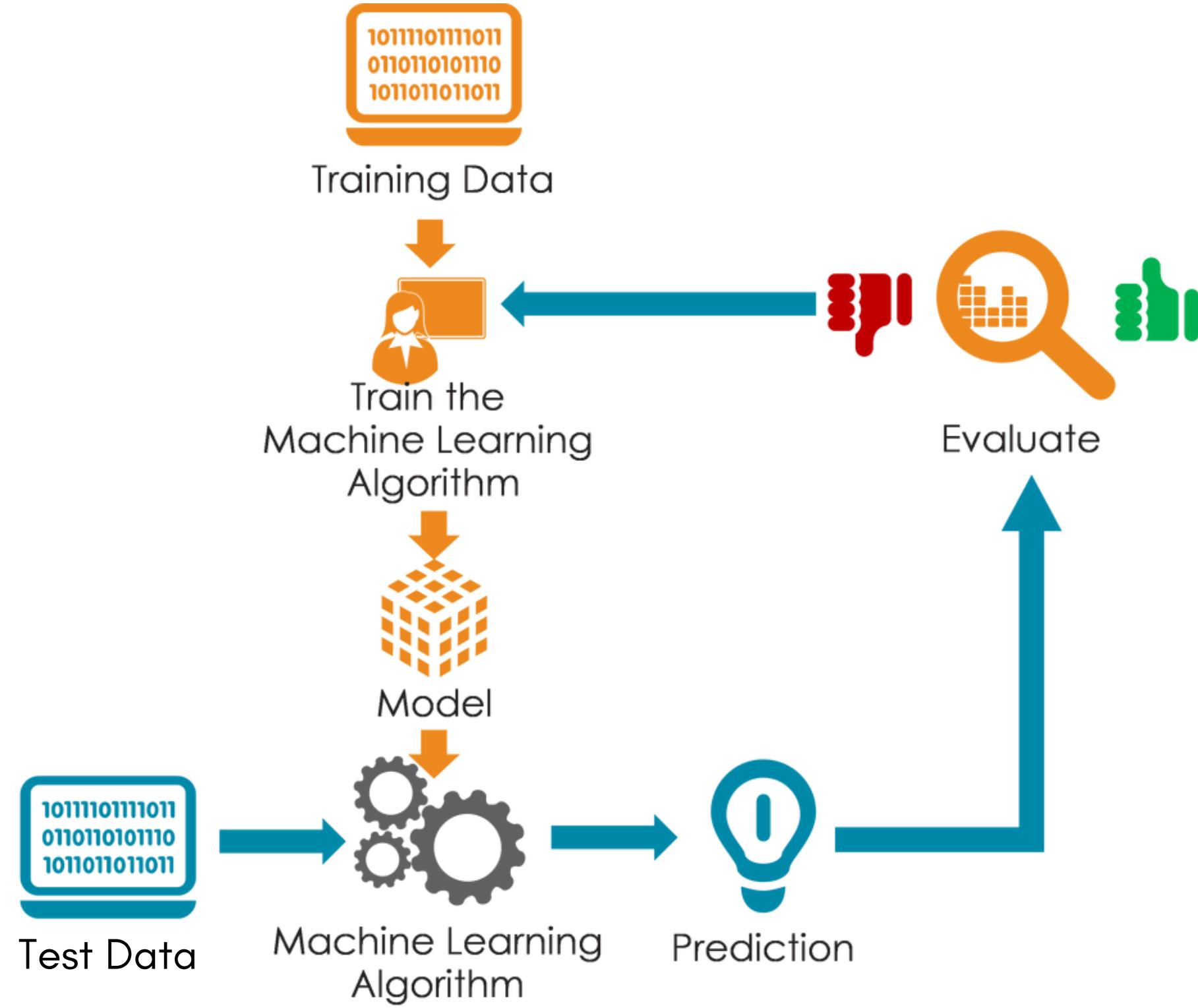
**Model that predicts the likelihood of developing diabetes**

# PROPOSED SOLUTION

Develop a model capable of predicting the likelihood of diabetes disease to be present on a patient.



