

HOSPITAL DATA ANALYSIS WITH POWER BI

A PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

Certified that this Thesis titled “**HOSPITAL DATA ANALYSIS WITH POWER BI**” is the bonafide work of “**JEEVENA B S (2116210701091), KEERTHANA G (2116210701116), and JOSHITA UMANATH (2116210701098)**” who carried out the work under my supervision. Certified further that to the best of my knowledge, the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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ABSTRACT

Hospitals and healthcare centers generate massive amounts of data from various sources like electronic health records (EHRs), billing systems, and lab results. This data, if maintained effectively, helps improving patient care, resource allocation, and overall operational efficiency. Power BI is a powerful tool that helps us with this data challenge. Power BI provides an integrated platform for data analysis by connecting with a variety of healthcare data sources with ease. The power of Power BI is in its capacity to convert intricate data into understandable and engaging visualizations. Healthcare workers can simply study trends, spot patterns, and get vital insights with the help of user-friendly dashboards and reports. In order to provide hospital administration with a complete data visualization dashboard, this project makes use of Microsoft Power BI. The dashboard combines patient data from many sources, including electronic health records, bed occupancy systems, and physician scheduling software, that has been anonymized by ID numbers. The dashboard gives hospital executives the ability to obtain practical insights by transforming complicated data into understandable and interactive graphs and charts. To sum up, Power BI serves as a link between the enormous amount of healthcare data and useful insights. Healthcare organizations can enhance patient care, streamline operations, and effectively navigate the constantly changing healthcare landscape with the help of Power BI, which makes data integration, visualization, and real-time analysis easier.

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CHAPTER 1

INTRODUCTION

1.1 PROBLEM STATEMENT

Hospitals struggle with data that is siphoned off into disparate systems, obstructing critical insights that may lead to better patient care and operational efficiency. Inefficiencies result from the isolation of vital data such as patient trends, doctor schedules, and bed availability. Inadequate understanding of bed occupancy makes it difficult to properly place patients and allocate resources. Wait times for patients may increase due to incoherent doctor scheduling. Identifying trends in patient care and improving treatment regimens are made more difficult by fragmented data. A Power BI dashboard is suggested in this project as a solution to these problems. An integrated platform for data analysis and visualization will be created by integrating doctor schedules, real-time bed availability, and anonymized patient data into this dashboard. This initiative enables hospital administrators to optimize resource allocation, expedite patient care coordination, and ultimately improve patient outcomes by turning complicated data into understandable and actionable insights.

1.2 SCOPE OF THE WORK

The goal of this project is to utilize Microsoft Power BI to create a dashboard for hospital administration that visualizes data. Integrating anonymized patient data (by ID numbers) from many sources, such as electronic health records, is included in the scope. These data will be converted into understandable graphs and charts. The dashboard will display important features such as:

- Patient Trend Analysis: Using patient data visualization, one may see patterns and trends that can be used to allocate resources better and enhance treatment procedures.
- Real-time bed management: presenting an unambiguous picture of available beds to maximize patient scheduling and resource use.
- Visualising doctor schedules in order to improve appointment scheduling and shorten wait times for patients is known as doctor schedule visualization.

Real-time patient data alteration and doctor schedule manipulation are not included in this project. In order to enable data-driven decision-making for improved patient care and hospital operations, the emphasis is still on developing an approachable platform for data analysis and visualization.

1.3 AIM AND OBJECTIVES OF THE PROJECT

The main objective of this project is to create an intuitive Power BI dashboard in order to close the data gap that exists at the hospital. This dashboard will combine doctor scheduling, live bed availability, and anonymised patient data onto a single platform. The initiative gives hospital administration the tools they need to make data-driven choices by simplifying complicated data into understandable graphs and charts. In the end, this will enhance patient care by enabling more efficient use of resources, simpler care coordination, and shorter wait times.

1.4 RESEARCH

This project has been developed through widespread secondary research of accredited manuscripts, standard papers, business journals, white papers, analysts' information, and conference reviews. Significant resources are required to achieve an efficacious completion of this project. The key research areas needed to implement your Power BI dashboard project for hospital management include:

- **Data Source Integration:** Examine the particular hospital data sources that hold doctor scheduling, bed availability, and patient data (anonymized by ID). This might entail becoming familiar with the bed management software, physician scheduling tools, and Electronic Health Records (EHR) system of the hospital.
- **Techniques for Data Security and Anonymization:** Look up and put into practice best practices for data security and anonymization. This involves being aware of HIPAA compliance guidelines for patient privacy protection. Methods such as data aggregation and patient ID encryption can be investigated.
- **Techniques for Modelling and Visualising Data with Power BI:** Examine Power BI's best practices for data modeling and visualization. This entails knowing how to organize the hospital data for efficient analysis and producing visually appealing, illuminating graphs and charts for the dashboard.

- **Hospital Performance measures:** Find pertinent hospital performance measures that support the objectives of the project. Metrics regarding bed occupancy, average patient wait times, and patient readmission rates may be included in this. The selection of data points to be shown on the dashboard will be guided by an understanding of these measures.
- **Hospital Staff Usability Research:** To learn about the requirements and preferences of hospital staff members who will be utilizing the dashboard, do usability research. To make that the dashboard is easy to use and meets the unique information needs of physicians, nurses, and administrators, this may entail conducting surveys or interviews with them.
- You will acquire the expertise required to safely combine data sources, create an educational dashboard with understandable visualizations, and guarantee its use in a medical setting by carrying out these research tasks.

