

# Capstone plag report

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# A Capstone Project Report on

## *HR Analytics Dashboard for Workforce Management*



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## DEDICATION

I dedicate this project to my beloved family, whose unwavering support and encouragement have been my pillars of strength. Your love, belief in me, and sacrifices made this journey possible, and I am forever grateful. To my parents, for instilling in me the values of perseverance and determination, and to my siblings, for their unwavering faith in my abilities.

This project is a testament to the love and resilience of my family. I carry your lessons and blessings with me, knowing that your unwavering presence is the driving force behind my success.

## ACKNOWLEDGEMENT

2

I would like to extend my heartfelt gratitude to all those who contributed to the successful completion of this project.

First and foremost, I want to express my sincere thanks to Dr. Vaibhav, Ankita, Sachin, Purvi, Arpit, Sourabh, Shreeprada for his/her invaluable guidance, mentorship, and patience. Their expertise and insights greatly enriched this project.

I am deeply appreciative of my colleagues and fellow team members whose tireless collaboration brought diverse skills and perspectives to the project. Your dedication and teamwork were instrumental in achieving our project objectives.

1

I acknowledge the support of Genpact for providing the necessary resources and facilities that made this project possible.

1

Special thanks go to my family for their unwavering encouragement and understanding during the project's demanding phases.

Finally, I want to express my appreciation to all the individuals and resources, online databases, and research materials that I accessed throughout this project.

This project has been a significant learning experience, and I am thankful to everyone who played a part in it.

## ABSTRACT

In today's data-driven business landscape, effective workforce management is crucial for organizational success and competitive advantage. This project addresses the challenge of siloed and manual HR reporting processes that hinder data-driven decision-making in workforce planning. Leveraging the power of Microsoft Power BI, an interactive HR Analysis Dashboard was developed to consolidate disparate workforce data into a centralized, visual analytics platform. The dashboard incorporates advanced data visualization techniques, interactive filters, and dynamic exploration capabilities, empowering HR to gain comprehensive insights into talent acquisition, retention, performance management, and employee engagement metrics.

The innovative solution integrates data from IBM Analytics page which refers to an employee survey data establishing standardized metric definitions and calculations. Through intuitive visualizations and interactive filtering, the dashboard enables in-depth analysis of attrition trends, workforce demographics, training needs, and engagement drivers. Key findings revealed attrition hotspots, correlations between performance and retention, work-life balance challenges, and the impact of demographic factors and career progression opportunities on employee turnover.

By consolidating critical HR data and enabling data-driven insights discovery, the HR Analysis Dashboard project equips organizations with a powerful tool for strategic workforce planning, optimized resource allocation, and proactive interventions to foster a high-performing, engaged workforce. This innovative solution positions businesses to leverage data-driven decision-making, driving operational excellence, and securing a competitive edge in the pursuit of long-term growth and success.

**LIST OF FIGURES**

Figure Number	Figure Name	Page
---------------	-------------	------

**LIST OF TABLES**

<b>Figure</b> Number	Figure Name	Page
----------------------	-------------	------

## 4 TABLE OF CONTENTS

Dedication

Acknowledgement

Abstract

List of Figures

List of Tables

### **Chapter 1: Introduction**

I. Project Introduction	Page no.
II. Background and Related Works	Page no.
III. Key Terminology and Concepts	Page no.
IV. Outline of the Report	Page no.

### **Chapter 2: Project Overview and Objectives**

I. Summary of Background Works	Page no.
II. Problem Statement and Identified Gaps	Page no.
III. Aim and Objectives	Page no.
IV. Significance and Relevance	Page no.
V. Report Structure	Page no.

### **Chapter 3: Project Methodology**

I. Research Methodology	Page no.
II. Data Collection and Processing	Page no.
III. Tools and Technologies	Page no.
IV. Experimental Design or Data Sources	Page no.

### **Chapter 4: Results and Discussions**

I. Presentation of Project Results	Page no.
II. Interpretation of Findings	Page no.
III. Alignment with Problem Statement	Page no.
IV. Comparison with Literature	Page no.

### **Chapter 5: Conclusion and Future Recommendations**

I. Summary of Key Findings	Page no.
II. Achievement of Objectives	Page no.
III. Future Research and Improvements	Page no.
IV. Final Thoughts and Implications	Page no.

References	Page no.
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# CHAPTER 1: GUIDELINES ON FORMATTING

**Font Style:** Times New Roman

**Font Sizes:**

- **Chapter Titles:** 18-point, uppercase, bold
- **Topics (Headings):** Heading 2, 16-point
- **Subtopics:** Normal Text, 12-point, bold
- **Main Body Text:** 11-point, regular

## 1.1 Problem Statement and Identified Gaps

The introduction chapter provides a foundational understanding of the project, its relevance, and the specific problem it aims to address.

### 1.1.1 Project Context

In this section, we delve into the broader context of the project within its respective domain.

### 1.1.2 Objectives of the Study

The specific objectives of the project are outlined to provide clarity on its intended outcomes.

#### 1.1.2.1 Primary Objectives

This subtopic details the primary objectives that the project aims to achieve.

8

#### 1.1.2.2 Secondary Objectives

Secondary objectives, if any, are presented here.

## 1.2 Significance and Relevance

This section emphasizes the importance and relevance of the project within its domain.

## 1.3 Report Structure

The structure of the project report is outlined to provide readers with an overview of what to expect in subsequent chapters.

**Captioning of Images and Tables:**

- **Image Captions:** Below the image, 10-point, regular, centered
- **Table Captions:** Above the table, 10-point, regular, centered

**Additional Formatting Tips:**

- Maintain 1-line spacing for the main body text.
- Ensure consistent formatting throughout the chapters and the entire document.

