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A Mini - Project Report

On

“A Data Driven LinkedIn Analysis”

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In

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Submitted by,

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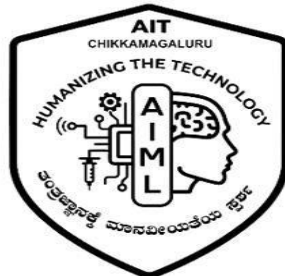
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CERTIFICATE

This is to certify that the work entitled “**A DATA DRIVEN LINKEDIN ANALYSIS**” of **Mini-Project [BAI586]** course is a bonafide work carried out by **PRAKUL H N** bearing a USN **4AI22AI041** of V semester B.E, in partial fulfillment for the award of **Bachelor of Engineering** degree in **Artificial Intelligence and Machine Learning** of Visvesvaraya Technological University, Belagavi during the academic year **2024-2025**. All corrections and suggestions indicated for Internal Assessment have been incorporated in the report and approved. It satisfies the academic requirements for the said degree.

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ABSTRACT

This project focuses on the development of a **LinkedIn Analytics Dashboard** using **Power BI** to track and visualize key LinkedIn activity metrics, such as total connections, companies followed, invitations sent/received, and engagement levels. The dashboard provides users with actionable insights into their professional networking efforts, enabling them to monitor growth trends, optimize engagement strategies, and make data-driven decisions.

The project involves the extraction of LinkedIn data through manual exports, followed by data transformation and visualization in Power BI. Key features of the dashboard include **month-over-month growth**, **connections by company and position**, and **reactions given by type**. Additionally, the system supports **mobile access** via the **Power BI Mobile App**, ensuring users can stay updated on their LinkedIn performance anytime and anywhere.

While the dashboard proves to be an effective tool for analyzing LinkedIn activities, its reliability and timeliness are impacted by the manual data extraction process. Future enhancements such as **automated data extraction**, **granular data analysis**, and **predictive analytics**, are proposed to further enhance the system's effectiveness. Additionally, improvements in **security**, **user interface**, and **cross-platform integration** would significantly increase the utility and user experience of the system.

This project provides valuable insights into LinkedIn activity, offering professionals a comprehensive and interactive platform to track their networking and engagement metrics.

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Chapter 1

Introduction

1.1 Background

1.1.1 Context: LinkedIn is one of the most prominent professional networking platforms, boasting millions of active users globally. It serves as a critical tool for career development, talent acquisition, and industry insights. Professionals use LinkedIn to expand their networks, engage with relevant content, and build their personal brand. Organizations leverage it for recruiting top talent, establishing thought leadership, and fostering relationships with clients and industry stakeholders.

With such a vast user base and diverse use cases, it is crucial to analyze LinkedIn data effectively to optimize professional networking strategies and track key engagement metrics. The availability of tools like **Power BI** provides an opportunity to harness this data for actionable insights.

1.1.2 Problem: Despite its potential, most users and organizations fail to utilize LinkedIn data effectively. Challenges include:

- A **lack of tools** for consolidating and analyzing data extracted from LinkedIn.
- Limited visibility into **engagement patterns**, such as the performance of connections, invitations, and reactions.
- **Inability to track trends** over time or analyze data dynamically (e.g., by year, position, or company).
- Absence of a mobile-friendly solution for on-the-go monitoring of network growth and performance metrics.

Without a structured and analytical approach, opportunities for strategic decision-making, network optimization, and content engagement are often overlooked.

1.1.3 Opportunity: This project offers the opportunity to bridge these gaps by:

1. **Developing a comprehensive dashboard in Power BI** to analyze LinkedIn metrics, including total connections, invitations sent/received, companies followed, and reactions by type.

2. Leveraging Power BI's **interactive visualizations and slicers** to enable dynamic filtering by year, position, company, and other key dimensions.
3. Providing **Month-over-Month (MoM) growth tracking** for network expansion and engagement trends.
4. Delivering a **mobile-friendly view** of the dashboard, allowing users to access insights in real-time.

By transforming raw LinkedIn data into actionable insights, the project empowers users and organizations to optimize their LinkedIn strategies, improve engagement, and enhance their professional presence.

1.2 Problem Statement

1.2.1 Overview of the Problem: LinkedIn has become a cornerstone for professional networking, job hunting, and personal branding. While the platform provides a wealth of data on user activity—such as connections, engagements, and invitations—it does not offer detailed tools for analyzing this data dynamically. Most users and organizations are left with raw, unstructured information that fails to provide actionable insights. As a result, they struggle to track network growth, understand engagement patterns, and make data-driven decisions to optimize their LinkedIn presence.

The lack of analytical solutions leaves a significant opportunity untapped: the ability to harness LinkedIn data to improve networking strategies, content performance, and professional outreach efforts.

1.2.1 Specific Issues:

- Unstructured Data
- Limited Insights into Engagements
- Static Analysis
- No Growth Tracking
- Lack of Accessibility
- Missed Opportunities for Strategic Planning

1.3 Objective of the System

The primary objective of this project is to develop a **data-driven analytical system using Power BI** to effectively analyze LinkedIn data and provide actionable insights. This system aims to empower users with tools to optimize professional networking strategies, enhance engagement, and track growth over time. The system will focus on converting raw LinkedIn data into a comprehensive and interactive dashboard for informed decision-making.

1.3.1 Key Goals:

- **Data Consolidation and Transformation:**

1. Collect and clean LinkedIn data, including total connections, invitations, companies followed, and reactions by type.
2. Transform raw data into a structured format suitable for analysis in Power BI.

- **Dynamic Dashboard Creation:**

Develop an interactive Power BI dashboard that includes:

- a. Total connections
- b. Connections by company and position
- c. Invitations sent and received
- d. Reactions given by type
- e. Month-over-Month (MoM) growth tracking
- f. Integrate slicers such as Year, Company, and Position for dynamic filtering and analysis.

- **Mobile-Friendly Visualization:** Design a mobile-optimized view of the dashboard to enable users to access insights on the go.

- **Performance Analysis and Engagement Tracking:**

1. Provide visual insights into key engagement metrics such as reactions (likes, comments, shares) and content performance trends.
2. Analyze invitations and connection acceptance rates to identify effective outreach strategies.

- **Growth Monitoring:** Implement tools to track MoM growth of connections and engagement, enabling users to identify and replicate successful strategies.

