



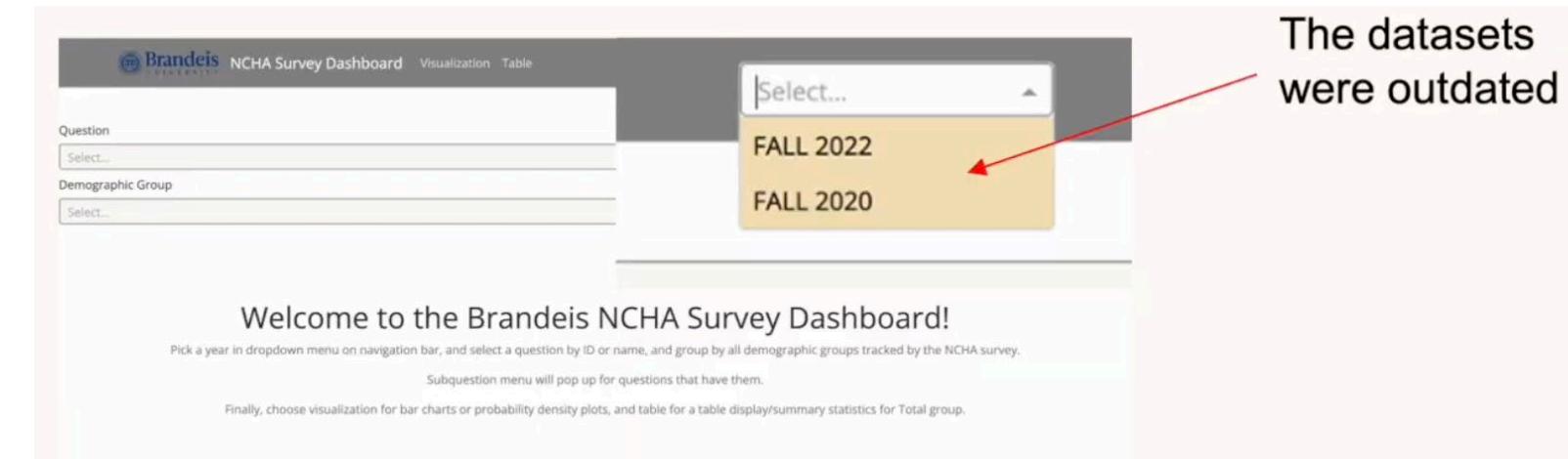
# Building an Interactive Dashboard for Student Wellness Analytics

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## Introduction

An existing dashboard was developed for student affairs professionals to access and analyze insights from the **National College Health Assessment (NCHA)** survey on student wellness, conducted by the **American College Health Association (ACHA)**.



The dashboard originally included data from 2020 and 2022. Since the NCHA data is updated every two years, it was necessary to update the dashboard with the 2024 dataset and modernize it according to current best practices in dashboard architecture and functionality.

## Main Objectives

### 1. Update the dataset (2024):

The NCHA survey contains hundreds of questions and sub-questions, making it challenging for student affairs professionals to locate specific information.

### 2. Integrate a Large Language Model (LLM):

To improve usability, an LLM was integrated into the dashboard, enabling users to query the system in natural language. For example, users can type, "Show me data about students who reported high stress levels," and the model identifies the most relevant survey question automatically.