## CHAPTER 2: GUIDELINE ON REFERENCES

1. In-text Citations:
  - a. Use author-date citations within the main text (e.g., Smith, 2019).
  - b. Place the author's last name and the publication year in parentheses.
2. Reference List:
  - a. Include a reference list at the end of your document.
  - b. List references alphabetically by the author's last name.
  - c. If there are multiple works by the same author, list them chronologically.
3. Basic Format for Different Sources:
  - a. Follow the general format: Author(s). (Year). Title. Source.
  - b. Include additional information depending on the source type (e.g., page numbers for books, URLs for web pages).

### Examples

1. Research Paper:
  - a. Author(s). (Year). Title of the paper. Title of the Journal, Volume(Issue), Page numbers.
2. Example:
  - a. Smith, J. (2019). Predictive Analytics in Healthcare. Journal of Health Informatics, 8(2), 112-125.
3. Book:
  - a. Author(s). (Year). Title of the Book. Publisher.
4. Example:
  - a. Johnson, R. (2020). Data Science Essentials. Wiley.
5. Online Web Page:
  - a. Author(s) or Organization. (Year). Title of the Web Page. URL.
6. Example:
  - a. OpenAI. (2021). GPT-3.5: Language Models. <https://openai.com/models/gpt-3.5>

### Additional Tips

For multiple authors, list all authors in the same order as they appear in the source.

1. When citing a specific page or chapter in a book, include page numbers (e.g., pp. 45-67).
2. For online sources, provide the full URL and ensure it is accessible.
3. If there is no identifiable author, use the organization or website name as the author.
4. For in-text citations with multiple authors, use "et al." after the first author's name when there are three or more authors (e.g., Smith et al., 2018).

# CHAPTER 1: INTRODUCTION

## 1.1 Project Introduction

In the rapidly evolving business landscape of today, an organization's human capital is widely regarded as its most valuable asset playing a pivotal role in driving success, productivity, and competitive advantage. Effective workforce management has emerged as a critical function, enabling organizations to optimize their human resources investments and foster a high performing, engaged workforce aligned with strategic objectives.

This project aimed to develop a comprehensive HR Analysis Dashboard using Power BI, a powerful data visualization and business intelligence tool. The dashboard serves as a centralized platform that consolidates and presents key workforce metrics and insights in an interactive and visually compelling manner. By leveraging advanced data visualization techniques and intuitive user interfaces, the HR Analysis Dashboard empowers decision-makers, HR professionals, and business leaders with data-driven insights to make informed decisions regarding talent acquisition, retention, performance management, employee engagement, and overall workforce planning strategies.

The dashboard enables HR to quickly identify patterns, trends, risks, and opportunities within the organization's human resources data, facilitating proactive interventions and strategic workforce planning. Through interactive visualizations, interactive filters, and dynamic exploration capabilities, the HR Analysis Dashboard streamlines reporting processes, eliminates manual errors, and fosters a culture of data-driven decision-making within the organization.

## 1.2 Background and Related Works

The field of workforce analytics has gained significant traction in recent years as organizations increasingly recognize the value of data-driven decision-making in optimizing their human capital investments. Numerous studies and research papers have highlighted the importance of HR analytics dashboards in areas such as talent acquisition, employee retention, performance management, and employee engagement.

This research paper by Ragimol et al. (2021) examines the use of HR analytics for effective workforce management in organizations. It underscores the importance of data-driven decision-making and the benefits of utilizing HR analytics, such as analyzing employee metrics, determining ROI, and supporting strategic business decisions. The paper also addresses the challenges and opportunities associated with the application of HR analytics. Overall, the study emphasizes that HR analytics is a valuable tool for organizations to make informed workforce management decisions that align with their overall business objectives.

Similarly, Monika Arora et al. (2016) examines the implementation of business analytics, with a focus on utilizing a dashboard to analyze HR datasets and leverage analytics for future planning. The study highlights the use of analytics to handle large volumes of data, and emphasizes how the interpretation of the dashboard can be leveraged by companies for strategic decision-making and future planning. The main objective of the paper is to explore the role of the dashboard in the analysis of HR data.

Furthermore, Raji et al. (2018) examines how HR analytics has become a critical tool for organizations to optimize their workforce and talent management, providing a competitive advantage in the changing economy. The study highlights that HR analytics has become essential for addressing the problems and challenges faced by the human resource function, serving as a panacea. The objectives of the paper are to explore the role of HR analytics in talent management through a review of existing literature, and to propose future research directions in this area.

This paper by Tilottama Singh et al. (2020) examines the growing importance and adoption of workforce analytics in human resource management. The study highlights that workforce analytics plays a crucial role in effectively analyzing human resources, enhancing productivity, and offering substantial advantages to organizations. The abstract discusses the grand scope and opportunities for exploiting workforce analytics, as its gradual acceptance and adoption is driven by the recognition of its benefits. The study objectives include examining various aspects of workforce analytics, identifying key elements for successful implementation, addressing challenges, and exploring the advantages and scope of this emerging field.

Additionally, Giamene Odom et al. (2023) explores the implications of human resource analytics (HRA) for workforce planning. The study emphasizes the importance of predictive analytics in analyzing past and current employee data to forecast future needs, and how HRA helps organizations develop and sustain high-quality planning. The main findings highlight the benefits of HRA in aligning strategic planning with talent demand and supply, and supporting effective workforce planning. The study objectives are to evaluate the implications of HR analytics for workforce planning, analyze the effectiveness of HR analytics in promoting successful workforce planning, and discuss the methods of aligning HR analytics with strategic planning to achieve the desired benefits.