- **Ease of Use:** Ensure the dashboard is user-friendly and accessible to both technical and non-technical users.
- **Ethical Data Usage:** Ensure compliance with LinkedIn's data policies, prioritizing privacy, consent, and data security throughout the analysis process.

By achieving these goals, the system will provide users with a powerful, actionable tool to optimize their LinkedIn activities and drive professional growth.

1.4 Significance of the System

1. Strategic Networking and Growth
2. Enhanced Engagement Insights
3. Data-Driven Decision-Making
4. Accessibility and Usability
5. Ethical and Secure Data Handling

1.5 Scope of the Project

1.5.1 In-Scope:

- 1.5.1.1 Data Collection and Preparation
- 1.5.1.2 Dashboard Development in Power BI
- 1.5.1.3 Data Analysis
- 1.5.1.4 Ethical Considerations
- 1.5.1.5 Data Management and Security
- 1.5.1.6 Frontend and User Interface
- 1.5.1.7 System Setup and Deployment

1.5.2 Out-of-Scope:

- 1.5.2.1 Automated Data Extraction
- 1.5.2.2 Predictive Analysis
- 1.5.2.3 Third Party Integration
- 1.5.2.4 LinkedIn API Usage
- 1.5.2.5 Custom LinkedIn Platform Features
- 1.5.2.6 Real Time Updates

1.6 Methodology

1.6.1 Approach: The project follows a structured approach to create a LinkedIn analytics dashboard in Power BI:

- **Data Collection:** Manually extract LinkedIn data (connections, invitations, reactions, companies followed).
- **Data Preparation:** Clean, format, and transform raw data for Power BI compatibility.
- **Dashboard Development:** Build an interactive dashboard with slicers (e.g., year, company, position) for dynamic filtering.
- **Insights Generation:** Analyze trends, monitor MoM growth, and engagement patterns.
- **Mobile View Optimization:** Create a mobile-friendly version of the dashboard.

1.6.2 Agile Development: The project uses an iterative Agile approach:

- **Sprints:** Tasks divided into sprints for incremental development (data prep, visualizations, testing).
- **Stakeholder Feedback:** Regular updates to incorporate feedback.
- **Final Sprint:** Focused on refining the dashboard and optimizing the mobile view.

1.6.3 Testing: Comprehensive testing ensures accuracy and usability:

- **Data Validation:** Check data consistency and correct calculations.
- **Functionality:** Test slicers, charts, and interactivity.
- **Mobile View:** Validate usability on mobile devices.
- **Usability:** Collect feedback to enhance user experience.

1.7 Target Audience

1. Individual Professionals

- **Job Seekers:** To analyze connections by company or position and identify networking opportunities for career advancement.
- **Content Creators:** To track engagement metrics (e.g., reactions by type) and refine content strategies for greater visibility.

- **Executives and Entrepreneurs:** To monitor their professional network growth and build strategic connections

2. Organizations and Businesses

- **Human Resource Teams:** To analyze outreach efforts such as invitations sent/received and connection acceptance rates for recruitment strategies.
- **Marketing Teams:** To track engagement metrics and identify content performance trends for brand-building on LinkedIn.
- **Business Development Teams:** To identify key stakeholders within companies for fostering partnerships and collaborations.

3. Data Enthusiasts and Analysts

- Professionals interested in leveraging Power BI for social media analytics, using the project as a reference for analyzing raw LinkedIn data.

1.8 Overview of the Report

Chapter 1: Introduction

This report provides a comprehensive analysis of the development and implementation of “**A Data Driven LinkedIn Analysis**” using Power BI. It is organized into chapters that detail the system design, implementation, testing, and the insights generated from the dashboard. The purpose is to empower users with actionable insights for optimizing LinkedIn strategies and enhancing professional networking.

Chapter 2: System Design

This chapter describes the design process, outlining the:

- Key system objectives and features (e.g., connections analysis, MoM growth tracking, and mobile optimization).
- Data flow architecture, from data collection and preparation to visualization in Power BI.
- Dashboard layout and visualization components, including slicers for dynamic analysis.

Chapter 3: Implementation

This chapter explains the step-by-step process of developing the system, including:

- Manual extraction of LinkedIn data and its cleaning, formatting, and transformation for Power BI compatibility.
- The development of interactive dashboards with key visualizations such as total connections, reactions by type, and invitations sent/received.
- Mobile view optimization for seamless access across devices

Chapter 4: Testing and Validation

This chapter highlights the testing phase to ensure data accuracy, functionality, and usability:

- Validation of data transformations and metrics (e.g., MoM growth, connections by company/position).
- Testing of dashboard interactivity, including slicers and dynamic visualizations.
- Mobile view testing to ensure proper display and responsiveness.
- User feedback and adjustments to enhance the overall experience.

Chapter 5: Results and Discussions

This chapter presents the outcomes and insights derived from the dashboard:

- Key trends in connections, invitations, and engagement metrics.
- Analysis of connections by company and position, as well as Month-over-Month (MoM) growth.
- Interpretations of engagement patterns based on reactions and invitations.
- The effectiveness of mobile-optimized dashboards for real-time access.

Chapter 6: Conclusion and Future Enhancements

This chapter summarizes the project and its contributions, highlighting:

- The system's success in delivering actionable LinkedIn insights.
- Limitations, such as manual data extraction and static updates.
- Future enhancements, such as automated data extraction via LinkedIn API, predictive analytics, and advanced insights for deeper analysis

Chapter 2

System Design

The system design for the LinkedIn analytics dashboard involves several core components including system architecture, module design, database design, UI design, and the technology stack used to build the solution. Each element plays a key role in ensuring the system is robust, scalable, and user-friendly.

