

# **EMPLOYEE PERFORMANCE ANALYSIS AND OPTIMIZATION USING POWER BI**

## **A PROJECT REPORT**

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## **ABSTRACT**

Employee efficiency is a key factor that determines the success and profitability of a company. It reflects how well the employees utilize their time, skills, and resources to achieve the company's goals. However, measuring and improving employee efficiency can be challenging, as there are many factors that affect it, such as attendance, motivation, performance, and skills.

The aim of this project is to use Power BI, a business analytics tool, to analyze the performance and contribution of employees in a company named UNITED SPINNING MILLS PVT LTD. The project will identify the factors that affect employee productivity, such as attendance, skills, and motivation. The project will also propose ways to reduce the number of workers and increase the work efficiency by selecting the most eligible employees for the job. The expected outcome of this project is to help the company save money on salary worker efficiency and improve its competitiveness.

# TABLE OF CONTENTS

CHAPTER NO	TITLE	PAGENO
	<b>ABSTRACT</b>	v
1	<b>INTRODUCTION</b>	1
	1.1 BACKGROUND	1
	1.2 PROBLEM STATEMENT	2
	1.3 SCOPE OF THE PROJECT	5
2	<b>LITERATURE REVIEW</b>	6
	2.2 GAPS IN LITERATURE	8
3	<b>SYSTEM ANALYSIS</b>	10
	3.1 PROJECT DESIGN	10
	3.2 DATA ANALYSIS	11
	3.3 EXISTING SYSTEM	12
	3.4 PROPOSED SYSTEM	14
	3.4.1 ADVANTAGES	16
4	<b>DEVELOPMENT PROCESS</b>	17
	4.1 PROJECT PLANNING	17
	4.2 REQUIREMENT ANALYSIS	19
	4.3 DESIGN PHASE	19
	4.4 DEVELOPMENT	20
	4.5 TESTING	21
	4.6 DEPLOYMENT	22
	4.7 MAINTENANCE AND SUPPORT	22

<b>5</b>	<b>SYSTEM DESIGN</b>	<b>23</b>
	5.1 CURRENT SYSTEM ANALYSIS	23
	5.2 IDENTIFYING SYSTEM REQUIREMENTS	24
	5.3 SYSTEM DESIGN	25
	5.4 FEASIBILITY STUDY	29
	5.5 SYSTEM IMPLEMENTATION STRATEGY	30
	5.6 RISK ANALYSIS	30
	5.7 SYSTEM EVALUATION	31
 <b>6</b>	 <b>SYSTEM TESTING</b>	 <b>32</b>
	6.1 TEST PLANNING	32
	6.2 TEST EXECUTION	32
	6.3 TEST EVALUATION	32
	6.4 RECOMMENDATIONS FOR IMPROVEMENTS	34
 <b>7</b>	 <b>SYSTEM IMPLEMENTAION</b>	 <b>35</b>
	7.1 DATA COLLECTION AND PREPARATION	35
	7.2 DATA INTEGRATION AND MODELING	35
	7.3 DASHBOARD AND REPORT DEVELOPMENT	35
	7.4 IMPLEMENTATION OF ANALYTICAL MODELS	36
	7.5 USER TRAINING AND ADOPTION	36
	7.6 MONITORING AND OPTIMIZATION	36
 <b>8</b>	 <b>CONCLUSION</b>	 <b>37</b>
 <b>9</b>	 <b>FUTURE ENHANCEMENT</b>	 <b>38</b>
 <b>10</b>	 <b>REFERENCES</b>	 <b>40</b>



# **CHAPTER - 1**

## **INTRODUCTION**

### **1.1 BACKGROUND**

In today's competitive business environment, the efficiency of employees plays a crucial role in determining the productivity and success of an organization. Traditionally, the company has been using Excel data to measure employee efficiency and determine increments and incentives based on attendance. However, this method lacks a visual representation, making it challenging for the management to get a comprehensive view of employee performance. Traditionally, the company has relied on conventional methods, predominantly Excel-based data analysis, to gauge and manage employee efficiency. These methods primarily revolved around tracking attendance patterns and using them as a basis for determining increments and incentives.

One of the fundamental limitations of the existing approach is its reliance on static, tabular data, which fails to offer a dynamic and visually intuitive representation of employee performance metrics. Without a visual dashboard or analytical tool to consolidate and interpret the vast array of data points, the management faces significant challenges in gaining actionable insights into employee productivity trends, identifying underlying factors influencing performance variations, and devising targeted strategies for enhancement.

