Transforming Obesity Management: A Machine Learning Approach

This presentation introduces a machine learning model designed to predict individual obesity levels (NObeyesdad) and enable personalized interventions, ultimately transforming how we manage the obesity epidemic.

The Team

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The Obesity Epidemic

Global Problem

Rising obesity rates worldwide.

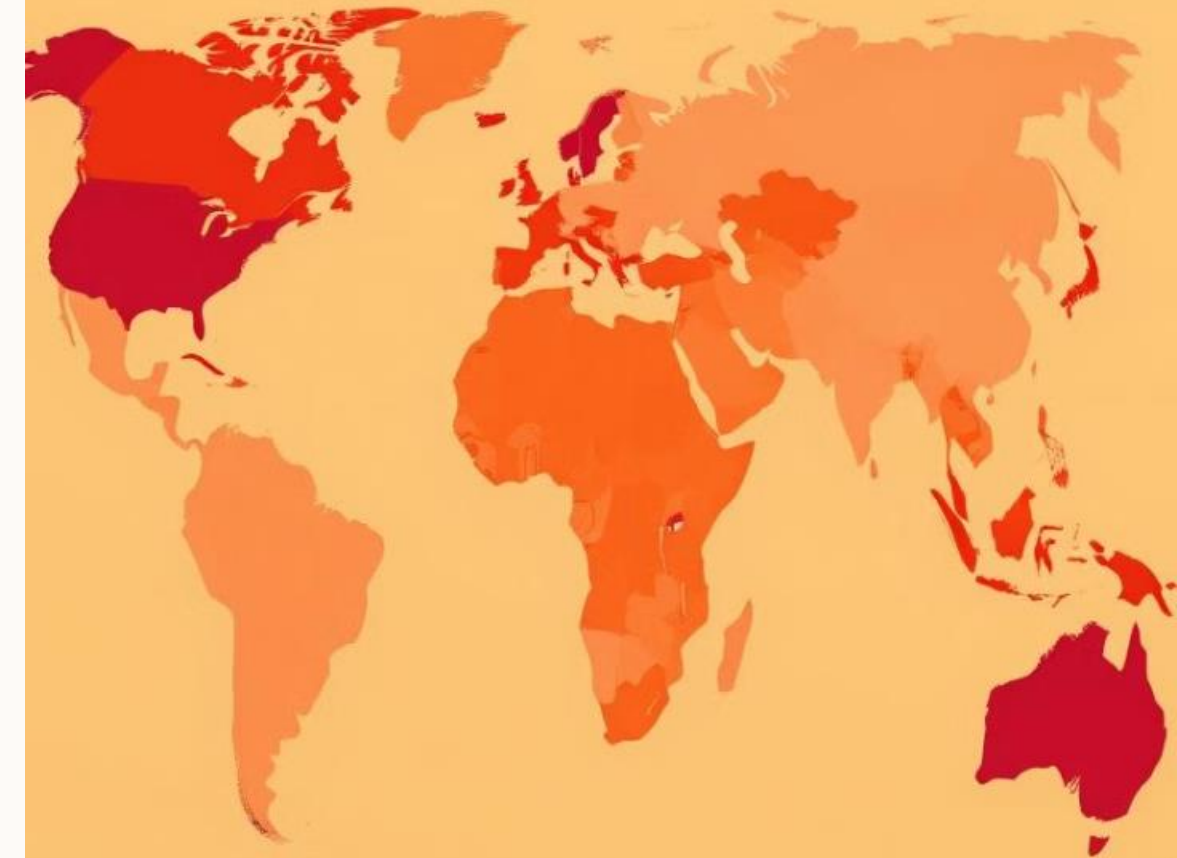### US Statistics

Increasing obesity prevalence in the US.

Health Impact

Individual health and societal costs.

Obesitty Rates Wordwid

Key	9200	6485
33%	45%	74%
22%	4.3%	115%

The Challenge of Personalized Intervention

Ineffective Methods

General health advice is often insufficient.

Lack of Personalization

Need to target at-risk individuals.

Economic Burden

Rising obesity-related healthcare costs.

Predicting Obesity Levels (NObeyesdad)

Prediction Difficulty

Challenges in predicting NObeyesdad accurately.

ML Model Needed

Need for a reliable machine learning model.

Feature Selection

Challenges in feature selection and optimization.

