

Customer Satisfaction Analysis in Hotels Using Power BI

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ABSTRACT

In the hospitality industry, customer satisfaction analysis is critical, especially in hotels where the visitor experience has a significant impact on company results. Using Power BI, this study explores the cleverness of customer happiness in hotels, highlighting critical indicators and insights from guest feedback data. By using skillful data visualization, trend analysis, and sentiment analysis, the study aims to provide hotel management with useful information to increase visitor happiness and raise service standards. It revolves around the adept use of Power BI, a robust business intelligence tool, to create an interactive dashboard for visualizing customer feedback in the field of hotel management. This dataset enclose a various range of feedback collected from surveys and reviews. Through the development of this dashboard, the project aims to provide hotel managers with an user-friendly tool to gain comprehensive insights into customer sentiment. Also, the project compares how well the hotel is doing compared to other similar places. This helps understand how effective the hotel is in its operations. The insights from these visuals give practical recommendations, empowering hotel managers and stakeholders to make smart decisions based on data. This Data Visualization lead to Performance analysis in order yield better results.

Keywords : Customer Satisfaction Analysis, Data Visualization, Feedback, Performance Analysis, Power BI, Sentiment Analysis.

I. INTRODUCTION

The Customer Satisfaction Analysis project is an innovative initiative aimed at leveraging data insights to enhance guest experiences and overall satisfaction at

a hotel. Through the development of an interactive Power BI dashboard, the project offers real-time visibility into customer feedback trends and sentiments. This dashboard incorporates dynamic elements such as charts, graphs, and heatmaps to

present information in an easily digestible format. Key performance indicators (KPIs) like Net Promoter Score (NPS) and Customer Satisfaction Score (CSAT) are prominently featured, providing a quick snapshot of customer satisfaction levels. Furthermore, the dashboard includes a benchmarking feature that enables the hotel to compare its performance against industry standards and competitors. This allows for a comprehensive understanding of where the hotel stands relative to others in the industry and highlights areas for improvement. The Net Promoter Score segments feedback into Promoters, Passives, and Detractors, while the Customer Satisfaction Score covers aspects like Staff Attitude, Room Service, Room Cleanliness, Food Quality, and more. Drill-down capabilities within the dashboard empower users to delve into specific time periods, departments, or services, facilitating targeted analysis and identification of areas needing attention. Overall, the Customer Satisfaction Analysis project aims to empower the hotel management with actionable insights to drive continuous improvement and deliver exceptional guest experiences.

1.1 POWER BI SOFTWARE

Visit the Microsoft Power BI website: Go to the official Power BI website at powerbi.microsoft.com.

Choose Version: Power BI is available in two main versions: Power BI Desktop (for individual users) and Power BI Service (for businesses and enterprises). If you're a beginner or just want to explore Power BI's capabilities, start with Power BI Desktop.

Download Power BI Desktop

- On the Power BI homepage, click on the "Products" tab in the top menu.
- Select "Power BI Desktop" from the dropdown menu.
- Click on the "Download free" button.
- Choose the version (Windows 64-bit or 32-bit) that is compatible with your operating system.

- Click on the "Download" button.

Installation: Once the setup file is downloaded, open it and follow the installation instructions. Accept the terms and conditions, choose the installation location, and complete the installation process.

Sign in or create an account: After installing Power BI Desktop, launch the application. You'll be prompted to sign in with your Microsoft account or create a new one if you don't have an account already. Signing in allows you to access additional features and services, but you can also use Power BI without signing in.

Start using Power BI: Once you're signed in, you can start using Power BI Desktop to create reports, dashboards, and visualizations with your data. Explore the various features and functionalities to build insightful analytics solutions.

Remember, Power BI Desktop is free to download and use for personal and individual purposes. For business use and collaboration features, you may need to subscribe to Power BI Pro or Power BI Premium, which are part of the Power BI Service offering.

1.2 KEY FEATURES OF POWER BI

Microsoft created Power BI, a potent business analytics tool. It enables users to visualize and analyze data from various sources, helping organizations make data-driven decisions. Power BI is a complete business intelligence and analytics solution because it provides a number of capabilities for data preparation, modelling, visualization, and collaboration. It includes

Data Connectivity: A variety of data sources, including as files, databases, web services, and cloud-based apps, can be connected to by Power BI. Both structured and unstructured data are supported.

Data Preparation: With Power BI's user-friendly interface and integrated capabilities, users can easily clean, transform, and shape data. This includes the ability to model data, clean up data, and establish connections between various data sources.

