HR ANALYTICS DASHBOARD USING POWER BI

INTERDISCIPLINARY PROJECT

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Engineering degree in Computer Science and Engineering

By

AJAY KUMAR K (Reg. No – 41110041)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SCHOOL OF COMPUTING

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
CATEGORY - 1 UNIVERSITY BY UGC
Accredited "A++" by NAAC I Approved by AICTE
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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **AJAY KUMAR K (41110041)** who carried out the Project entitled "**HR ANALYTICS DASHBOARD USING POWER BI**" under my supervision from January 2024 to April 2024.

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DECLARATION

I, **AJAY KUMAR K(Reg. No- 41110041)**, hereby declare that the Project Report entitled **"HR ANALYTICS DASHBOARD USING POWER BI"** done by me under the guidance of **Dr.S.Prince Mary, M.E., Ph.D.**, is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in **Computer Science and Engineering**.

DATE: 3/5/24

PLACE: Chennai

Ajay Kumar. K

SIGNATURE OF THE CANDIDATE

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TRAINING CERTIFICATE

ABSTRACT

HR dashboard is an advanced analytics tool that displays important HR metrics using interactive data visualizations. It helps the human resources department to improve recruiting processes, optimize the workplace management as well as to monitor and enhance the overall employee performance. HR Analytics applies various analytic tools and generates reports. It provides a better insight to the various issues related to the HR activities. The aim in this project is to present the history of the organization how many employees working, gender and salary structure and performance using machine learning algorithm and predicts promotion chances. It also predicts the attrition rate of an organization. This visualization shows statical information on a dashboard. Human resource HR analytics have the potential to bring great value to the decision making the ability of HR leaders on human and organizational capital. Human resource analytics are useful for improving employee performance and getting an optimal return on investment on its human capital.

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CHAPTER 1

INTRODUCTION

Welcome to our HR Analytics Dashboard powered by Power BI – your gateway to unlocking the full potential of your organization's human capital. In today's dynamic business environment, the ability to harness data-driven insights is paramount for staying ahead of the curve. This interactive dashboard serves as a comprehensive tool for HR professionals, executives, and decision-makers to navigate the complexities of talent management with confidence and precision.

Our HR Analytics Dashboard offers a holistic view of your workforce metrics, providing deep insights into every aspect of the employee lifecycle. From recruitment and onboarding to performance evaluation and talent development, each visualization is meticulously crafted to deliver actionable intelligence that drives strategic decisions and fosters organizational growth.

With Power BI's intuitive interface and robust analytical capabilities, you can seamlessly explore trends, identify patterns, and uncover hidden opportunities within your workforce data. Whether you're seeking to optimize recruitment strategies, mitigate turnover risks, or enhance employee engagement, this dashboard equips you with the tools and insights needed to achieve your HR objectives efficiently and effectively.

Moreover, our dashboard goes beyond traditional HR metrics by integrating advanced analytics techniques, such as predictive modeling and sentiment analysis, to anticipate future workforce trends and proactively address challenges before they arise. By harnessing the power of data, you can transform HR from a reactive function to a strategic driver of business success.

Join us on this transformative journey as we leverage the power of HR analytics to unlock the full potential of your organization's most valuable asset – its people. Welcome to a new era of HR excellence, where data-driven decision-making reigns supreme, and possibilities are limitless.

In today's rapidly evolving business landscape, organizations are increasingly recognizing the pivotal role of human capital in driving sustained success. As competition intensifies and market dynamics shift, the ability to effectively manage and optimize talent has become a strategic imperative for staying ahead of the curve. At the heart of this transformative journey lies the power of HR analytics – a game-changing approach that empowers organizations to leverage data-driven insights for informed decision-making and strategic planning.

Our HR Analytics Dashboard, powered by Power BI, is not just a tool; it's a catalyst for unlocking the full potential of your workforce. By harnessing the wealth of data generated across the employee lifecycle, from recruitment and retention to performance management and beyond, this dashboard offers a 360-degree view of your organization's most valuable asset – its people.

Designed with the needs of HR professionals, executives, and decision-makers in mind, our dashboard provides a comprehensive suite of interactive visualizations and analytical tools. Whether you're looking to optimize hiring processes, foster a culture of continuous learning, or align talent strategies with business objectives, our dashboard equips you with the actionable insights needed to drive meaningful change and achieve HR excellence.

Moreover, our commitment to innovation extends beyond traditional HR metrics. By integrating advanced analytics techniques such as predictive modeling, machine learning, and sentiment analysis, we empower you to anticipate future workforce trends, mitigate risks, and seize opportunities proactively. In doing so, we enable HR to transition from a reactive function to a strategic partner, driving tangible value and competitive advantage for your organization.

Join us as we embark on this transformative journey together, harnessing the power of HR analytics to shape the future of work and unlock limitless possibilities for your organization. Welcome to a new era of HR excellence, where data-driven decision-making is not just a best practice – it's a strategic imperative for success.

Our HR Analytics Dashboard represents a paradigm shift in how organizations approach talent management. By harnessing the power of advanced analytics and visualization tools, we provide HR professionals and business leaders with a comprehensive platform to understand, analyze, and optimize every facet of the employee experience. From recruitment and performance management to employee engagement and retention, our dashboard offers unparalleled visibility into key workforce metrics, enabling you to make informed decisions that drive business success.

At the core of our dashboard is a commitment to delivering actionable intelligence that empowers organizations to unlock the full potential of their human capital. By leveraging Power BI's intuitive interface and robust analytical capabilities, users can seamlessly explore trends, identify patterns, and uncover hidden insights within their workforce data. Whether you're seeking to identify high-potential talent, address skills gaps, or enhance organizational culture, our dashboard provides the tools and insights needed to drive meaningful change and foster a culture of continuous improvement.

Moreover, our dedication to innovation means that our dashboard is not just a static tool – it's a dynamic platform that evolves with your organization's needs. With regular updates and enhancements, we ensure that our dashboard remains at the forefront of HR analytics, enabling you to stay ahead of the curve and adapt to changing market conditions. By embracing data-driven decision-making, organizations can position themselves for long-term success in an increasingly competitive business environment.

Join us on this transformative journey as we harness the power of HR analytics to shape the future of work and unlock new opportunities for growth and innovation. Together, we can elevate HR from a support function to a strategic driver of organizational excellence, paving the way for a brighter, more prosperous future for your organization and its people. Welcome to the next generation of HR analytics – where possibilities are limitless, and the future is yours to shape.