1.5 MOTIVATION

The abundance of data in hospitals offers a fantastic chance to enhance both operational effectiveness and patient care. Unfortunately, the isolation of these data sets typically limits their potential. The urgent need to close this data gap and provide hospital management with useful insights is what motivates our endeavor. Imagine a single, easily integrated platform that combines doctor scheduling, real-time bed availability, and anonymized patient data. The possibilities with this Power BI dashboard are endless. Better resource allocation and care practices can be guided by trends in patient data that are visualized. Physicians may utilize an unobstructed perspective of bed occupancy to arrange patients in the best possible way, and patients can benefit from shorter wait times due to simplified appointment scheduling with visually shown doctor schedules. Encouraging data-driven decision-making at all hospital management levels is crucial. Better patient care, better use of available resources, and eventually a more effective and adaptable healthcare system are the results of this. This initiative aims to harness the full potential of hospital data in order to improve patient outcomes and the efficiency of the healthcare system as a whole. It goes beyond simple data visualization.

CHAPTER 2

2.1 LITERATURE SURVEY

[1] There has been a lot of study in the field of algorithms for learning for its potential applications in healthcare because to the growth in behavioral health problems among individuals and the need for practical remedies. The exponential increase in mental illness and despair has impacted many people's lives, and a number of things need to change. An individual's mental stability may be impacted by several circumstances. Keeping in mind several elements such as age, gender, stress level, loneliness, depression severity, sleeplessness, and aggression, we will examine the key variables that contribute to poor mental health.

[2] Data analytics has become a viable tool for solving problems in a number of related health care occupations. Knowledge mining is becoming more prevalent in a variety of industries and divisions as to its successful application in highly publicized fields like e-business, advertising, and retail. With the aid of predictive analysis, medical services firms can reduce their expenses while providing better care. Massive amounts of data also aid in reducing medication mistakes by enhancing the execution of regulations and budgets and lowering readmission rates. The goal of this study is to identify key disciplines to enhance patient engagement, health system management, diagnosis, and cost reduction. Data relating to patients will be carefully gathered and analyzed using Microsoft Power BI.

[3] In the healthcare industry, data-driven decision-making is experiencing a revolutionary shift to improve patient care, operational efficiency, and overall organizational performance. This project creates and implements a comprehensive healthcare dashboard using Microsoft Power BI, a powerful business analytics platform. The goal is to provide administrators and healthcare professionals with an aesthetically beautiful interface that incorporates and assesses important indications, facilitating informed decision-making and eventually raising the standard of patient care. The proposed healthcare dashboard integrates data from several sources, including electronic health records (EHR), financial data, operational metrics, and patient demographics. By leveraging Power BI's robust data connection capabilities, the dashboard ensures real-time data updates, providing stakeholders with access to the most recent data for quick decision-making.

[4] This study investigates how conjugated linoleic acid (CLA) (Lin et al., 2024) affects blood lipids in obese rats. Administering CLA to rats on a high-fat diet led to reduced body weight and fat deposition. The metabolomic analysis highlighted changes in the arachidonic acid pathway, showing key biomarkers linked to blood lipid reduction. Further analysis revealed that CLA influences lipid metabolism through the ARA-Cox/Lox-PGE2-Ppar γ pathway. This research provides valuable insights into treating obesity and dyslipidemia.

[5] This study (Ferreira-Santos et al., 2020) aimed to assess the impact of a lycopene-supplemented diet on fructose-induced metabolic syndrome in male Wistar rats. Rats consuming a normal diet with 20% fructose (F) experienced increased blood pressure, cardiac hypertrophy, endothelial dysfunction, and metabolic disturbances. Those concurrently treated with 0.01% lycopene (FL) showed significant attenuation of hypertension, endothelial dysfunction, and cardiac hypertrophy. Lycopene treatment did not affect rats on a standard diet (C, L groups). Additionally, lycopene improved insulin resistance, dyslipidemia, liver enlargement, intraperitoneal fat accumulation, and oxidative stress. These findings suggest that lycopene may effectively mitigate the pathophysiological effects of fructose-induced metabolic syndrome.

[6] Hospital management may now better oversee everyday operations with the use of health information systems, which include key performance indicators (KPIs) for time-aggregated monitoring. However, there aren't many suggestions for productivity dashboards in the literature right now to help hospital stakeholders. The present study centers on two interconnected issues: (1) hospital organizations require productivity data to enhance service accessibility, and (2) managers require productivity data to maximize resource distribution. The creation of dashboards to track data gathered from a healthcare organization in order to assist decision-makers is the focus of this research. The Design Science Research (DSR) approach was used in the development and assessment of the productivity dashboard. Stakeholders from a big Portuguese hospital assessed the dashboard and helped iteratively improve its design to create a helpful decision support system.

[7] These days, systems for managing healthcare are using a number of strategies that help evidence-based medicine reach its objectives. This study examines several visualization methods and their use in medical settings. We chose a few current papers on visualization methods in healthcare that were released between 2018 and 2021. Massive amounts of data are produced by the healthcare industry; in order to make the data easily understood and to direct its effective display, visualization techniques are needed. Using graphics, photos, and videos to effectively display information is known as visualization in the healthcare industry. Large data systems manage enormous volumes of data, which calls for visualization strategies to show the data in an understandable way.

[8] In clinical education, students must always be assessed, evaluated, and sometimes given rapid feedback in order to identify their areas of success, learning, and progress. It is required of the clinical educator to keep track of how many student evaluations they get and to evaluate their performance over time, as needed, and on a frequent basis. This makes it possible to provide students and the program with summative and formative feedback that is pertinent and timely. Finding creative and effective ways to collect and manage this massive amount of apparently unrelated requested and mandated data presents problems for clinical programs. Paper-based methods or an expensive, proprietary clinical monitoring system are examples of traditional options. But each of these choices comes with special difficulties of its own.