A Machine Learning Model for Obesity Prediction

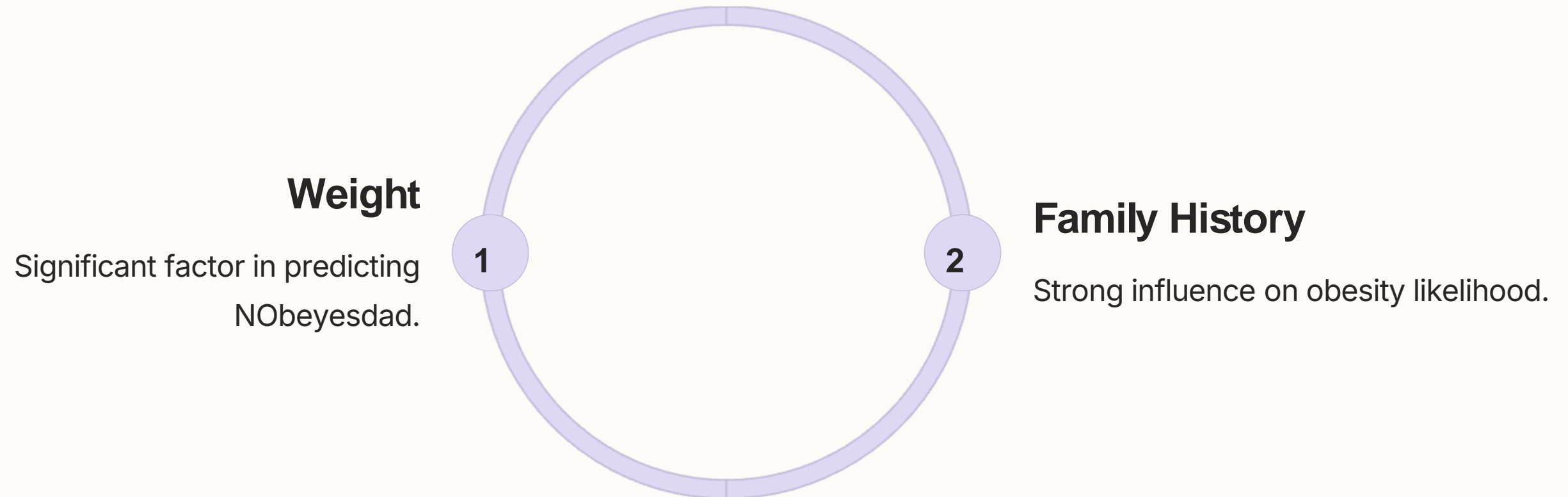**Proposed ML Solution**

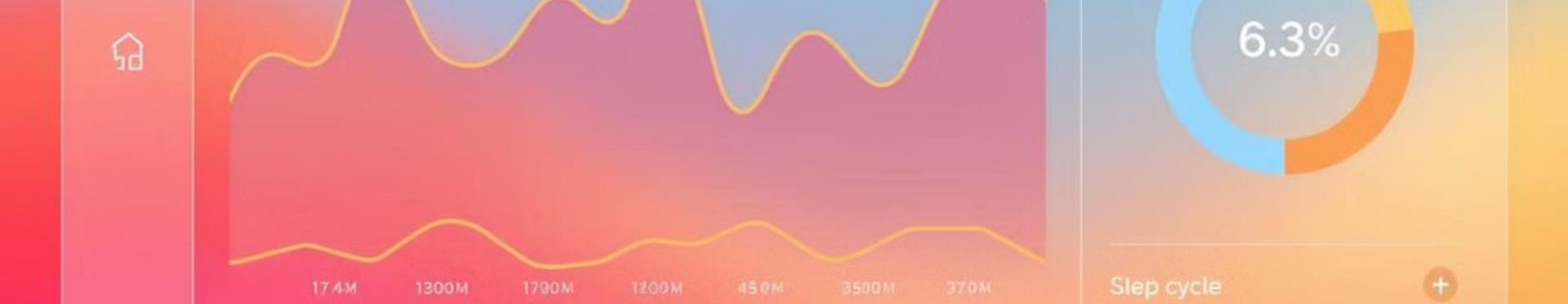**Personalized Insights**

Algorithm Types

Understanding the Predictive Factors

Demographics —— 1

Gender, Age, Height, Weight.

2 —— **Family History**

Family History with Overweight.

Dietary Habits —— 3

FAVC, FCVC, NCP, CAEC.