# Path to success



## Dataset

Information about participants in the Austin Public Health's Diabetes Self-Management Education program

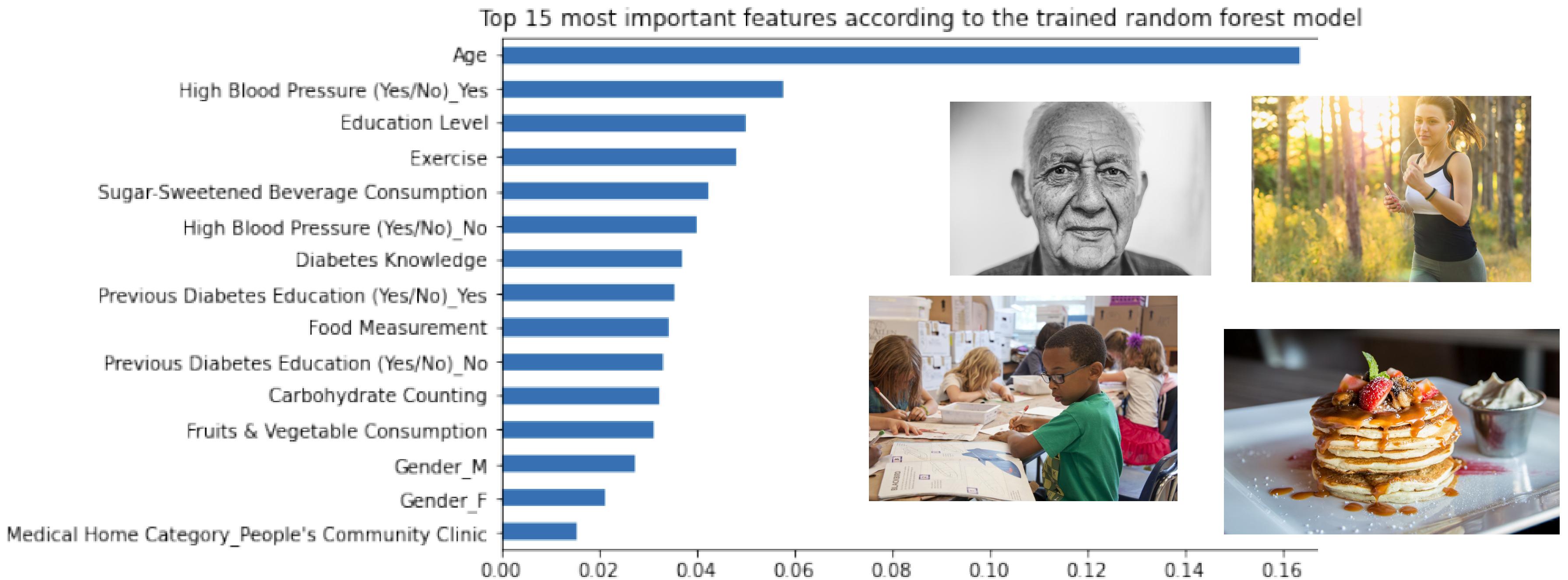
## Model

- Output probabilities
- Retain explainability
- Allow numerical and categorical features