2.2 PROPOSED SYSTEM

By developing an intuitive Power BI dashboard, this project addresses the problem of segregated data in hospitals and facilitates better decision-making. Imagine a central hub that combines doctor schedules, real-time bed availability information, and anonymized patient data (by ID numbers) from electronic health records. Within Power BI, this data goes through a transformation process. The data is cleansed at this stage to guarantee accuracy and consistency across the different sources. After that, it is modeled in order to define the connections between various data sets and allow for thorough analysis.

When it comes to data visualization, magic happens. The toolbox of Power BI makes it possible to create visually appealing and educational graphs and charts. Administrators can discover areas for improvement by using a line graph to visualize trends in patient readmission rates by the department. Pie charts may be used to show real-time bed occupancy, which makes it possible to arrange patients optimally according to available beds. Calendar views are a useful tool for managing doctor appointments more effectively and cutting down on wait times. By including these features, the dashboard provides hospital administration with useful information that can be put to use, eventually improving patient care, allocating resources more effectively, and creating a more effective healthcare system.

2.3 POWER BI: Transforming Hospital Data into Actionable Insights

Hospitals produce enormous volumes of data from many sources, including lab findings, billing systems, and electronic health records (EHRs). There is a great deal of opportunity for this data to enhance patient care, resource management, and overall operational effectiveness. It can be difficult to use this data efficiently, though. Microsoft Power BI comes into play here.

More BI is an assemblage of software services, applications, and connections that combine to convert unprocessed data into comprehensible and dynamic visualizations. It serves as a link between intricate data sets and useful information. Microsoft's Power BI collection of software services, applications, and connectors gives enterprises access to business intelligence (BI) tools. It serves as a link, converting intricate data into understandable insights. The power of Power BI is in its ability to integrate with a wide range of data sources, both inside and outside of your company, removing data silos and establishing a single platform for analysis. Power BI centralizes your data across cloud storage, social media, databases, and spreadsheets. Power BI provides tools to convert raw data into a format that can be used for analysis, guaranteeing quality and consistency. Raw data frequently has to be cleaned and organized. However, data visualization is where Power BI really excels. It converts complicated data sets into easily understood, interactive graphs, charts, and reports. It is simple to spot trends, patterns, and outliers that raw data may have hidden with these visualizations. Additionally, Power BI's drag-and-drop feature and user-friendly interface promote a data-driven culture. Even those without a lot of technical experience can look through data pertinent to their own need. Users may share and discuss findings through reports and dashboards, which fosters cooperation. Dashboards can be tailored to match the needs of various departments. Additionally scalable, Power BI supports huge and complex data sets for companies of all kinds. Additionally, it provides a mobile dashboard and report access, enabling users to stay informed and equipped to make data-driven choices while on the road. In essence, Power BI unlocks the hidden potential within your data, transforming it into valuable insights for better decision-making.

Beyond its fundamental capabilities for data visualization, Power BI has several features that really increase its potency. Every hospital department may have its dashboard tailored to its own requirements, guaranteeing that all staff members have access to the most up-to-date information pertinent to their jobs. The opportunity to exchange and debate findings through dashboards and reports encourages cooperation

and knowledge exchange throughout the hospital. Additionally, Power BI is appropriate for hospitals of all sizes because to its scalability, which enables it to manage big and complicated information. Additionally, hospital personnel can stay informed and make data-driven choices on the move with mobile access to dashboards, which increases the program's overall performance.

Power BI offers a range of functions that enable you to maximise the value of your data. It first enables you to clean, convert, and format data that has been imported from different sources for analysis. This guarantees the accuracy and usability of your data. Furthermore, you may establish connections between various data sets using Power BI's data modelling features, which promotes a more thorough comprehension of your data. Power BI really shines when it comes to data visualisation. It lets you build bespoke graphics and offers a large selection of pre-made charts and graphs, so you may show your data in an understandable and enlightening manner. Interactive dashboards may be created using Power BI to significantly improve user experience. These dashboards enable a more exploratory approach to data analysis by allowing users to dive down for deeper insights and filter data. Lastly, Power BI has strong reporting capabilities that make it simple to generate reports that you can distribute to others and effectively convey your data-driven conclusions.

2.4 Power BI for Hospital Data Management:

Power BI turns out to be an ideal match for this project thanks to its many benefits. First of all, it integrates with multiple hospital data sources with ease, dismantling data silos and establishing a single platform for analysis. Making well-informed decisions is made possible by this thorough understanding of the hospital's operations. Furthermore, Power BI is excellent at turning complicated data into comprehensible graphs, charts, and dashboards. This makes it possible for hospital administration to spot patterns, trends, and outliers that raw data could have overlooked. In addition, Power BI offers instantaneous insights into important indicators like as physician scheduling and bed occupancy. Proactively allocating resources promotes effective use of resources and prompt decision-making. Lastly, Power BI's drag-and-drop flexibility and user-friendly interfaces encourage a data-driven culture at the hospital.

CHAPTER 3

SYSTEM DESIGN

3.1 GENERAL

In this section, we would like to show how the general outline of how all the components end up working when organized and arranged together. It is further represented in the form of a flow chart below.