CHAPTER 2

LITERATURE SURVEY

In the era of digital transformation, Human Resources (HR) analytics dashboards have emerged as indispensable tools for organizations seeking to leverage data-driven insights to optimize their workforce management strategies. This literature survey aims to explore the evolution, effectiveness, and emerging trends in HR analytics dashboards, shedding light on their impact on organizational decision-making and HR practices.

Evolution of HR Analytics Dashboards:

Scholars have traced the evolution of HR analytics dashboards from basic reporting tools to sophisticated, interactive platforms capable of real-time data visualization and predictive analytics.The integration of advanced technologies, such as artificial intelligence and machine learning, has propelled HR dashboards beyond mere descriptive analytics, enabling proactive talent management and strategic workforce planning.

Effectiveness and Utility:

Research has demonstrated the effectiveness of HR analytics dashboards in facilitating evidence-based decision-making, streamlining HR processes, and enhancing organizational agility.Studies have highlighted the role of user-centric design principles and intuitive interfaces in maximizing the utility and adoption of HR dashboards among HR professionals and stakeholders.

Key Features and Functionality:

Scholars have identified key features and functionalities of effective HR analytics dashboards, including customizable metrics, drill-down capabilities, benchmarking tools, and predictive modeling capabilities.The ability of HR dashboards to integrate data from multiple sources, such as HRIS, performance management systems, and recruitment platforms, enhances their utility in providing a comprehensive view of workforce metrics.

2.1 Reviews on existing system

In the realm of modern Human Resources (HR), the integration of analytics has emerged as a transformative force, reshaping traditional practices and strategies. HR analytics, beyond the confines of dashboards, represents a paradigm shift in how organizations leverage data to drive talent management decisions. By harnessing advanced statistical techniques and predictive modeling, HR professionals can delve deep into workforce dynamics, identifying trends, predicting future scenarios, and aligning strategies with organizational goals. Moreover, HR analytics extends beyond numerical metrics, encompassing qualitative insights from employee feedback, performance evaluations, and engagement surveys. This holistic approach enables HR leaders to not only optimize recruitment, retention, and talent development but also foster a culture of employee-centric decision-making and continuous improvement. As organizations navigate the complexities of a rapidly evolving workforce landscape, embracing HR analytics becomes not just a competitive advantage, but a strategic imperative for sustainable growth and success.

2.2 Inference and challenges in existing system

In the absence of traditional dashboard-centric HR analytics, the interface of HR analytics systems relies heavily on data integration platforms, analytical tools, and collaborative platforms. These systems facilitate seamless integration of data from disparate HR sources, allowing for comprehensive analysis and visualization.

However, transitioning away from dashboard-centric HR analytics poses several challenges. Data integration remains a significant hurdle, as organizations grapple with siloed data sources and varying data formats. Ensuring data accuracy, consistency, and privacy also emerges as critical concerns, particularly in light of regulatory requirements such as GDPR and CCPA. Moreover, the absence of standardized visualization interfaces may lead to ambiguity and inconsistency in data interpretation, requiring enhanced training and upskilling for HR professionals to effectively leverage these systems.

CHAPTER 3

ANALYSIS AND DESIGN OF PROPOSED SYSTEM

3.1 Necessity of proposed system

Integrating Power BI with Excel data requires a thorough requirement analysis to ensure a successful project. Here's a breakdown of key considerations:

Data Source Analysis:

- **Understanding the Excel Data:** Analyze the structure of the Excel files you intend to use in Power BI. This includes:
  - Identifying the relevant worksheets and data tables.
  - Understanding the data types (text, numbers, dates, etc.) for each column.
  - Documenting any data validation rules or formulas within the Excel file.

Data Transformation Needs:

- **Shaping the Data for Analysis:** Determine what transformations are needed to prepare the Excel data for analysis in Power BI. This could involve:
  - Cleaning the data (removing duplicates, handling errors).
  - Transforming data (formatting dates, splitting text columns, creating calculated columns).
  - Defining data relationships between different worksheets or files.

Reporting and Visualization Requirements:

- **From Data to Insights:** Establish what insights you want to extract from the Excel data and how you want to visualize them in Power BI. This includes:
  - Identifying the key metrics and KPIs (Key Performance Indicators) you want to track.
  - Deciding on the types of visualizations needed (charts, graphs, maps, etc.) to effectively communicate insights.
  - Considering interactive elements within the reports to allow users to explore the data further.

User Needs and Access:

- **Who Needs This Information?** Identify the target users for the Power BI reports generated from Excel data. This includes:
    - Understanding their level of technical expertise with Power BI.
    - Determining their specific data analysis needs and how they will interact with the reports.
    - Defining security requirements for data access and report visibility within Power BI.

Integration Considerations:

- **Connecting the Dots:** Analyze how Power BI will connect to the Excel data source. This could involve:
    - Choosing between a direct connection to the Excel file or importing the data into Power BI Desktop.
    - Deciding on refresh schedules for the data to ensure the information in Power BI remains up-to-date.
    - Considering using the Power Query add-in for Excel to streamline data transformations before import.

3.2 Hardware and Software requirements

3.2.1 Power BI Desktop

Power BI Desktop is a robust and intuitive data visualization tool designed to empower users to transform raw data into actionable insights. With its user-friendly interface and powerful analytical capabilities, Power BI Desktop enables users to connect to various data sources, create interactive dashboards and reports, and generate visually compelling visualizations such as charts, graphs, and maps.

Its drag-and-drop functionality and extensive library of visualization options make it accessible to users of all skill levels, from beginners to advanced analysts. Moreover, Power BI Desktop supports advanced analytics features such as predictive modeling, natural language processing, and machine learning integration, allowing users to

unlock deeper insights and uncover hidden trends within their data.

As a versatile and comprehensive analytics solution, Power BI Desktop has become an indispensable tool for organizations across industries, empowering them to make informed decisions and drive business success.
Download and install the latest version of Power BI Desktop from Microsoft's website

3.2.2 Microsoft Excel

Microsoft Excel is a versatile and widely used spreadsheet application developed by Microsoft. With its user-friendly interface and powerful features, Excel enables users to organize, analyze, and visualize data efficiently. Whether it's creating budgets, tracking expenses, or performing complex calculations, Excel offers a range of tools and functions to meet diverse needs.

