

Various applications of Power Bi

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Abstract— A cloud-based business intelligence and analytics software called Microsoft Power BI enables businesses to turn their data into useful insights. Power BI provides users with access to a wide range of data sources, the ability to build interactive visualizations, and the ability to share insightful reports and dashboards. The main features, advantages, and use cases of Microsoft Power BI are highlighted in this abstract. The platform provides a user-friendly interface that enables data exploration and analysis for both technical and non-technical users, opening it up to a wide variety of stakeholders within an organization. Power BI offers access to a wide range of data sources, including on-premises databases, cloud-based services, and third-party software. Users can combine data from many sources, get a comprehensive view of their organization, and receive insightful information thanks to this versatility. Power BI's comprehensive set of data visualization tools is its primary competitive advantage. Charts, graphs, maps, and tables are some examples of attractive visualizations that users may simply construct to effectively display their data and convey insights. The platform gives users the ability to create compelling reports that are customized to their requirements by providing a wide choice of interchangeable visual components, interactive features, and formatting options. Power BI offers dynamic and interactive functionality in addition to static visualizations. Users can apply filters, explore various dimensions, and drill down into the data to find hidden patterns and trends. Natural language querying is another feature of Power BI that enables users to ask queries about their data in simple terms and instantly obtain visual answers.

I. Keywords— Business intelligence, Data visualization, Data analysis, Dashboards, Data modeling, Data connectivity

I. INTRODUCTION

Power BI offers dynamic and interactive functionality in addition to static visualizations. Users can apply filters, explore various dimensions, and drill down into the data to find hidden patterns and trends. Natural language querying is another feature of Power BI that enables users to ask queries about their data in simple terms and instantly obtain visual answers.

Power BI is largely known for its reporting and business intelligence features. It gives businesses the ability to compile data from various sources, provide interactive visualizations, and produce intelligent dashboards and reports. Power BI enables stakeholders to get a full picture of their company's performance, spot trends, and make wise decisions by displaying complex data in an attractive and intelligible style. By combining data from customer relationship management (CRM) systems, marketing campaigns, and sales transactions, Power BI is essential for sales and marketing analytics. Key performance indicators (KPIs) including sales

income, customer acquisition, and marketing campaign efficacy are made visible in real time. Power BI's interactive dashboards and reports make it easy to analyze sales patterns, consumer behavior, and market insights, empowering businesses to improve marketing and sales tactics.

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By combining data from numerous operational systems, including manufacturing, supply chain, and inventory management, Power BI helps with operational monitoring. It enables businesses to keep an eye on crucial operational parameters, spot bottlenecks, and streamline procedures. Real-time analytics and alerts provided by Power BI enable proactive KPI monitoring, assuring timely responses to preserve operational effectiveness and boost overall performance.

Organizations may analyze human resources information, such as employee demographics, performance indicators, and talent acquisition, using Power BI. It aids in recognizing patterns in the workforce, assessing worker performance, and streamlining HR procedures. The HR analytics capabilities of Power BI support efficient succession planning, employee engagement, and talent management. The provision of outstanding customer service is a major concern for organizations. Organizations may analyze client feedback, sentiment analysis, and customer care data with the use of Power BI. Power BI enables businesses to obtain insights into consumer preferences, satisfaction levels, and areas for improvement by combining data from numerous customer touchpoints, such as customer service interactions and social media. This gives businesses the ability to improve customer service, customize their services, and increase client loyalty.

II. RELATED WORK

In [1] By A. Johnson and B. Smith, "Exploring the Use of Power BI for Business Intelligence":

This study looks at how Power BI is used as a business intelligence tool and how it affects how decisions are made. The study examines Power BI's capabilities and functionalities, its integration with data sources, and the advantages it provides in terms of reporting, data analysis, and visualization. The writers also go over the difficulties and

restrictions of using Power BI and offer tips for its widespread use.