## Performance measure

Check the goodness of a predicted probability score

# Model insights



**Focus our efforts on features with bigger impact**

# Is our model trustworthy?

Performance measure

Brier Score

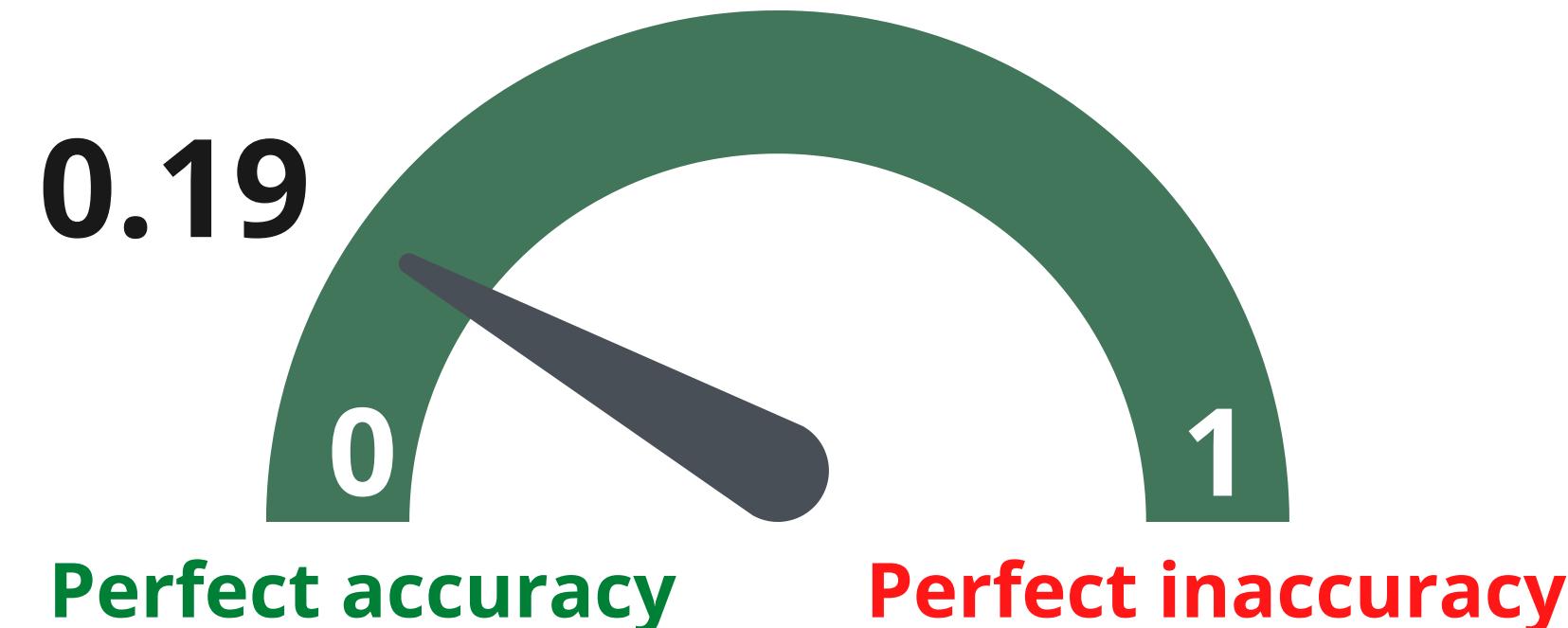
Measures the accuracy of probabilistic predictions.