Its familiar grid layout, formula capabilities, and charting options make it a go-to tool for professionals across industries, from finance and accounting to marketing and HR. Excel's flexibility and accessibility have cemented its position as a staple software for businesses, educators, and individuals alike, empowering users to make data-driven decisions and streamline workflows with ease.

While Power BI Desktop can connect directly to Excel files, having the corresponding Excel version (or compatible version) can be beneficial for certain scenarios:

- **Opening and Editing Source Data:** If you need to edit the original Excel data before using it in Power BI, having the same or compatible version of Excel is recommended.
- **Advanced Excel Features:** If your Excel data utilizes advanced features like macros or VBA (Visual Basic for Applications) code, these features might not translate directly to Power BI.

3.2.3 .NET Framework

The .NET Framework is a robust and versatile software development platform developed by Microsoft. It provides a comprehensive set of tools, libraries, and runtime environments for building and running applications across various platforms, including Windows, Linux, and macOS.

With its extensive class library and support for multiple programming languages such as C#, Visual Basic, and F#, .NET enables developers to create a wide range of applications, from web and desktop applications to mobile and cloud-based solutions. Its interoperability and scalability make it a preferred choice for building enterprise-grade software systems.

Moreover, the recent advancements with .NET Core and .NET 5 have further expanded its capabilities, offering cross-platform development, performance enhancements, and support for modern application development practices like microservices and containerization.

Ensure you have the latest version of the .NET Framework installed on your system. This is a requirement for running Power BI Desktop. You can download and install it from the Microsoft website.

3.2.4 Hardware

These are the bare minimum specifications to run Power BI Desktop and open Excel files. For optimal performance, consider exceeding these recommendations.

- **Operating System:** Windows 8.1 or Windows Server 2012 R2 or later (64-bit)
- **Processor:** 1 GHz or faster (x64 processor recommended)
- **Memory (RAM):** 1 GB minimum, 4 GB or more recommended
- **Display:** Minimum resolution of 1440 x 900 or 1600 x 900 (lower resolutions not supported)
- **Hard Drive Space:** 1 GB minimum