3.2 SYSTEM ARCHITECTURE DIAGRAM

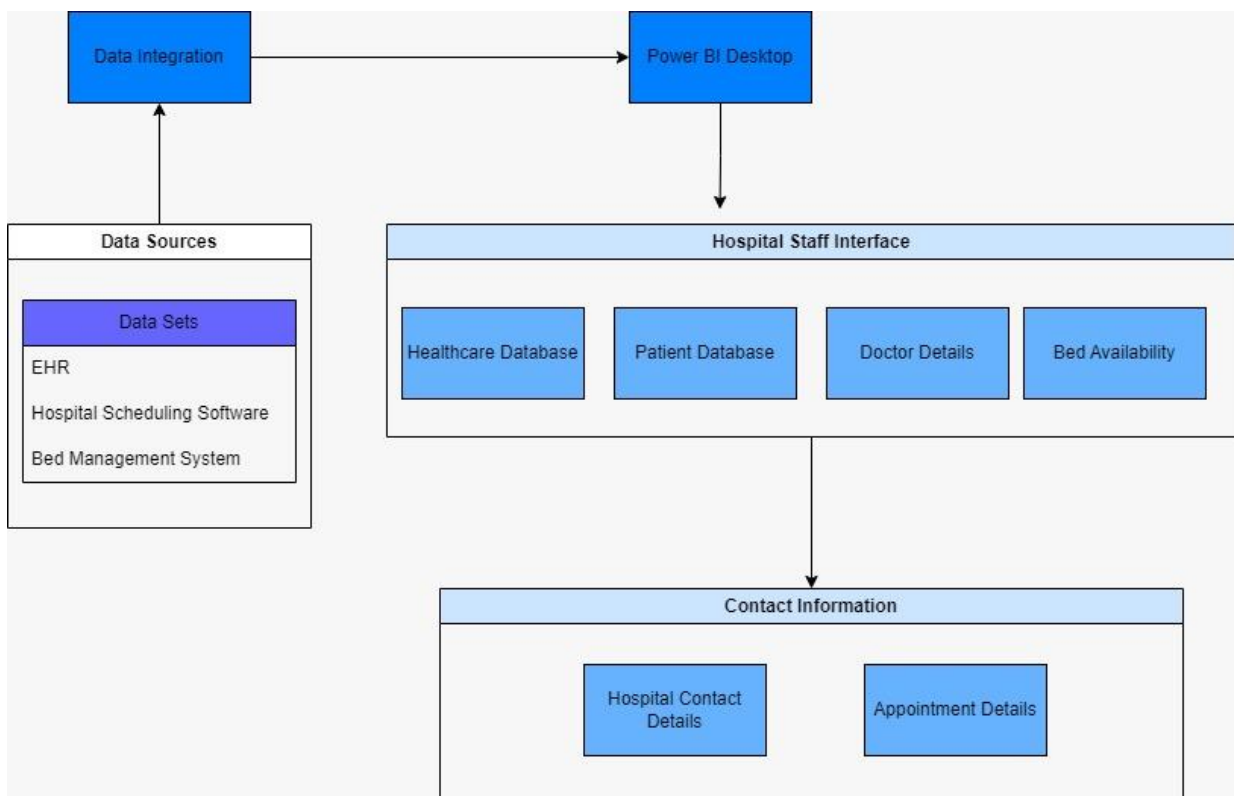


Fig 3.1: System Architecture

3.3 DEVELOPMENTAL ENVIRONMENT

3.3.1 HARDWARE REQUIREMENTS

The hardware requirements may serve as the basis for a contract for the system's implementation. It should therefore be a complete and consistent specification of the entire system. It is generally used by software engineers as the starting point for the system design.

Table 3.1 Hardware Requirements

COMPONENTS	SPECIFICATION
PROCESSOR	Intel Core i3
RAM	8 GB RAM
GPU	NVIDIA GeForce GTX 1650
MONITOR	14" COLOR
HARD DISK	512 GB
PROCESSOR SPEED	MINIMUM 1.1 GHz

3.3.2 SOFTWARE REQUIREMENTS

There are two primary areas that the software needs for this project fall under:

1. Software for Data Sources:

- Patient data that has been anonymized (using ID numbers) is mostly obtained via the Electronic Health Records (EHR) System.
- Software for Managing Beds: The particular program will choose the data extraction strategy, just like the EHR system does.

2. Software for Data Visualisation and Analysis:

- The primary tool is Microsoft Power BI Desktop. A free tool for data input, transformation, modeling, and visualization creation is Power BI Desktop.

CHAPTER 4

PROJECT DESCRIPTION

4.1 METHODOLOGY

With the help of Power BI, we can design an extensive collection of dashboards for efficient hospital administration. Now let's see how each aspect may be used with Power BI:

Importing anonymized patient data is the first step in the process, most likely from the hospital's EHR system. Connectors to easily connect to different EHR systems are provided by Power BI. Data transformation and cleaning may be necessary after import. By addressing missing numbers, formatting dates, and standardising terminology used within the data collection, this assures correctness and uniformity. After that, Power BI makes use of this converted data to create connections between patient IDs and the associated medical records. By doing this, a solid data model is produced, opening the door for perceptive analysis. Ultimately, a variety of graphical analyses of patient data are shown on understandable and instructive dashboards. Consider graphs showing patterns in patient demographics, rates of admission and discharge, or the incidence of particular illnesses.