Number of instances on test set

**329**

Score on test set

**0.19**



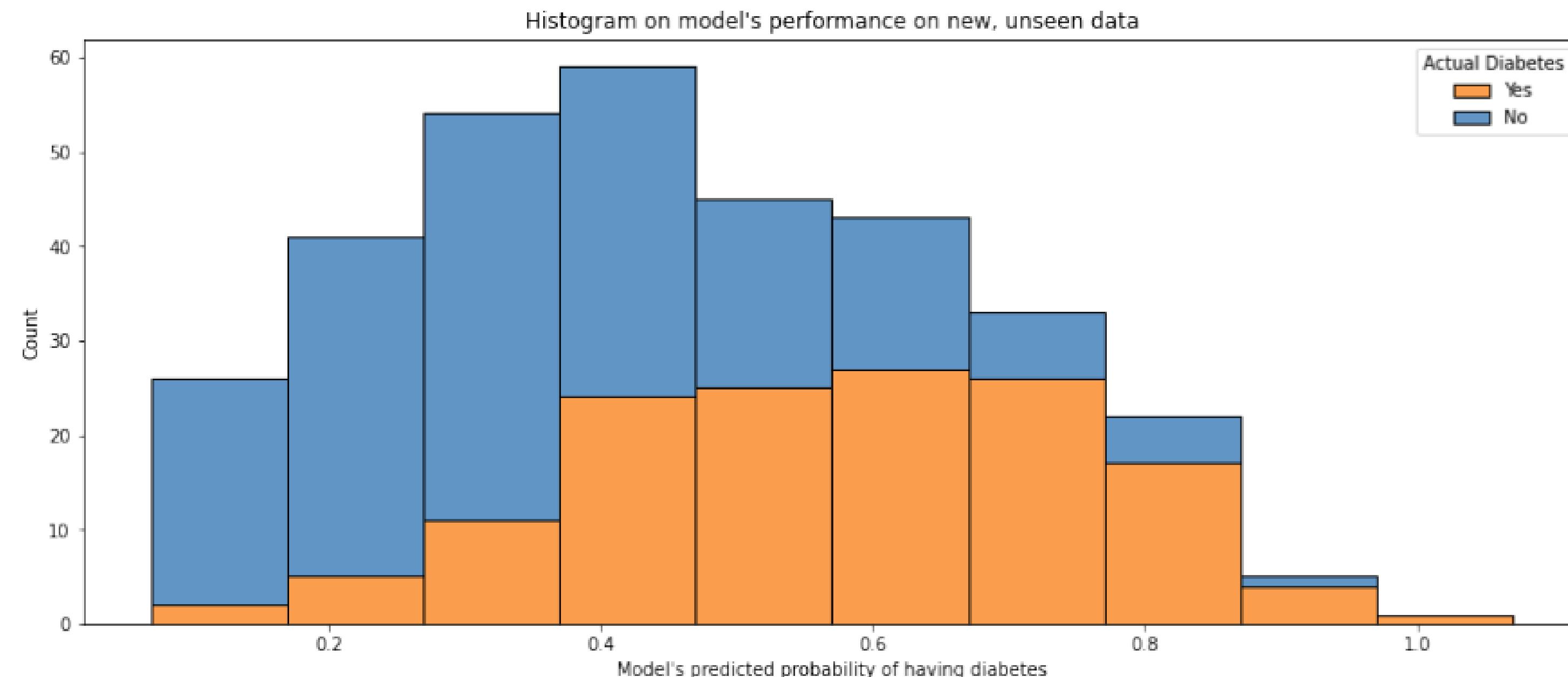
# The solution in action

Profile

Personalize