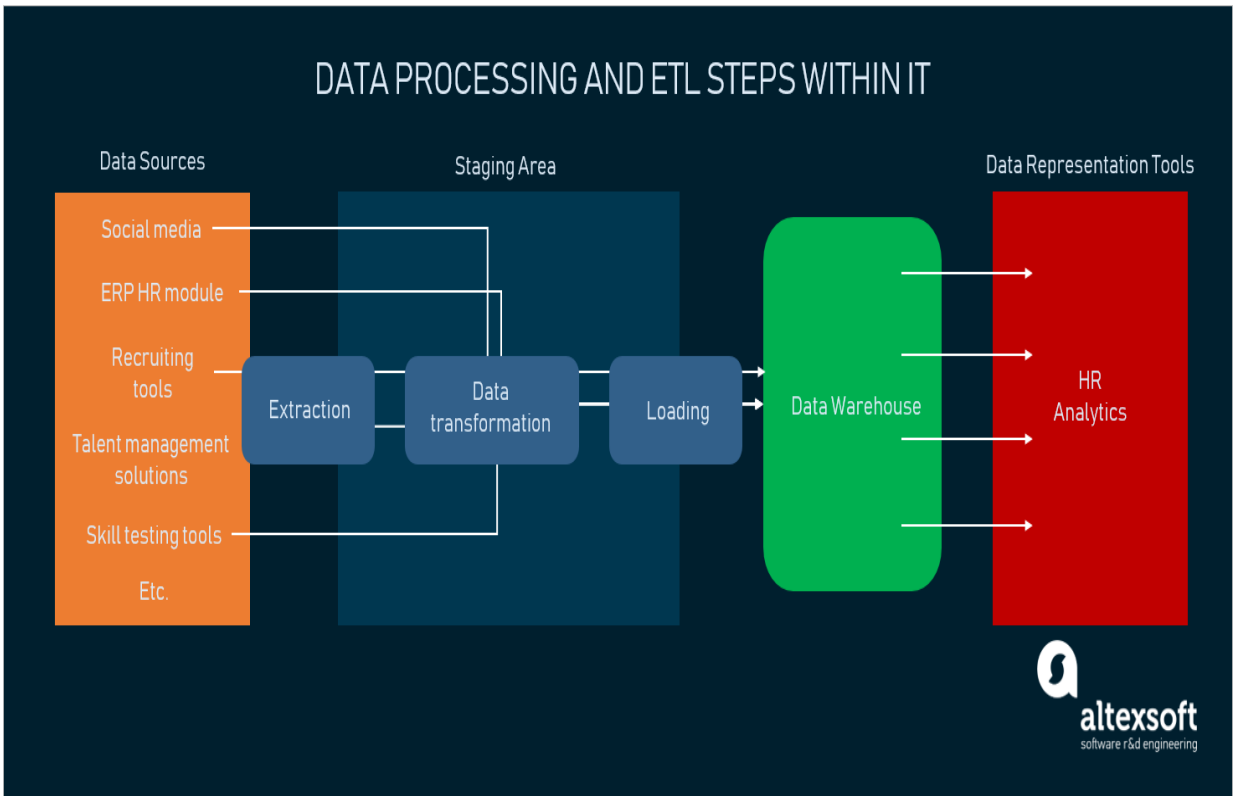

Fig.No:3.1 Architecture Diagram

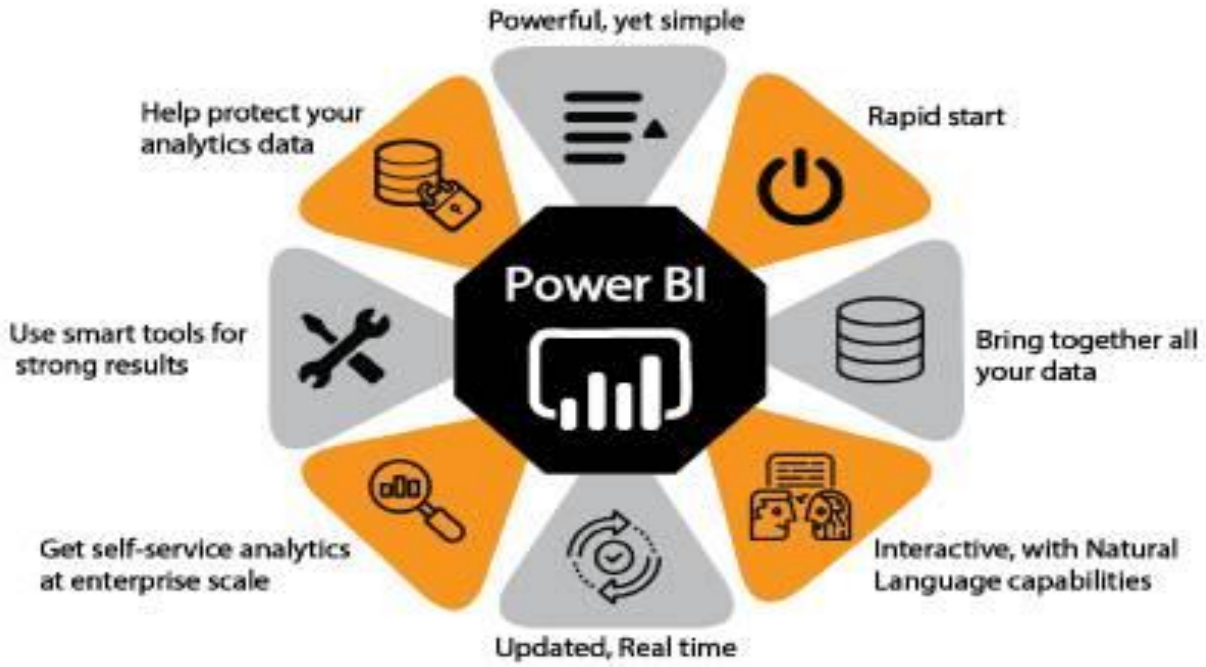

Fig.No:3.2 Features of Power bi

CHAPTER 4

IMPLEMENTATION OF PROPOSED SYSTEM

4.1 Description of datasets

The Excel dataset comprises a comprehensive collection of employee-related data aimed at facilitating HR analytics within an organization. The dataset encompasses key attributes essential for workforce analysis and decision-making.

Attrition: This column indicates whether an employee has left the organization (e.g., "Yes" or "No"), providing insights into turnover rates and retention strategies.
Employee Number: Each employee is assigned a unique identification number, enabling individual-level analysis and tracking of employee movements.

Hourly Rate: This column records the hourly wage or salary rate of each employee, facilitating compensation analysis and benchmarking across departments and roles.

Department: Employees are categorized into different departments or functional areas within the organization (e.g., "Human Resources," "Finance," "Operations"), allowing for department-specific analysis of various HR metrics.

Work-Life Balance: This column captures employees' perceptions of their work-life balance, typically measured through surveys or self-assessment scales. It provides insights into employee satisfaction, well-being, and organizational culture.

Employee Number: Each employee is assigned a unique identification number, enabling individual-level analysis and tracking of employee movements.

Education: This column captures the highest level of education attained by each employee (e.g., "High School Diploma," "Bachelor's Degree," "Master's Degree," "Ph.D."). Education level serves as a proxy for skill level and potential career advancement, aiding in talent management and succession planning.

Job Role: Each employee is assigned a specific job role or title within the organization (e.g., "HR Analyst," "Data Scientist," "Finance Manager," "Operations Coordinator"). Job roles provide insights into workforce composition, skill sets, and organizational structure, enabling targeted analysis of job performance, career pathways, and diversity initiatives.

Business Travel: This column categorizes employees based on the frequency or extent of their business travel, providing insights into the impact of travel requirements on job satisfaction, productivity, and retention.

Distance from House: Each employee's distance from their place of residence to the workplace is recorded in this column, offering insights into commuting patterns and potential correlations with attrition rates and work-life balance perceptions.

Environment Satisfaction: Employees rate their satisfaction with their work environment on a scale, providing insights into the quality of workplace amenities, culture, and overall satisfaction levels.

Job Level: Employees are categorized into different job levels or hierarchies within the organization (e.g., "Entry-Level," "Mid-Level," "Senior-Level"), allowing for analysis of career progression, leadership development, and talent management strategies.

Marital Status: This column records the marital status of employees (e.g., "Single," "Married," "Divorced"), offering insights into the relationship between personal life circumstances and job satisfaction, engagement, and turnover intentions.

