CHAPTER 1

INTRODUCTION

1.1 INTERACTIVE DASHBOARD

Interactive dashboards are an increasingly popular tool for visualizing and analyzing data in various domains, including education. In the education sector, interactive dashboards are being used to collect and analyze student data, providing valuable insights into student performance and behavior. In this essay, we will explore some of the existing work on interactive dashboards for student data analysis. One of the most popular tools for creating interactive dashboards is Power BI, a business analytics service by Microsoft. Power BI offers a template for education analytics that includes dashboards for tracking student performance and attendance, analyzing course trends, and monitoring school finances. With Power BI, educators can visualize and analyze student data in real-time, allowing them to identify trends and patterns that can help improve student outcomes. Tableau is another popular data visualization software that provides interactive dashboards and reports. Tableau for Education includes a variety of dashboards that can help schools and educators track student performance, analyze enrollment trends, and manage school budgets. Tableau is known for its intuitive interface and drag-and-drop functionality, making it easy for educators to create customized dashboards that meet their specific needs. Google Data Studio is a free tool for creating interactive dashboards and reports. It includes several templates for student data analysis, including dashboards for tracking student progress, analyzing exam results, and monitoring school attendance. With Google Data Studio, educators can create and share customized dashboards that provide real-time insights into student performance. In summary, interactive dashboards for student data analysis are becoming increasingly popular in the education sector.

1.2 BUSINESS INTELLIGENCE

Business Intelligence (BI) refers to the process of collecting, analyzing, and presenting data in a way that helps organizations make informed business decisions. BI typically involves the use of technology to gather and analyze data from various sources, such as sales records, customer information, and financial data. The main goal of BI is to provide decision-makers with timely and accurate information that they can use to optimize business operations, identify opportunities for growth, and improve performance. This can involve a range of activities, from creating dashboards and reports to performing complex data analysis using statistical models and machine learning algorithms. Some common BI tools and technologies include data warehouses, data mining tools, reporting and visualization software, and predictive analytics platforms. These tools can help organizations to transform raw data into actionable insights, and to share these insights across the organization in a way that is easily understandable and actionable. BI can be a powerful tool for organizations of all sizes, helping them to make data-driven decisions and gain a competitive edge in their industry. It provide valuable insights into student performance and behavior, allowing educators to make data-driven decisions and improve outcomes for their students. Existing solutions such as Power BI, Tableau, Google Data Studio, and Databox offer a variety of options for creating interactive dashboards based on student data. By leveraging these tools, educators can gain valuable insights that can help improve student outcomes and create more effective learning environments.

1.3 PERSONALIZED INFORMATION

In today's data-driven world, personalized information has become an integral part of our daily lives. An interactive dashboard is a data visualization tool that displays information in a way that is easy to understand and visually appealing. It allows users to interact with data in real-time, enabling them to explore and analyze information to gain insights and make informed decisions. In the context of education, interactive dashboards provide students, teachers, and administrators with personalized information that is tailored to their specific needs and goals. For students, interactive dashboards provide a wealth of personalized information that can help them succeed academically. They can track their grades, attendance, and progress towards learning objectives in real-time. This information can be used to identify areas where they need to improve and develop personalized learning plans to address those areas. Additionally, interactive dashboards can provide students with personalized feedback and recommendations to help them achieve their goals. For teachers, interactive dashboards provide a powerful tool for tracking student progress and identifying areas where students need extra support. They can monitor student performance in real-time, identifying students who are struggling and developing personalized interventions to help them succeed. Interactive dashboards can also provide teachers with personalized recommendations for curriculum development, instructional strategies, and student engagement. For administrators, interactive dashboards provide a comprehensive view of the education system, enabling them to identify trends, measure performance, and make data-driven decisions. They can track student outcomes, measure teacher effectiveness, and identify areas where resources are needed. Interactive dashboards can also be used to communicate information to stakeholders, providing them with personalized insights and recommendations to improve education outcomes.

1.4 PURPOSE

- **Data Visualization:** Interactive dashboards can display data in a way that is easy to understand and visually appealing. Students can explore and interact with data to develop a better understanding of complex concepts.

- **Real-time Feedback:** Interactive dashboards can provide real-time feedback to students, helping them to track their progress and identify areas where they need to improve.

- **Personalized Learning:** Dashboards can be customized to meet the unique learning needs of each student. Teachers can use dashboards to create individualized learning paths and monitor progress towards learning goals.

- **Collaboration:** Dashboards can facilitate collaboration among students and teachers. Students can work together on projects and share their progress with teachers in real-time.

- **Data-driven Decision Making:** Interactive dashboards can help teachers make data-driven decisions about curriculum development and instructional strategies. They can use dashboards to identify areas where students are struggling and adjust their teaching accordingly.

Overall, an interactive dashboard can enhance the educational experience by providing students with a dynamic and engaging way to learn and explore data.

1.5 PROJECT OVERVIEW

An interactive dashboard is a powerful tool that provides users with a visual representation of data, allowing them to quickly and easily identify patterns, trends, and insights. The following is an overview of the project plan for creating an interactive dashboard:

- **Define the business objectives:** The first step in creating an interactive dashboard is to define the business objectives that the dashboard will support. This involves identifying the key performance indicators (KPIs) that the dashboard will track and the metrics that will be used to measure progress.

- **Identify data sources:** Once the business objectives have been defined, the next step is to identify the data sources that will be used to populate the dashboard. This may include data from internal systems, third-party data providers, or publicly available data sources.

- **Design the dashboard:** The design of the dashboard will depend on the business objectives and the data sources. The dashboard should be visually appealing and easy to navigate, with clear and concise data visualizations that provide actionable insights.

- **Develop the dashboard:** Once the dashboard design has been finalized, the next step is to develop the dashboard using a suitable technology stack. This may involve using a business intelligence (BI) platform such as Tableau, Power BI, or Qlik, or building a custom dashboard using web development tools such as React or Angular.

- **Test and refine:** Once the dashboard has been developed, it should be thoroughly tested to ensure that it is working as intended and that it provides the desired insights. User feedback should be solicited and incorporated into the design and functionality of the dashboard.

- **Deploy and maintain:** Once the dashboard has been tested and refined, it should be deployed to the intended users. Ongoing maintenance and updates will be necessary to ensure that the dashboard remains relevant and useful over time.

CHAPTER 2
LITERATURE SURVEY

2.1 TITLE: DATA DASHBOARD IN EDUCATION

AUTHOR: ERTMER ET AL

YEAR:2017

DESCRIPTION:

It is a research article that provides a comprehensive review of the literature on the use of data dashboards in education. The article discusses the potential benefits of using data dashboards in education, the challenges associated with their implementation, and the key design considerations that need to be taken into account. The authors begin by discussing the importance of using data to inform decision-making in education, and how data dashboards can help educators to visualize and analyze student data. They highlight the potential benefits of using data dashboards, such as improving student achievement, increasing accountability, and enhancing data-driven decision-making. The article provides a detailed review of the literature on the use of data dashboards in education, including studies that have investigated their effectiveness in improving student achievement, supporting teacher decision-making, and enhancing accountability. The authors also discuss the challenges associated with the implementation of data dashboards, such as data quality issues, privacy concerns, and the need for appropriate training and support. The article also discusses the key design considerations that need to be taken into account when developing data dashboards for education, such as the need to involve end-users in the design process, the importance of data visualization and interactivity, and the need to ensure that the dashboard is aligned with the goals and needs of the institution. Overall, "Data Dashboards in Education: A Review of the Literature" provides a comprehensive review of the literature on the use of data dashboards in education.

2.2 TITLE: INTERACIVE DASHBOARD FOR STUDENT PERFORMANCE DATA

AUTHOR: DAUT ET AL

YEAR: 2018

DESCRIPTION:

It is a research article that presents a case study of the development of an interactive dashboard for student performance data. The study was conducted in a Malaysian university, where the dashboard was designed and implemented to help educators monitor and track student performance data in real-time. The authors begin by discussing the importance of using data to inform decision-making in education, and how interactive dashboards can help educators to visualize and analyze student performance data. They also highlight the challenges that educators face when working with large amounts of data and the potential benefits of using interactive dashboards to simplify data analysis. The case study presented in the article describes the design and implementation of an interactive dashboard for student performance data. The dashboard provides visualizations of student data, such as grades, attendance, and participation, and allows educators to drill down into the data to gain a deeper understanding of student performance. The authors discuss the process of developing the dashboard, including the design and implementation stages, as well as the challenges that were encountered during the development process. They also present the results of a survey that was conducted to evaluate the effectiveness of the dashboard in supporting decision-making. The study found that the interactive dashboard was effective in helping educators to monitor and track student performance data in real-time, and provided a useful tool for identifying students who may be at risk of poor performance. The survey also found that the dashboard was well-received by educators and was considered easy to use and informative.