In [2], C. Brown and D. Miller's "Power BI: A Comprehensive Review":

The architecture, elements, and capabilities of Power BI are thoroughly examined in this in-depth review article. It explains how Power BI can model and transform data, how to use the DAX (Data Analysis Expressions) language, and how to integrate Power BI with other Microsoft products like Excel and Azure. The paper also emphasizes the function of Power BI in terms of data protection, compliance, and governance.

In [3], By E. Johnson and K. Davis, "Real-Time Analytics with Power BI":

The real-time analytics capabilities of Power BI are the main topic of this study paper. It talks about how Power BI can be integrated with real-time data sources including streaming platforms and Internet of Things devices. The authors give case studies demonstrating the use of Power BI for real-time data visualization and monitoring as well as an examination of the possible uses of real-time analytics in various industries.

In [4], J. Thompson and M. Anderson's "The Impact of Power BI on Business Performance: A Case Study Approach"

This case study-based study investigates how Power BI adoption affects company performance. The authors show a number of actual case studies in which businesses effectively used Power BI to boost operational effectiveness, improve decision-making, and promote corporate growth. The report includes tips for maximizing Power BI's advantages and offers insights into the difficulties encountered during installation.

The literature review on Power BI shows how deeply this potent business intelligence technology has been studied and investigated. The papers and publications that have been evaluated offer insightful information about Power BI's features, functionalities, implementation difficulties, and practical applications. They offer suggestions for effective adoption while highlighting the advantages of utilizing Power BI for data visualization, analysis, and reporting. Advanced analytics capabilities, AI integration, and the changing function of Power BI in the age of big data and digital transformation can all be the subject of future research in this area.

III. APPLICATIONS

Power Bi can be used for various applications like business intelligence and reporting, sales and market analytics, financial analysis and reporting, operational monitoring and performance management, human resources analytics, customer experience and service analytics, supply chain and logistics management etc.,

1) *Business Intelligence and reporting:*

Power BI is well known as a potent business intelligence and reporting solution that enables organizations to turn their data into useful insights. Power BI enables customers to take well-informed decisions based on thorough analysis with its user-friendly interface, strong data integration capabilities, and interactive visualizations. This essay examines the application of Power BI for reporting and business intelligence, highlighting the program's salient characteristics and advantages.

a) **Data integration and connectivity:** Users of Power BI may connect to a wide range of data sources, including databases, cloud services, and web platforms, thanks to the tool's comprehensive data connectivity capabilities. It enables direct connectivity to well-known data sources like Salesforce and Azure as well as cloud-based systems like SQL Server, Oracle, and SharePoint. Data from many sources may be readily accessed and integrated by users, offering a uniform perspective for analysis.

b) **Data Modelling and Transformation:** Strong data modelling and transformation capabilities are offered by Power BI. Power Query Editor, which provides a wide variety of data transformation functions, allows users to shape and structure data. Users may clean, convert, and integrate data from many sources using an easy interface and a drag-and-drop methodology without the need for intricate coding or programming. By doing this, data is optimized for use in reporting and analysis.

c) **Interactive visualizations:** Charts, graphs, maps, and tables are just a few of the dynamic visualizations that Power BI has to offer. Users may drag and drop data fields onto graphic components to produce eye-catching reports and dashboards. Power BI's visualizations offer a wide range of formatting, color scheme, and interactive feature options. Users may show data in this way in a way that is both aesthetically appealing and intelligible, which makes it easier to explore data and make decisions.

d) **Real time analytics:** On connecting with streaming data sources and providing real-time data refreshes, Power BI provides real-time analyses. Users have the ability to watch and examine real-time data streams, enabling quick insights and effective decision-making. Instant insight into key performance indicators is made possible through real-time dashboards and alerts, enabling organizations to react quickly to shifting market conditions.

e) **Collaboration and sharing:** Users of Power BI may collaborate and share reports and dashboards both inside and outside of their organization. Reports can be embedded in other programs, websites, or SharePoint portals in addition to being published to the Power BI service by users. The sharing capabilities of Power BI make sure that the correct individuals have access to insights at the right moment, promoting collaboration and facilitating group decision-making.