Data Visualization: A wide range of visualization tools, such as tables, charts, graphs, maps, and custom visualizations, are available with Power BI. For the purpose of exploring data and gaining insights, users can construct dynamic, interactive reports and dashboards.

Advanced Analytics: Predictive analytics, statistical modelling, and machine learning integration are examples of advanced analytics features that Power BI provides. By using these features, users can use their data to find correlations, trends, and patterns.

Natural Language Query: With Power BI, customers may use natural language queries to pose inquiries about their data. Based on the data, the tool analyzes these queries and produces insights or visualizations.

Collaboration and Sharing: By sharing reports and dashboards with stakeholders or other colleagues, users can work together on them. Power BI provides tools for managing access to data and insights, as well as for sharing, publishing, and embedding reports.

Mobile Access: Power BI offers iOS, Android, and Windows mobile apps that let users view and engage with their dashboards and reports on the go.

Overall, Power BI is a versatile and user-friendly tool that empowers organizations to unlock the value of their data, drive business growth, and gain a competitive edge in today's data-driven world.

OBJECTIVES

The objective of the customer satisfaction analysis project in hotels, utilizing Power BI, is to develop an interactive dashboard that offers real-time insights into customer feedback. This dashboard will prominently feature key performance indicators (KPIs) such as Net Promoter Score (NPS) and Customer Satisfaction Score (CSAT), allowing hotel management to quickly assess satisfaction levels.

Furthermore, the dashboard will enable users to drill down into specific time periods, departments, or services to identify areas for improvement. It will track KPIs like Promoters, Passives, and Detractors for NPS,

and feedback categories such as Staff Attitude, Room Service, and Food Quality for CSAT.

Benchmarking, hotels can compare their performance with industry standards and competitors. The dashboard offers customization, allowing users to adapt it to their specific requirements. Predictive analytics helps forecast future satisfaction levels. Overall, the dashboard turns insights into actionable strategies for improving customer satisfaction and driving business success through continuous improvement efforts.

II. 2. IMPORT DATASET IN POWER BI

Launch Power BI Desktop: Start by opening Power BI Desktop, which you can download and install from the Microsoft website if you haven't already done so.

Get Data: Once Power BI Desktop is open, click on the "Home" tab in the ribbon at the top of the window. Then, click on the "Get Data" button. This will open a dropdown menu with various data source options.

Choose Data Source: Select the type of data source you want to import from. Power BI supports a wide range of data sources, including Excel files, databases (such as SQL Server, MySQL, PostgreSQL), online services (such as SharePoint Online, Dynamics 365), and many others. Click on the appropriate data source option.

Connect to Data Source: After selecting the data source, you'll be prompted to connect to it. Depending on the data source you chose, you may need to provide additional information such as server details, file path, or authentication credentials.

Select Data: Once connected, Power BI will display a navigator window showing the available data objects (e.g., tables, sheets, views) within the data source. Select the specific data object(s) you want to import into Power BI by checking the checkboxes next to them. You can preview the data by clicking on the object name.

Load Data: After selecting the desired data object(s), click on the "Load" button (or "Transform Data" if you want to perform data transformation tasks before loading). Power BI will then import the selected data into the Power BI Desktop environment.

Data Transformation (Optional): If needed, you can perform data transformation tasks such as cleaning, shaping, and combining data before loading it into Power BI. Clicking on the "Transform Data" button in the navigator window will open Power Query Editor, where you can apply various transformations.

Data Model: Once the data is loaded into Power BI, you can work with it in the data model view. Here, you can define relationships between tables, create calculated columns and measures, and prepare the data for visualization.

Visualize Data: After importing and modeling your data, you can start creating reports and dashboards using Power BI's visualization tools. Drag and drop fields from your dataset onto the report canvas to create visualizations such as charts, graphs, and tables.

Save and Publish: Finally, save your Power BI Desktop file (.pbix) and publish it to the Power BI service if you want to share your reports and dashboards with others or access them on the web or mobile devices.

III. MODULE DESCRIPTION

- Data Integration Techniques
- Key Performance Indicators (KPIs)
- Drill-Down Capabilities

3.1. Data Integration Techniques

Participants will learn how to aggregate feedback data from various sources including online reviews, surveys, and social media platforms, ensuring a comprehensive data set for analysis.

3.2. Key Performance Indicators (KPIs)

The module emphasizes the calculation and interpretation of crucial KPIs such as Net Promoter Score (NPS) and Customer Satisfaction Score (CSAT), enabling participants to measure and track guest satisfaction effectively.