Monitor

Empower and engage



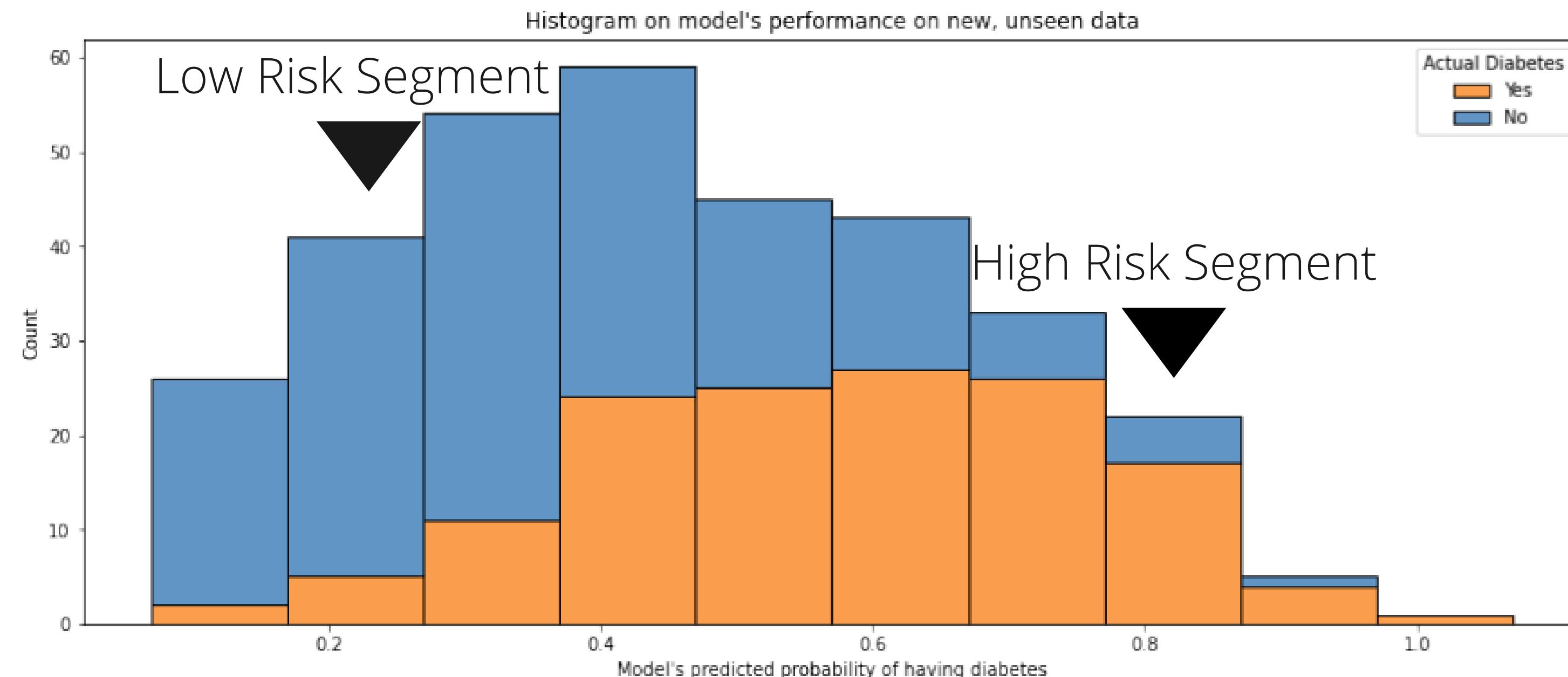
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# The solution in action