2.3 TITLE: DESIGNING INTERACTIVE DASHBOARD FOR STUDENT DATA ANALYSIS

AUTHOR: LEE ET AL

YEAR:2020

DESCRIPTION:

It is a research article that discusses the use of a user-centered approach in the design of interactive dashboards for student data analysis. The article provides a case study of a user-centered design process that was used to develop an interactive dashboard for student data analysis at a large university. The authors begin by discussing the importance of user-centered design in the development of interactive dashboards. They highlight the benefits of involving end-users in the design process, such as improving the usability and usefulness of the dashboard and increasing user adoption. The case study presented in the article describes the design and development of an interactive dashboard for student data analysis. The authors describe the user-centered design process that was used, which involved conducting user research, creating personas, developing wireframes and prototypes, and conducting usability testing. The article provides a detailed description of each stage of the user-centered design process and the methods that were used, such as surveys, interviews, and focus groups. The authors also discuss the key findings from the user research and how these findings were used to inform the design of the dashboard. The authors conclude by discussing the benefits of using a user-centered design approach in the development of interactive dashboards for student data analysis. They highlight the importance of involving end-users in the design process to ensure that the dashboard meets their needs and is useful and usable. The article demonstrates the importance of involving end-users in the design process and provides useful insights for other institutions that are considering developing interactive dashboards for student data analysis.

2.4 TITLE: INTERACTIVE DASHBOARDS FOR HEALTHCARE DATA ANALYTICS

AUTHOR: MAADANI ET AL

YEAR:2021

DESCRIPTION:

It is a research article that provides a comprehensive review of the literature on interactive dashboards in healthcare data analytics. The article discusses the potential benefits of interactive dashboards for healthcare professionals and highlights the challenges that healthcare organizations face when implementing these dashboards. The authors provide an overview of the different types of interactive dashboards, such as static dashboards, dynamic dashboards, and hybrid dashboards. They also discuss the various features that interactive dashboards can offer, such as data visualization, data filtering, and data exploration. One of the main benefits of interactive dashboards is that they can help healthcare professionals to make informed decisions by providing real-time access to patient data. The authors discuss how interactive dashboards can be used to monitor patient health, track key performance indicators, and identify trends and patterns in patient data. However, the authors also highlight some of the challenges that healthcare organizations face when implementing interactive dashboards. These challenges include data quality issues, data security concerns, and the need for technical expertise to design and maintain the dashboards. Overall, "Interactive Dashboards for Healthcare Data Analytics: A Review of the Literature" provides a useful overview of the potential benefits and challenges of using interactive dashboards in healthcare data analytics. The article is a valuable resource for healthcare professionals who are considering implementing interactive dashboards in their organizations.

2.5 TITLE: INTERACTIVE DASHBOARD FOR STUDENT SUCCESS

AUTHOR: CHEN ET AL

YEAR:2021

DESCRIPTION:

It is a research article that discusses the use of interactive dashboards for student success in higher education. The article provides a framework for the design and implementation of interactive dashboards that can help universities and colleges to support student success. The authors begin by discussing the importance of student success in higher education and the potential benefits of using interactive dashboards to support this goal. They then outline a framework for designing and implementing interactive dashboards, which includes six key stages: needs assessment, data preparation, dashboard design, implementation, evaluation, and continuous improvement. The article provides a detailed discussion of each stage in the framework, highlighting the key considerations and challenges that need to be addressed at each stage. For example, the authors discuss the importance of engaging stakeholders in the needs assessment stage and the need for data cleaning and transformation in the data preparation stage. The authors also provide examples of interactive dashboards that have been implemented in higher education institutions to support student success. These examples include dashboards that provide real-time feedback on student progress, dashboards that track student engagement, and dashboards that provide predictive analytics to identify students who may be at risk of dropping out. Overall, "Interactive Dashboards for Student Success: A Framework for Design and Implementation" provides a useful guide for higher education institutions that are considering using interactive dashboards to support student success.

OVERVIEW OF LITERATURE SURVEY

Table 2.1 Overview of literature survey

TITLE	AUTHOR	YEAR	MERITS	DEMERITS
Data Dashboards in Education: A Review of the Literature	Ertmer et al	2017	It is a valuable resource for researchers and practitioners in the field.	Therefore, the findings may not be generalizable to other contexts or educational levels.
Interactive Dashboard for Student Performance Data	Daud et al	2018	It can be used to monitor and analyze the student performance data when necessary.	The implementation of an interactive dashboard may differ depending on the context in which it is used.
Designing Interactive Dashboards for Student Data Analysis	Lee et al	2020	It helps to create dashboards that are more intuitive and user-friendly.	It is unclear how applicable their approach is to other domains.
Interactive Dashboards for Healthcare Data Analytics	Maadani et al	2021	It provides useful insights into the benefits of using interactive dashboards for healthcare data analytics.	It focuses only on interactive dashboards for healthcare data analytics.
Interactive Dashboards for Student Success	Chen et al	2021	It is presented in a clear and organized manner, making it easy for readers to follow and implement in their own organizations.	It does not provide a detailed explanation of how the framework was developed or validated.

Table 2.1: Overview of literature survey

CHAPTER 3

SYSTEM ANALYSIS

3.1 EXISTING SYSTEM

While interactive dashboards for student data analysis provide many benefits, there are also some disadvantages that should be considered. Here are some potential drawbacks of using interactive dashboards for student data analysis.

Data Privacy Concerns: One major concern with using interactive dashboards for student data analysis is data privacy. Interactive dashboards often require access to sensitive student data such as grades, attendance records, and behavioral data. This data must be stored securely and only accessed by authorized personnel to protect student privacy.

Technical Expertise Required: To effectively use interactive dashboards for student data analysis, educators and school administrators need to have technical expertise in data visualization, data analysis, and dashboard design. This may require additional training and resources to ensure that educators have the skills necessary to effectively use the tools.

Data Overload: Interactive dashboards can provide a wealth of information, which can be overwhelming for educators and school administrators who may not be used to working with data. Without proper training, educators may struggle to make sense of the data presented in the dashboard.

Cost: Some interactive dashboard solutions can be expensive, requiring schools to invest in additional software or hardware to effectively use the tools. This may be a barrier to adoption for some schools or districts.

Potential Bias: Interactive dashboards can be designed to present data in a way that is biased or misleading. This can happen if the dashboard designer has a preconceived notion about what the data should show or if the data is not presented in a clear and objective way.

Overall, while interactive dashboards can provide valuable insights into student performance and behavior, it is important to carefully consider the potential drawbacks before adopting these tools. Data privacy, technical expertise, data overload, cost, and potential bias are all factors that should be carefully considered when using interactive dashboards for student data analysis.

3.2 DISADVANTAGES

Interactive dashboards have become an increasingly popular tool for data analysis in various fields, including education. By providing a real-time view of data, interactive dashboards enable educators to make data-driven decisions that can improve student outcomes. In this essay, we will discuss a proposed work for an interactive dashboard using Power BI, a powerful business intelligence tool from Microsoft.

The first step in creating an interactive dashboard is defining the scope of the project. This involves identifying the data sources that will be used, the key metrics that will be tracked, and the target audience for the dashboard. In the case of a dashboard for education, data sources might include student information systems, learning management systems, and surveys. Key metrics could include student performance, attendance, behavior, and engagement. The target audience might be school administrators, teachers, and other staff members.

Once the scope has been defined, the next step is gathering and cleaning the data. This may involve importing data from multiple sources, merging datasets, and cleaning the data to remove any errors or inconsistencies. This is a critical step, as the accuracy and quality of the data will determine the usefulness of the dashboard.

The design of the dashboard is also critical to its success. This involves selecting the appropriate charts, graphs, and visuals to communicate the data effectively. Power BI offers a wide range of visualization options, including bar charts, line graphs, and maps. The design should be user-friendly, with intuitive navigation and clear labeling of data.

After the design has been finalized, the next step is building the dashboard in Power BI. This involves creating the visualizations, adding filters and slicers, and connecting the data to the dashboard. Power BI offers a range of tools to help build a dashboard, including the ability to import data from a variety of sources, pre-built templates for common visualizations, and customizable visualizations.

Once the dashboard has been built, it is important to test it thoroughly to ensure that it is working correctly and communicating the data effectively. Any issues or errors should be addressed, and the dashboard should be refined based on user feedback. Regular maintenance is also important to ensure that the data remains up-to-date and that any issues or errors are addressed promptly.

Possible features of the interactive dashboard could include tracking student performance, attendance, and behavior, analyzing course trends, and monitoring school finances. The dashboard could also provide insights into student engagement, such as which activities or resources are most popular with students.

In conclusion, an interactive dashboard using Power BI can provide valuable insights into student data and help educators make data-driven decisions to improve student outcomes. By carefully designing and building the dashboard, and regularly maintaining and refining it, educators can gain valuable insights that can help improve student success.

3.3 PROPOSED SYSTEM

Interactive dashboards have become an increasingly popular tool for data analysis in various fields, including education. By providing a real-time view of data, interactive dashboards enable educators to make data-driven decisions that can improve student outcomes. In this essay, we will discuss a proposed work for an interactive dashboard using Power BI, a powerful business intelligence tool from Microsoft.