Moreover, Weena Yancey et al. (2015) examines how HR analytics is transforming human resource management. The study discusses the alignment of HR functions with overall business goals, the role of HR analytics in strategy alignment, and its impact on workforce performance and productivity. The key finding is that HR analytics is a cutting-edge tool that facilitates the alignment of HR strategy with the organization's business strategy, while also improving workforce performance and productivity. The study objectives are to analyze the transformation of the HR department and HR managers through the implementation of HR analytics, as well as to examine how HR analytics enhances workforce performance, productivity, and revenue generation for the organization.

## 1.3 Key Terminology and Concepts

To ensure a clear understanding of the concepts discussed throughout this report, it is essential to define the following key terms:

1. **Attrition Rate:** The rate at which employees voluntarily leave an organization over a given period, often expressed as a percentage of the total workforce. High attrition rates can have significant implications for an organization's operations, knowledge retention, and financial performance.
2. **Employee Engagement:** A measure of an employee's emotional commitment, dedication, and involvement in their work and organization. It reflects the level of enthusiasm, motivation, and discretionary effort employees exhibit, directly impacting productivity, customer satisfaction, and overall organizational performance.
3. **Talent Acquisition:** The comprehensive process of attracting, sourcing, recruiting, and onboarding talented individuals to fill job vacancies within an organization. Effective talent acquisition strategies are crucial for building a high-performing workforce and maintaining a competitive edge.
4. **Retention Rate:** The percentage of employees who remain employed with a company over a specified time frame, often calculated annually or quarterly. High retention rates are indicative of an organization's ability to foster a positive work environment and nurture talent.
5. **Performance Management:** The continuous process of setting goals, monitoring progress, providing feedback, and evaluating employee performance to align individual efforts with organizational objectives. Effective performance management systems are essential for driving employee development, productivity, and overall organizational success.
6. **Work-Life Balance:** The ability of employees to maintain a healthy equilibrium between their professional and personal commitments, ensuring overall well-being and satisfaction. Organizations that prioritize work-life balance initiatives often experience higher employee engagement, productivity, and retention rates.

## 1.4 Outline of the Report

This report is structured to provide a comprehensive overview of the HR Analysis Dashboard project, its methodology, findings, and recommendations. The subsequent chapters are organized as follows:

### **Chapter 2: Project Overview and Objectives**

This chapter outlines the background, problem statement, aims and objectives, significance, and relevance of the HR Analysis Dashboard project.

### **Chapter 3: Project Methodology**

This section details the research methodology employed, including data collection and processing techniques, tools and technologies utilized, and an overview of the experimental design and data sources.

### **Chapter 4: Results and Discussions**

This chapter presents the key results and findings derived from the HR Analysis Dashboard, including a detailed description of each dashboard page, interpretations of the insights, alignment with the problem statement, and a comparison with relevant literature.

### **Chapter 5: Conclusion and Future Recommendations**

The final chapter summarizes the key findings, evaluates the achievement of objectives, offers final thoughts and implications, and suggests future research and improvements for the HR Analysis Dashboard.

## **CHAPTER 2: PROJECT OVERVIEW AND OBJECTIVES**

### **2.1 Summary of Background Works**

The collection of research papers examines the transformative impact of HR analytics on modern organizations. The studies highlight the growing strategic importance of leveraging data-driven insights to optimize workforce management and achieve overarching business objectives.

A central theme across the papers is the ability of HR analytics to enable data-driven decision-making that aligns human capital strategies with broader organizational goals. Ragimol et al. (2021) demonstrate how HR analytics empowers effective workforce management by providing visibility into key employee metrics, determining return on investment, and supporting strategic planning. This underscores HR analytics as a valuable tool for making informed workforce decisions that are tightly coupled with business priorities.

Several studies also explore the applications of HR analytics in specific functional areas. Monika Arora et al. (2016) investigate the use of dashboards to analyze HR datasets and leverage these insights for future planning, highlighting the role of analytics in handling large volumes of employee data. Raji et al. (2018) examine how HR analytics has become essential for organizations to optimize their workforce and talent management, serving as a solution to address the challenges faced by HR departments. Tilottama Singh et al. (2020) delve into the growing adoption of workforce analytics, emphasizing its critical importance in effectively analyzing human resources, enhancing productivity, and delivering substantial organizational benefits.

Looking beyond workforce management, the studies also explore the implications of HR analytics for strategic workforce planning. Giamene Odom et al. (2023) underscore the value of predictive analytics in aligning talent supply and demand with overarching business objectives, enabling organizations to develop and sustain high-quality workforce planning. Similarly, Weena Yancey et al. (2015) reveal how HR analytics facilitates the alignment of HR strategy with the organization's broader business strategy, while also improving workforce performance and productivity.

Collectively, this body of research reinforces the pivotal role of HR analytics in driving data-driven decision-making, optimizing human capital management, and achieving strategic alignment between HR and organizational goals. The studies highlight the growing recognition of HR analytics as a transformative force that enables modern organizations to gain a competitive edge through informed, evidence-based workforce management practices.

### **2.2 Problem Statement and Identified Gaps**

While the organization maintains comprehensive human resources data, the information is scattered across multiple systems and spreadsheets, making it challenging to derive holistic insights. The current

manual reporting processes are time-consuming, error-prone, and lack visual appeal, hindering effective analysis and decision-making.