## Deliver personalized content and goals

Low Risk Segment

Preventing  
the disease

Soft



Personalize

Communication topics

Diet plan

Exercise program  
frequency

Monitor

Empower and  
engage

High Risk Segment

Dealing with  
the disease

Hard



***Distinctive coaching program to improve self- management  
and drive behavior change***

# The solution in action

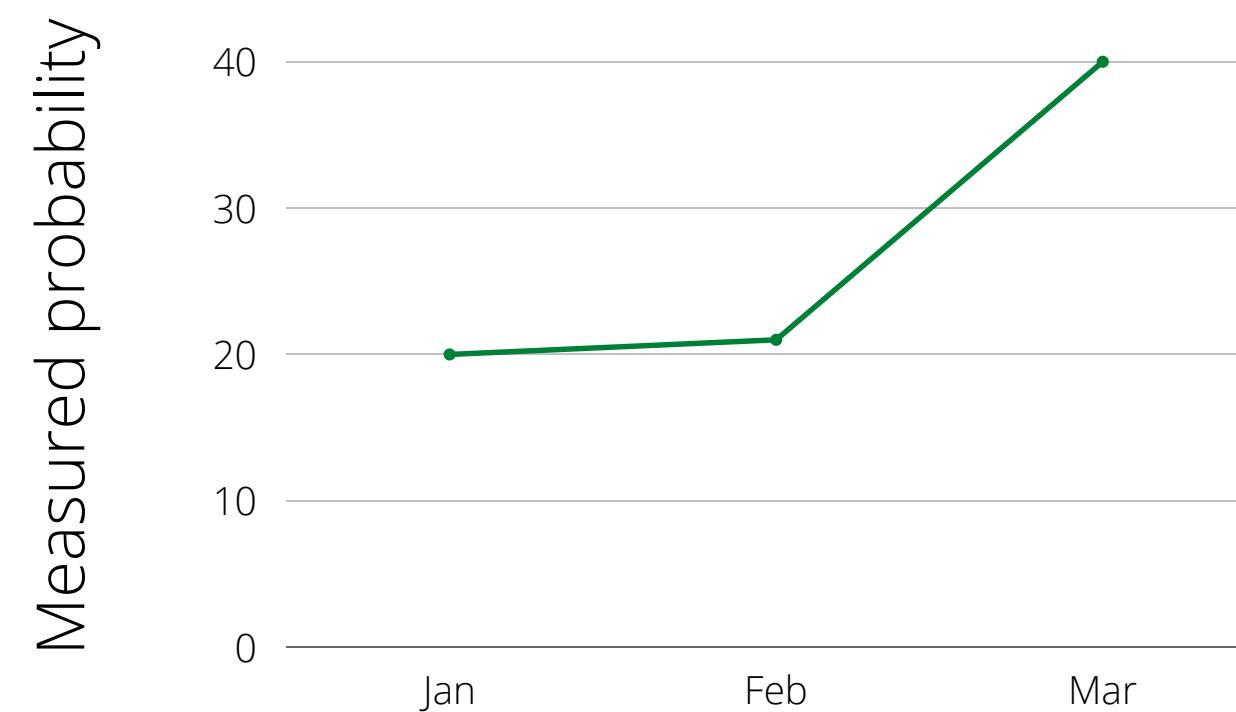
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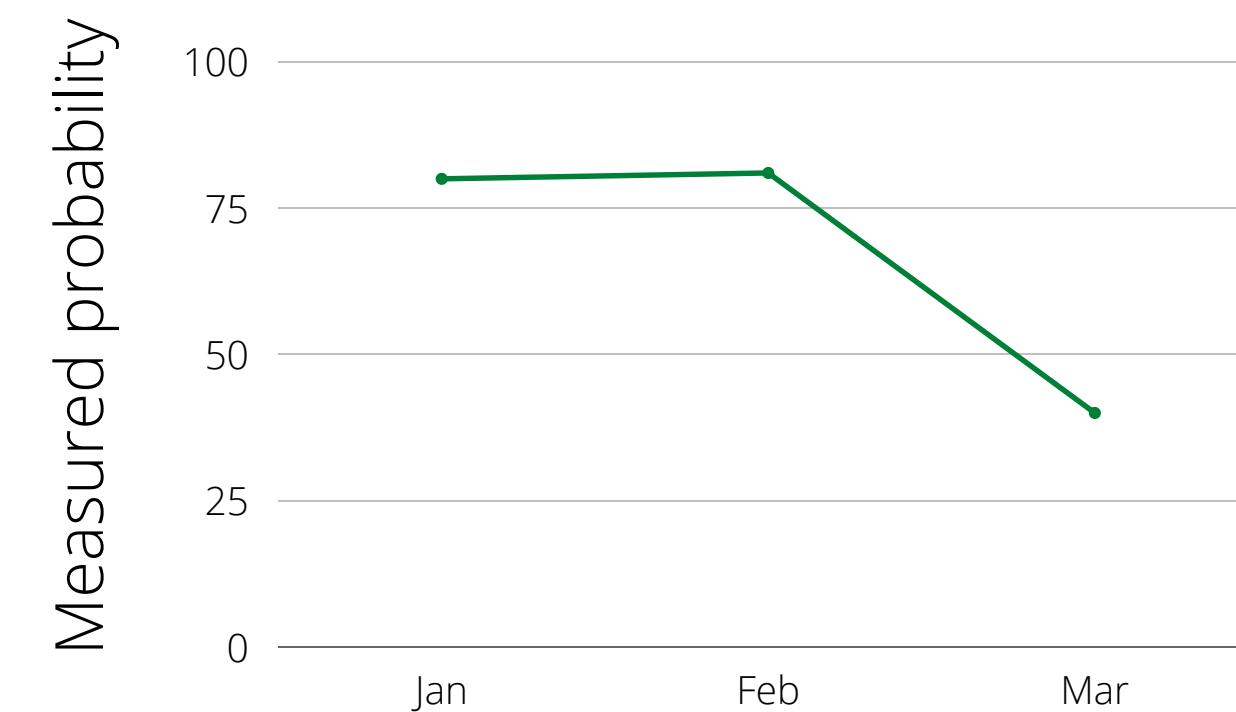
Empower and engage