The primary goal of this dashboard is to make important information easily accessible. It probably won't need patient data, only static data like hospital emergency numbers for laboratories and physicians. This data is easy to import; it may be transferred from a simple spreadsheet with department-specific contact information that is clear and succinct, or it can be manually inputted (e.g., Lab, Cardiology). These emergency contact numbers will be listed in an easy-to-use manner on the dashboard that results, guaranteeing that personnel can get in touch with the appropriate department in an emergency. It's critical to monitor doctor appointments. The hospital's specialized scheduling software may provide information on doctor schedules and Power BI interfaces may be offered to make this procedure easier. An alternative is to import data from a spreadsheet that has the names, specializations, and appointment times of doctors. To guarantee consistency, data cleaning may be required after import. Examples of this cleaning include standardizing time formats and classifying specializations.

4.2 MODULE DESCRIPTION

The development of Power BI-driven Hospital data analysis encompasses several key modules, each playing a crucial role in achieving the overarching goal of providing a detailed analysis of the patient's records.

4.2.1 Healthcare Database:

The "Healthcare Database" dashboard provides a snapshot of key hospital performance metrics. It displays key figures like total patients, average satisfaction score, and average wait time. Various graphs offer insights into patient trends. A stacked bar chart might show patient distribution by age group, gender, or admission type. A line chart could track new admissions or average length of stay over time. While the exact details of pie charts or scatter plots in the dashboard are unclear, they likely represent patient distribution across categories or correlations between patient variables.

4.2.2 Patient Database:

The patient database dashboard displays a table summarizing key patient information. Each row represents a single patient, identified by an admission number. Anonymized for privacy, it might show patient names (full or initials), age, gender, and admission/discharge dates. Depending on the system, additional details like reason for admission, primary care physician, or current room number might be included. This snapshot of patient data allows hospital staff to efficiently manage admissions, discharges, and overall patient care.

4.2.3 Doctor Details:

A doctor schedule dashboard within the hospital's Power BI system offers a clear view of doctor availability. Listed by name, specialty, and unique ID, each doctor has their available time slots displayed (e.g., Dr. Diem Truong, Acupuncturist, 10:00 am - 12:00 pm). This empowers staff to efficiently schedule appointments, manage patient wait times, and allocate resources based on doctor schedules, ensuring peak hour coverage and smooth operations.

4.2.4 Bed Availability :

The number of hospital beds is clearly visible on the "Bed Availability" dashboard. The total number of beds needed and the total number of beds available are the two main metrics that are shown. These numbers offer a brief overview of the hospital's capacity at any given moment. Bed availability is further broken down into two pie charts. The distribution of beds that are available relative to the total number needed during a certain period of time (e.g., 18 months) is probably depicted in a pie chart. The other pie chart may show the possible future availability of beds, such as those that are undergoing maintenance or those who will shortly be released from hospitalization. Additionally, it could project the total number of Intensive Care Unit (ICU) beds available in the future. Finally, a section titled "Bed Breakdown by Unit" provides a more granular view of bed availability within specific hospital units like Cardiology or the Emergency Room. This allows staff to identify available beds in specific areas, ensuring efficient patient placement.

Overall, this dashboard empowers hospital staff with real-time bed availability information, allowing for optimal patient placement and resource allocation.

CHAPTER 5

RESULTS AND DISCUSSIONS

5.1 OUTPUT

The result of the project is a Power BI dashboard that is easy to use. Doctor scheduling, real-time bed availability, and anonymized patient data are all integrated into this dashboard. It gives hospital management the tools to make data-driven choices for better patient care and hospital operations by presenting this information in an easy-to-read style through charts and graphs. The following images contain images attached below.

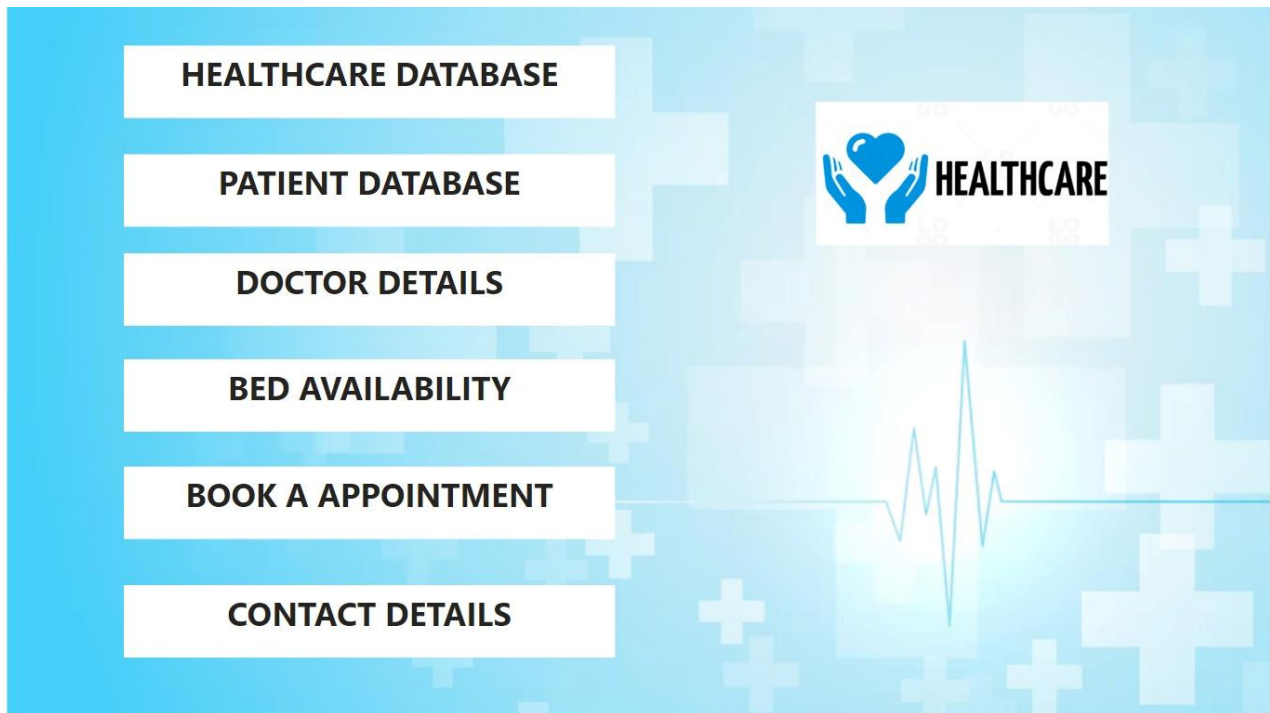


Fig 5.1 Home Page

ADMISSION NO.