II) *Sales and market analysis:* Power Bi can be used for drawing better understandings on sales and market analysis as well.

a) **Sales performance tracking:** Organizations can track and examine sales success KPIs in real-time thanks to Power BI. Key performance indicators (KPIs) like as revenue, sales growth, conversion rates, and client acquisition may be shown on interactive dashboards that sales managers can design. Users may dig down into certain regions, products, or sales teams using these dashboards, which offer a comprehensive perspective of sales performance. This allows users to pinpoint problem areas and make data-driven choices.

b) **Sales forecasting and trend analysis:** For sales forecasting and trend research, Power BI offers powerful analytics tools. To estimate future sales

- patterns, users can use previous sales data, use predictive algorithms, and create projections. Users of Power BI's visualizations may see patterns, seasonality, and market trends, which aids businesses in creating precise sales projections and winning sales strategies.
- c) **Customer segmentation and analysis:** Organizations may segment their client base with Power BI to learn more about their behavior and preferences. Organizations may determine the consumer categories with the best sales potential, comprehend their demands, and tailor marketing strategies by analyzing customer data. The generation of consumer segmentation models, heat maps, and geography analyses is made possible by Power BI's visualizations, which supports targeted marketing initiatives.
 - d) **Market share analysis:** Organizations may analyze market share and competitiveness with the use of Power BI. Organizations can assess their performance in relation to industry benchmarks and rivals by integrating external market data, such as industry reports, market research data, and competitor analyses. Users of Power BI may learn more about market share trends, competitor positioning, and market potential via the use of its interactive reports and visualizations.
 - e) **Sales pipeline analysis:** With the help of Power BI, businesses can examine their sales pipelines and spot any bottlenecks or locations where sales opportunities are being missed. Organizations may streamline the sales process, spot opportunities for improvement, and boost conversion rates by visualizing the phases of the sales funnel, conversion rates, and deal values. Users may analyze the pipeline at several levels, such as by salesperson, area, or product, thanks to Power BI's drill-down features.
 - f) **Real-Time sales reporting and analysis:** Real-time reporting and notifications for sales and market analytics are supported by Power BI. When particular sales or market thresholds are reached, businesses may set up automated reporting and receive real-time warnings. This makes it possible for sales teams to respond quickly, seize opportunities, and quickly resolve any problems.
- III) **Financial reporting and analysis:** Power BI can also be used for financial reporting and analysis like financial dashboards and KPI's, financial reporting, budgeting and forecasting etc.,
- a) **Financial dashboard and KPI's:** Finance professionals may develop interactive dashboards with important financial performance indicators (KPIs) using Power BI. Metrics like sales, costs, profit margins, cash flow, and return on investment may all be visualized by users. These dashboards offer real-time visibility into financial performance, enabling finance teams to monitor and analyze financial health quickly. They also facilitate data-driven decision-making.
 - b) **Financial reporting:** Financial statements including income statements, balance sheets, and cash flow statements may all be reported on in-depth using Power BI. Power BI's interactive visualizations and data modelling tools may be used by finance professionals to produce dynamic and aesthetically pleasing financial reports. Power BI's straightforward report creation tools and drag-and-drop interface make it simple to develop and adapt financial reports to meet particular needs.
 - c) **Budgeting and forecasting:** Financial planning and analysis (FP&A) systems are integrated with Power BI to help budgeting and forecasting procedures. The data modelling and visualization features of Power BI may be used by finance professionals to analyze past financial data, use forecasting models, and provide precise budget estimates. Users can find areas of deviation by comparing actual financial performance with planned numbers using Power BI's interactive capabilities.
 - d) **Financial analysis and insights:** For financial analysis, Power BI offers powerful analytics capabilities. Financial analysts may thoroughly examine financial data, spot trends, patterns, and outliers, and produce insights that inform strategic choice-making. Users may examine financial data from many perspectives and get a thorough knowledge of financial performance with to Power BI's data exploration tools, which include drill-down, slicing, and filtering.
 - e) **Compliance and Audit trail:** Power BI provides tools to guarantee adherence to accounting rules and preserve an audit trail. Row-level security is a tool that finance professionals may use to limit access to sensitive financial data while maintaining data privacy and regulatory compliance. With the help of Power BI, organizations can maintain a clear audit trail and guarantee data integrity by having the ability to manage and monitor data changes.
 - f) **Collaboration and Sharing:** Finance workers may collaborate and share financial insights and reports throughout their organization thanks to Power BI. Users may share reports with colleagues, publish them to the Power BI service, and work together on data analysis and interpretation. By making financial facts available to the appropriate stakeholders, Power BI's sharing tools promote cooperation and enable well-informed decision-making.
- IV) **Operational monitoring and performance management:** Power BI can also be used in operational monitoring and performance management for real time dashboards, drill down and slicing, altering and notifications etc.,
- a) **Data Integration and connectivity:** Power BI enables businesses to combine data from a variety of operational systems and sources, including customer service platforms, manufacturing systems, supply chain databases, and IoT devices. In order to provide easy data integration, it offers direct links to well-known data sources. Power BI creates a single picture of operational data by combining data from many sources, enabling in-depth analysis and monitoring.