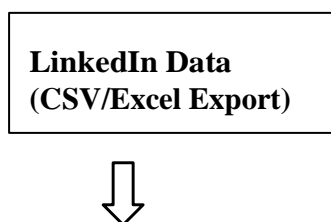
2.1 System Architecture

2.1.1 High-Level Overview:

The architecture includes the following layers:

- **Data Collection:** LinkedIn data is manually extracted (CSV/Excel) with details like connections, invitations, and reactions.
- **Data Processing:** Data is cleaned, formatted, and transformed using Power Query in Power BI.
- **Data Analysis:** Key metrics like growth, reactions, and invitations are calculated using DAX.
- **Visualization:** Interactive Power BI dashboards display key insights using charts, graphs, and KPIs.
- **Mobile Optimization:** Ensures the dashboard adapts to mobile devices with a responsive design

2.1.2 Architecture Diagram:



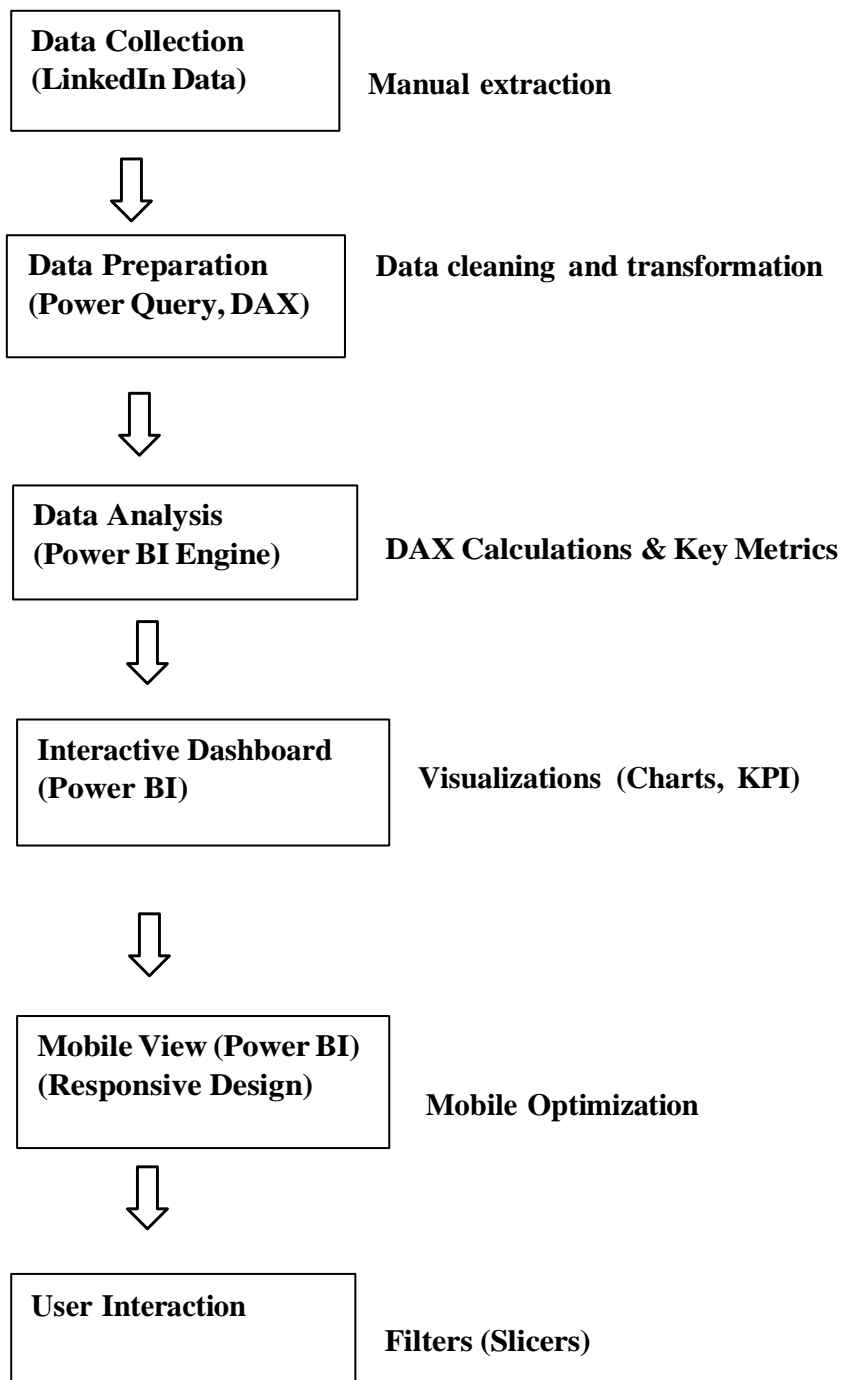


Fig. 2.1 Architecture Diagram

2.1.3 Key Components

1. **LinkedIn Data:** Manually extracted data in CSV/Excel format.
2. **Data Collection:** Organizes the extracted LinkedIn data.
3. **Data Processing (Power Query):** Cleans, transforms, and structures data for analysis.
4. **Data Analysis (DAX):** Advanced metrics (e.g., MoM growth, reactions) are calculated.
5. **Visualization:** Power BI dashboards display visualizations and KPIs.
6. **Mobile View:** Ensures dashboard is mobile-responsive.
7. **User Interaction:** Filters and slicers allow user-driven data exploration.

2.2 Module Design

The system is divided into distinct modules that each handle a specific aspect of the process:

1. **Data Collection Module:**
 - Responsible for manually collecting data from LinkedIn using CSV/Excel exports. This module also ensures the data is periodically updated to keep the analysis relevant.
2. **Data Processing and Transformation Module:**
 - Handles the cleaning, formatting, and transforming of the raw data for use in Power BI. This includes removing duplicates, handling missing data, and aggregating key metrics like connections and reactions.
3. **Dashboard Module:**
 - Builds the visualizations in Power BI, which display key metrics and insights. This module includes the creation of charts, graphs, and the application of dynamic slicers to filter data by time, company, and position.
4. **Mobile Optimization Module:**
 - Ensures the dashboard layout and interactions are optimized for mobile devices. This module ensures the visualizations adapt to different screen sizes and remain user-friendly.
5. **User Interaction Module:**
 - Allows users to interact with the dashboard through slicers and filters. It ensures smooth navigation, real-time filtering, and intuitive drill-down features.