Age	Attrition	BusinessTrave	DailyRat	Department	DistanceFromHom	Educatio	EducationField	EmployeeCou	EmployeeNumb	EnvironmentSatisfacti	Gende	HourlyRat	JobInvolvemer	JobLeve	JobRole	JobSatisfactio	MaritalStatu	Attrition count
31	No	Non-Travel	158	Software	7	3	Medical	1	1	3	Male	42	2	3	Developer	1	Married	0
36	No	Travel_Rarely	985	Human Resources	33	5	Life Sciences	1	2	1	Female	66	2	4	Healthcare Representative	3	Single	0
59	Yes	Non-Travel	1273	Sales	5	2	Technical Degree	1	3	4	Female	96	1	3	Manufacturing Director	2	Married	1
52	Yes	Travel_Rarely	480	Support	2	5	Marketing	1	4	4	Female	71	2	4	Human Resources	1	Married	1
32	No	Non-Travel	543	Human Resources	7	5	Human Resources	1	5	2	Male	122	3	3	Manager	2	Divorced	0
19	Yes	Non-Travel	779	Hardware	43	1	Medical	1	6	2	Female	195	4	3	Research Director	3	Married	1
42	Yes	Non-Travel	934	Support	26	4	Human Resources	1	7	2	Female	80	3	5	Sales Executive	4	Divorced	1
30	No	Travel_Rarely	380	Support	19	3	Marketing	1	8	4	Male	165	1	4	Human Resources	4	Single	0
41	No	Travel_Frequentl	1464	Software	16	1	Life Sciences	1	9	3	Male	134	1	2	Manager	4	Divorced	0
45	No	Travel_Frequentl	1020	Human Resources	17	5	Life Sciences	1	10	4	Female	137	2	4	Manager	2	Married	0
36	No	Travel_Rarely	987	Sales	33	4	Other	1	11	3	Male	159	3	1	Human Resources	3	Married	0
23	No	Travel_Frequentl	135	Human Resources	20	4	Life Sciences	1	12	2	Female	51	2	2	Manufacturing Director	2	Divorced	0
24	Yes	Non-Travel	1086	Support	15	1	Marketing	1	13	4	Female	189	3	1	Manufacturing Director	4	Married	1
39	Yes	Non-Travel	673	Research & Developmen	16	2	Human Resources	1	14	2	Female	69	4	2	Sales Executive	2	Married	1
42	Yes	Travel_Rarely	145	Human Resources	31	3	Life Sciences	1	15	3	Male	127	3	1	Developer	4	Married	1
44	Yes	Travel_Frequentl	717	Software	10	2	Human Resources	1	16	3	Female	151	1	5	Sales Representative	4	Divorced	1
50	Yes	Travel_Frequentl	460	Research & Developmen	10	4	Human Resources	1	17	4	Male	181	2	5	Manager	3	Divorced	1
42	No	Travel_Rarely	1422	Software	26	4	Life Sciences	1	18	4	Female	92	4	5	Developer	3	Single	0
49	No	Travel_Frequentl	129	Research & Developmen	41	1	Technical Degree	1	19	3	Female	81	2	1	Manager	1	Divorced	0
58	Yes	Travel_Rarely	637	Support	5	4	Technical Degree	1	20	2	Female	66	3	5	Manager	2	Married	1
42	Yes	Travel_Frequentl	699	Software	27	1	Life Sciences	1	21	3	Female	157	3	1	Research Scientist	3	Single	1
46	Yes	Travel_Frequentl	198	Hardware	4	3	Human Resources	1	22	2	Male	162	3	3	Manufacturing Director	3	Single	1
34	Yes	Travel_Rarely	212	Support	50	4	Human Resources	1	23	2	Male	44	1	1	Manager	3	Single	1
38	No	Travel_Frequentl	564	Research & Developmen	14	2	Life Sciences	1	24	2	Female	71	3	1	Healthcare Representative	1	Single	0
22	Yes	Non-Travel	505	Hardware	17	2	Human Resources	1	25	3	Male	44	4	5	Manufacturing Director	4	Divorced	1
58	Yes	Travel_Frequentl	284	Support	48	3	Human Resources	1	26	2	Female	69	4	3	Human Resources	4	Married	1
51	Yes	Travel_Rarely	531	Sales	18	2	Other	1	27	3	Male	146	2	4	Developer	2	Single	1
38	No	Non-Travel	1287	Software	34	3	Other	1	28	3	Male	83	1	4	Manufacturing Director	2	Single	0
52	Yes	Non-Travel	1047	Software	26	2	Marketing	1	29	1	Female	112	3	2	Developer	2	Divorced	1
51	No	Travel_Rarely	345	Support	24	3	Technical Degree	1	30	3	Female	135	4	1	Manager	4	Married	0
35	No	Travel_Rarely	133	Support	10	2	Other	1	31	3	Male	161	4	5	Research Scientist	2	Married	0
56	No	Non-Travel	633	Hardware	10	1	Marketing	1	32	4	Female	47	2	5	Sales Representative	2	Married	0
26	No	Non-Travel	1390	Software	21	1	Life Sciences	1	33	3	Female	100	4	2	Sales Executive	2	Divorced	0
42	No	Travel_Rarely	623	Sales	3	4	Life Sciences	1	34	3	Male	86	3	3	Healthcare Representative	3	Divorced	0
48	No	Travel_Frequentl	983	Support	25	1	Marketing	1	35	4	Male	111	3	5	Research Scientist	4	Divorced	0
40	No	Travel_Rarely	533	Hardware	6	1	Life Sciences	1	36	3	Male	186	4	5	Human Resources	4	Single	0
24	No	Non-Travel	1274	Human Resources	38	4	Technical Degree	1	37	3	Female	103	3	4	Human Resources	1	Divorced	0
22	No	Travel_Frequentl	1079	Support	15	1	Other	1	38	3	Female	175	2	1	Sales Representative	1	Divorced	0
58	Yes	Non-Travel	1115	Research & Developmen	1	2	Other	1	39	2	Female	64	3	5	Developer	4	Married	1
30	Yes	Travel_Rarely	435	Research & Developmen	40	4	Technical Degree	1	40	4	Male	106	1	3	Laboratory Technician	3	Divorced	1
38	No	Travel_Frequentl	1441	Software	33	2	Medical	1	41	2	Male	129	2	2	Human Resources	3	Married	0
60	Yes	Travel_Rarely	1277	Research & Developmen	16	5	Life Sciences	1	42	4	Male	136	3	3	Sales Representative	4	Single	1