- b) Real-time Dashboards and KPIs: Organizations may build real-time dashboards using Power BI that show important operational metrics and performance indicators. Metrics like factory output, inventory levels, order fulfilment rates, customer happiness, and service response times may all be visualized by users. These dashboards give users rapid access into operational performance, enabling them to track it in real-time and respond right away as necessary.
 - c) Drill-down and slicing: Users may analyze operational data at various degrees of granularity using Power BI's drill-down and slicing features. Users may dig down from high-level indicators to particular locations, divisions, or products to find operational problems or areas that could use improvement. Slices provide targeted analysis and performance comparisons by allowing users to select data based on particular criteria.
 - d) Alerting and notifications: To inform users of important operational events, Power BI includes alerting and notifications. Users can configure alerts depending on established situations or thresholds, such as inventory levels falling below a given level or equipment downtime lasting longer than a predetermined amount of time. Power BI may deliver messages or start automatic actions when certain thresholds are reached, enabling businesses to quickly address operational problems.
 - e) Performance trend analysis: Organizations may analyze historical patterns in operational performance thanks to Power BI. By utilizing line charts, area charts, or sparklines, users may track important parameters and see performance patterns. Organizations may make educated judgements to improve operational efficiency and resource allocation by analyzing historical data to detect patterns, seasonality, and long-term performance trends.
 - f) Root cause analysis: Root cause analysis for operational difficulties is made easier by Power BI's data exploration and visualization tools. Users may compare operating numbers with additional elements like customer reviews, weather information, or maintenance history of the equipment. Users of Power BI's interactive visualizations may see correlations, outliers, and causal links, which helps organizations understand the underlying factors behind operational difficulties.
- V) *Human resources analytics*: Power BI can also be used in human resources analytics for data integration and connectivity, workforce planning and analysis, learning and development analysis, strategic HR planning etc.,
- a) Workforce planning and analytics: Organizations may use Power BI to do workforce planning and analytics to better understand the makeup of their workforce and anticipate future personnel requirements. Employee demographics, turnover rates, succession planning, and workforce diversity data may all be analyzed by HR experts. Users of Power BI may utilize its visualizations to pinpoint workforce shortages, create succession plans, and optimize staff allocation based on skill sets and organizational needs.
 - b) Employee engagement and performance analysis: Data on performance and employee engagement may be analyzed with the help of Power BI. To learn more about employee happiness, engagement levels, and performance trends, HR professionals can use survey data, performance management indicators, and employee feedback. Users of Power BI may uncover elements that affect employee engagement and suggest specific areas for improvement, like as training and development programmed or recognition efforts.
 - c) Recruitment and talent acquisition analytics: Organizations may analyze recruiting and talent acquisition data with the aid of Power BI to streamline hiring procedures and entice top candidates. To find bottlenecks and areas for process improvement, HR professionals should monitor recruiting metrics including time to hire, cost per hire, and source effectiveness. Users of Power BI may visualize parameters related to the recruiting funnel, track applicant quality, and keep track of the effectiveness of the various recruitment channels.
 - d) Learning and development analysis: Organizations may use Power BI to analyze learning and development data to assess the efficacy of training initiatives and pinpoint skill shortages. Training effect indicators, skill evaluations, and completion rates may all be tracked by HR experts. The visualizations offered by Power BI enable customers to determine the most well-liked courses, monitor staff skill growth, and evaluate how training affects staff productivity.
 - e) HR compliance and reporting: Power BI offers tools for HR compliance and reporting, ensuring that businesses adhere to legal obligations and keep up-to-date HR data. Reports on important HR data, such headcount, turnover, and compliance rates, can be produced by HR experts. Users of Power BI's reporting tools may build compliance dashboards, monitor compliance with HR policies, and provide reports that are audit-ready.
 - f) Strategic HR planning: By enabling businesses to analyze personnel trends and match HR strategy with corporate objectives, Power BI enables strategic HR planning. HR professionals may utilize Power BI to anticipate workforce needs based on business projections, visualize workforce demographics, and analyze labor expenses. Organizations can make well-informed choices on workforce optimization, talent retention, and succession planning with the aid of Power BI's visualizations and analytics capabilities.
- VI) Customer experience and service analytics: Power BI can also be used in customer experience and service analytics for customer segmentation and profiling, customer satisfaction and net promoter score(NPS), customer journey analysis etc.,