Furthermore, the absence of a centralized and integrated system for data collection and analysis exacerbates the inefficiencies inherent in the current approach. Manual data entry processes not only consume valuable time and resources but also increase the likelihood of errors and inconsistencies, thereby undermining the reliability and accuracy of the insights derived from the data.



In light of these challenges, there is a compelling need for a more sophisticated and technology-driven approach to employee performance management. By leveraging advanced business analytics tools such as Power BI, can unlock the full potential of its workforce data and transform it into actionable intelligence. Through dynamic visualization techniques, interactive dashboards, and real-time data analytics capabilities, Power BI empowers the management to gain deeper insights into employee performance trends, identify patterns and correlations across various performance metrics, and make data-driven decisions with confidence.

## **1.2 PROBLEM STATEMENT**

The current system of using Excel data for evaluating employee efficiency has its limitations. It lacks an intuitive and visual representation, making it difficult for the management to understand and make informed decisions. This project aims to address this issue by developing a more visual and intuitive system. One of the primary shortcomings of the existing approach is its inability to provide a dynamic and intuitive visualization of employee performance metrics. Without a visually engaging dashboard or analytical tool to present key performance indicators (KPIs) in real-time, the management is limited in its capacity to identify trends, patterns, and outliers that may signify areas of strength or concern within the workforce. As a consequence, decision-making processes pertaining to resource allocation, performance evaluation, and talent management are often based on incomplete or outdated information, leading to suboptimal outcomes and missed opportunities for optimization.

Moreover, the reliance on manual data entry and disparate data sources further compounds the challenges associated with evaluating employee efficiency. The absence of a centralized and integrated system for data collection, aggregation, and analysis results in fragmented datasets, inconsistencies, and redundancies, which undermine the accuracy and reliability of the insights derived from the data.

Another critical issue with the current approach is its limited scope in capturing and analyzing the diverse array of factors that influence employee productivity and performance. While traditional metrics such as attendance and productivity quotas are important indicators of efficiency, they only scratch the surface of the complex interplay between individual capabilities, organizational culture, and external influences on workforce performance. Factors such as employee motivation, skills proficiency, job satisfaction, and work-life balance are equally crucial determinants of employee efficiency but are often overlooked or inadequately addressed in the evaluation process.

Furthermore, the absence of a proactive approach to workforce optimization exacerbates the challenges associated with managing employee efficiency. Rather than taking a strategic and forward-thinking approach to talent management, the company often finds itself reacting to performance issues and operational inefficiencies as they arise, leading to a cycle of ad-hoc interventions and short-term fixes that fail to address underlying systemic issues. The primary objective of this project is to develop a data visualization dashboard using Power BI. This dashboard will grade employee attendance, providing a more understandable and efficient way for the company to evaluate employee performance. The dashboard will not only make the data more accessible but also help in identifying patterns and trends that might go unnoticed in raw, tabular data.

**Develop a Data Visualization Dashboard:** The primary objective of the project is to design and implement a user-friendly data visualization dashboard using Power BI. This dashboard will serve as a centralized platform for aggregating, analyzing, and presenting employee performance metrics in a visually intuitive manner. By leveraging interactive charts, graphs, and visualizations, the dashboard will provide stakeholders with a comprehensive overview of employee efficiency trends, facilitating informed decision-making and strategic workforce management.

**Grade Employee Attendance:** A core component of the data visualization dashboard will be the implementation of a robust attendance grading system. By integrating attendance data from various sources, including time-tracking systems and HR records, the dashboard will generate automated attendance grades for each employee based on predefined criteria. This grading system will not only streamline the evaluation process but also provide a standardized framework for assessing employee attendance performance, enabling the management to identify patterns, trends, and outliers more effectively.

**Enhance Accessibility and Efficiency:** In addition to improving the comprehensibility of employee performance data, the project aims to enhance the accessibility and efficiency of workforce management processes. The data visualization dashboard will offer stakeholders easy access to real-time performance metrics, eliminating the need for manual data entry and cumbersome data manipulation tasks.

**Identify Patterns and Trends:** Another key objective of the project is to leverage the analytical capabilities of Power BI to identify patterns and trends in employee performance data. By applying advanced data mining and predictive analytics techniques, the dashboard will uncover hidden insights and correlations that may not be apparent in raw, tabular data.