2.3 Database Design

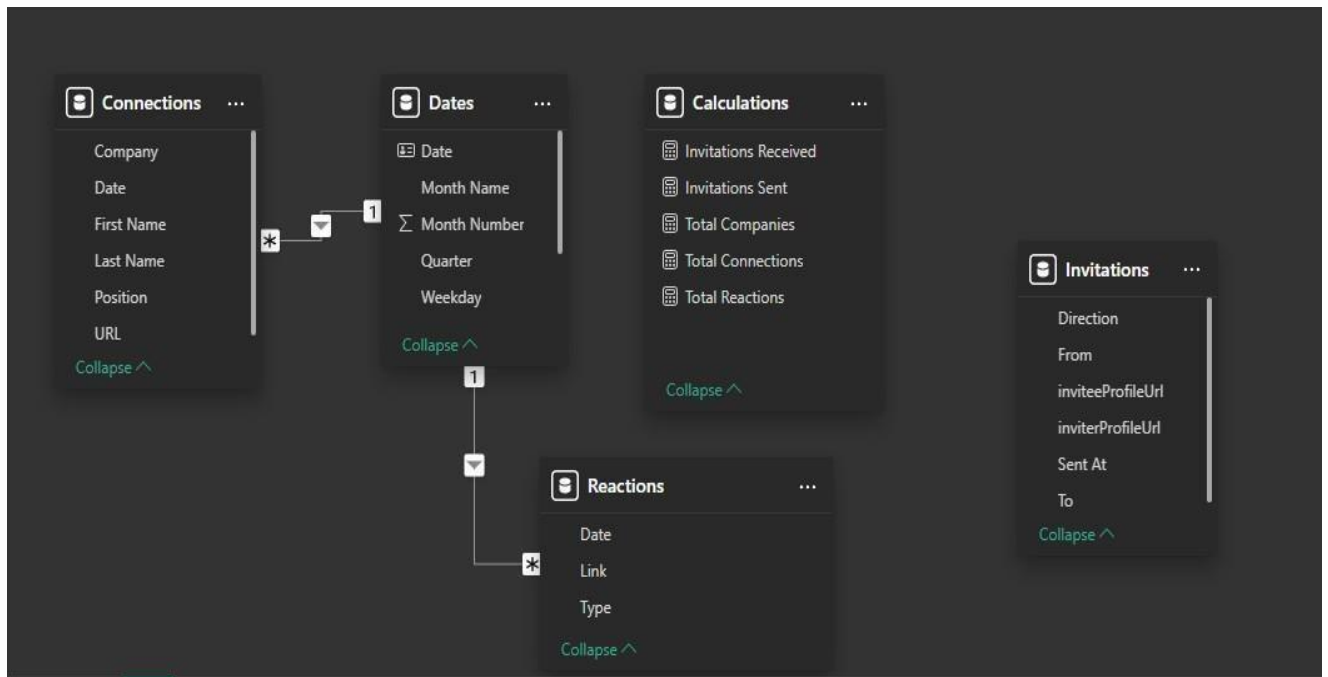


Fig. 2.2 Dashboard Model View

2.4 User Interface (UI) Design

The User Interface (UI) design focuses on providing a simple, intuitive, and interactive experience. The dashboard UI follows these principles:

1. Clear Layout:

- The dashboard features a top section for key metrics (e.g., total connections, invitations) followed by detailed visualizations like bar charts and pie charts.
- Metrics are grouped by category (e.g., network growth, engagement analysis, invitations).

2. Interactive Filters:

- Slicers and filters such as **Year**, **Position**, and **Company** allow users to drill down into specific subsets of data. This gives users the flexibility to explore trends and patterns in their LinkedIn activity.

3. Graphical Representation:

- The dashboard uses interactive charts (bar, line, and pie charts) to present data visually, helping users to easily understand trends and make data-driven decisions.

- Charts have tooltips that provide additional information when users hover over a Data Point.

4. Mobile Optimization:

- The dashboard layout automatically adjusts to mobile screens. The design ensures that key metrics are visible on smaller devices and that users can interact with filters and visualizations without difficulty.

2.5 Technology Stack

The technology stack used to build the LinkedIn analytics system includes the following tools and platforms:

- Power BI Desktop
- Power BI Service
- Power BI Mobile Application
- Microsoft PowerPoint
- Excel/CSV
- Power Query
- DAX (Data Analysis Expressions)
- Relationships (Model View)

Chapter 3

Implementation

This chapter outlines the process of implementing the LinkedIn Analytics dashboard, detailing the stages from data collection to dashboard development, including the tools, techniques, and challenges involved.

3.1 Data Management

Data management is crucial to ensuring that the collected LinkedIn data is clean, well-structured, and ready for analysis. This section covers the stages from data collection to transformation in Power BI.

3.1.1 Data Collection

The data is manually extracted from LinkedIn using the export feature available on the platform.

The relevant data includes:

- **Total Connections:** The number of LinkedIn connections.
- **Companies Followed:** The list of companies the user is following.
- **Invitations Sent/Received:** The count of invitations sent and received.
- **Reactions on Posts:** Reactions like likes, comments, and shares on posts.

The data is exported in **CSV** or **Excel** format and then processed for further use.

3.1.2 Data Processing and Transformation

Once the data is collected, it is imported into **Power BI** and transformed for analysis. The **Power Query** tool in Power BI is used for this:

- **Data Cleaning:** Removing duplicates, correcting inconsistencies, and handling missing values.
- **Data Transformation:** Creating calculated columns for key metrics such as:
 - **Month-over-Month Growth** for connections.
 - **Total Connections by Position** and **Total Connections by Company**.
 - **Reactions by Type** (like, comment, share).

These transformations help structure the data for meaningful analysis and ensure accuracy in visualizations.

3.1.3 Data Analysis Expressions (DAX)

In Power BI, **DAX (Data Analysis Expressions)** is used to perform advanced calculations:

- **Month-over-Month Growth:** Measures the growth in connections or reactions over time.
- **Reactions Breakdown:** Categorizes reactions into likes, comments, and shares.
- **Total Connections:** Aggregates connections by position or company.

```
Invitations Received = COUNTROWS(FILTER(ALL(Invitations), Invitations[Direction]="Incoming"))
```

```
Invitations Sent = COUNTROWS(FILTER(ALL(Invitations), Invitations[Direction]="Outgoing"))
```

```
Total Companies = DISTINCTCOUNT(Connections[Company])
```

```
Total Connections = COUNT(Connections[First Name])
```

```
Total Reactions = COUNT(Reactions[Type])
```

```
1 Dates =  
2 VAR MinDate = YEAR(MIN(Connections[Date]))  
3 VAR MaxDate = YEAR(MAX(Connections[Date]))  
4 RETURN  
5 ADDCOLUMNS(  
6     FILTER(  
7         CALENDARAUTO(),  
8         AND(YEAR([Date])>=MinDate, YEAR([Date])<=MaxDate)  
9     ),  
10    "Year", FORMAT([Date], "yyyy"),  
11    "Month Name", FORMAT([Date], "mmm"),  
12    "Month Number", MONTH([Date]),  
13    "Weekday", FORMAT([Date], "dddd"),  
14    "Weekday Number", WEEKDAY([Date]),  
15    "Year Month", FORMAT([Date], "mmm yy"),  
16    "Quarter", "Q" & TRUNC((MONTH([Date])-1)/3)+1  
17 )
```

Fig. 3.1 DAX Functions

These calculations are displayed as KPIs or metrics in the dashboard, providing insightful information on user LinkedIn activity.