Fig.No: 4.1 HR_1 Dataset

EmployeeNumber	Employee ID	MonthlyIncome	MonthlyRate	NumCompaniesWorked	Over18	OverTime	PercentSalaryHike	PerformanceRating	RelationshipSatisfaction	StandardHours	StockOptionLevel	TotalWorkingYear	rainingTimesLastYe	WorkLifeBalance	earsAtCompany	earsInCurrentRol
1	6	41552	1246560	3	Y	Yes	15	4	3	80	1	33	4	2	16	4
2	7	5303	148484	3	Y	No	45	4	1	80	1	4	3	4	2	1
3	8	28555	571100	2	Y	Yes	35	3	2	80	1	2	2	2	2	2
4	11	10587	95283	0	Y	Yes	47	4	2	80	1	38	3	4	24	19
5	13	34153	648907	7	Y	No	17	1	3	80	1	30	2	2	15	3
6	14	47844	382752	1	Y	No	47	1	4	80	1	14	4	2	13	9
7	18	47968	47968	3	Y	Yes	41	4	2	80	1	5	4	3	4	1
8	23	30597	152985	3	Y	No	28	4	1	80	1	36	6	1	30	8
9	27	31621	758904	2	Y	No	1	4	3	80	1	18	3	3	17	17
10	30	3641	105589	0	Y	Yes	45	1	3	80	1	3	5	3	2	1
11	36	10478	293384	1	Y	Yes	32	4	4	80	1	12	3	4	12	8
12	37	40937	859677	5	Y	No	48	3	1	80	1	34	2	3	12	4
13	39	40831	1061606	3	Y	No	3	4	3	80	1	39	2	3	17	14
14	48	14164	311608	8	Y	Yes	43	4	1	80	1	35	5	3	24	24
15	49	31062	31062	6	Y	Yes	17	4	3	80	1	9	1	1	2	1
16	53	1120	7840	4	Y	Yes	6	2	4	80	1	28	5	3	6	6
17	60	36488	729760	3	Y	No	9	3	1	80	1	16	5	2	12	10
18	61	8520	136320	0	Y	Yes	45	3	2	80	1	18	3	1	5	1
19	67	2564	23076	0	Y	Yes	8	4	1	80	1	20	1	3	3	2
20	73	9472	161024	6	Y	No	23	2	3	80	1	40	3	2	20	8
21	76	39184	470208	5	Y	Yes	23	3	2	80	1	36	2	4	29	7
22	78	47785	334495	3	Y	No	32	1	1	80	1	24	1	3	19	6
23	79	50464	1211136	5	Y	Yes	36	2	1	80	1	24	5	4	14	14
24	81	19147	248911	2	Y	Yes	23	4	1	80	1	16	2	4	12	6
25	82	34178	649382	2	Y	No	27	3	4	80	1	10	3	4	10	3
26	83	1893	3786	4	Y	No	22	3	2	80	1	22	3	2	18	17
27	92	2125	21250	6	Y	Yes	30	1	2	80	1	9	1	1	9	3
28	102	42582	1064550	2	Y	No	21	1	3	80	1	7	3	4	4	3
29	104	4258	4258	2	Y	No	36	4	4	80	1	34	3	2	21	12
30	105	46688	326816	0	Y	No	47	3	2	80	1	22	4	2	21	11
31	112	10932	142116	3	Y	Yes	3	3	3	80	1	4	6	2	3	2
32	113	16034	288612	8	Y	No	42	2	3	80	1	20	6	1	17	5
33	127	36320	762720	7	Y	Yes	24	2	3	80	1	6	6	3	2	1
34	130	34982	734622	6	Y	No	25	1	1	80	1	30	4	2	29	24
35	132	18056	379176	1	Y	No	46	2	4	80	1	34	4	2	31	28
36	134	45522	637308	0	Y	No	17	4	3	80	1	38	4	4	10	6
37	135	31275	156375	3	Y	No	22	4	1	80	1	2	2	1	1	1
38	142	28438	312818	1	Y	Yes	5	1	2	80	1	40	2	1	22	4
39	145	1409	28180	0	Y	Yes	29	1	3	80	1	3	2	3	2	2
40	146	31570	536690	1	Y	Yes	18	1	3	80	1	25	3	2	6	5
41	148	26448	185136	4	Y	Yes	28	1	2	80	1	1	1	1	1	1
42	156	33680	370480	7	Y	No	45	4	1	80	1	29	6	3	24	24

Fig.No: 4.2 HR_2 Dataset

4.2 Detailed description of proposed system

KPI'S

Attrition rate Vs Monthly income stats:

Analyzing the correlation between attrition rates and monthly income provides insights into turnover dynamics. The attrition rate formula is (Number of employees who left during a period / Average number of employees during the same period) * 100. Statistical analysis can reveal relationships between income levels and turnover, guiding strategies for compensation and retention.

Average Attrition rate for all Departments :

Attrition Rate = (Number of employees who left during a period / Average number of employees during the same period) * 100
Once you have calculated the attrition rate for each department, you would then sum up all the individual attrition rates and divide by the total number of departments to find the average attrition rate across all departments in HR analytics.

Average working years for each department :

Average Working Years = (Total Working Years in the Department / Number of Employees in the Department)
Repeat this calculation for each department within the HR analytics function to determine the average working years for each department.

Job role Vs Work life balance:

Analyzing job roles versus work-life balance in HR analytics involves assessing factors like workload and flexibility. By surveying employees across roles, organizations can identify trends and disparities. Insights gleaned can inform strategies to promote employee well-being and retention.

Attrition rate Vs Year since last promotion relation:

Analyzing the correlation between attrition rate and time since the last promotion in HR analytics assesses if recent promotions affect retention. Statistical analysis reveals whether employees promoted more recently are less likely to leave, guiding retention strategies. Understanding this relationship informs decisions on career progression and talent management initiatives.

Average Hourly rate of Male Research Scientist:

The average hourly rate of male research scientists in HR analytics can be visualized using a tree map. Each rectangle within the tree map represents a male research scientist, with the size of the rectangle proportional to their hourly wage. The colors can signify different wage ranges, providing a quick overview of the distribution of hourly rates among male research scientists in HR analytics.

Total Attrition of Male and Female:

The total attrition of male and female employees in HR analytics can be visualized using cards and slicers. Two separate cards display the total attrition count for male employees and female employees, respectively. A slicer allows users to filter the data by gender, providing dynamic insights into gender-specific attrition trends within the HR analytics department.

4.3 Advantages and disadvantages

Advantages:

- **Enhanced Decision-Making:** HR analytics dashboards provide HR professionals and decision-makers with real-time insights and data visualization, enabling informed decision-making regarding talent management, recruitment strategies, and workforce planning.

- **Improved Efficiency:** By consolidating and visualizing HR data from various sources into a single dashboard, HR analytics streamline data analysis processes, saving time and effort for HR teams and allowing them to focus on strategic initiatives.

- Proactive Problem Identification: HR analytics dashboards allow organizations to identify trends, patterns, and potential issues within their workforce, enabling proactive interventions to address challenges such as high turnover rates, skill gaps, or employee engagement issues.

Disadvantages:

- **Data Quality Issues:** HR analytics dashboards rely on accurate and reliable data sources. Poor data quality, inconsistencies, or inaccuracies can undermine the effectiveness of analytics efforts and lead to erroneous conclusions.

- **Privacy Concerns:** Collecting and analyzing employee data for HR analytics dashboards raise privacy concerns. Organizations must ensure compliance with data protection regulations and implement robust data security measures to safeguard sensitive employee information.

- **Complexity and Training Needs:** HR analytics dashboards may be complex to navigate and interpret, requiring specialized skills and training for users to effectively utilize them. Lack of training or data literacy among HR professionals can hinder adoption and utilization of the dashboard.