The first step in creating an interactive dashboard is defining the scope of the project. This involves identifying the data sources that will be used, the key metrics that will be tracked, and the target audience for the dashboard. In the case of a dashboard for education, data sources might include student information systems, learning management systems, and surveys. Key metrics could include student performance, attendance, behavior, and engagement. The target audience might be school administrators, teachers, and other staff members.

Once the scope has been defined, the next step is gathering and cleaning the data. This may involve importing data from multiple sources, merging datasets, and cleaning the data to remove any errors or inconsistencies. This is a critical step, as the accuracy and quality of the data will determine the usefulness of the dashboard.

The design of the dashboard is also critical to its success. This involves selecting the appropriate charts, graphs, and visuals to communicate the data effectively. Power BI offers a wide range of visualization options, including bar charts, line graphs, and maps. The design should be user-friendly, with intuitive navigation and clear labeling of data.

After the design has been finalized, the next step is building the dashboard in Power BI. This involves creating the visualizations, adding filters and slicers, and connecting the data to the dashboard. Power BI offers a range of tools to help build a dashboard, including the ability to import data from a variety of sources, pre-built templates for common visualizations, and customizable visualizations.

Once the dashboard has been built, it is important to test it thoroughly to ensure that it is working correctly and communicating the data effectively. Any issues or errors should be addressed, and the dashboard should be refined based on user feedback. Regular maintenance is also important to ensure that the data remains up-to-date and that any issues or errors are addressed promptly.

Possible features of the interactive dashboard could include tracking student performance, attendance, and behavior, analyzing course trends, and monitoring school finances. The dashboard could also provide insights into student engagement, such as which activities or resources are most popular with students.

In conclusion, an interactive dashboard using Power BI can provide valuable insights into student data and help educators make data-driven decisions to improve student outcomes. By carefully designing and building the dashboard, and regularly maintaining and refining it, educators can gain valuable insights that can help improve student success.

3.4 ADVANTAGES

The proposed work of an interactive dashboard using Power BI offers several advantages in the field of education. Some of these advantages include:

Real-time data analysis: One of the biggest advantages of an interactive dashboard is the ability to view and analyze data in real-time. This allows educators to identify issues and trends as they happen, enabling them to make quick and informed decisions.

Improved decision-making: By providing a visual representation of data, an interactive dashboard can help educators make data-driven decisions. This can lead to more effective use of resources and improved student outcomes.

Customizable visualizations: Power BI offers a wide range of visualization options, allowing educators to customize the dashboard to meet their specific needs. This can help ensure that the dashboard is user-friendly and communicates the data effectively.

Integration with multiple data sources: Power BI can integrate data from multiple sources, making it easier to analyze data from different systems. This can help educators gain a more comprehensive view of student data and identify trends that might not be apparent from a single source.

Cost-effective: Power BI offers a range of pricing options, including a free version, making it accessible to educators with limited budgets.

Improved communication and collaboration: An interactive dashboard can facilitate communication and collaboration among educators, enabling them to

share insights and best practices. This can lead to more effective use of resources and improved student outcomes.

Overall, the proposed work of an interactive dashboard using Power BI has the potential to transform the way educators view and analyze student data. By providing real-time insights into student performance, attendance, behavior, and engagement, educators can make data-driven decisions that can improve student outcomes. By carefully designing and building the dashboard, and regularly maintaining and refining it, educators can gain valuable insights that can help improve student success.

CHAPTER 4

SYSTEM REQUIREMENTS

4.1 HARDWARE REQUIREMENTS

Minimum Hardware Requirements:

- Processor: Dual-core CPU
- RAM: 2 GB
- Hard disk: 256 GB
- Compact Disk: Not required
- Keyboard: Standard keyboard
- Monitor: Standard monitor

4.2 SOFTWARE REQUIREMENTS

- Operating system: Windows OS
- Software: Power BI
- Front End: Browser

CHAPTER 5
SOFTWARE DESCRIPTION

5.1 SOFTWARE: POWER BI

Power BI is a business intelligence and data visualization software developed by Microsoft that helps users analyze data and create interactive dashboards, reports, and visualizations. It enables organizations to gain insights from their data and make data-driven decisions.

Power BI is designed to be user-friendly and intuitive, making it accessible to users of all skill levels. It has a drag-and-drop interface, allowing users to easily create charts, tables, and other visualizations with minimal coding. The software also has a large library of pre-built data connectors, which allows users to easily connect to various data sources such as Excel spreadsheets, cloud-based data sources such as Azure SQL Database or Salesforce, or other databases such as MySQL, PostgreSQL or SQL Server.

One of the key features of Power BI is its ability to connect to a variety of data sources, including real-time data streams. This means that users can get up-to-the-minute insights into their data, and quickly respond to changes in their business environment. Power BI also includes advanced analytics capabilities such as predictive modeling and machine learning, allowing users to uncover insights that might not be immediately apparent.

Another important feature of Power BI is its ability to create interactive dashboards and reports. These dashboards can be customized to display the most relevant data, and can be shared with other users across the organization. Power

BI also allows users to collaborate on dashboards and reports, enabling teams to work together to gain insights and make informed decisions.

Power BI is a cloud-based software, which means that users can access their dashboards and reports from anywhere, using any device with an internet connection. This makes it easy for users to stay connected to their data, and to collaborate with colleagues in real-time.

In conclusion, Power BI is a powerful and user-friendly software that allows organizations to gain insights from their data, create interactive dashboards and reports, and make data-driven decisions. Its ability to connect to a variety of data sources, its advanced analytics capabilities, and its cloud-based design make it an essential tool for businesses looking to gain a competitive edge in today's data-driven world.

Feature of Power BI:

Power BI is a robust business intelligence software that comes equipped with a wide range of features designed to help users analyze and visualize data in powerful ways. Here are some of the key features of Power BI:

Data connectivity: Power BI supports a wide range of data connectors, including Excel, SQL Server, Oracle, Salesforce, and many others. This means that users can easily connect to a variety of data sources and pull in data from multiple systems.

Data modeling: Power BI allows users to transform and model data using a drag-and-drop interface. Users can create relationships between tables, add calculated columns, and create measures to analyze data in various ways.

Visualizations: Power BI offers a wide range of customizable visualizations, including bar charts, line charts, scatter plots, maps, and more. Users can customize the appearance of these visualizations with a variety of formatting options.

Dashboards: Power BI allows users to create interactive dashboards that display data from multiple sources. Users can create tiles that display visualizations, KPIs, and other data, and organize them on the dashboard in any way they choose.

Collaboration: Power BI allows users to collaborate with others on dashboards and reports. Users can share dashboards with others in their organization, and collaborate in real-time using tools like comments and notifications.

Mobile app: Power BI has a mobile app that allows users to access their dashboards and reports on-the-go. The mobile app provides a similar experience to the desktop version of Power BI, with support for touch gestures and mobile-specific features like geo-location.

Natural language queries: Power BI allows users to ask questions in natural language, and it will automatically generate visualizations based on the data. This feature makes it easier for users to get quick answers to their data-related questions.

Machine learning: Power BI includes built-in machine learning capabilities that allow users to build predictive models and perform advanced analytics on their data.

Overall, Power BI is a feature-rich software that provides users with a powerful set of tools to analyze and visualize data. Its wide range of features makes it a popular choice for businesses of all sizes, across a variety of industries.

Uses of Power BI:

Power BI is a robust business intelligence software that comes equipped with a wide range of features designed to help users analyze and visualize data in powerful ways. Here are some of the key features of Power BI:

Data connectivity: Power BI supports a wide range of data connectors, including Excel, SQL Server, Oracle, Salesforce, and many others. This means that users can easily connect to a variety of data sources and pull in data from multiple systems.

Data modeling: Power BI allows users to transform and model data using a drag-and-drop interface. Users can create relationships between tables, add calculated columns, and create measures to analyze data in various ways.

Visualizations: Power BI offers a wide range of customizable visualizations, including bar charts, line charts, scatter plots, maps, and more. Users can customize the appearance of these visualizations with a variety of formatting options.

Dashboards: Power BI allows users to create interactive dashboards that display data from multiple sources. Users can create tiles that display visualizations, KPIs, and other data, and organize them on the dashboard in any way they choose.

Collaboration: Power BI allows users to collaborate with others on dashboards and reports. Users can share dashboards with others in their organization, and collaborate in real-time using tools like comments and notifications.

Mobile app: Power BI has a mobile app that allows users to access their dashboards and reports on-the-go. The mobile app provides a similar experience to the desktop version of Power BI, with support for touch gestures and mobile-specific features like geo-location.

Natural language queries: Power BI allows users to ask questions in natural language, and it will automatically generate visualizations based on the data. This feature makes it easier for users to get quick answers to their data-related questions.

Machine learning: Power BI includes built-in machine learning capabilities that allow users to build predictive models and perform advanced analytics on their data.

Overall, Power BI is a feature-rich software that provides users with a powerful set of tools to analyze and visualize data. Its wide range of features makes it a popular choice for businesses of all sizes, across a variety of industries.