3.2 Frontend Implementation

The frontend of the LinkedIn Analytics dashboard focuses on the design and visualization of data. This section describes the creation of the user interface and interactive elements in Power BI.

3.2.1 Dashboard Design

The main objective is to provide an interactive and visually appealing interface that presents LinkedIn activity data clearly. Key elements of the frontend include:

- **Visualizations:** The dashboard uses various visual elements like bar charts, line graphs, and pie charts to represent data such as total connections, reactions by type, and growth trends.
- **KPIs:** Key performance indicators (KPIs) highlight important metrics like the total number of connections, invitations sent/received, and engagement (reactions).
- **Charts:**
 - **Bar charts** show connections by company or position.
 - **Line graphs** display trends like MoM growth.
 - **Pie charts** visualize the breakdown of reactions (likes, comments, shares).

3.2.2 Interactivity and User Filters

One of the key features of the frontend is user interactivity. The dashboard allows users to filter data based on their preferences:

- **Slicers:** Users can filter data by **year**, **position**, or **company** to focus on specific subsets of data.
- **Drill-Down Functionality:** Clicking on visual elements (e.g., company or position) enables users to see detailed data.
- **Mobile Optimization:** The dashboard is made mobile-responsive, ensuring the interface adjusts to various screen sizes while maintaining usability on smartphones and tablets.

3.2.3 User Experience (UX)

The frontend is designed with a focus on ease of use. A clean, simple interface ensures that users

can quickly interpret data. The use of color coding and clear labels helps in navigating the dashboard. Tooltips and hover-over effects provide additional context for users.

3.3 Database Implementation

In this LinkedIn Analytics Dashboard project, the **data management** is handled primarily through **Power BI** using **CSV/Excel files** exported manually from LinkedIn. These files contain data about user connections, companies followed, invitations sent/received, and reactions. Below is an overview of the database implementation.

3.3.1 Data Sources

The data is exported manually from LinkedIn into **CSV** or **Excel** files containing:

- **User Connections:** Details about connections.
- **Companies Followed:** Companies the user is following.
- **Invitations Sent/Received:** Information on invitations.
- **Reactions:** User reactions (like, comment, share).

3.3.2 Power BI Integration

The exported files are imported into **Power BI** where the following steps occur:

- **Import Data:** Files are loaded into Power BI.
- **Data Cleaning:** Using **Power Query Editor**, duplicate entries are removed, and null values are handled.
- **Data Transformation:** Key metrics such as **month-over-month growth**, **total connections by company**, and **reactions breakdown** are calculated using **DAX** functions.

3.3.3 Data Model in Power BI

The data from the files is structured into tables, and relationships are created in Power BI to connect the data:

- **Connections Table:** Stores details about connections.
- **Companies Table:** Contains data about companies followed.

- **Invitations Table:** Tracks invitations sent and received.
- **Reactions Table:** Captures user reactions to posts.

Relationships are established based on **UserID** and **ConnectionID**, allowing seamless analysis across tables.

3.3.4 Limitations

The current system relies on **manual data export** and refresh, which may result in:

- **Human Error:** Inconsistent or missing data during export.
- **Delays:** The need for manual updates can lead to outdated information.
- **Scalability Issues:** As the dataset grows, managing large files in Power BI may become inefficient.

3.3.5 Conclusion

The current database implementation in Power BI is functional for visualizing LinkedIn data. However, manual data extraction and updates pose challenges for real-time insights and scalability. Future improvements could include automating data extraction and integrating directly with LinkedIn APIs.

Chapter 4

Testing

Testing is a critical phase of the LinkedIn Analytics Dashboard project, ensuring that the system functions as intended, meets the requirements, and provides accurate insights. This chapter focuses on the testing methods used to validate the system's data, functionality, and user interface.

4.1 Types of Testing

4.1.1 Functional Testing

Functional testing verifies that the core features of the LinkedIn Analytics Dashboard work as expected. This includes checking that the data is loaded correctly, metrics are calculated accurately, and visualizations are responsive.

Key Functional Test Scenarios:

- Importing CSV/Excel files without errors.
- Correct calculation of key metrics (e.g., total connections, reactions, month-over-month growth).
- Proper data aggregation by company, position, and reaction type.
- User interface elements (like slicers) respond to inputs correctly.

4.1.2 Integration Testing

Integration testing ensures that the different components of the system, such as data import, transformation, and visualization, work together seamlessly.

Key Integration Test Scenarios:

- Data import from CSV/Excel files into Power BI is smooth.
- Relationships between data tables (e.g., Users, Connections) are working as expected.
- Metrics (e.g., total connections by position) are computed accurately when data is linked across tables.
- Dashboards update dynamically when slicers or filters are applied.

4.1.3 User Interface Testing

UI testing ensures that the Power BI dashboard is user-friendly, intuitive, and visually appealing. This includes verifying that the dashboard layout is consistent and that key insights are easily accessible.

Key UI Test Scenarios:

- All key metrics (e.g., total connections, invitations) are displayed clearly.
- Filters and slicers are functional and responsive.
- Mobile view is optimized and correctly displayed on different screen sizes.
- Data visualizations (charts, tables) are clear, labeled, and easy to understand.

4.1.4 Performance Testing

Performance testing ensures that the system performs well under expected usage, especially when handling larger datasets.

Key Performance Test Scenarios:

- The dashboard loads within an acceptable time frame (e.g., within 5 seconds).
- Large datasets (e.g., many months of data) do not cause slowdowns or errors.
- Interactions with slicers and filters (e.g., selecting year, reaction type) remain responsive

4.2 Testing Environment

4.2.1 Hardware Setup

4.2.1.1 User Machines

- **Processor:** Intel i5 or higher (recommended Intel i7).
- **RAM:** Minimum 8 GB (recommended 16 GB).
- **Storage:** At least 10 GB free space (SSD preferred).
- **Display:** Full HD (1920x1080) or higher.

4.2.1.2 Power BI Mobile App

- **Mobile Devices:** iPhone 6s or later, Android 6.0 or higher.

- **RAM:** 2 GB minimum.
- **Storage:** 500 MB free space.