3.2.1. NPS - NET PROMOTER SCORE

NPS Measure Formula NPS

NPS Measure = $\text{IF}(\text{General}[\text{NPS Rating}] > 8, \text{"Promoters"}, \text{IF}(\text{General}[\text{NPS Rating}] < 7, \text{"Detractors"}, \text{"Passive"}))$

PROMOTERS - Promoters are customers who rate the product or service highly (usually 9 or 10).

NPS Promoters % = $(\text{CALCULATE}(\text{COUNT}(\text{General}[\text{NPS Rating}] > 8), \text{General}[\text{NPS Rating}] > 8) / \text{COUNT}(\text{General}[\text{NPS Rating}])) * 100$.

PASSIVE - Passive are customers who rate the product or service 7 or 8.

DETRACTORS - Detractors are those who rate it poorly (usually 0 to 6).

NPS Detractors % = $(\text{CALCULATE}(\text{COUNT}(\text{General}[\text{NPS Rating}] < 8), \text{General}[\text{NPS Rating}] < 8) / \text{COUNT}(\text{General}[\text{NPS Rating}])) * 100$.

NPS Score = $\text{General}[\text{NPS Promoters \%}] - \text{General}[\text{NPS Detractors \%}]$

3.3. Drill-Down Capabilities

This feature enables users to focus on specific time periods, departments, or services, providing a targeted approach to identifying areas for improvement.

IV. CUSTOMER SATISFACTION MEASUREMENT

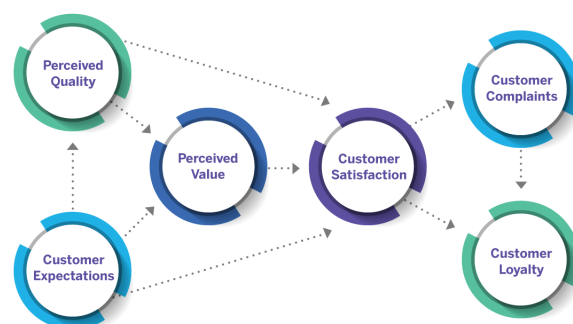


Fig 1. Customer Satisfaction Measurement

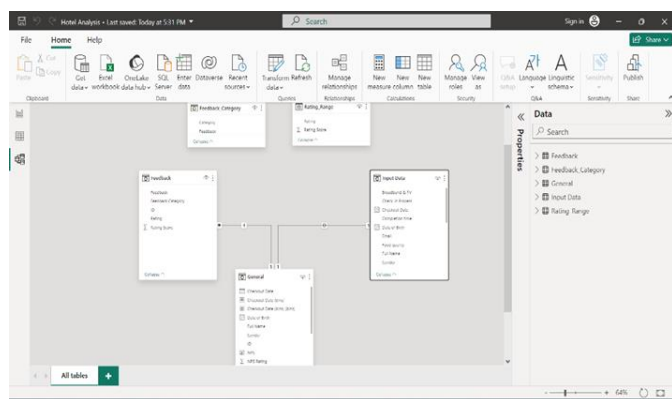


Fig 4 : Model View

The above ER diagram captures the relationship between customers and their feedback regarding their experiences with the hotel. The "Customer" entity represents individual customers, while the "Feedback" entity contains information provided by customers, including metrics such as Net Promoter Score (NPS), Customer Satisfaction Score (CSAT), Purpose of Visit, and Source of Information.

Customers interact with the hotel and provide feedback through various channels, such as surveys or online reviews. This feedback is stored in the "Feedback" entity, where each entry is associated with a specific customer. The attributes of the "Feedback" entity, including NPS, CSAT, Purpose of Visit, and Source of Information, allow for detailed analysis of customer sentiments and preferences.

Analyzing this feedback data enables hotel managers and stakeholders to understand how well the hotel is performing compared to other similar establishments. Visualizations and insights derived from this data provide practical recommendations for improving operations and enhancing the overall customer experience. By making data-driven decisions, hotel managers can address areas of improvement and capitalize on strengths, ultimately driving customer satisfaction and loyalty.