CHAPTER 6

SYSTEM DESIGN

6.1 SYSTEM ARCHITECTURE:

Power BI is a powerful business intelligence tool that provides a comprehensive suite of data visualization and analysis features. A system architecture for an interactive dashboard using Power BI should consider the data sources, data modeling, data visualization, data analysis, and data sharing components. With Power BI's advanced features and scalability options, organizations can create interactive dashboards that enable decision-makers to gain insights and make data-driven decisions. The first step is to identify and connect to the relevant data sources. Power BI supports various data sources, including Microsoft Excel, SQL Server, SharePoint, Salesforce, and more. Once the data sources are connected, the next step is to model the data. Power BI provides a robust data modeling engine that enables users to create relationships between tables, define calculated fields, and perform data transformations and aggregations. The core of the interactive dashboard is the visualizations themselves. Power BI provides a rich set of visualization types, including charts, tables, maps, and custom visuals. In addition to basic visualizations, Power BI offers a range of advanced data analysis features, such as forecasting, clustering, and regression analysis. These tools can be used to gain deeper insights into the data and identify trends and patterns. Finally, the dashboard needs to be shared with the relevant stakeholders. Power BI offers several options for sharing and collaboration, including embedding the dashboard in a web page, publishing it to the Power BI service, or exporting it to a PDF or PowerPoint presentation.

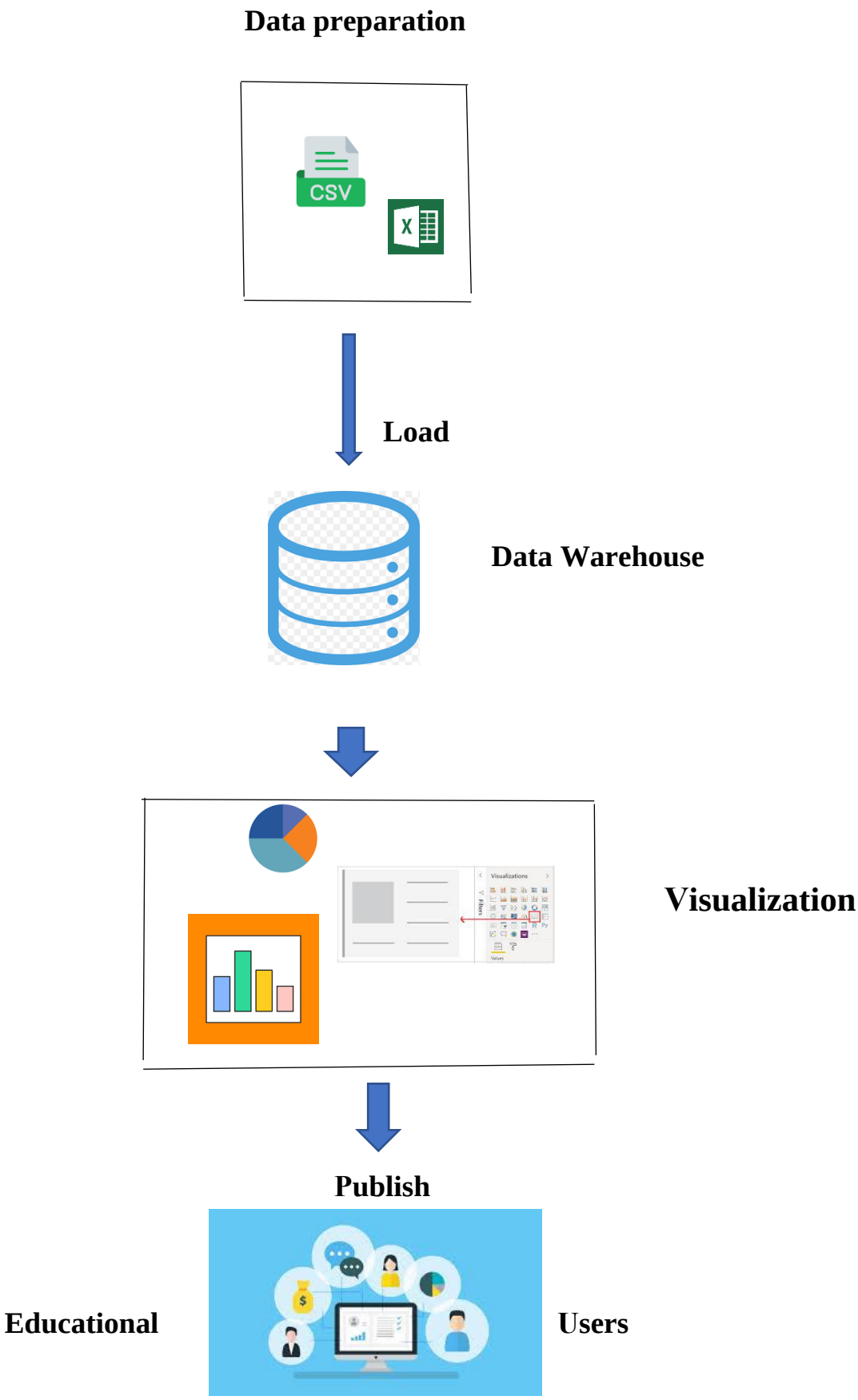

Fig 6.1 System Architecture

6.2 DATA FLOW DIAGRAM

A two-dimensional diagram explains how data is processed and transferred in a system. The graphical depiction identifies each source of data and how it interacts with other data sources to reach a common output. Individuals seeking to draft a data flow diagram must identify external inputs and outputs, determine how the inputs and outputs relate to each other, and explain with graphics how these connections relate and what they result in. This type of diagram helps business development and design teams visualize how data is processed and identify or improve certain aspects.

TABLE 6.1: Data flow Symbols table

Symbol	Description
	An entity. A source of data or a destination for data.
	A process or task that is performed by the system.
	A data store, a place where data is held between processes.
	A data flow indicator.

Table 6.1: Data flow Symbols table

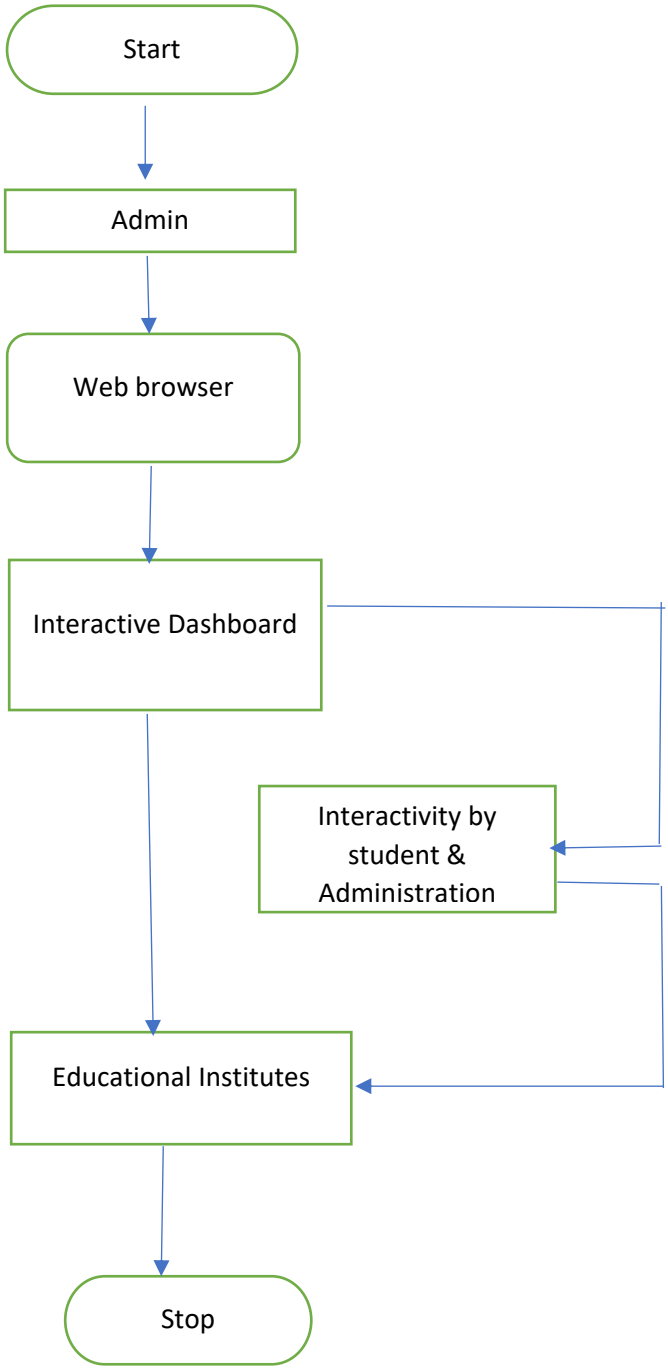

Fig 6.2 Dataflow diagram

6.3 USE CASE DIAGRAM

A use case diagram is a graphical depiction of a user's possible interactions with a system. A use case diagram shows various use cases and different types of users the system has and will often be accompanied by other types of diagrams as well. The use cases are represented by either circles or ellipses. The actors are often shown as stick figures