4.2.1.3 Power BI Service (Cloud-Based)

- **Internet Speed:** 10 Mbps download / 5 Mbps upload.

4.2.2 Software Setup

- **Power BI Desktop:** Latest version for data import, transformation, and visualization.
- **Power BI Service:** For cloud-based sharing and collaboration.
- **Mobile App:** For mobile access.
- **Excel/CSV Files:** For data import.

4.2.3 Operating System:

- **Power BI Desktop:** Windows 10 or later.
- **Power BI Service:** Accessible via web browsers.
- **Mobile App:** iOS 11+ or Android 6.0+

4.2.4 Browser: Recommended browsers for Power BI Service:

- Google Chrome, Microsoft Edge, Mozilla Firefox, and Safari (latest versions).

4.3 Conclusion

This setup ensures optimal performance for the LinkedIn Analytics Dashboard, with smooth data processing, visualization, and access across devices.

Chapter 5

Results and Discussion

The **LinkedIn Analytics Dashboard** developed in this project aimed to provide a comprehensive view of LinkedIn activity by visualizing key metrics such as connections, companies followed, invitations sent and received, and engagement (e.g., reactions). The system incorporated data extraction, transformation, and visualization tools such as **Power BI Desktop** for analysis and **Power BI Service** for sharing reports.

5.1 Results

- 1) **Card Visual:** The card visual in this Power BI dashboard is used effectively to highlight key LinkedIn metrics for data analysis. It displays essential insights such as the **total number of connections, companies followed, invitations received and sent, and reactions given**. This setup ensures quick and clear access to important KPIs, enabling users to grasp performance and engagement trends at a glance.



Fig. 5.1 Card Visuals

- 2) **Area Chart:** The **area chart** in the Power BI dashboard effectively visualizes **Month-over-Month (MoM) growth** trends. By using a filled area under the line, it highlights the magnitude of changes over time, making it easy to observe fluctuations in growth rates. This visual is particularly useful for identifying seasonal patterns, upward or downward trends, and growth stability at a glance.

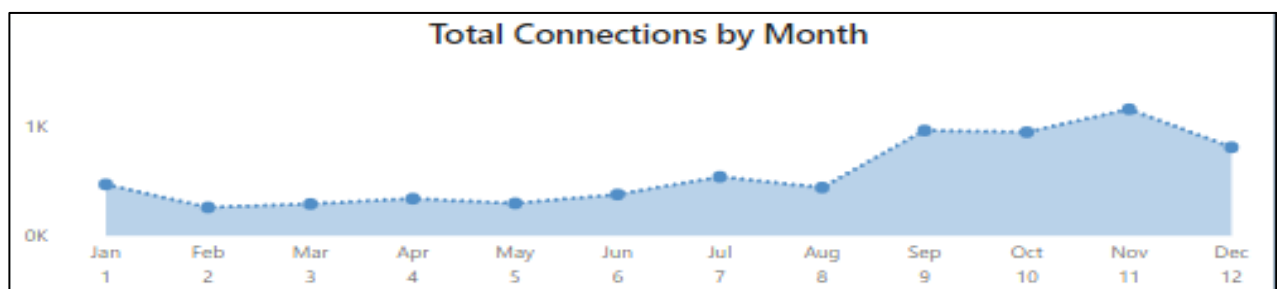


Fig. 5.2 Area Chart

- 3) **Stacked Bar Chart:** The **stacked bar chart** in this Power BI dashboard presents the **total connections categorized by company**, providing a clear breakdown of how connections are distributed across various organizations. This visualization allows for easy comparison of connection volumes while also showcasing the contribution of individual companies within the overall total. It's ideal for analyzing networking reach and engagement across different professional affiliations.

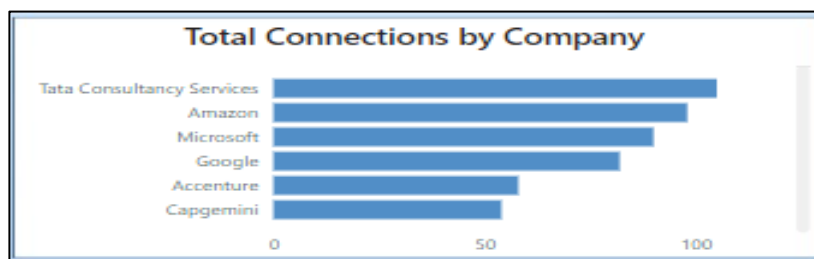


Fig. 5.3 Stacked Bar Chart

- 4) **Stacked Column Chart:** The **stacked column chart** in this Power BI dashboard visualizes the **total reactions given, categorized by type** (e.g., likes, comments, shares). This chart provides a clear comparison of reaction types, highlighting user engagement patterns. The stacking feature allows for an intuitive understanding of the proportional distribution of each reaction type while differentiating between actions initiated by the user versus responses from others.

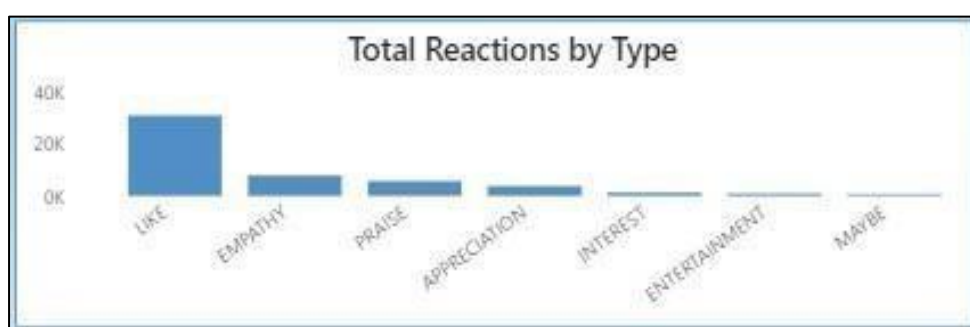


Fig. 5.4 Stacked Column Chart

- 5) **WordCloud 2.3.4:** The **WordCloud (2.3.4.0)** visual in this Power BI dashboard creatively represents the **total connections categorized by position**. Larger font sizes correspond to positions with higher connection counts, making it easy to identify the most frequent roles or job titles within the network. This visual is particularly effective for showcasing the dominance of specific

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Fig. 5.5 WordCloud 2.3.4.0

- 6) **Slicer:** The **slicer** in this Power BI dashboard provides an interactive filter for the years **2022**, **2023**, and **2024**. This allows users to dynamically focus on specific time periods, enabling a detailed view of metrics such as connections, reactions, or growth trends for the selected year. The slicer enhances the dashboard's interactivity, making it easier to analyze and compare data across different years.