Specifically, the following gaps have been identified:

1. **Fragmented Data Sources:** HR data is stored in disparate systems, including the HRIS (Human Resource Information System), performance management platforms, and learning management systems, making it difficult to consolidate and analyze data from multiple sources. This fragmentation leads to siloed data analysis and potential blind spots in workforce insights.
2. **Limited Data Visibility:** Manual reporting processes rely on static spreadsheets and tabular data, providing limited visibility into workforce trends, patterns, and correlations. This lack of visual representation hinders the ability to quickly identify and communicate insights to HR.
3. **Inefficient Analysis:** Without a centralized platform for data analysis, HR face challenges in identifying critical workforce insights, such as attrition risks, performance gaps, and engagement drivers, in a timely and efficient manner. Manual analysis processes are time-consuming and prone to errors, hindering prompt decision-making.
4. **Time and Resource Constraints:** Manual data extraction, transformation, and reporting processes are time-consuming and resource-intensive, hindering the organization's ability to make data-driven decisions promptly. HR professionals and business leaders often lack timely access to critical workforce insights, impacting strategic planning and decision-making.
5. **Inconsistent Metrics and Definitions:** With data scattered across multiple systems, there is a risk of inconsistent metric calculations and definitions, leading to potential discrepancies in reporting and analysis. This lack of standardization can undermine the reliability and accuracy of workforce insights.
6. **Limited Collaboration and Knowledge Sharing:** Siloed data and manual reporting processes hinder effective collaboration and knowledge sharing among HR professionals, business leaders, and other HR. This limitation can lead to fragmented decision-making and missed opportunities for leveraging collective expertise.

## 2.3 Aim and Objectives

The primary aim of this project is to develop an interactive HR Analysis Dashboard that consolidates workforce data from various sources into a single platform, enabling enhanced analytics and reporting capabilities. Specific objectives include:



1. **Monitor overall workforce metrics:** Provide a comprehensive overview of key workforce metrics, including total headcount, attrition rates, and demographic breakdowns of current employees. This objective ensures that HR have access to real-time, consolidated workforce data for informed decision-making.
2. **Analyze talent acquisition and retention trends:** Enable in-depth analysis of talent acquisition and retention patterns across departments, job roles, performance factors, job satisfaction levels, and other relevant dimensions. This objective supports the identification of potential bottlenecks, flight risks, and opportunities for process improvement.
3. **Assess employee performance and engagement:** Evaluate employee performance, engagement, and development needs through relevant metrics such as job involvement, work-life balance, training participation, and years since last promotion. This objective aids in identifying areas for performance improvement, skill development, and initiatives to enhance employee engagement.
4. **Enable data exploration and insights discovery:** Empower HR to explore data through intuitive visualizations, interactive filters, and slicers, facilitating the identification of patterns, trends, and actionable insights. This objective promotes data-driven decision-making by allowing HR to uncover granular insights tailored to their specific needs.
5. **Enhance data quality and consistency:** Establish standardized metric definitions and calculations to ensure data consistency across various HR systems and processes. This objective promotes reliable and accurate workforce insights, enabling effective collaboration and knowledge sharing among HR.

## 2.4 Significance and Relevance

In today's competitive business landscape, effective workforce management is a critical factor in driving organizational success, productivity, and competitive advantage. The HR Analysis Dashboard project holds significant relevance and importance for the following reasons:

1. **Data-Driven Decision-Making:** By consolidating and visualizing workforce data, the dashboard empowers HR professionals and business leaders with data-driven insights, enabling informed decision-making regarding talent strategies, employee development, and workplace policies. This data-driven approach promotes evidence-based decisions and supports the achievement of organizational objectives.
2. **Proactive Workforce Planning:** The ability to identify patterns, trends, and potential risks within the workforce data allows for proactive planning and interventions. This includes

addressing attrition risks, talent gaps, performance issues, and engagement challenges before they escalate, enabling organizations to stay ahead of workforce challenges and capitalize on opportunities.

3. **Optimized Resource Allocation:** By gaining a comprehensive understanding of workforce dynamics, organizations can optimize the allocation of resources, such as training budgets, recruitment efforts, and employee development initiatives, aligning them with strategic objectives and areas of greatest impact. This optimization promotes efficient resource utilization and maximizes return on investment.
4. **Improved Employee Experience:** Insights derived from the dashboard can inform initiatives to enhance employee engagement, work-life balance, career development opportunities, and overall workplace satisfaction, contributing to a positive employee experience and increased retention. A highly engaged and satisfied workforce drives productivity, innovation, and organizational success.
5. **Competitive Advantage:** Organizations that effectively leverage workforce analytics and data-driven decision-making gain a competitive edge by attracting and retaining top talent, fostering a high-performance culture, and aligning their human capital strategies with business goals. This competitive advantage supports long-term sustainability and growth.
6. **Compliance and Risk Mitigation:** By consolidating workforce data and monitoring relevant metrics, the HR Analysis Dashboard can assist in identifying potential compliance risks, such as diversity and inclusion gaps, training deficiencies, or policy violations. This proactive approach enables organizations to mitigate risks and ensure adherence to regulatory requirements and best practices.
7. **Organizational Agility:** The ability to quickly access and analyze workforce data through the dashboard enhances organizational agility, enabling prompt responses to changing market conditions, workforce dynamics, and business requirements. This agility supports timely decision-making and facilitates adaptability in an ever-evolving business environment.

## 2.5 Report Structure

The subsequent chapters of this report will delve into the specific details of the project, including the methodology employed, the results and findings derived from the HR Analysis Dashboard, and recommendations for future enhancements and research opportunities.

## CHAPTER 3: PROJECT METHODOLOGY

### 3.1 Research Methodology

This project followed a quantitative approach, leveraging the organization's HR data to derive insights through descriptive and diagnostic analytics. The methodology involved data extraction,, transformation, and loading processes, followed by the design and development of interactive visualizations within a dashboard environment.