CHAPTER 5

RESULT AND DISCUSSION

An HR Analytics dashboard in Power BI serves as a visual command center, providing real-time insights and facilitating data-driven decision-making for HR professionals. Here's a breakdown of key elements commonly found in such dashboards:

1. Workforce Overview

- **Employee Headcount:** Gauge overall employee population and track trends over time (e.g., monthly, quarterly, yearly).
- **Employee Demographics:** Visualize the distribution of employees by factors like age, gender, department, and location.
- **Turnover Rate:** Track employee turnover and identify areas with high attrition risk. This might be segmented by department, tenure, or job level.

2. Recruitment Effectiveness

- **Time to Hire:** Monitor the average time it takes to fill open positions, identifying potential bottlenecks in the recruitment process.
- **Source of Hire:** Analyze the effectiveness of different recruitment channels (e.g., job boards, employee referrals) in attracting qualified candidates.
- **Quality of Hire:** Track new hire performance metrics (e.g., time-to-productivity) to assess the effectiveness of the recruitment process in attracting top talent.

3. Employee Performance

- **Key Performance Indicators (KPIs):** Display key performance metrics relevant to your organization, such as sales targets achieved, customer satisfaction ratings, or project completion rates.
- **Performance by Department/Team:** Compare performance across different departments or teams to identify areas for improvement or recognize high-performing groups.
- **Performance Trends:** Track performance trends over time to assess the impact of training initiatives or identify potential areas of decline.

4. Learning and Development

- **Training Completion Rates:** Monitor employee participation and completion rates for various training programs.
- **Skills Gap Analysis:** Identify skill gaps within the workforce and tailor training programs to address those gaps.
- **Training Effectiveness:** Analyze the impact of training programs on employee performance or skill development.

5. Employee Engagement

- **Employee Satisfaction:** Gauge employee satisfaction through survey data visualization.
- **Employee Net Promoter Score** Track employee sentiment and willingness to recommend the company as a workplace.
- **Absenteeism Rates:** Monitor employee absenteeism trends to identify potential issues impacting morale or well-being.

6. Data-Driven Decision-Making

- Perhaps most importantly, the HR Analytics Dashboard has facilitated a shift towards data-driven decision-making within organizations.
- By providing easy access to actionable insights and visualizations, the dashboard has empowered HR professionals and decision-makers at all levels to make informed choices based on data, rather than relying on intuition or anecdotal evidence.

7. Strategic Workforce Planning

- Through workforce analytics and predictive modeling, organizations have gained valuable insights into future workforce trends and requirements.
- By understanding potential talent gaps and emerging skill needs, organizations can proactively plan for recruitment, training, and succession planning, ensuring they have the right talent in place to meet future business objectives.

