Maven Healthcare Story

# Overview

working as a Data Analyst for the American Hospital Association (AHA), a **national organization** that represents hospitals and their patients, and acts as a source of information on health care issues and trends.

As part of your role, you've been asked to analyze the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey results for the last 9 years. The intent of the HCAHPS initiative is to provide a standardized survey instrument for measuring patients’ perspectives on hospital care, and one of its 3 main goals is to **"create incentives for hospitals to improve their quality of care".**

# Target Audience

* **Chief executive officer:​** Eager to know which measures are performing the best so they can allocate the operation resources efficiently.
* **Chief Financial Officer:​** Would like to keep an eye on measures report to assign the incentives for hospitals, send sufficient doctors and nurses serving patients and show the government/investors how they can grow their service on measures that didn’t make the satisfaction.
* **Chief Information Officer**:​ It’s essential that they understand swings in the hospital operations on patient data and health care data security issues. If one measure becomes more dominant over time, they’ll want to know so they can make sure hospitals have a sufficient number of IT infrastructure, doctors and nurses serving patients.

# Key Questions

Your task is to **evaluate whether the HCAHPS survey has been successful in accomplishing this goal** by answering questions like these:

1. **Have hospitals' HCAHPS scores improved over the past 9 years?**
2. **Are there any specific areas where hospitals have made more progress than others?**
3. **Are there any major areas of opportunity remaining?**
4. **What recommendations can you make to hospitals to help them further improve the patient’s experience?**

# Objective

# Context

* **Project Scale:**Two weeks
* **Analytics based on the client’s business data**

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Description automatically generatedA computer screen with tools on it

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A circular icon with a gear in the head

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* Format: Excel-CSV
* Information:
* Data Citation:

# Data model

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Table Name** | **measures** | **national\_results** | **questions** | **reports** | **responses** | **state\_results** | **states** |
| **measures** | measure\_id | measure\_id | measure\_id |  |  | measure\_id |  |
| **national\_results** | measure\_id | *Composite key* |  | release\_period |  |  |  |
| **questions** | measure\_id |  | **Q# ?** |  |  |  |  |
| **reports** |  | release period |  | release period | release period | release period |  |
| **responses** |  |  |  | release\_period | *Composite key* |  |  |
| **state\_results** | measure\_id | release\_period |  | release\_period |  | *Composite key* |  |
| **states** |  |  |  |  | state | state | state |

**ER diagram: On draft.**

Fact Table:

Dimension Tables:

Project Communications, Milestones, and Deliverables

|  |  |
| --- | --- |
| *Communication Mode* | *Communication Details* |
| Meeting | 1. At the beginning of the project, we hold a meeting with representatives of each group of stakeholders mentioned above; During the meeting, business requirements are discussed, and we will brainstorm the clarifying, funneling, attaching, elevating, bias, and privacy- and ethics-related questions. 2. In the middle of project, we hold another meeting to provide some updates on insights and hypotheses and get feedback from attendees. 3. In late phases, we hold a final meeting to discuss whether the project met its goals and whether there are any remaining questions or future steps to take. |
| Call | During the modeling phase, we will schedule some video calls with stakeholders to update them with project progress. We will collect feedbacks and will also explain next steps on the project. |
| Written Communication | Starting in week three, lasting until end of project, we send weekly updates on analysis reports, dashboards, and the project progress. |
| Emergency/Contingency Plan | Any urgent issues are communicated via email, messaging with a follow-up call scheduled within two business days. |