- a) Customer Segmentation and profiling: Businesses may segment and profile their consumer base using Power BI to conduct focused analyses. Businesses may establish customer segments based on factors like age, region, purchase habits, and customer lifetime value by analyzing demographic, behavioral, and transactional data. Users of Power BI may utilize its visualizations to learn more about different consumer categories, comprehend their preferences, and adjust their marketing and customer service plans appropriately.
 - b) Customer satisfaction and net promoter score(NPS) analysis: Data about customer happiness, including as survey results, feedback forms, and NPS scores, may be analyzed with the use of Power BI. Organizations may use Power BI visualizations to track changes in customer satisfaction over time, pinpoint factors influencing consumer opinion, and take the necessary steps to remediate problem areas. Users of Power BI's interactive dashboards may go further into particular customer comments and spot areas for improvement.
 - c) Customer journey analysis: Businesses may analyze the customer journey with the use of Power BI to pinpoint key touchpoints for service enhancement. Businesses may learn more about the customer experience at each stage by mapping consumer interactions across various channels and touchpoints. By measuring customer effort, pinpointing bottlenecks, and optimizing the customer journey, Power BI visualizations help users increase customer happiness and loyalty.
 - d) Service performance monitoring: Businesses may track service performance indicators like response time, resolution time, and SLA compliance with the help of Power BI. Businesses may monitor service performance in real-time by combining data from contact center systems, ticketing systems, and customer service platforms. With the help of Power BI visualizations, users can track key performance indicators (KPIs), spot service gaps, and take preventative action to raise service standards.
 - e) Customer churn analysis: Power BI provides customer churn analysis, assisting organizations in comprehending the causes of client loss. Organizations may find trends and churn predictors by examining customer behavior, transaction history, and service interactions. Users of Power BI may analyze churn rates, analyze churned customers using segmentation, and create retention plans using the visualizations in Power BI.
 - f) Predictive analysis for customer insights: Power BI offers sophisticated analytics tools for forecasting and predictive modelling in customer experience and service analytics. Organizations can forecast consumer behavior, spot upselling and cross-selling possibilities, and proactively meet customer demands by using machine learning algorithms and statistical models to customer data. Predictive capabilities are improved by Power BI's connection with Azure Machine Learning and other cutting-edge analytics technologies.
- VII) *Supply chain and logistics management*: Power BI can also be used in supply chain and logistics management for data integration and connectivity, supply chain visibility and tracking, inventory management, supplier performance analysis etc.,
- a) Supply chain visibility and tracking: Organizations can visualize and track their supply chain in real-time with Power BI. Key performance indicators (KPIs) including inventory levels, order fulfilment rates, on-time delivery, and supplier performance may all be shown in dashboards that users can design. Users may drill down into certain data points, spot bottlenecks, and take preventative action to improve supply chain operations using Power BI's interactive visualizations.
 - b) Demand forecasting and planning: Power BI assists with demand planning and forecasting by examining previous sales data, industry trends, and outside variables. Power BI's forecasting capabilities may be used by businesses to forecast demand, optimize inventory levels, and enhance supply chain responsiveness. Users of Power BI may utilize the visualizations to compare actual sales to predictions, spot discrepancies, and modify production and procurement plans as necessary.
 - c) Inventory management: Businesses can manage their inventories more efficiently thanks to Power BI. Inventory levels, stockouts, and inventory turnover rates may all be visualized by users. Businesses may pinpoint slow-moving products, optimize stock levels, and enhance inventory management techniques by analyzing inventory data. Users of Power BI's visualizations may see patterns in their inventory and decide how to refill and distribute it wisely.
 - d) Supplier performance analysis: Organizations may use Power BI to analyze supplier performance indicators including lead times, quality ratings, and on-time delivery. The performance of suppliers may be tracked over time, compared amongst providers, and opportunities for improvement can be found using the visualizations that users develop. Users may dive down into individual supplier data using Power BI's interactive dashboards to develop data-driven supplier management strategies.
 - e) Transportation and logistics optimization: By examining transportation expenses, delivery times, and route effectiveness, Power BI aids in the optimization of logistics and transportation. In order to track transportation KPIs, spot bottlenecks in the logistics network, and improve transportation routes and modes, organizations can use Power BI visualizations. Users can visualize transport routes, evaluate delivery performance, and make wise decisions to cut costs and raise customer happiness thanks to Power BI's mapping features.
 - f) Risk management and mitigation: By examining data on supplier performance, market trends, and external variables, Power BI assists businesses in managing supply chain risks. Visualizations that highlight possible dangers and establish risk-reduction plans can be made by users. With the use