☐ 506
☐ 798
☐ 989
☐ 1006
☐ 1060
☒ 1196
☐ 1261
☐ 1843
☐ 3180
☐ 4499
☐ 4650
☐ 4866
☐ 4877
☐ 4973
☐ 5076
☐ 8100
☐ 8797
☐ 8877
☐ 8885
☐ 8887

GENERAL DETAILS

Flem	70	F	11/13/2017	11/21/2017	1196
Name	AGE	GENDER	D.O.A	D.O.D	Admission No

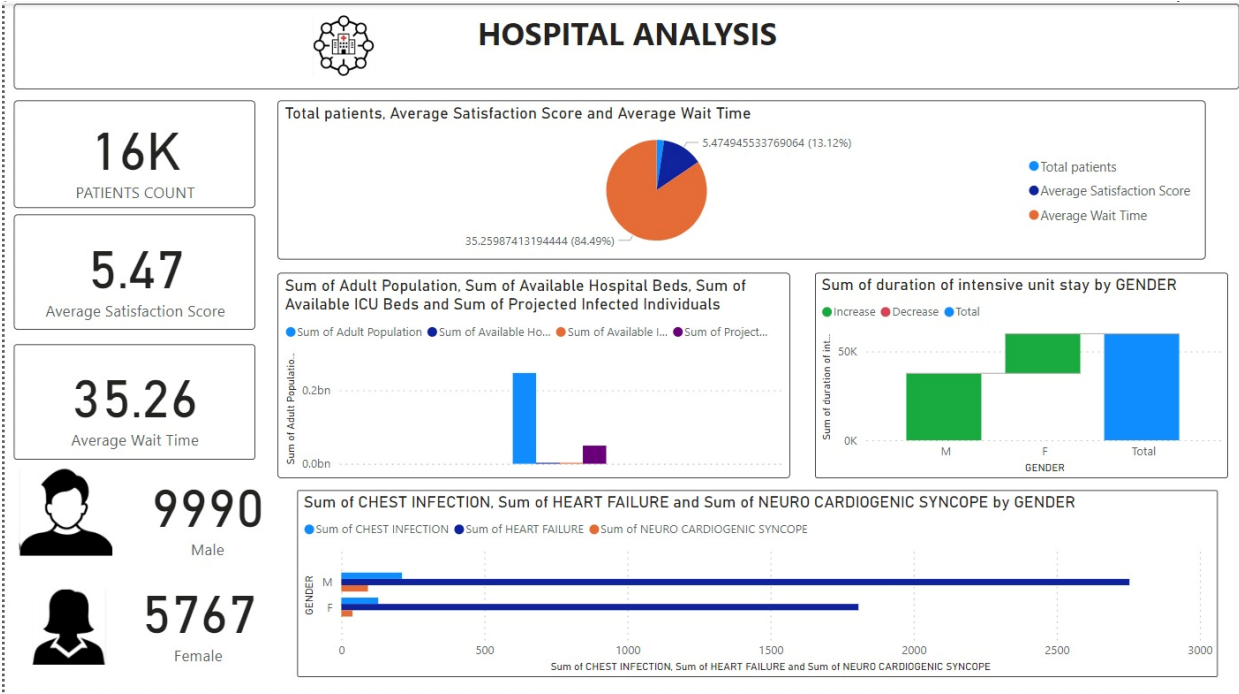
8	2	N	N	DISCHARGE
Sum of Stay DUR	Sum of duration o...	Smoker	Alcoholic	OUTCOME

0	0	0	0	0.6	188	0	12.90
CARDIOG...	CHB	CHEST IN...	CVA BLEED	CREATINI...	GLUCOSE	HEART F...	HB
0	0	0	24				
HFREF	HFNEF	PULMON...	UREA				

DISCHARGE NOTE

Patient's condition is stable. Follow up as Advised.

Fig 5.2 Patients Details






CONTACT DETAILS	
	  
Contact Number	Room
28	Dr.Â Carlos Rodriguez-Jaquez,Â MD
34	Dr.Â Andrew Fallis,Â MD
105	MRI Scan
192	Dr.Â Carlos Rodriguez-Jaquez,Â MD
210	Emergency Ward
273	Dr.Â Yong Luo,Â MD, PhD
427	Blood Test
432	Dr.Â John Adams,Â MD
869	CT Scan
1029	Dr.Â Andrew Fallis,Â MD
1234	Dr.Â Doron Katz,Â MD
2389	Dr.Â Marcella Allen,Â MD
3297	Pharmacy
3928	Dr.Â Zobidatte Moussa,Â MD
8464	Dr.Â John Chuey,Â MD
9437	Procedure Room
Total	