Schedule and Milestones

| *Start Date: 10 Aug, 2023* |
| --- |
| Data preparation milestones | **Week 1** | **Week 2** | **Week 3** | | | **Week 4** | **Week 5** | | **Week 7** | | **Week 8** | **Week 9** | **Week 10** | **Total days** |
| 1.2: Starting with Requirements | 10 |  |  | | |  |  | |  | |  |  |  | **1** |
| 1.3: Designing a Data Research Project | 10-15 |  |  | | |  |  | |  | |  |  |  | **5** |
| 1.4: Sourcing the Right Data |  | 15-18 |  | | |  |  | |  | |  |  |  | **3** |
| 1.5: Data Profiling & Integrity |  | 18-25 | | | |  |  | |  | |  |  |  | **7** |
| 1.6: Data Quality Measures |  |  |  | | |  |  | |  | |  |  |  | **7** |
| 1.7: Data Transformation & Integration |  |  |  | | |  |  | |  | |  |  |  | **7** |
| 1.8: Conducting Statistical Analyses |  |  |  | | |  |  | |  | |  |  |  | **10** |
| 1.9: Statistical Hypothesis Testing |  |  |  | | |  |  | |  | |  |  |  | **2** |
| 1.10 First report |  |  |  | | |  | | |  | |  |  |  | **41** |
| **DELIVERABLE- MILESTONE 1** |
| Exploratory and modeling milestones | **Week 1** | **Week 2** | **Week 3** | | | **Week 4** | **Week 5** | | **Week 7** | | **Week 8** | **Week 9** | **Week 10** | **Total days** |
| 2.1: Data Visualization |  |  |  | | |  |  | | 5-14 | |  |  |  | **15** |
| 2.2: Visual Design Basics |  |  |  | | |  |  | |  | | |  |  | **20** |
| 2.3: Composition & Comparison Charts |  |  |  | | |  |  | |  | |  | |  | **28** |
| 2.4: Temporal Visualizations & Forecasting |  |  |  | | |  |  | |  | |  |  | 1-8 | **8** |
| 2.5: Statistical Visualizations: Histograms & Box Plots |  |  |  | | |  |  | |  | |  |  | 9-15 | **7** |
| 2.6: Statistical Visualizations: Scatter Plots & Bubble Charts |  |  |  | | |  |  | |  | |  |  | 9-30 | **21** |
| 2.7: Spatial Analysis |  |  |  | | |  |  | |  | |  |  |  | **8** |
| 2.8: Textual Analysis |  |  |  | | |  |  | |  | |  |  |  | **31** |
| 2.9: Storytelling with Data Presentations |  |  |  | | |  |  | |  | |  |  |  | **30** |
| 2.10: Presenting Findings to Stakeholders |  |  |  | | |  |  | |  | |  |  |  | **31** |
| **Deliverable- Milestone 2** |
| **Deliverables** | | | | | | | | | | | | | | | |
| milestones | | | | tasks | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | |
| **1.2: Starting with Requirements** | | | | * Create a list of the data questions you need to answer for your analysis. | | | | | | | | | | | |
| **1.3: Designing a Data Research Project** | | | | * Design your data research project. * Formulate a research hypothesis. | | | | | | | | | | | |
| **1.4: Sourcing the Right Data** | | | | * Describe the data sets you have access to for your project. * Explain the relevance and limitations of each data set to your project. | | | | | | | | | | | |
| **1.5: Data Profiling & Integrity** | | | | Create a data profile for each of the data sets in your analysis.Include information on data types, data integrity issues (accuracy and consistency), any cleaning you conducted, as well as summary statistics in each profile. | | | | | | | | | | | |
| **1.6: Data Quality Measures** | | | | Implement additional data quality measures to your data profiles related to completeness, uniqueness, and timeliness. | | | | | | | | | | | |
| **1.7: Data Transformation & Integration** | | | | Integrate data from two sources into one cohesive data set using data transformations. | | | | | | | | | | | |
| **1.8: Conducting Statistical Analyses** | | | | Calculate the variance and standard deviation for key variables.Identify variables with a potential relationship and test for a correlation. | | | | | | | | | | | |
| **1.9: Statistical Hypothesis Testing** | | | | Formulate a statistical hypothesis regarding an outcome of interest around two groups in your data.Conduct hypothesis testing and interpret the results. | | | | | | | | | | | |
| **DELIVERABLE 1 - Consolidating Analytical Insights** | | | | Create an interim report consolidating the findings of your analysis. | | | | | | | | | | | |
| 2.1: Intro to Data Visualization | | | | Explain how data visualizations can be used in your project. | | | | | | | | | | | |
| **2.2: Visual Design Basics & Tableau** | | | | Create a data visualization design checklist.Explain how the visualizations in a given example can be improved.Connect your project data to Power BI. | | | | | | | | | | | |
| **2.3: Composition & Comparison Charts** | | | | Create a pie, bar, or column chart, as well as a treemap in Power BI.Use your visualization design checklist to design your charts. | | | | | | | | | | | |
| **2.4: Temporal Visualizations & Forecasting** | | | | Create a time forecast for a variable and display it in Power BI.Use your visualization design checklist to design your chart. | | | | | | | | | | | |
| **2.5: Statistical Visualizations: Histograms & Box Plots** | | | | Create visualizations that look at the distribution of a variable.Use your visualization design checklist to design your charts. | | | | | | | | | | | |
| **2.6: Statistical Visualizations: Scatter Plots & Bubble Charts** | | | | Create visualizations that look at the correlation between variables.Use your visualization design checklist to design your chart. | | | | | | | | | | | |
| **2.7: Spatial Analysis** | | | | Map a variable and justify your spatial visualization choice (heat, density, or choropleth).Use your visualization design checklist to design your chart. | | | | | | | | | | | |
| **2.8: Textual Analysis** | | | | Create a word cloud using qualitative data.Use your visualization design checklist to design your chart. | | | | | | | | | | | |
| **2.9: Storytelling with Data Presentations** | | | | Create a narrative to communicate your research findings and insights in relation to your research goals.Publish your analysis as a Power BI Dashboard. | | | | | | | | | | | |
| **DELIVERABLE 2 - Presenting Findings to Stakeholders** | | | | * **Record a video presentation for your stakeholders.** | | | | | | | | | | | |
|  | | | |  |  | | |  | |  | | | | | |

# Power BI Report

# Questions and Solutions

# Challenges and Limitations

# Recommendation

# Deliverables