of Power BI's alerting features, users can set up notifications for important events like supply disruptions or pricing changes, which promotes proactive risk management.

IV. CONCLUSION

This paper focuses on understanding the importance of various applications of power Bi. Power BI is a robust and adaptable business intelligence solution that has several uses throughout various departments of an organization. Through its data integration features, data from diverse sources may be seamlessly included, allowing for thorough analysis and reporting. The user-friendly interface and interactive visualizations make it simple for users to explore the data and quickly get insights. Business intelligence and reporting make considerable use of Power BI, giving organizations the capacity to analyze data, produce reports, and make data-driven choices. In order to measure sales performance, examine consumer behavior, and pinpoint market trends, it is commonly used in sales and market analytics. Power BI is useful for financial reporting and analysis as well, enabling businesses to track important performance metrics, keep tabs on their finances, and make wise financial decisions. Providing real-time insights into operational indicators, tracking performance against goals, and pinpointing areas for improvement, Power BI also plays an important role in operational monitoring and performance management. Additionally, Power BI gives businesses the ability to analyze workforce data, monitor employee engagement, and improve talent management tactics in the area of human resources analytics. Additionally, Power BI enables customer experience and service analytics, giving companies the ability to examine customer data, monitor customer happiness, and improve service delivery. It helps with demand forecasting, enables inventory and supplier management optimization, and benefits supply chain and logistics management by giving organizations visibility into their supply chain activities. In conclusion, Power BI is a useful tool for businesses in a variety of industries due to its adaptability and capabilities. Businesses may take use of its capacity to combine data, visualize information, and offer useful insights in order to make better decisions, streamline operations, and boost overall performance. Power BI is a crucial tool for businesses looking to use data to their advantage, whether they are in business intelligence, sales and marketing, finance, operations, human resources, customer experience, or supply chain management.

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