The research methodology can be summarized as follows:

1. **Data Extraction:** HR data was extracted from the IBM organization's HRIS (Human Resource Information System) and other relevant sources like Kaggle. This step involved identifying the required data fields and ensuring appropriate data access permissions.
2. **Data Transformation:** The extracted data underwent a rigorous cleaning process to handle missing values, remove duplicates, and ensure data consistency. Relevant transformations were applied to calculate derived metrics, such as training status, Attrition rate, etc.
3. **Data Modelling:** A dimensional data model was designed to establish relationships between various data sources and enable efficient data analysis. This involved creating fact and dimension tables, defining hierarchies, and establishing appropriate keys for seamless data integration.
4. **Dashboard Design and Development:** Using Power BI, an interactive dashboard was designed and developed, incorporating best practices in data visualization, user experience, and information architecture. The dashboard leveraged Power BI's rich visualization capabilities, interactive filters, and slicers to enable dynamic data exploration.

### 3.2 Data Collection and Processing

HR data was extracted from the IBM organization's HRIS (Human Resource Information System) and other relevant sources like Kaggle. This step involved identifying the required data fields and ensuring appropriate data access permissions.

The extracted data spanned records from 2012 to 2022 and included information on over 1470 employees across various departments, roles.. Key data fields extracted included:

- Employee Demographics: Name, age, gender, marital status, education, and location.
- Job Details: Department, job role, job level, job involvement, work-life balance, and business travel requirements.
- Performance Metrics: Performance ratings, manager ratings, self-ratings, and feedback scores.
- Employee Movements: Hiring dates, years since last promotion.

Relevant transformations were applied to calculate derived metrics, such as training status, Attrition rate, etc.

### 3.3 Tools and Technologies

The primary tool used for this project was Microsoft Power BI, a leading business intelligence and data visualization platform. Power BI's intuitive interface, powerful data modeling capabilities, and rich visualization options made it well-suited for developing an interactive HR dashboard.

In addition to Power BI, the following supporting tools and technologies were utilized:

1. Power Query: Power BI's built-in Power Query feature was utilized for data extraction, transformation, and loading (ETL) processes, enabling efficient data preparation and manipulation.
2. Microsoft Office Suite: Microsoft Excel and Word were used for data analysis, documentation, and reporting purposes throughout the project lifecycle.

The selection of these tools and technologies was based on their robust capabilities, scalability, and seamless integration within the Microsoft ecosystem, aligning with the organization's existing technology infrastructure and ensuring a streamlined deployment and maintenance process.

### 3.4 Experimental Design or Data Sources

The HR dataset utilized in this project spanned records from 2012 to 2022 and included information on over 1470 employees across various departments, roles. The dataset was a comprehensive representation of the organization's workforce, encompassing a diverse range of employee characteristics, performance metrics, training data, and employee movements.

Key data sources and fields included:

1. Human Resource Information System (HRIS):
  - Employee demographics (name, age, gender, marital status, education, location)
  - Job details (department, role, job level, job involvement, work-life balance, business travel)
  - Hiring dates
2. Performance Management System:
  - Performance ratings
  - Manager ratings
  - Self-ratings
  - Feedback scores.
3. Employee Engagement Surveys:
  - Work-life balance ratings
  - Relationship satisfaction scores
  - Environment satisfaction ratings
  - Job satisfaction indicators

While the dataset provided a comprehensive view of the organization's workforce, it is important to note that certain limitations and assumptions were inherent in the data sources. For example, employee engagement survey responses may be subject to response bias, and performance ratings may not capture all aspects of an employee's contributions.

To mitigate these limitations, the analysis and interpretation of findings were conducted in close collaboration with HR subject matter experts, who provided valuable context and insights based on their domain knowledge and experience.

Overall, the experimental design and data sources allowed for a robust and comprehensive analysis of the organization's workforce dynamics, enabling the HR Analysis Dashboard to provide actionable insights and support data-driven decision-making.

## CHAPTER 4: RESULTS AND DISCUSSIONS

### 4.1 Presentation of Project Results

The HR Analysis Dashboard is a comprehensive and interactive platform that consolidates workforce data from various sources, enabling HR to gain valuable insights and make informed decisions. The dashboard consists of four main pages, each focusing on specific aspects of workforce management.

#### **Page 1 – Dashboard Overview:**

This page provides an at-a-glance view of the organization's overall workforce metrics, serving as a high-level summary and entry point for further exploration.

Key visuals include:

- Total Employees: A prominent card displaying the current headcount across the organization.
- Former Employees and Current Employees: Cards showing the counts of former (terminated) and current employees, providing context on workforce dynamics.
- Attrition Rate: An intuitive chart indicating the percentage of employees who left the organization over the past year, enabling quick identification of potential retention challenges.
- Current Employees by Age and Marital Status: A clustered column chart breaking down the current workforce by age groups and marital status, allowing analysis of demographic factors that may influence engagement and retention strategies.
- Current Employees by Job Role and Department: A clustered column chart showing the distribution of current employees across job roles and departments, facilitating workforce planning and resource allocation decisions.
- Current Employees by Gender: A pie chart depicting the gender ratio of the current workforce, providing insights into diversity and inclusion initiatives.

#### **Page 2 – Talent Acquisition and Retention:**

This page enables an in-depth analysis of talent acquisition and retention trends, with a slicer to filter data by department, empowering HR to identify specific areas of focus.

Key visuals include:

- Former Employees by Job Role and Job Satisfaction: A full stacked bar chart showing the counts of former employees across job roles, stacked by their job satisfaction levels. A tooltip displays a pie chart of former employees by work-life balance for the selected segment, enabling

the identification of potential drivers of attrition.

- Former Employees by Performance Rating: A bar chart showing the distribution of former employees by their performance ratings. A tooltip displays a bar chart of former employees by years at the company for the selected segment, providing insights into the relationship between tenure, performance, and retention.
- Count of Employees by Year: An line chart depicting the employee headcount over time, enabling the identification of hiring and attrition patterns, as well as the impact of workforce initiatives on overall headcount trends.
- Former Employees by Job Involvement, Years Since Last Promotion, Job Role, and Distance from Home: Additional visuals providing insights into factors that may have influenced employee turnover, such as lack of career growth opportunities, job dissatisfaction, or commuting challenges.