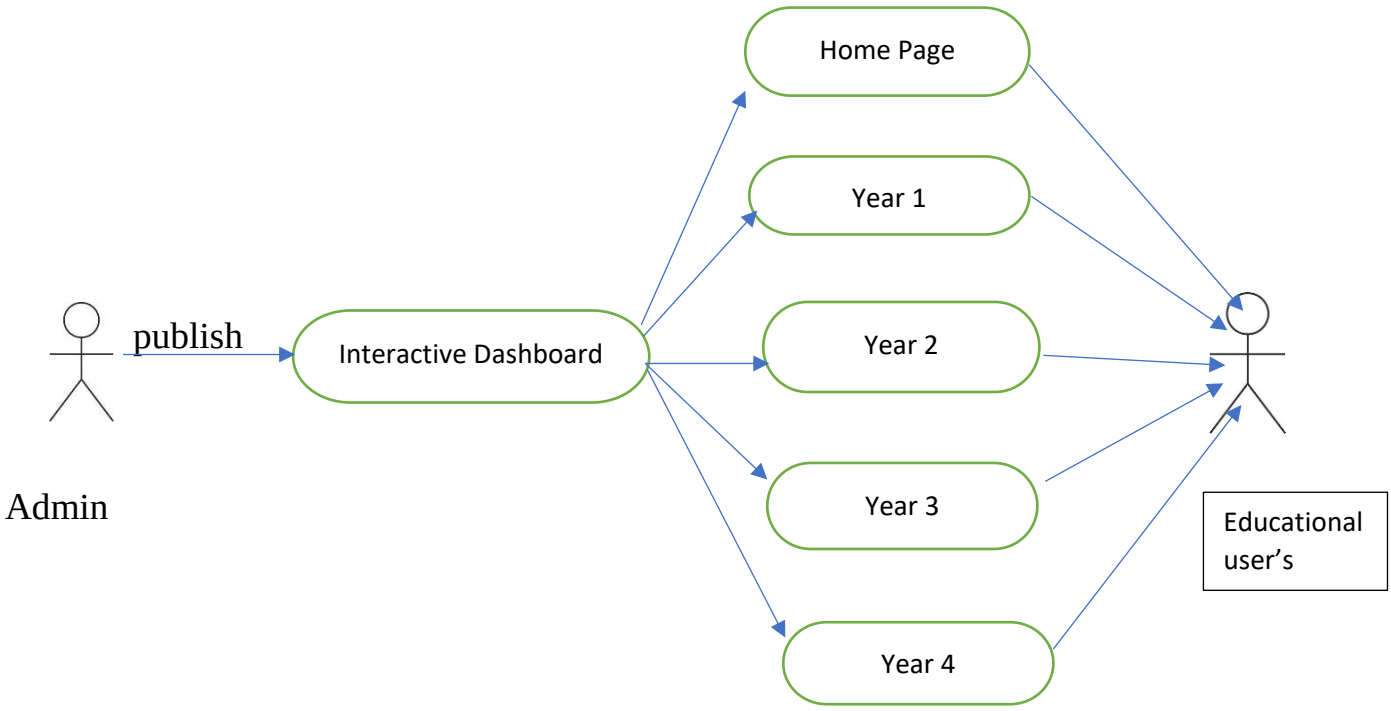

Fig 6.3 Use-case diagram

CHAPTER 7

SYSTEM IMPLEMENTATION

7.1 POWER BI

1. Data source connection: The first step is to connect to the data source(s) and import the data into Power BI. Power BI supports a wide range of data sources, including Excel files, databases, and cloud-based data services like Azure.
2. Data preparation: Once the data is imported, it may need to be cleaned and transformed to ensure that it is in a suitable format for analysis. Power BI provides tools for data cleansing and transformation, including data shaping and modeling capabilities.
3. Dashboard design: The next step is to design the dashboard itself, including selecting visualizations and arranging them in a meaningful way. Power BI includes a wide range of visualization options, including charts, tables, and maps.
4. Interactivity and drill-down: Power BI allows users to interact with the dashboard, including drilling down into specific data points and filtering data based on specific criteria. This functionality can be customized to meet the needs of the user.
5. Publishing and sharing: Once the dashboard is complete, it can be published to the Power BI service and shared with others. The Power BI service allows users to access the dashboard from a web browser or mobile device, and includes additional functionality like collaboration and data alerts.

7.2 INTERACTIVE DASHBOARD

- Open Power BI Desktop and connect to the data source(s).
- Clean and transform the data as needed.
- Select the visualizations you want to use and arrange them on the dashboard.
- Add interactivity and drill-down functionality using Power BI's tools.
- Publish the dashboard to the Power BI service and share it with others.

7.3 DEPLOYMENT

Charts and graphs: Power BI includes a wide range of chart and graph types, including bar charts, line charts, scatter plots, and pie charts. These visualizations can help you quickly understand trends and patterns in your data.

Maps: Power BI can display maps with location-based data. This can be useful for analyzing sales data by region or visualizing customer locations.

Tables: Power BI can display tables with your data. Tables can be sorted and filtered, allowing you to quickly find the information you need.

KPIs: Power BI can display key performance indicators (KPIs) to help you track progress towards specific goals. KPIs can be displayed as gauges, cards, or other visualizations.

Drill-downs: Power BI allows users to drill down into specific data points to explore the underlying data in more detail. This can help you identify trends and patterns that may not be immediately visible in a high-level view.

Filters: Power BI allows users to filter data based on specific criteria. This can help you focus on specific segments of your data and uncover insights that may be hidden in the larger dataset.

Interactive visuals: Power BI can display visuals that allow users to interact with the data directly. For example, users can hover over a data point to see more information or click on a visualization to filter the data.

CHAPTER 8

SYSTEM TESTING

8.1 TESTING

Testing is the process of evaluating a system or its component(s) with the intent to find whether it satisfies the specified requirements or not. In simple words, testing is executing a system in order to identify any gaps, errors, or missing requirements in contrary to the actual requirements.

8.2 Test Case:

Table 8.1: Test-Case for Interactive Dashboard:

ID	TEST CASE	INPUT DATA	EXPECTED OUTPUT	RESULT
1	Data Source Testing	Making sure that data is imported correctly without any errors or discrepancies.	Datas are loaded in data panel.	pass
2	Data Modeling Testing	Test the relationships between tables, ensuring that they are defined correctly. Verify that calculated fields and data transformations are working as expected.	Transform data if any changes occur	pass
3	Data Visualization Testing	Test that charts, tables, maps, and custom visuals are displaying the data correctly.	Visualizing data About student ‘s	pass
4	Data Analysis Testing	Test the custom calculations and measures created using DAX, and	Formula are added to find percentages of marks.	pass

		ensure that they are accurate.		
5	Data Sharing Testing	Verify that the dashboard can be published to the Power BI service, embedded in a web page	Finally visible in web browser	pass
6	Performance and Security Testing	Verify that the dashboard is performing well and responding quickly to user interactions.	Checked in web browser.	pass

Table 8.1: Test-Case table for Interactive Dashboard:

CHAPTER 9

SCREENSHOTS

This is the home page for interactive dashboard, in this homepage it includes department of computer science& engineering year 1,2,3,4 button to display those year student details.

Fig 9.1 Homepage

This figure shows overall year 1 students details which include total no. of students, male, female, district wise, cgpa wise, blood group wise details of students.

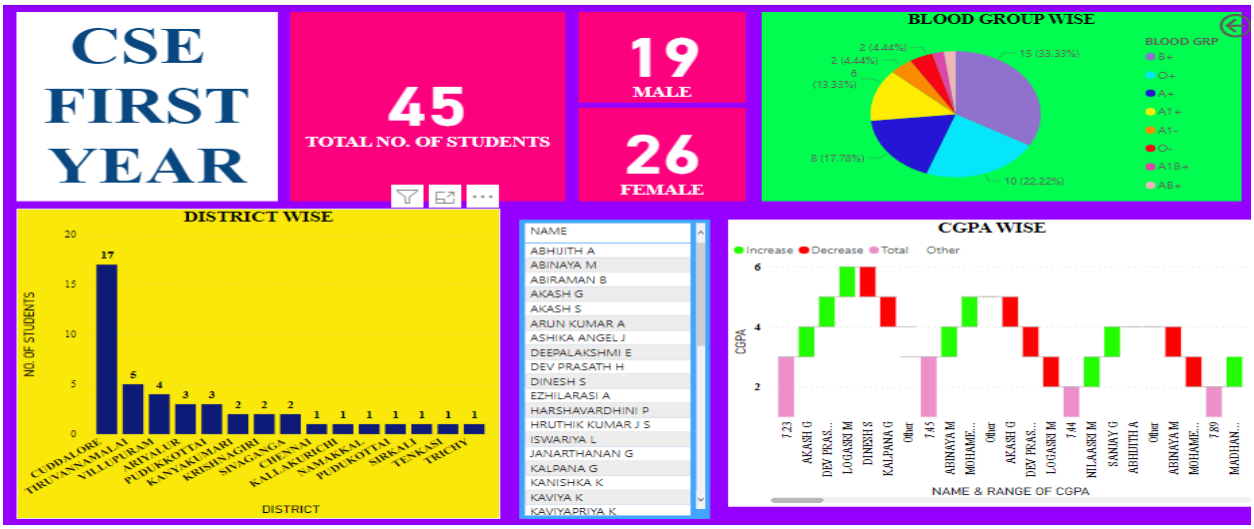

Fig 9.2 Overall year 1 student details

This figure shows only district wise students count and details.