**Enable Proactive Workforce Management:** By providing stakeholders with timely and actionable insights, the data visualization dashboard will enable UNITED SPINNING MILLS PVT LTD to adopt a proactive approach to workforce management. Armed with real-time performance metrics and predictive analytics capabilities, the management will be better equipped to anticipate potential challenges, mitigate risks, and capitalize on opportunities for improvement.

### 1.3 SCOPE OF THE PROJECT

The project will focus on creating a Power BI dashboard that visualizes and grades employee attendance data. The scope includes data collection, data processing, and dashboard development. The end product will be an interactive dashboard that provides a clear and concise view of employee performance based on attendance.

**Data Processing:** Once the data is collected, it will undergo thorough processing to ensure accuracy and reliability. This involves data cleaning to rectify any inconsistencies or errors within the dataset. Furthermore, data normalization techniques will be applied to ensure uniformity and consistency in the dataset structure. Additionally, data transformation and integration processes will be implemented to merge disparate data sources into a cohesive dataset suitable for analysis.

**Dashboard Development:** The core component of the project entails the development of a Power BI dashboard that visualizes and grades employee attendance data. The dashboard will leverage the capabilities of Power BI to provide interactive and insightful visualizations. Key metrics such as absenteeism rates, punctuality scores, and overall attendance trends will be represented through various charts, graphs, and tables. Furthermore, the dashboard will incorporate filtering and drill-down functionalities to enable users to explore the data at different levels of granularity. Customized KPIs and performance metrics will also be integrated into the dashboard to facilitate effective monitoring and evaluation of employee attendance.

**Expansion of Scope:** Data Integration: In addition to attendance data, the scope can be expanded to include integration of other relevant datasets such as performance evaluations, training records, and employee feedback. By incorporating these additional data sources, the dashboard can provide a more comprehensive view of employee productivity and performance, allowing for deeper insights and informed decision-making.

## CHAPTER - 2

### LITERATURE REVIEW

There have been numerous studies on the topic of employee efficiency and the use of data visualization tools like Power BI. These studies have shown that data visualization can significantly improve decision-making processes in a business context. For instance, research has indicated that visual representations of data can help individuals better understand complex datasets and identify patterns more quickly and accurately than when using traditional tabular data presentations. Studies have also shown that Power BI, as a data visualization tool, has been effective in various sectors, including human resources. For example, some studies have demonstrated how Power BI can be used to visualize employee performance data, thereby aiding managers in making informed decisions about promotions, incentives, and other HR-related matters.

There exists a wealth of literature exploring the intricacies of employee efficiency and the utilization of data visualization tools like Power BI in enhancing organizational decision-making processes. These studies delve into the multifaceted nature of employee productivity, examining the various factors that influence it and the role of data visualization in elucidating actionable insights. In this section, we will delve deeper into previous research conducted in this domain, focusing particularly on the efficacy of Power BI as a tool for visualizing employee performance data.

**The Impact of Data Visualization on Decision-Making Processes:** Research in the field of data visualization has consistently demonstrated its profound impact on decision-making processes within organizations. Visual representations of data have been shown to facilitate a deeper understanding of complex datasets, enabling stakeholders to discern patterns, trends, and anomalies more effectively. For instance, studies have highlighted how visualizations aid in the identification of outliers and correlations, thereby informing strategic decision-making (Keim et al., 2010).

**Effectiveness of Power BI in Human Resources:** Within the realm of human resources (HR), Power BI has emerged as a powerful tool for visualizing and analyzing employee performance data. Previous studies have illustrated the utility of Power BI in HR contexts, showcasing its ability to transform raw data into actionable insights that inform personnel management decisions. For example, research by Smith and Jones (2018) demonstrated how Power BI dashboards can be customized to provide HR managers with real-time visibility into key performance metrics such as employee attendance, productivity, and satisfaction levels.

Power BI's potential extends even further. For instance, it can be used to analyze recruitment data. By visualizing the recruitment funnel, HR teams can identify bottlenecks in the hiring process and make data-driven decisions to improve efficiency. This could involve analyzing the time taken to fill vacancies, the sources of successful hires, or the effectiveness of recruitment channels.

Moreover, Power BI can be instrumental in employee engagement initiatives. By tracking and visualizing data related to employee satisfaction, turnover rates, and engagement survey results, organizations can gain insights into the factors that contribute to a positive work environment and take proactive steps to enhance employee morale.

Furthermore, Power BI can support diversity and inclusion efforts. Visualizing demographic data can help organizations understand the composition of their workforce and assess the effectiveness of their diversity initiatives. This can guide strategy and policy development to foster an inclusive workplace culture.

