

Ideation Phase

Defining the Problem Statements

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Team ID	716
Project Name	6112-Public Health Awareness Campaign Analysis using Data Analytics

Public Health Awareness Campaign Analysis

Problem Definition and Design Thinking

Introduction

The task at hand is to develop a public health awareness system using data analytics. Public health awareness campaigns play a crucial role in promoting healthy behaviors within communities. Data analytics is a valuable tool for evaluating public health awareness campaigns. The ultimate goal is to prevent illness and improve public health.

This document will outline the problem statement, the steps involved in solving it, and the design thinking approach that will guide our project.

Problem Statement

Objective: Develop a data analytics-driven public health awareness system.

Data: We have a dataset containing various features of data sources (awareness campaign data, surveys, government health data). This data will be used for comprehensive health analysis.

Key Challenges:

1. Data Quality: Ensuring the dataset used for analysis is accurate.
2. Privacy and security: Public health data involves sensitive information so we have to handle it properly.
3. Data Integration: Combining data from various sources can be technically challenging.

4. Time sensitivity: Public health issues often require timely responses.
5. Resource constraints: Health organizations may have limited budgets so we have to choose the correct resources for awareness campaigns.

Design Thinking Approach

Empathize:

Understanding the importance of public health awareness campaigns, it's crucial to empathize with the challenges that data analytics brings. While data can provide valuable insights to target interventions effectively, protecting individuals' privacy, addressing biases, and overcoming resource limitations. Measuring the true impact of these campaigns is complex but essential.

Actions:

- Conduct surveys or interviews with potential users to gather their perspectives.
- Analyse historical real estate market trends to identify critical pricing factors.
- Seek feedback from domain experts in the real estate industry.

Define:

Based on our understanding of the problem and the users' needs, we will define clear objectives and success criteria for our project.

Objectives:

- Develop a machine learning model that achieves a Mean Absolute Error (MAE) of less than \$X on the test data.
- Create a user-friendly web application for users to input house details and receive price predictions.

Ideate:

Brainstorm potential solutions and approaches to address the problem. This phase involves thinking creatively and considering various algorithms and techniques for house price prediction.

Actions:

- Explore different machine learning algorithms such as linear regression, decision trees, random forests, and neural networks.
- Experiment with feature engineering techniques to enhance model performance.
- Consider incorporating external data sources (e.g., neighbourhood crime rates, school quality) to improve predictions.

Prototype

Create a prototype of the machine learning model and the user interface for price prediction.

Actions:

- Develop a Jupyter Notebook or Python script for data pre-processing, model training, and evaluation.
- Create a simple web interface using tools like Flask or Django to allow users to input house details.
- Test the prototype with a subset of the dataset to ensure it meets performance objectives.

Test

Evaluate the model's performance using appropriate metrics and gather feedback from users.

Actions:

- Split the dataset into training and testing sets.
- Train the model on the training set and evaluate it on the testing set.
- Use metrics such as MAE, Root Mean Square Error (RMSE), and R-squared to assess model performance.
- Collect user feedback on the web interface for usability and accuracy.

Implement

Once the prototype meets the defined objectives and receives positive feedback, proceed with full implementation.

Actions:

- Train the final machine learning model on the entire dataset.
- Deploy the model as part of a production-ready web application.
- Conduct thorough testing to ensure the application is robust and user-friendly.

Iterate

Continuous improvement is essential. Gather user feedback and iterate on the model and interface to enhance accuracy and usability.

Actions:

- Monitor the model's performance and retrain it periodically with updated data.
- Address user feedback and make necessary improvements to the web interface.
- Stay informed about advancements in machine learning and real estate pricing models for potential enhancements.

Conclusion

In this document, we've outlined our approach to solving the problem of house price prediction using machine learning. We've defined the problem, identified key challenges, and laid out a design thinking approach that involves empathizing with users, defining objectives, ideating potential solutions, prototyping, testing, implementing, and iterating.

Our ultimate goal is to develop an accurate and user-friendly solution that provides valuable insights for both homebuyers and real estate professionals in the housing market. By following this structured approach, we aim to create a reliable tool that contributes positively to the real estate industry.