Weight and Family History as Strong Predictors

Weight

Significant factor in predicting NObeyesdad.

1

2

Family History

Strong influence on obesity likelihood.

Desired Outcomes and Metrics

90%

Accuracy

Target accuracy in predicting NObeyesdad.

10%

Reduce False Positives

Minimize false positive predictions.

Model Development and Evaluation
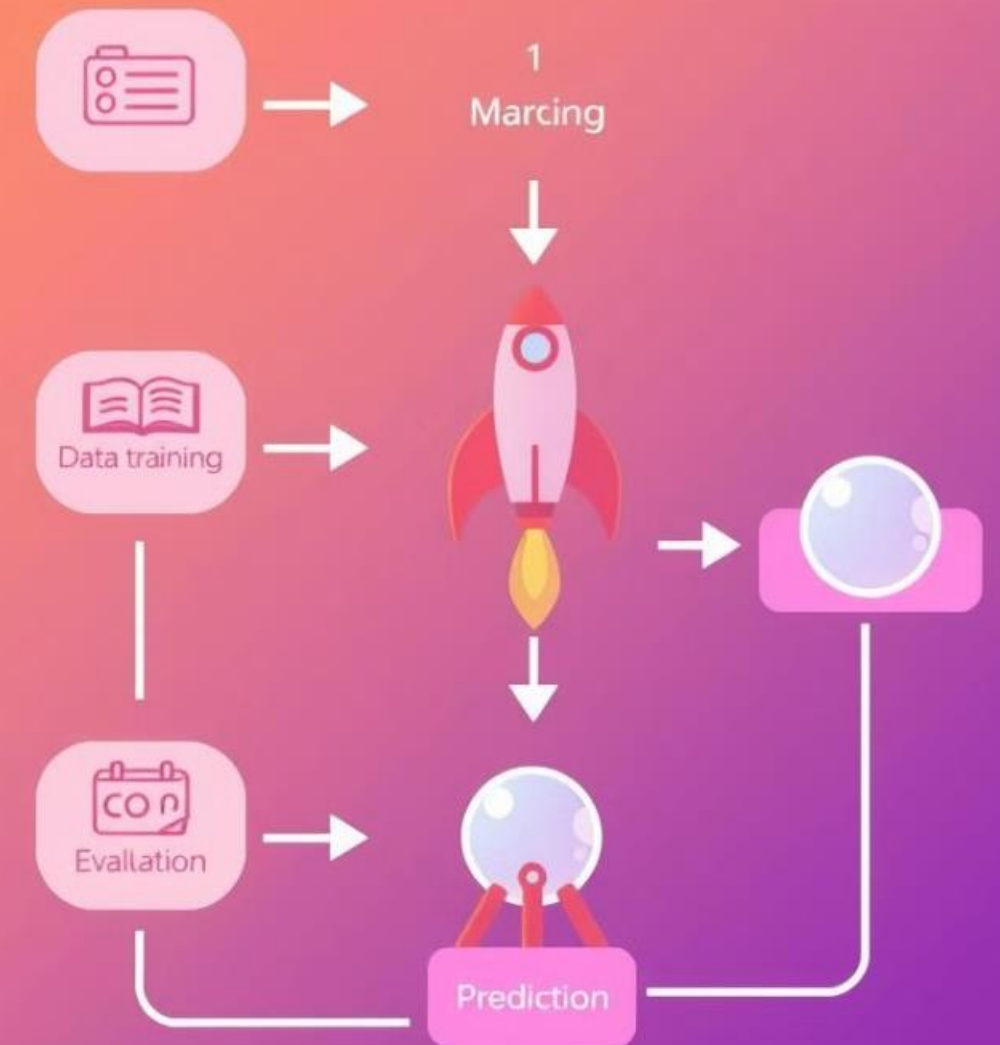
Data Preprocessing

Cleaning and preparing the data.

Model Selection

Choosing the best algorithm.

Evaluation Metrics

Measuring model performance.

Machine Learning

Transforming Obesity Management

1 **Model Selection**

We evaluated Random Forest, Gradient Boosting, and LightGBM classifiers.

2 **Hyperparameter Tuning**

GridSearchCV and RandomizedSearchCV optimized model performance.

3 **Streamlined Transformations**

Pipelines enhanced data processing and model training efficiency.

Transforming Obesity Management

Recap

Addressing business and technical problems.

Potential Impact

Personalized obesity intervention.

Call to Action

Next steps and future directions.

Thank You