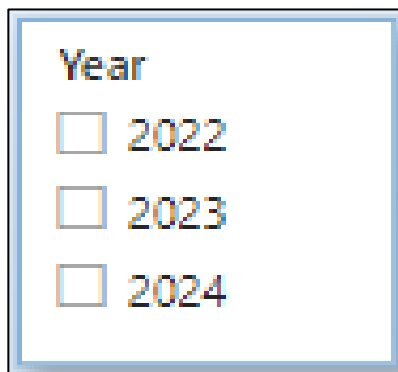


Fig. 5.6 Slicer

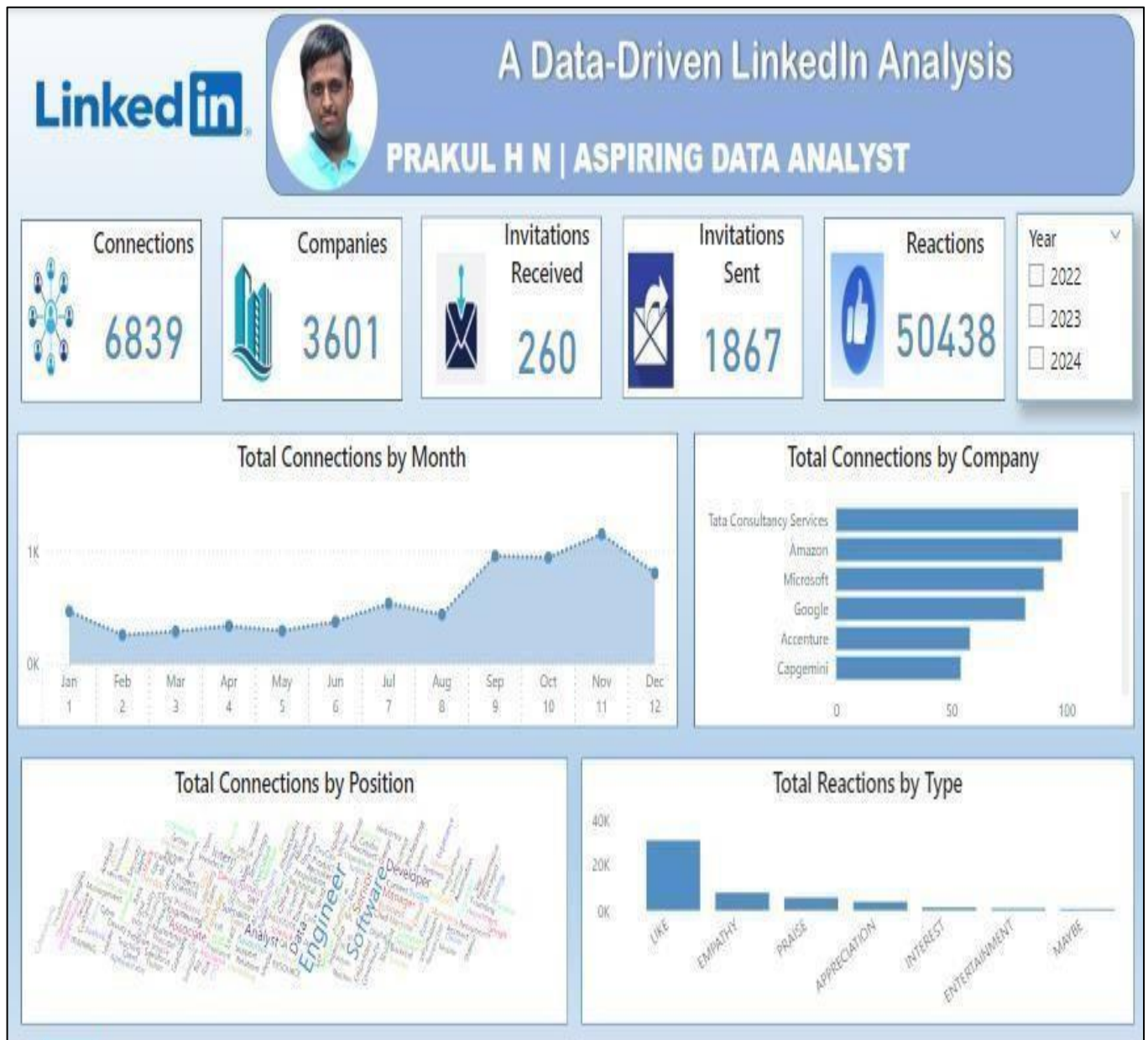


Fig. 5.7 LinkedIn Analysis Dashboard (Power BI Desktop View)

Embed Report:

```
<iframe title="LinkedIn Analytics" width="600" height="373.5"
src="https://app.powerbi.com/view?r=eyJrIjoibG9jYzOTc3YTYtZDgyMi00NzFkLTk2NzAtNT
M5OGVjM2MyODNhIiwidCI6ImI3MzM3ODVhLTZhNmYtNGY3My04MWJiLTBjMzRiO
WE1MmVkOSJ9" frameborder="0" allowFullScreen="true"></iframe>
```