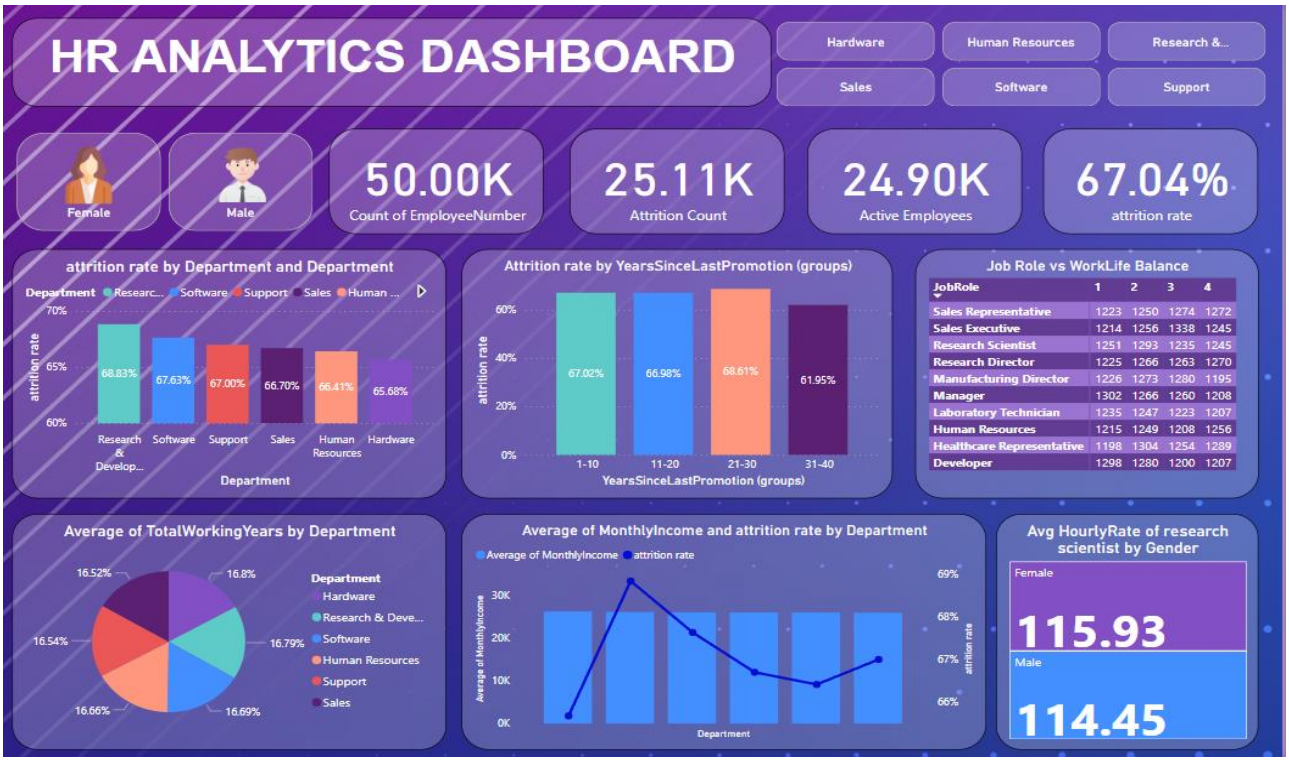

Fig.No:5.1 Dashboard 1

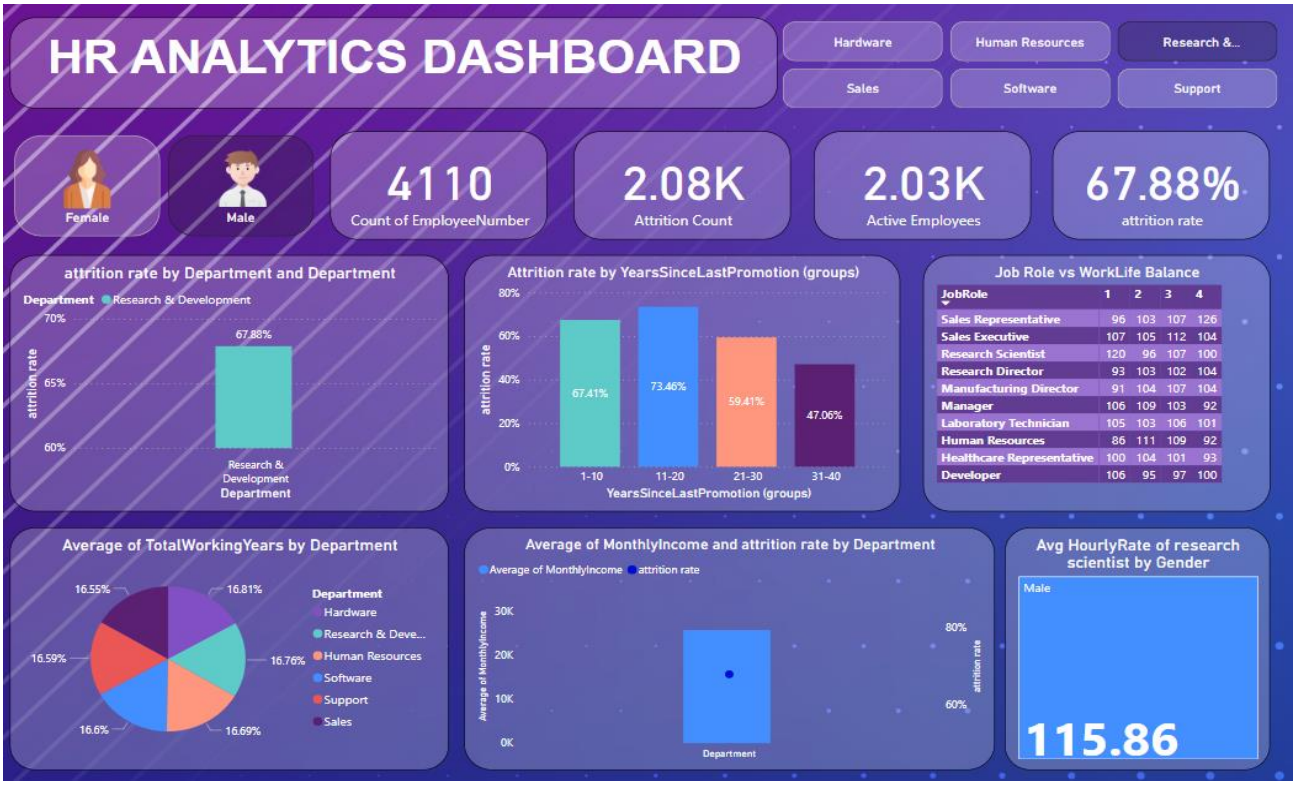

Fig.No:5.2 Dashboard 2

CHAPTER 6

CONCLUSION AND FUTURE ENHANCEMENTS

Conclusion:

In conclusion, our HR Analytics Dashboard powered by Power BI represents more than just a tool – it's a gateway to unlocking the full potential of your organization's human capital. In today's dynamic business environment, where data reigns supreme, the ability to harness insights from workforce data is essential for driving strategic decisions and fostering organizational growth.

Through intuitive visualizations, comprehensive analytics, and advanced techniques, our dashboard empowers HR professionals, executives, and decision-makers to navigate the complexities of talent management with confidence and precision. From recruitment and onboarding to performance evaluation and talent development, every aspect of the employee lifecycle is meticulously analyzed to provide actionable intelligence that drives business success.

By embracing data-driven decision-making, organizations can transform HR from a reactive function to a strategic partner, driving tangible value and competitive advantage. With Power BI's robust analytical capabilities and our commitment to innovation, the possibilities are limitless. Together, we can shape the future of work, unlock new opportunities for growth and innovation, and pave the way for a brighter, more prosperous future for your organization and its people.

Moreover, our HR Analytics Dashboard transcends geographical boundaries, enabling organizations with global footprints to standardize HR processes, monitor workforce trends, and benchmark performance across regions. This global perspective allows for strategic workforce planning and talent mobility initiatives, ensuring that your organization remains agile and adaptable in the face of evolving market dynamics.

In conclusion, our HR Analytics Dashboard is not just a tool – it's a strategic enabler that empowers organizations to optimize their most valuable asset: their people. By harnessing the power of data, we help you unlock new opportunities, mitigate risks, and drive sustainable growth. Welcome to a future where HR analytics isn't just a function; it's a cornerstone of organizational excellence.

Future Enhancements:

Looking ahead, there are several exciting avenues for enhancing your HR analytics dashboard using Power BI. Here are some future enhancement ideas to consider:

Predictive Analytics: Incorporate predictive modeling to forecast future workforce trends, such as attrition rates, performance outcomes, and skill gaps. By leveraging historical data and machine learning algorithms, you can identify patterns and make proactive decisions to optimize talent management strategies.

Natural Language Processing (NLP): Integrate NLP capabilities to analyze employee feedback from various sources, including surveys, performance reviews, and social media. By extracting sentiment and key themes, you can gain valuable insights into employee satisfaction, engagement levels, and potential areas for improvement.

Dynamic Data Integration: Implement real-time or near-real-time data integration to ensure that your dashboard reflects the most up-to-date information. By connecting directly to HR systems, such as HRIS, ATS, and LMS, you can provide users with timely insights and enable faster decision-making.

Interactive Scenario Analysis: Develop interactive scenario analysis tools that allow users to simulate the impact of different workforce scenarios, such as hiring freezes, mergers, or organizational restructuring. By adjusting parameters and variables, users can explore potential outcomes and make data-driven decisions to mitigate risks and optimize resource allocation.

Advanced Visualization Techniques: Explore advanced visualization techniques, such as network analysis, geospatial mapping, and predictive analytics visualizations, to uncover deeper insights and tell compelling stories with your data. By leveraging Power BI's rich library of visualization options, you can communicate complex information in a clear and engaging manner.

By embracing Power BI and staying abreast of these advancements, HR teams can position themselves as strategic partners within their organizations, driving a data-driven culture that fosters a more productive and engaged workfor

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