### 3. Open-source the dashboard:

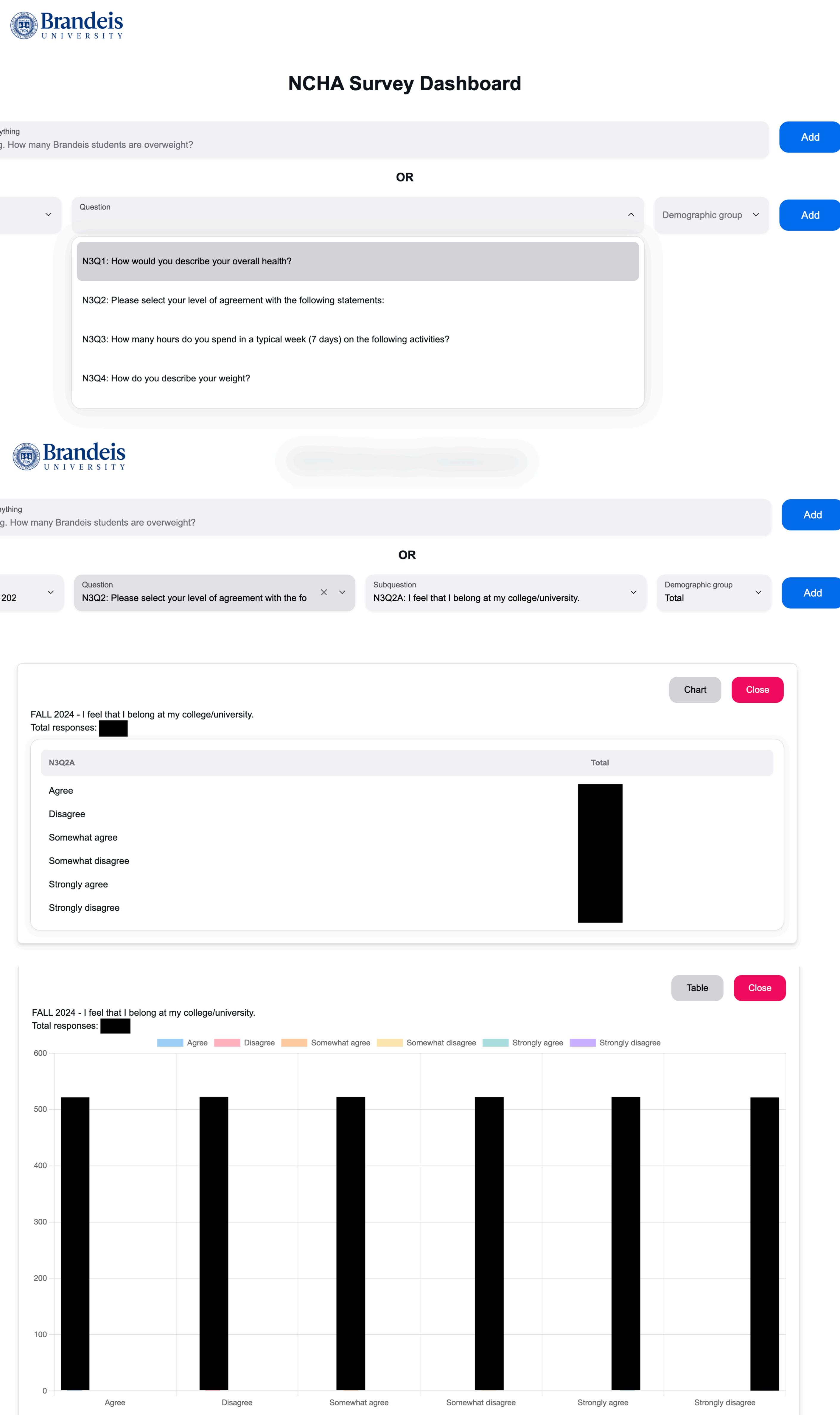
Many ACHA member institutions need tools to analyze their own NCHA data. By making the dashboard open source, other institutions can adapt and use it for their own data analyses.

### 4. Refactor the dashboard using Next.js:

To prepare for open-source deployment, the dashboard's architecture was refactored to separate the data from the backend source code.

## Results

The new dashboard: (Built by Next.js)



## Challenges

Because the NCHA dataset contains sensitive and confidential student wellness data, data protection was a top priority. Several measures were made to ensure privacy and security:

- Data separation: The dataset is stored separately from the dashboard source code.
- LLM data protection: To prevent potential data leaks to OpenAI's servers, the LLM was designed with restricted access.
- The LLM cannot view or process any student data. Instead, it is given access only to a JSON file containing the ID and description of each survey question. These questions are public data, so their use poses no privacy risk.
- After identifying the correct survey question, the LLM returns its ID to the dashboard. The dashboard then retrieves and visualizes the relevant data internally, without exposing any sensitive information to the external model.

## References

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3. Fazio, M., Celesti, A., Puliafito, A., and Villari, M. 2015. Big Data Storage in the Cloud for Smart Environment Monitoring.

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