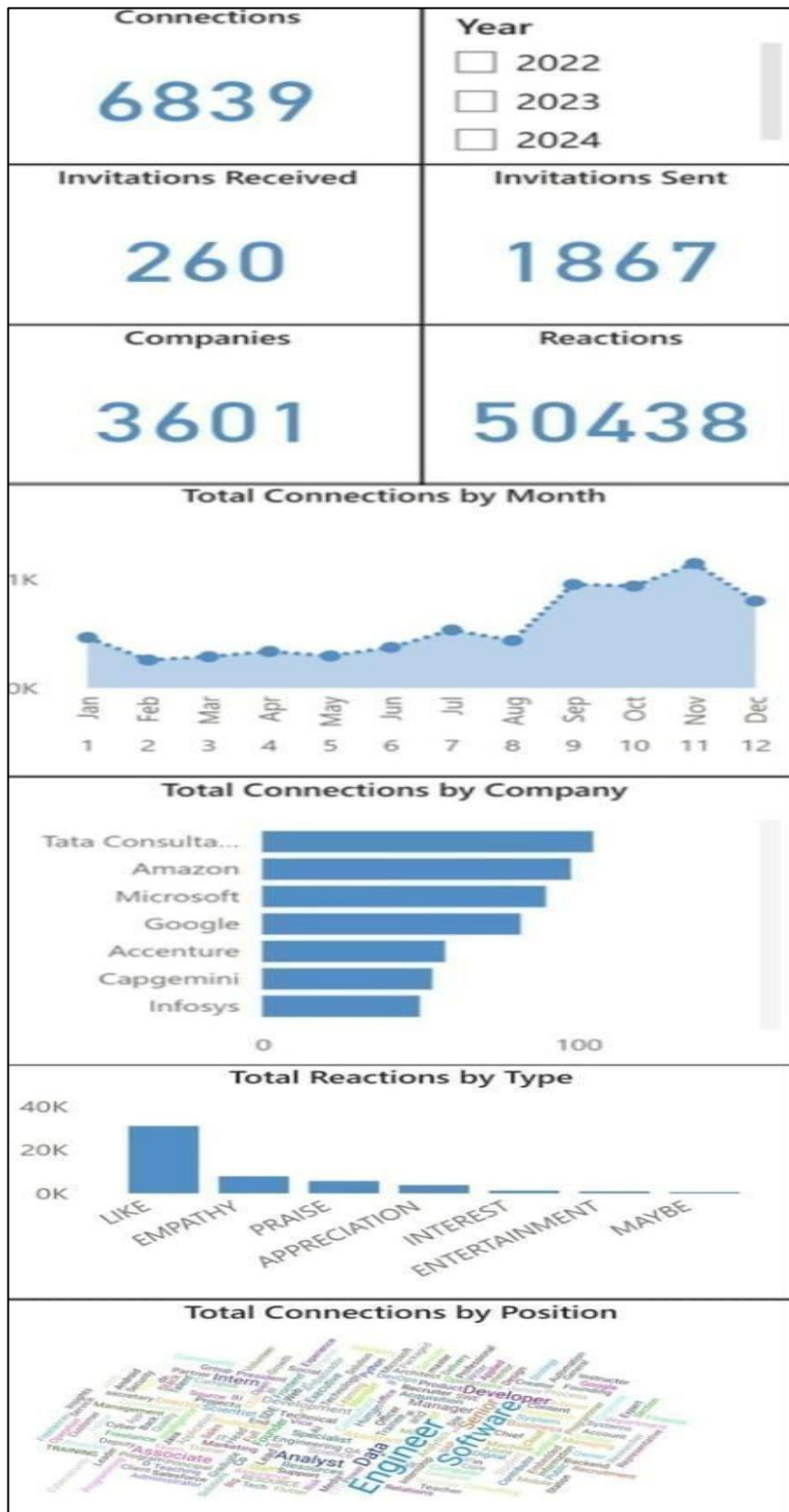



Fig. 5.8 LinkedIn Analysis Dashboard (Power BI Mobile Layout)

5.2 Discussion

5.2.1 Effectiveness

- **Data Visualization:** The dashboard provides clear and interactive charts for tracking key metrics like total connections, MoM growth, and engagement by position/company. This makes it easy for users to assess their LinkedIn activity and identify trends.
- **Mobile Accessibility:** The **Power BI Mobile App** enables users to access the dashboard on the go, providing flexibility and ensuring users can stay updated anywhere.
- **Actionable Insights:** Key insights, such as **growth patterns** and **engagement trends**, help users optimize their LinkedIn strategy and improve networking.
- **Ease of Use:** The system is user-friendly, allowing both tech-savvy and non-tech users to navigate and interpret the data with ease.

5.2.2 Reliability

- **Data Accuracy:** The manual data extraction process limits the dashboard's accuracy. Automating data syncing via LinkedIn's API would improve reliability and ensure up-to-date data.
- **System Stability:** The system performs well, handling large datasets and providing consistent results without performance issues.
- **Scalability:** Manual data imports may limit scalability as data volume grows. Automating the process would address this limitation and support more extensive datasets.
- **Data Privacy and Security:** Ensuring proper security measures, such as encryption and authentication, is crucial for maintaining the reliability and privacy of the system.

Chapter 6

Conclusion and Future Enhancements

6.1 Conclusion

- The **LinkedIn Analytics Dashboard** developed using **Power BI** effectively tracks key LinkedIn activity metrics, such as connections, companies followed, invitations sent and received, and engagement patterns. The dashboard provides valuable insights into professional networking trends, making it an essential tool for users looking to optimize their LinkedIn strategies.
- The **mobile accessibility** of the dashboard further enhances its usability, allowing users to stay connected and monitor their growth on the go. However, the **manual data extraction** process limits the system's timeliness and accuracy. Moving forward, automating data imports through **LinkedIn's API** would significantly improve the reliability and scalability of the system.
- Despite these challenges, the dashboard proves to be a highly effective tool for visualizing LinkedIn performance and offering actionable insights. Future improvements, such as data granularity enhancements and strengthened security measures, would further elevate the overall functionality and user experience of the system.

6.2 Future Enhancements

To improve the **LinkedIn Analytics Dashboard** and provide users with even more value, the following future enhancements are recommended:

1. Automated Data Extraction
2. Granular Data Analysis
3. Predictive Analytics
4. Enhanced User Interface (UI) and User Experience (UX)
5. Advanced Security Features
6. Cross-Platform Integration
7. Custom Reporting and Alerts

REFERENCES

1. Power BI Service, YEAR: 2024, <https://learn.microsoft.com/en-us/power-bi/consumer/end-user-sign-in>
2. Power BI Desktop, YEAR: 2024, <https://www.microsoft.com/en-us/download/details.aspx?id=58494>
3. IPL Data Analysis and Visualization Using Microsoft Power BI Tool, YEAR: 2023, JULY, <https://ieeexplore.ieee.org/document/10306783>
4. LinkedIn Analytics in Power BI, YEAR: 2021, https://youtu.be/btP41Yn9_EU?si=UPUa1Tc68QniVedI
5. Human Resource Analytics using Power Bi Visualization Tool, YEAR: 2020, MAY, <https://ieeexplore.ieee.org/document/9120897>
6. ChatGPT, <https://chatgpt.com/share/675ecd56-46d4-800a-9729-6240c2b8f3c0>
<https://chatgpt.com/share/676834f2-249c-800a-a2d1-3320a992cec4>