Fig 9.3 District wise detail

This figure shows total no. of. students, male , female count in year 1.

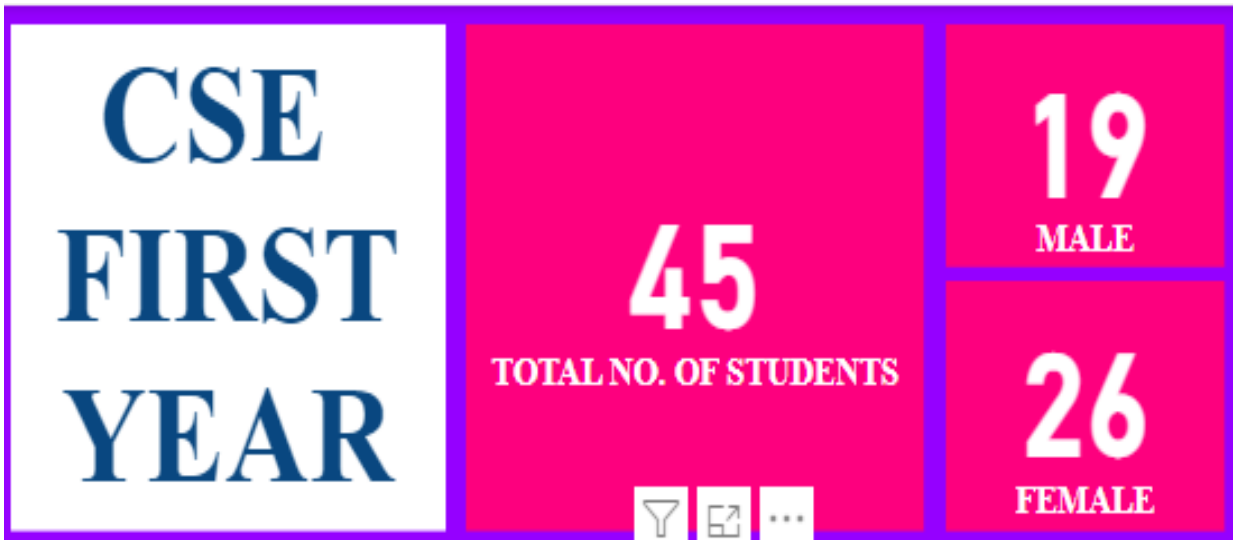

Fig 9.4 Total no of student

This figure shows blood group wise detail of year 1 students, this include all kind of blood group of students.

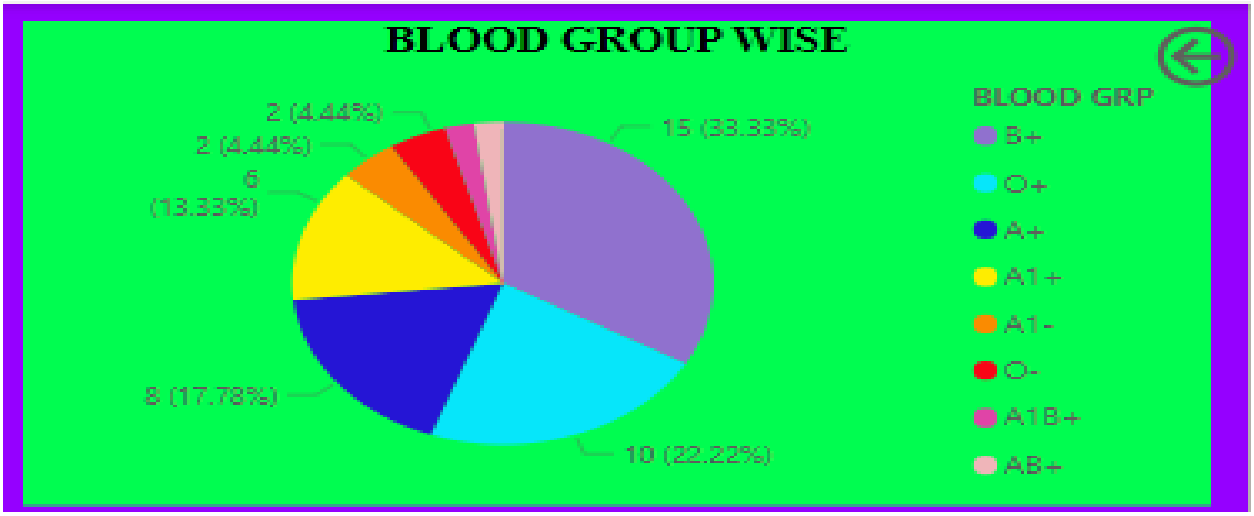

Fig 9.5 Blood group wise

This figure shows CGPA wise details of year 1, from this they came to know about student cgpa from ascending to descending manner.

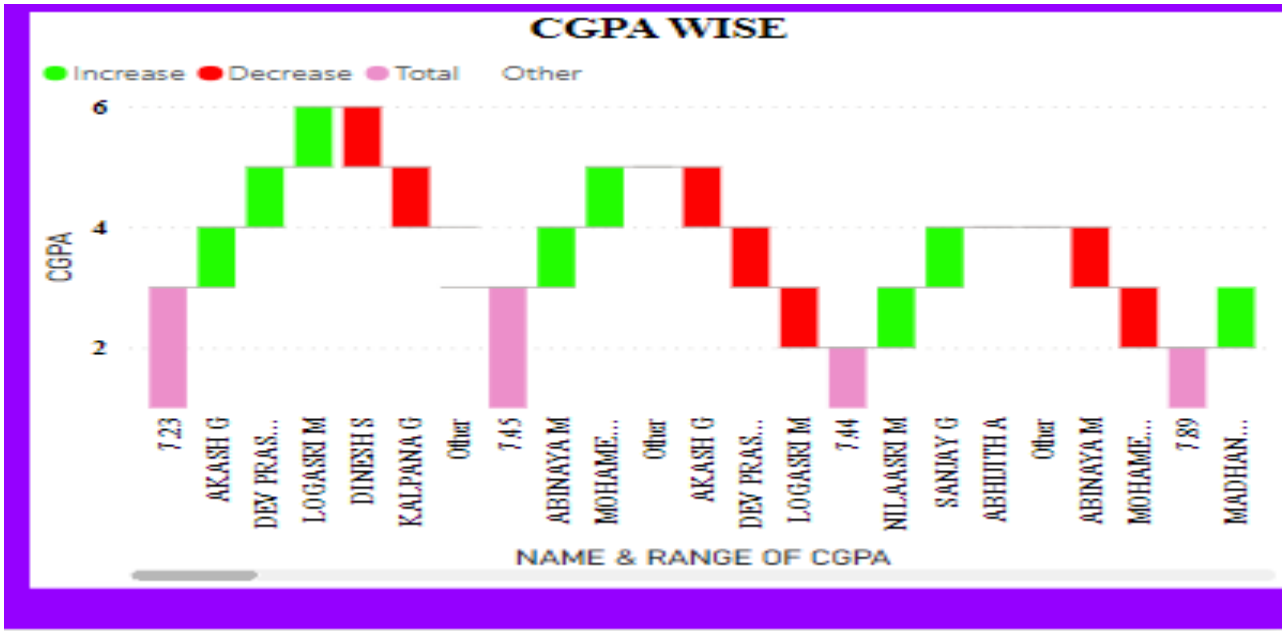

Fig 9.6 CGPA wise

This figure shows interactive dashboard features if we click particular district it shows particular student detail like their blood group, their name, no. of male, female, cgpa of particular students.