## Low Risk Segment



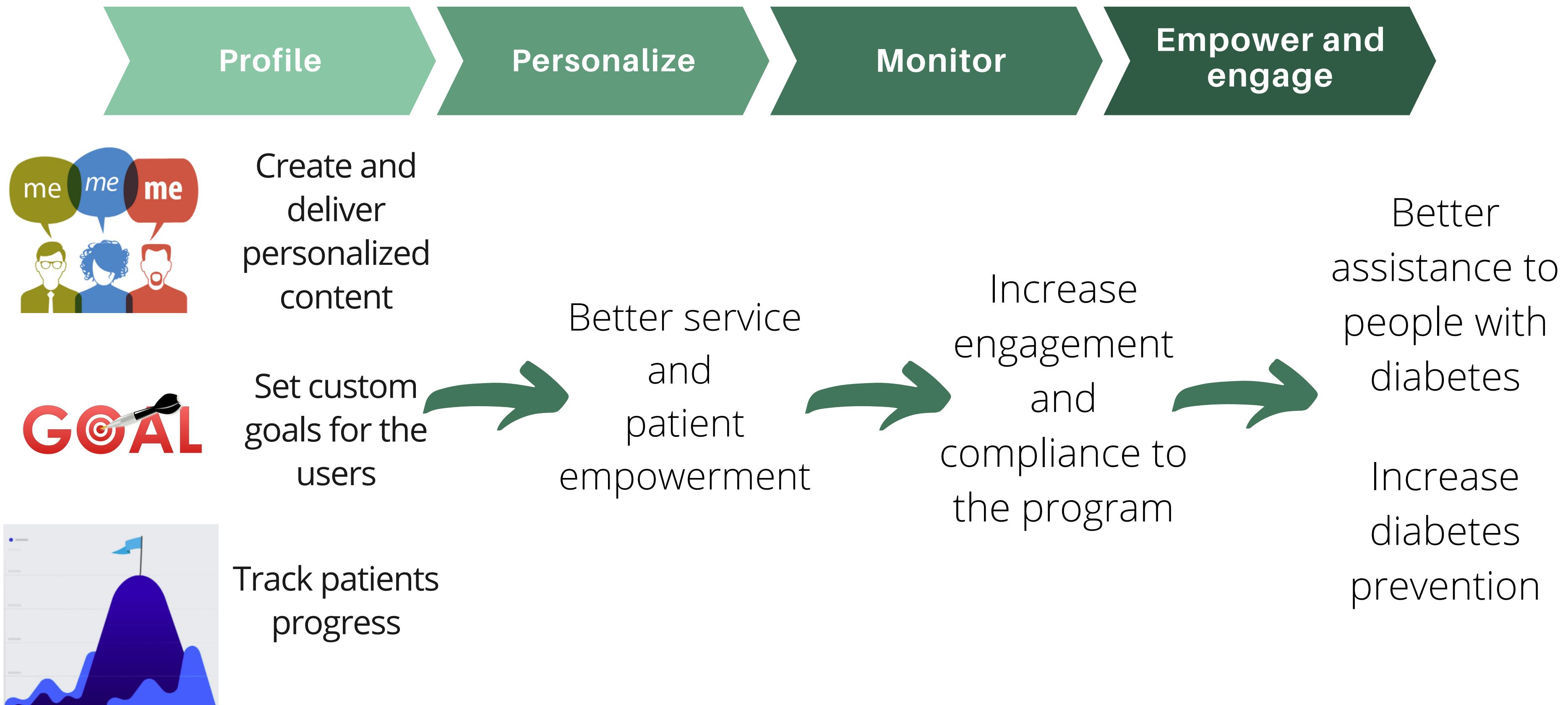
**Correct behavior when deviations arise  
(push notifications, reminders, etc.)**

## High Risk Segment



**Congratulate and motivate when  
goals are achieved**

# The solution in action



# Further benefits and opportunities

**Integration with health service providers**



**Allocate resources efficiently**



**Improve management's decision making process**



**Reach a bigger audience**



# Conclusion and Recommendations

- Engagement and compliance with DSMES have proven to be a big barrier in the fulfillment of the strategic goals of the program.
- During this presentation, we have seen the potential of using a data-driven approach, by developing a model capable of predicting the likelihood of having diabetes.
- The results from the model can then be used to deliver personalized and adequate content and set custom goals for users, increasing their engagement on the program.
- Improvement of the model seems to be achievable with the gathering of more data.



*"Hiding within those mounds of data is the knowledge that could change the life of a patient, or change the world".*

Dr. Atul Butte

Chief Data Scientist at University of California Health