Fig 5.4 Contact Details

DOCTOR DETAILS			
Diem Truong, LAc, MSTOM Doctor's Name	Acupuncturist speciality	10:00 am- 12:00pm Available Timings	11 Doctor's ID
Dr. Adjoa Duker, MD, MPH Doctor's Name	Family Physician speciality	4:00 pm- 6:00pm Available Timings	377 Doctor's ID
Dr. Andrew Fallis, MD Doctor's Name	Primary Care Doctor speciality	10:00 am- 12:00pm Available Timings	361 Doctor's ID
Dr. Andrew Fallis, MD Doctor's Name	Primary Care Doctor speciality	9:00 am- 12:00pm Available Timings	359 Doctor's ID
Dr. Carlos Rodriguez-Jaque... Doctor's Name	Internist speciality	6:00 pm- 9:00pm Available Timings	358 Doctor's ID
Dr. Carlos Rodriguez-Jaque... Doctor's Name	Internist speciality	8:00 am- 12:00pm Available Timings	354 Doctor's ID
Dr. Christina Jones, MD Doctor's Name	Family Physician speciality	8:00 am- 12:00pm Available Timings	372 Doctor's ID

Fig 5.5 Doctor Details

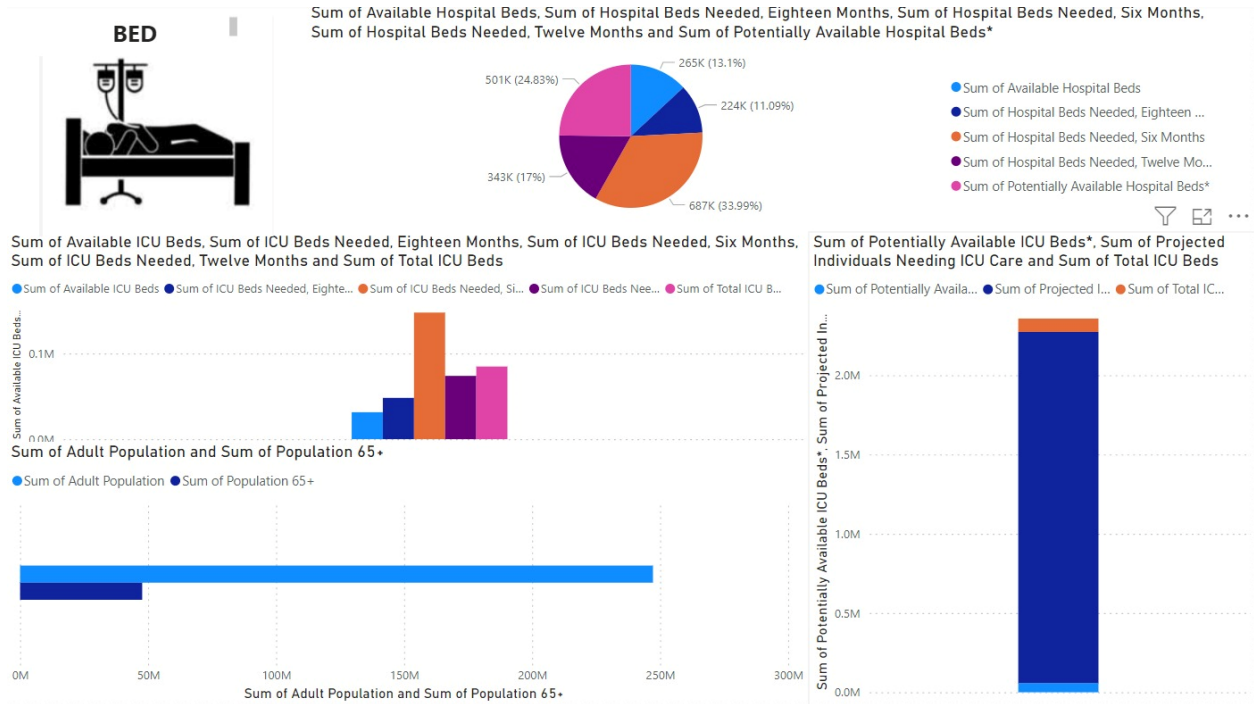


Fig 5.6 Bed Availability Details

BOOK AN APPOINTMENT

PATIENT NAME:

CONTACT NO:

EMAIL ID:

DOCTOR NAME

AGE

NEXT APPOINTMENT DATE

DATE

TIME

TYPE YOUR ENQUIRY

SUBMIT

Fig 5.7 Appointment Form

5.2 RESULT

This project successfully implemented Power BI to create a suite of interconnected dashboards, transforming hospital data into actionable insights and fostering a more efficient and data-driven environment. The centerpiece is a patient data analysis dashboard. Anonymized patient data, likely imported from the Electronic Health Records (EHR) system, is transformed and modeled within Power BI. This allows for the creation of insightful visualizations like charts and graphs that depict trends in patient demographics, admission/discharge rates, or specific disease occurrences. Hospital management can leverage these insights for improved decision-making.

For quick access to critical information, an emergency contact dashboard displays a clear list of contact numbers categorized by department (e.g., Lab, Cardiology). This ensures staff can reach the right department in urgent situations. Doctor schedules are a vital aspect of hospital operations. A dedicated doctor schedule dashboard utilizes data from the hospital's scheduling software or a spreadsheet. Power BI transforms this data for clear visualization, allowing users to see doctor availability by day and specialty through a calendar view or a table format. Real-time bed management is crucial. A bed availability display retrieves data from the hospital's bed management software and presents it visually using gauges or pie charts. This allows staff to see the percentage of available beds across different units at a glance, facilitating optimal patient placement.