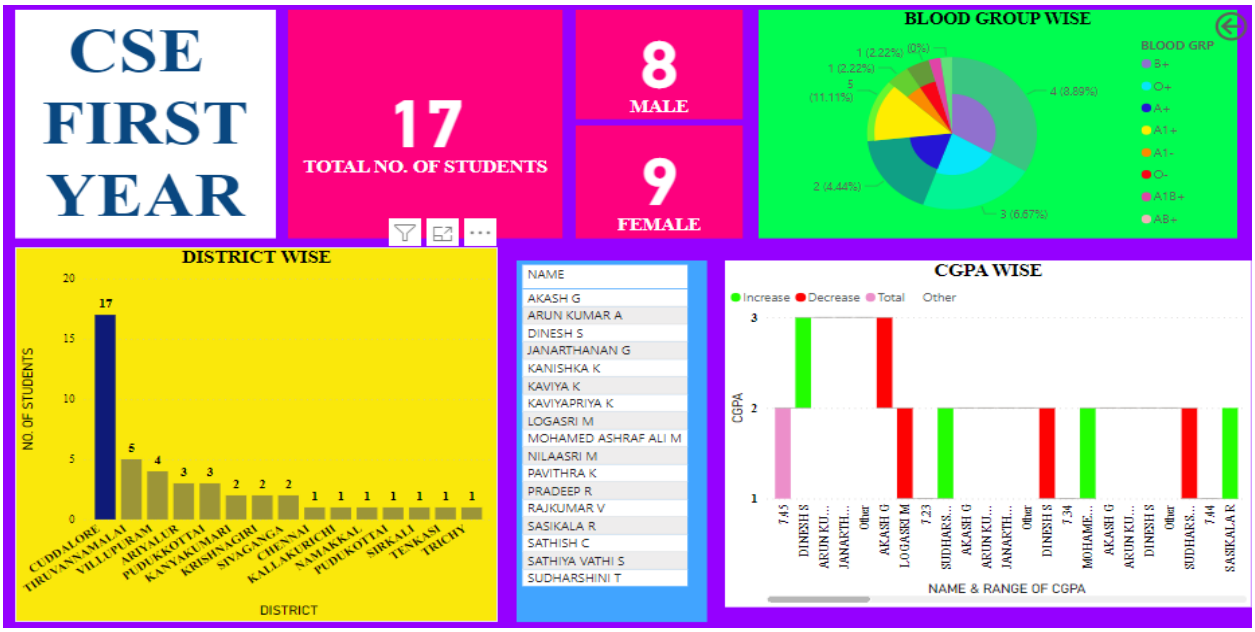

Fig 9.7 District wise and their details.

This figure shows particular blood group wise details and they come from which district, no. of. Male and female, their cgpa etc…

Fig 9.8 CGPA wise student detail.

This figure shows year 4 student detail their pass percentage arrear percentage, total no of student, semester wise arrear of student etc….

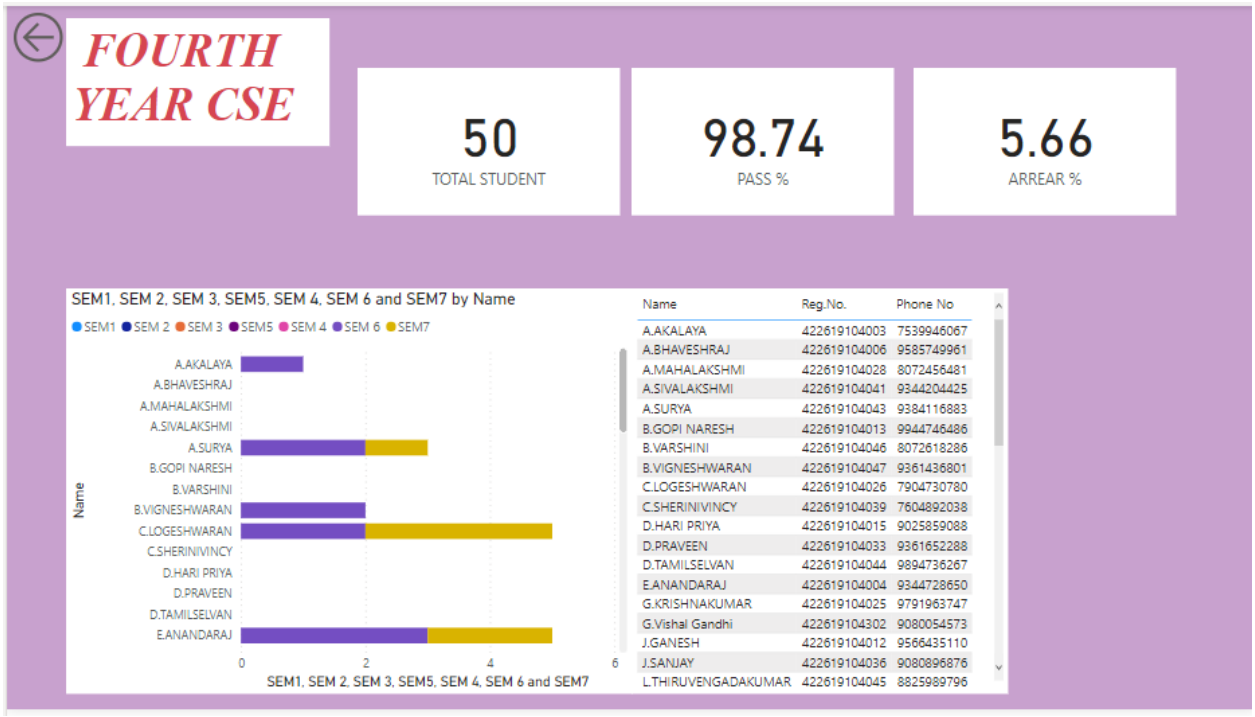

Fig 9.9 Year 4 student details

This figure shows total no of student and their pass and arrear percentage of students.

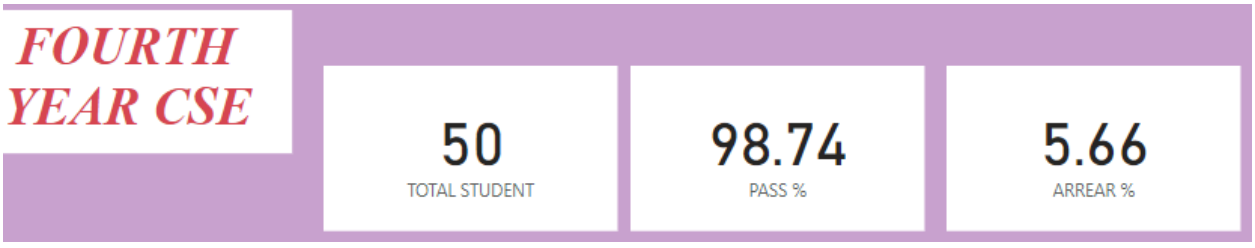

Fig 9.10 Total students in year 4

This figure shows semester wise arrear and their name, total no. of arrear kept in semester wise, particular student pass and arrear percentage etc...

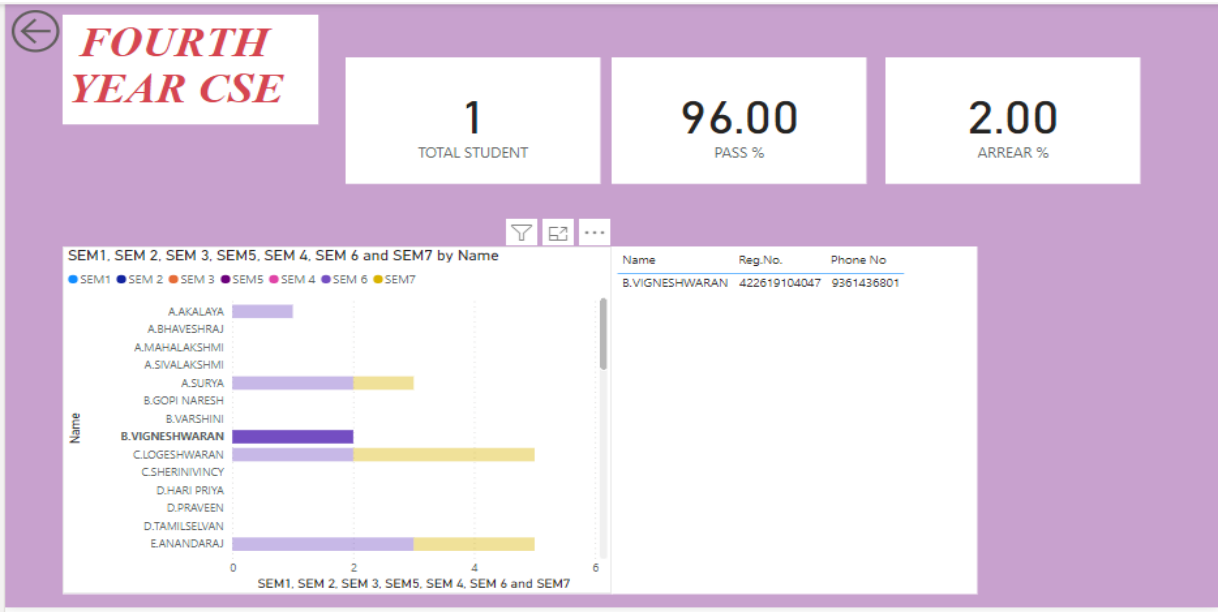

Fig 9.11 Particular student detail

This figure shows total arrear of student and register number, name, phone number of students.