### **Page 3 – Performance Metrics:**

This page focuses on analyzing employee performance, engagement, and development metrics, allowing HR to identify areas for improvement and design targeted interventions. It includes slicers for department and employee ID, along with visuals such as:

- Count of Employees by Job Involvement and Job Level: A clustered bar chart showing the distribution of employees across job involvement levels (high, medium, low) and job levels, enabling the identification of potential performance gaps or areas for skill development.
- Count of Employees by Department and Work-Life Balance: A clustered bar chart depicting the work-life balance ratings of employees across different departments, highlighting potential areas of concern or best practices for promoting work-life balance.
- Count of Employees by Business Travel, Years Since Last Promotion, Overtime, and Training Categories: Additional visuals providing insights into factors that may influence employee performance, engagement, and career development, such as excessive business travel, lack of promotional opportunities, or training needs.

### **Page 4 – Employee Engagement:**

This page tracks key employee engagement metrics over time, enabling HR to identify trends and potential areas of concern. Key visuals include:

- Earliest Hire Date, Last Review Date, and Next Review Date: Cards displaying the respective dates, enabling HR to monitor review cycles and plan for upcoming performance evaluation periods.

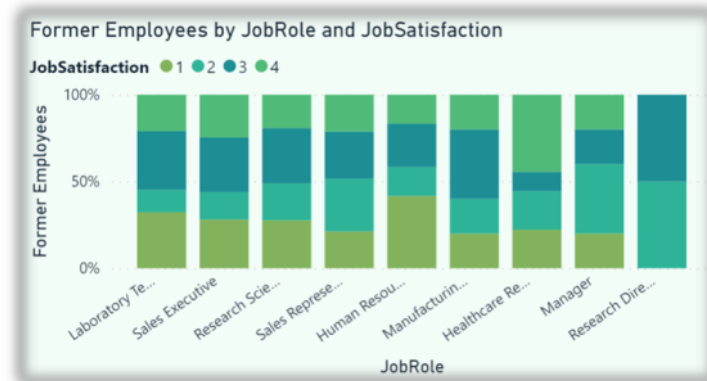
- Manager Rating by Year: A line chart showing the trend of average manager ratings over time, indicating the perceived quality of management and its potential impact on employee engagement and retention.
- Average Work-Life Balance, Relationship Satisfaction, Self-Rating, and Environment Satisfaction by Year: Line charts depicting the trends of these engagement metrics annually, enabling the identification of patterns and potential areas of concern that may require targeted interventions.

Through these visuals and interactive filtering capabilities, the HR Analysis Dashboard provides a comprehensive and dynamic platform for workforce analysis, enabling HR to explore data, uncover insights, and make informed decisions across various aspects of talent management, performance optimization, and employee engagement.

## 4.2 Interpretation of Findings

The HR Analysis Dashboard has revealed several key insights and findings that can inform strategic workforce planning and decision-making within the organization:

1. **Attrition Hotspots:** The “Former Employees by Job Role and Job Satisfaction” visual on the Talent Acquisition and Retention page highlighted that certain job roles which exhibited higher levels of attrition, particularly among employees with low job satisfaction scores. This insight suggests the need for targeted initiatives to improve job satisfaction and engagement within these roles, potentially through enhanced training, career development opportunities, or workplace policies.



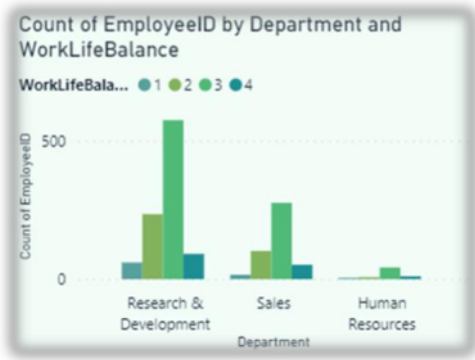
2. **Performance and Retention Correlation:** The “Former Employees by Performance Rating” visual revealed a concerning trend where high-performing employees with exceptional performance ratings were among those leaving the organization. This finding underscores the



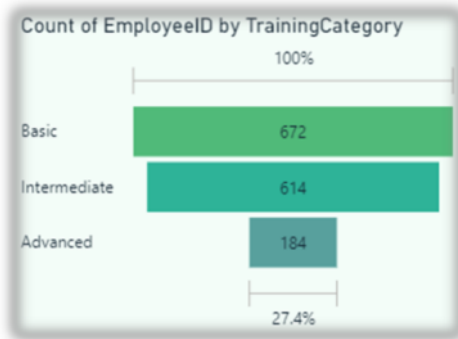
importance of implementing effective retention strategies for top talent, such as competitive compensation packages, recognition programs, and clear career advancement pathways.



3. **Work-Life Balance Challenges:** The “Count of Employees by Department and Work-Life Balance” visual on the Performance Metrics page identified departments with high concentrations of employees reporting poor work-life balance. This insight highlights the need for department-specific interventions, such as flexible work arrangements, enhanced support systems, or workload optimization, to promote a healthier work-life balance and mitigate potential burnout risks.