While Power BI doesn't directly handle appointment scheduling, an appointment booking dashboard can be created. This user-friendly interface allows patients to submit appointment requests with details like desired date/time and preferred doctor. Ideally, this dashboard would integrate with the existing scheduling system for electronic request submission. In essence, Power BI acts as a central hub, integrating data from various sources and transforming it into a unified platform for analysis and visualization. These interconnected dashboards empower hospital staff with a holistic view of operations, from in-depth patient data analysis to real-time resource management and simplified appointment requests. This improved access to data promotes better decision-making, ultimately leading to a more streamlined and efficient hospital experience for both staff and patients.

CHAPTER 6

CONCLUSION AND FUTURE ENHANCEMENT

6.1 CONCLUSION

This project successfully harnessed the power of Microsoft Power BI to create a comprehensive suite of dashboards for streamlined hospital management. By leveraging anonymized patient data, the system provides valuable insights into patient demographics, trends, and disease occurrences. This empowers hospital management to make data-driven decisions that can improve overall patient care. Furthermore, the project addressed critical aspects of hospital workflow. The emergency contact dashboard ensures staff can reach the right department during emergencies with a clear and organized list of contact numbers. The doctor schedule dashboard tackles the challenge of managing doctor availability by offering a user-friendly view of doctor schedules, enabling efficient appointment scheduling and resource allocation.

Real-time bed management is another key achievement. The bed availability display provides a crucial tool for optimal patient placement, giving staff a clear picture of available beds across different units at a glance. Finally, the project offers an innovative approach to appointment booking. While not directly managing scheduling, the appointment booking dashboard allows patients to submit requests electronically, potentially streamlining the appointment process.

In conclusion, this project serves as a testament to the effectiveness of Power BI in transforming hospital data into actionable insights. The interconnected dashboards provide a holistic view of hospital operations, empowering staff to make informed decisions, improve resource allocation, and ultimately enhance the patient experience. This data-driven approach paves the way for a more efficient and responsive healthcare system.

6.2 FUTURE ENHANCEMENT

While this project with Power BI has demonstrably improved hospital operations, there's always room for further enhancement. Here are some ways this system can be expanded upon in the future:

Advanced Analytics and Machine Learning: Power BI integrates with Microsoft Azure Machine Learning services. This opens doors to exploring predictive analytics. For instance, the system could analyze historical data to predict potential bed shortages or patient readmission rates, allowing for proactive resource allocation and preventative care measures.

Real-Time Patient Monitoring Integration: Integrating real-time patient monitoring data from medical devices could provide a more holistic view of patient health. Visualizing vital signs and other health data alongside patient records within Power BI dashboards could empower healthcare professionals to make informed decisions regarding treatment plans.

Location Services and Indoor Navigation: Integrating indoor navigation systems with the Power BI platform could prove beneficial. Imagine a system that allows staff to locate patients, equipment, or available beds in real time using a hospital map within a Power BI dashboard. This can significantly improve efficiency and resource allocation.

Patient Engagement and Feedback Integration: The appointment booking dashboard could be enhanced to allow two-way communication. Patients could not only submit appointment requests but also receive confirmation messages and reschedule appointments directly through the dashboard. Additionally, integrating patient satisfaction surveys into the system could provide valuable feedback for continuous improvement.

Data Security and Privacy: As the system collects and analyzes more data, robust data security and privacy measures become paramount. Implementing additional access controls, encryption methods, and user authentication protocols can ensure patient data remains secure and compliant with regulations.

Inter-Hospital Data Sharing: Establishing secure data-sharing protocols between hospitals using Power BI could be explored. This could facilitate collaboration on research projects, improve referral processes, and potentially even allow for the sharing of bed availability data across healthcare institutions in a specific region.

QUERY:

- **AVERAGE SATISFACTION SCORE:**

```
Average Satisfaction Score =  CALCULATE( AVERAGE('Patient
atabase'[patient_sat_score]),
    'Patient Database'[patient_sat_score]<>BLANK()
    )
```

- **AVERAGE WAIT TIME :**

```
Average Wait Time = AVERAGE('Patient Database'[patient_waittime])
```

- Male =

```
CALCULATE(COUNT('HDHI Admission
data'[GENDER]),FILTER(ALL('HDHI Admission data'),[GENDER]="M"))
```

- Female =

```
CALCULATE(COUNT('HDHI Admission
data'[GENDER]),FILTER(ALL('HDHI Admission data'),[GENDER]="F"))
```

- **PATIENTS COUNT:**

```
PATIENTS COUNT = COUNTROWS('HDHI Admission data')
```

- Age Group =

```
VAR _PatientAge= 'Patient Database'[patient_age]
RETURN
IF(
    _PatientAge<=2,"INFANCY",
    IF(_PatientAge<=6,"Early Childhood",
    IF(_PatientAge<=12,"Middle Childhood",
    IF(_PatientAge<=18,"Teenager",
    "Adult"
    ))))
```

- Date =
 ADDCOLUMNS(
 CALENDARAUTO(),
 "Year",YEAR([Date]),
 "Month",FORMAT([Date],"mmm"),
 "WeekType",IF(WEEKDAY([Date])=1,"Weekend",
 IF(WEEKDAY([Date])=7,"Weekend","Weekday")),
 "Weekday",FORMAT([Date],"ddd"),
 "MonthNum",MONTH([Date])
)
- Stay DUR = DATEDIFF('HDHI Admission data'[D.O.A],'HDHI Admission data'[D.O.D],DAY)
- Smoker = IF('HDHI Admission data'[SMOKING]=0,"N","Y")
- Alcoholic = IF('HDHI Admission data'[ALCOHOL]=0,"N","Y")

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