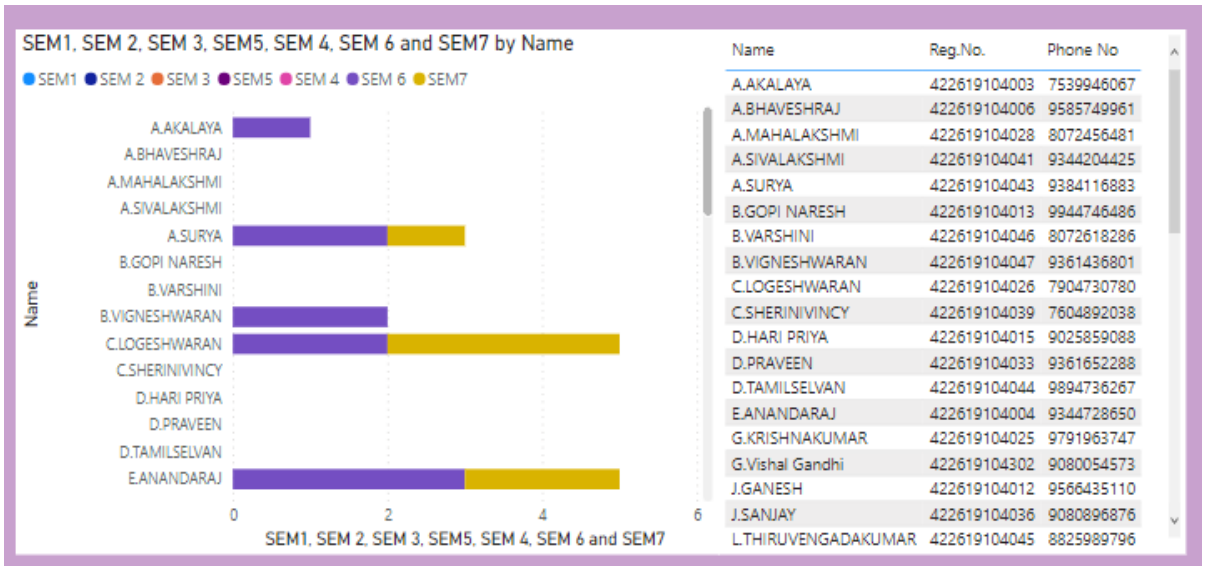

Fig 9.12 Semester wise arrear

This figure shows water fall graph of all student details which include total no of subject, appeared, pass and arrears of year 4 students.

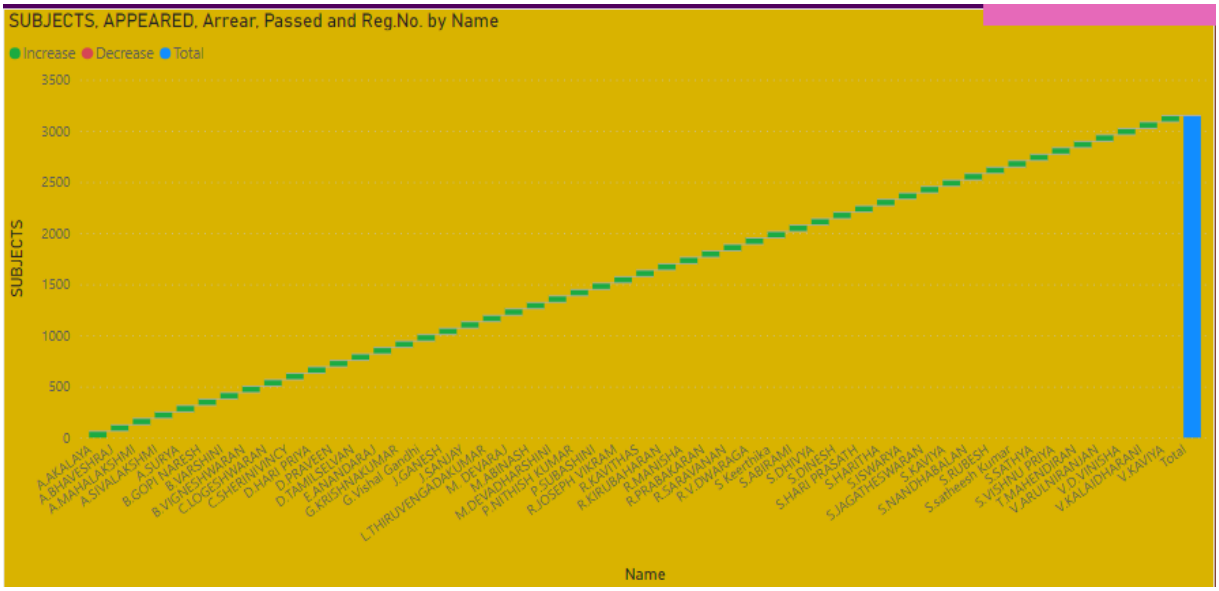

Fig 9.13 Water fall graph of students

This figure shows particular of selected student details their pass and arrear percentage, no of subjects passed etc.

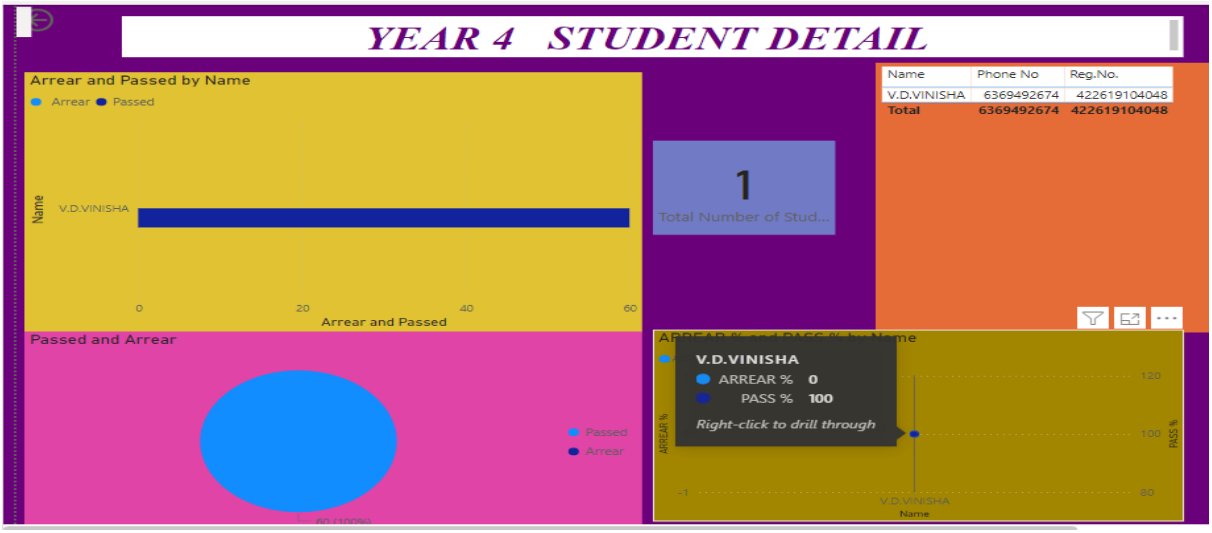

Fig 9.14 Student pass percentage

CHAPTER 10

CONCLUSION AND FUTURE ENHANCEMENT

10.1 CONCLUSION

In conclusion, interactive dashboards using Power BI have become an essential tool for organizations to effectively analyze and visualize their data. It has the ability to quickly identify trends, gain insights, and make data-driven decisions. It has ability to integrate data from a wide variety of sources, allowing organizations to consolidate their data and gain a holistic view of their business. The interactive nature of Power BI dashboards enables users to drill down into their data, explore relationships, and identify patterns that might not be immediately apparent. With a user-friendly interface and intuitive drag-and-drop features, creating and customizing dashboards is simple and straightforward. Additionally, the ability to create custom visuals and incorporate natural language queries makes it easy for non-technical users to access and analyze data. Overall, Power BI dashboards have become an essential tool for organizations looking to gain insights from their data. By providing an interactive and customizable platform for data analysis, Power BI dashboards enable users to quickly identify trends, gain insights, and make data-driven decisions. As data continues to play an increasingly important role in business strategy, Power BI dashboards will become even more critical for organizations seeking to stay ahead of the curve.

10.2 FUTURE ENHANCEMENT

- Offer users the ability to customize the layout, colors, and other visual elements
- Incorporate advanced data visualizations.
- Provide users with real-time updates of data
- Allow users to collaborate with others by sharing the dashboard

REFERENCES

[1] Microsoft's official documentation: The Microsoft documentation provides detailed information on creating and publishing dashboards in Power BI, as well as tips and best practices for creating effective dashboards. You can find it at: https://docs.microsoft.com/en-us/power-bi/create-reports/desktop-dashboard-tutorial

[2] Power BI Community: Power BI has a large community of users and experts who share their knowledge and best practices in the community forum. You can ask questions, read articles, and participate in discussions related to Power BI dashboards at: https://community.powerbi.com/

[3] Udemy courses: Udemy offers a variety of Power BI courses, including courses specifically focused on creating interactive dashboards. You can find courses that suit your needs at: https://www.udemy.com/topic/power-bi-dashboard/

[4] Power BI blog: The Power BI team regularly updates their blog with tips, tricks, and tutorials for using the tool. You can find the blog at: https://powerbi.microsoft.com/en-us/blog/