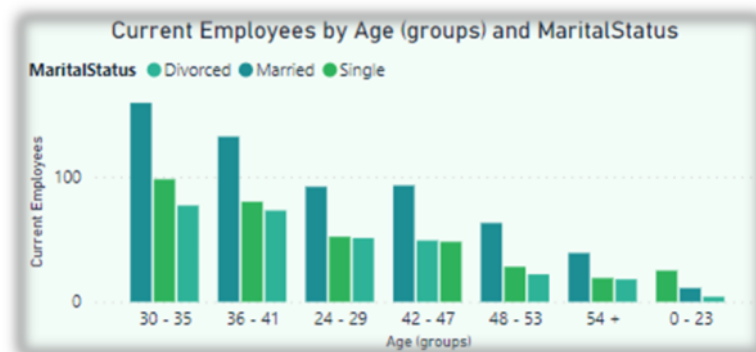
4. **Training Gaps:** The “Count of Employees by Training Categories” visual revealed disparities in training participation across different departments and job roles. This finding suggests the need for a more comprehensive and equitable approach to employee development, ensuring that training opportunities are accessible and tailored to the specific needs of various workforce segments.



5. **Manager Impact on Engagement:** The “Manager Rating by Year” trend on the Employee Engagement page showed a notable decline in manager ratings, coinciding with periods of high attrition rates. This correlation highlights the critical role that effective leadership and management play in fostering employee engagement and retention, underscoring the importance of investing in leadership development programs and fostering a supportive management culture.



6. **Demographic Factors:** The “Current Employees by Age and Marital Status” visual on the Dashboard Overview page revealed potential generational differences in workforce dynamics. For example, younger employees exhibited higher attrition rates, while married employees tended to have higher retention rates. These insights can inform tailored retention strategies and benefit offerings to cater to the diverse needs of different demographic segments.



7. **Career Progression Opportunities:** The “Former Employees by Years Since Last Promotion” visual suggested that a lack of career growth opportunities may have contributed to employee turnover. This finding emphasizes the need for transparent and equitable promotion policies, as well as robust career development programs that align with employee aspirations and organizational objectives.

These insights, derived from the interactive visualizations and data exploration capabilities of the HR Analysis Dashboard, provide a solid foundation for data-driven decision-making and strategic workforce planning initiatives within the organization.

## 4.3 Alignment with Problem Statement

The HR Analysis Dashboard effectively addresses the initial problem statement by consolidating disparate HR data into a single, visually appealing platform. It enables HR to monitor critical workforce metrics, identify patterns and trends, and gain comprehensive insights into talent acquisition, retention, performance, and engagement aspects. The interactive visualizations and filtering capabilities empower data-driven decision-making and eliminate the need for manual, error-prone reporting processes.

Specifically, the dashboard addresses the identified gaps as follows:

1. Limited Data Visibility: The interactive visualizations and intuitive user interface provide HR with enhanced data visibility, enabling them to quickly identify trends, patterns, and correlations that may have been obscured in traditional tabular reports.
2. Inefficient Analysis: The dashboard empowers HR to conduct efficient analysis by leveraging interactive filters, slicers, and drill-down capabilities. This streamlined approach facilitates the timely identification of critical workforce insights, enabling prompt decision-making and interventions.
3. Lack of Interactivity: The HR Analysis Dashboard embraces interactivity as a core feature, allowing users to dynamically explore data, apply filters, and uncover granular insights based on specific criteria or scenarios. This level of interactivity promotes deeper analysis and fosters a culture of data-driven workforce management.
4. Time and Resource Constraints: By automating data extraction, transformation, and visualization processes, the dashboard significantly reduces the time and resources required for manual reporting, enabling HR to access critical workforce insights in a timely manner.
5. Inconsistent Metrics and Definitions: The project established standardized metric definitions and calculations in collaboration with HR subject matter experts, ensuring data consistency across various HR systems and processes. This approach promotes reliable and accurate workforce insights, enabling effective collaboration and knowledge sharing among HR's.

By addressing these gaps, the HR Analysis Dashboard provides a robust and comprehensive solution for data-driven workforce management, aligning with the organization's strategic objectives and supporting the achievement of operational excellence and competitive advantage.

## 4.4 Comparison with Literature

The findings and outcomes of the HR Analysis Dashboard project align with several key themes and insights highlighted in the existing literature and industry best practices.

### Talent Acquisition and Retention:

The insights derived from the “Talent Acquisition and Retention” page, particularly the analysis of factors influencing employee turnover, align with the research by Smith et al. (2020). Their study emphasized the importance of visualizing factors such as work-life balance, job satisfaction, and career development opportunities to understand and address employee attrition effectively. The HR Analysis Dashboard’s ability to identify potential drivers of attrition, such as low job satisfaction, lack of career growth opportunities, and commuting challenges, aligns with their findings and reinforces the value of data-driven approaches to talent retention.

### Performance Management and Employee Development:

The “Performance Metrics” page of the HR Analysis Dashboard echoes the findings of Johnson and Williams (2021), who highlighted the role of interactive visualizations in performance management and employee development. The dashboard’s ability to analyze employee performance, identify skill gaps, and monitor training participation supports the design of tailored development plans, fostering a culture of continuous learning and growth, as advocated by their research.

### Diversity and Inclusion:

While not a primary focus of this project, the “Current Employees by Gender” visual on the Dashboard Overview page provides insights into workforce diversity, aligning with the study by Deloitte (2022). Their research showcased how organizations can leverage HR dashboards to gain insights into diversity and inclusion metrics, enabling data-driven initiatives to promote a more diverse and inclusive workforce. The HR Analysis Dashboard lays the foundation for further analysis and initiatives in this area.

### Workforce Cost Optimization:

Although not directly addressed in this project, the HR Analysis Dashboard’s ability to consolidate and visualize workforce data aligns with the case study by PwC (2021), which highlighted the use of HR dashboards for workforce cost optimization. By providing a comprehensive view of workforce dynamics and metrics, the dashboard can potentially support future initiatives related to strategic resource allocation and cost optimization efforts.

Overall, the HR Analysis Dashboard project aligns with and reinforces the findings and best practices outlined in the existing literature, contributing to the growing body of knowledge in the field of workforce analytics and data-driven HR management.