4.4. SYSTEM SPECIFICATION

4.4.1. HARDWARE SPECIFICATION

Dual-core processor

8GB of RAM

256GB or more of storage (SSD recommended)

Basic integrated GPU

12-inch or larger screen

4.4.2. SOFTWARE SPECIFICATION

Microsoft Excel

Power BI

Power Query

Power Pivot

Internet Connection

4.5. FEEDBACK ANALYSIS DASHBOARD IN HOTEL

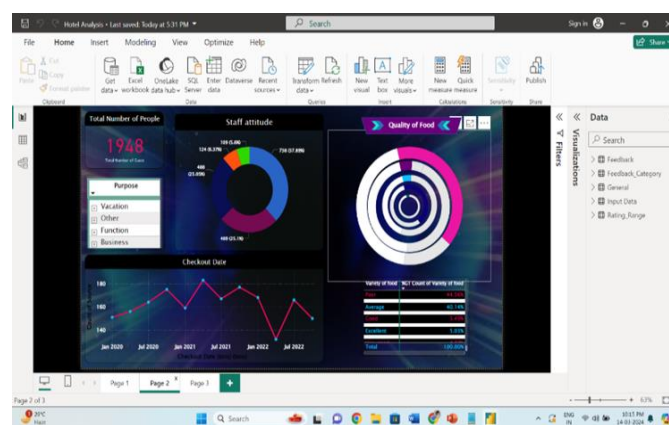


Fig 5 : Customer Dashboard - 1

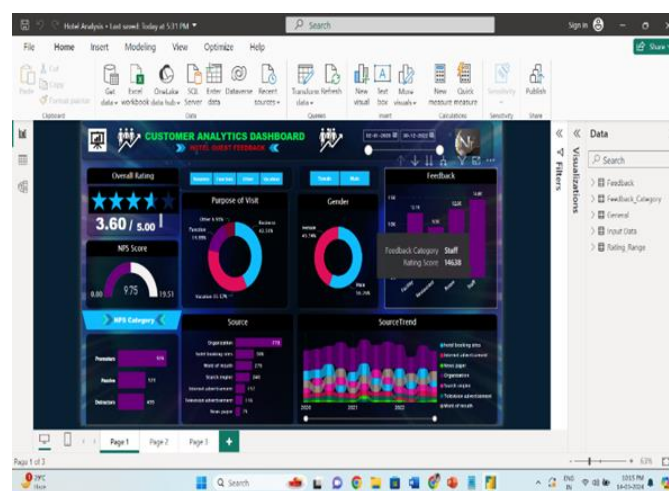


Fig 6 : Customer Dashboard-2

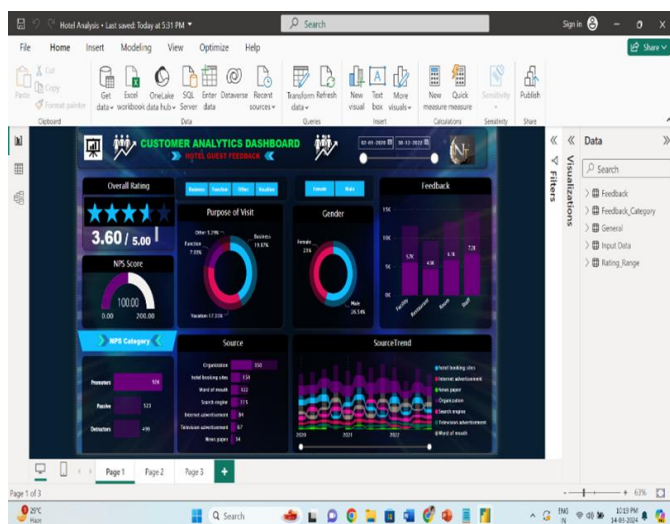


Fig 7 : NPS Promoters

V. SYSTEM IMPLEMENTATION

To implement your Hotel Feedback Dashboard, first set up and configure the database for efficient data storage. Integrate the chosen dashboard tool with the database, design clear visualizations, and arrange them logically. Add interactive features like filters, and optionally, set up user authentication. Conduct thorough testing, provide user training, and deploy the dashboard to the chosen hosting environment. Monitor performance, address security requirements, and engage in User Acceptance Testing. Once successful, officially launch the dashboard for regular use. This systematic approach ensures a seamless user experience and valuable insights.

VI. CONCLUSION & FUTURE ENHANCEMENT

The dashboard offers a centralized platform for visualizing customer satisfaction, enabling data analysis and is to decision-making. However, areas for improvement include check-in efficiency and dining options. Leveraging these insights, we'll streamline processes, enhance cleanliness standards, and expand dining choices to better meet guest expectations. Continuous monitoring with Power BI ensures proactive response to evolving needs, reaffirming our commitment to delivering exceptional guest experiences and maintaining our position as a premier

hospitality destination. By implementing interactive features and ensuring a user-friendly interface, it empowers stakeholders to derive meaningful insights and take targeted actions to address areas of improvement. In future this analysis will be applied in all the domains to ensure the Customer Satisfaction to improve the business.

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