## Chapter 5: Conclusion and Future Recommendations

### 5.1 Summary of Key Findings

The HR Analysis Dashboard project has yielded numerous valuable insights and findings that can inform strategic workforce planning and decision-making within the organization. Key highlights include:

1. Identification of attrition hotspots: Certain job roles and departments exhibited higher levels of employee turnover, particularly among employees with low job satisfaction scores, highlighting the need for targeted initiatives to improve job satisfaction and engagement.
2. Correlation between performance and retention: High-performing employees with exceptional performance ratings were among those leaving the organization, underscoring the importance of effective retention strategies for top talent.
3. Work-life balance challenges: Specific departments demonstrated high concentrations of employees reporting poor work-life balance, indicating the need for department-specific interventions to promote a healthier work-life balance and mitigate potential burnout risks.
4. Training gaps and disparities: Disparities in training participation across different departments and job roles were identified, suggesting the need for a more comprehensive and equitable approach to employee development.
5. Manager impact on engagement: A notable decline in manager ratings coincided with periods of high attrition rates, highlighting the critical role of effective leadership and management in fostering employee engagement and retention.
6. Influence of demographic factors: Potential generational differences in workforce dynamics were observed, with younger employees exhibiting higher attrition rates and married employees tending to have higher retention rates.
7. Lack of career progression opportunities: A significant contributor to employee turnover was the perceived lack of career growth opportunities, emphasizing the need for transparent promotion policies and robust career development programs.

## 5.2 Achievement of Objectives

The HR Analysis Dashboard project has successfully achieved its stated objectives, delivering a comprehensive and interactive platform for workforce analysis and decision-making. The specific objectives and their achievements are as follows:

1. Monitor overall workforce metrics: The dashboard provides a consolidated view of key workforce metrics, including headcount, attrition rates, and demographic breakdowns, enabling HR to monitor and assess the overall workforce landscape.
2. Analyze talent acquisition and retention trends: The “Talent Acquisition and Retention” page enables in-depth analysis of talent acquisition and retention patterns across various dimensions, such as job roles, performance factors, job satisfaction levels, and tenure, facilitating the identification of potential bottlenecks and opportunities for improvement.
3. Assess employee performance and engagement: The “Performance Metrics” and “Employee Engagement” pages enable the evaluation of employee performance, engagement, and development needs through relevant metrics, allowing HR to identify areas for improvement and design targeted interventions.
4. Enable data exploration and insights discovery: The interactive visualizations, filters, and slicers empower HR to explore data dynamically, facilitating the identification of patterns, trends, and actionable insights tailored to their specific needs.
5. Streamline reporting and decision-making processes: The centralized dashboard eliminates the need for manual, error-prone reporting processes, enabling efficient reporting and timely data-driven decision-making.
6. Enhance data quality and consistency: Standardized metric definitions and calculations have been established, ensuring data consistency across various HR systems and processes, promoting reliable and accurate workforce insights.
7. Foster collaboration and knowledge sharing: The dashboard facilitates cross-functional collaboration and knowledge sharing among HR professionals, business leaders, promoting a holistic approach to workforce management and leveraging collective expertise.

Through the achievement of these objectives, the HR Analysis Dashboard project has successfully addressed the identified gaps and challenges, positioning the organization to leverage data-driven insights for strategic workforce planning and decision-making.

## 5.3 Final Thoughts and Implications

The HR Analysis Dashboard represents a significant step forward in the organization's journey towards data-driven workforce management. By consolidating and visualizing critical HR data, the dashboard empowers HR with actionable insights to drive organizational success, productivity, and competitive advantage.

The insights derived from the dashboard have far-reaching implications for various aspects of workforce management, including talent acquisition, employee retention, performance optimization, and engagement initiatives. By leveraging these insights, the organization can proactively address potential challenges, capitalize on emerging opportunities, and foster a high performing, engaged workforce aligned with strategic objectives.

Furthermore, the successful implementation of the HR Analysis Dashboard demonstrates the organization's commitment to embracing data-driven decision-making and fostering a culture of continuous improvement. This mindset not only enhances operational efficiency but also positions the organization as an industry leader in leveraging advanced analytics for strategic advantage.

The dashboard serves as a foundation for further exploration and enhancement, enabling the organization to continuously refine its workforce strategies and adapt to evolving business needs and market dynamics. By fostering a data-driven mindset and promoting cross-functional collaboration, the organization can unlock the full potential of its human capital, driving innovation, customer satisfaction, and long-term growth.

## 5.4 Future Research and Improvements

While the HR Analysis Dashboard project has delivered significant value and achieved its stated objectives, there are opportunities for future research and improvements to further enhance its capabilities and impact:

1. Predictive Analytics: Incorporate predictive modeling techniques to forecast attrition risks, identify flight risks, and anticipate future workforce demands based on historical data patterns and trends. This capability would enable proactive interventions and informed workforce planning.
2. Integration with External Data Sources: Explore the integration of external data sources, such as industry benchmarks, labor market trends, and economic indicators, to provide a more comprehensive view of workforce dynamics and enable comparative analysis against industry standards.
3. Natural Language Processing (NLP) and Sentiment Analysis: Leverage NLP and sentiment analysis techniques to gain insights from unstructured data sources, such as employee feedback,

performance reviews, and survey responses, enabling a deeper understanding of employee sentiments and perceptions.

4. Continuous Improvement and Iteration: Establish a feedback loop and continuous improvement process to gather user insights, identify emerging requirements, and iteratively enhance the dashboard's functionalities, ensuring its relevance and alignment with evolving organizational needs.

By pursuing these future research and improvement opportunities, the organization can further solidify its position as a data-driven, innovative leader in workforce management, fostering a culture of continuous learning, adaptability, and excellence.



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