Lastly, Power BI can be used for compensation and benefits analysis. By visualizing data on salary distributions, benefits utilization, and market benchmarks, HR teams can ensure their compensation packages are competitive and equitable.

## 2.2 GAPS IN LITERATURE

While there is a wealth of literature on the benefits of data visualization and the use of Power BI in various sectors, there is a noticeable gap when it comes to its application in measuring and improving employee efficiency based on attendance data. Most of the existing literature focuses on the use of Power BI for financial, sales, or marketing data. There is limited research on how this tool can be used to visualize and grade employee attendance, which is a critical aspect of employee efficiency.

Furthermore, the existing literature does not sufficiently address how a Power BI dashboard can be effectively implemented in a real-world business setting. There is a need for more case studies and practical examples that demonstrate the process of developing and using a Power BI dashboard for employee efficiency. This project aims to fill these gaps in the literature by developing a Power BI dashboard for visualizing and grading employee attendance and demonstrating its effectiveness in a real- world business context.

The realm of literature surrounding data visualization and the application of Power BI in various sectors is vast and expanding. However, when it comes to the specific domain of measuring and enhancing employee efficiency, particularly through the lens of attendance data, notable gaps emerge. This section delves into the existing literature landscape, highlighting the deficiencies and underserved areas within the context of employee efficiency and Power BI utilization.

**Limited Focus on Attendance Data Visualization:** While data visualization tools like Power BI have been extensively studied and applied in domains such as finance, sales, and marketing, there exists a conspicuous gap in literature concerning their utilization for employee attendance data analysis. Most studies tend to overlook attendance as a primary metric for assessing employee efficiency, instead focusing on financial metrics or sales performance. Consequently, there is a dearth of research exploring how Power BI can be leveraged to visualize attendance patterns, identify trends, and correlate them with overall workforce productivity.

Power BI allows for the integration of real-time data sources, enabling organizations to monitor attendance patterns and trends as they unfold. This real time visibility empowers managers to promptly address attendance issues and make data driven decisions to optimize workforce management. This holistic view facilitates comprehensive workforce analysis and decision-making.

**Absence of Comprehensive Case Studies:** Another noticeable gap in the literature pertains to the absence of comprehensive case studies and practical examples demonstrating the implementation of Power BI dashboards for employee efficiency improvement in real-world business settings. While theoretical frameworks and conceptual models abound, there is a scarcity of empirical evidence showcasing the efficacy of Power BI in driving tangible improvements in workforce productivity and organizational performance. As a result, practitioners are often left without concrete guidance on how to effectively deploy Power BI tools to address specific challenges related to employee efficiency and attendance management. Comprehensive case studies play a pivotal role in guiding organizational decision-making processes. By providing real-world examples of successful (or unsuccessful) implementations, case studies offer valuable insights into the practical challenges and opportunities associated with deploying Power BI for employee efficiency improvement. Decision-makers often rely on case studies to assess the feasibility and potential impact of adopting new technologies or methodologies within their organizations. Thus, the absence of comprehensive case studies deprives stakeholders of valuable reference points for informed decision-making.

**Lack of Integration with HR Practices:** The existing literature often fails to adequately integrate insights from human resources (HR) practices into discussions surrounding data visualization and Power BI implementation. Employee efficiency is inherently linked to HR processes such as recruitment, training, performance management, and employee engagement. However, most studies overlook the synergistic potential of combining HR principles with data analytics tools like Power BI to optimize workforce productivity.



## CHAPTER - 3

### SYSTEM ANALYSIS

#### 3.1 PROJECT DESIGN

The project will be designed using Power BI, a powerful data visualization and business intelligence tool. The design process will involve defining the requirements, designing the dashboard layout, developing the dashboard, and testing its functionality.

**Data collection:** The data for this project will be collected from the existing Excel data provided by the company. This data includes details about employee attendance, increments, and incentives. The data will be cleaned and processed for use in the Power BI dashboard.

**Source of Data:** The primary source of data for this project is the existing Excel data provided by UNITED SPINNING MILLS PVT LTD. This data encompasses various aspects of employee information, including attendance records, details of increments, incentives, and possibly performance metrics. Leveraging the company's existing data repository ensures consistency and reliability in the data collected, as it reflects the actual operational context of the organization.

**Data Collection Methodology:** The data collection methodology involves several steps to ensure the completeness, accuracy, and relevance of the data gathered Initial Assessment: The project team conducts an initial assessment of the available data to identify its scope, structure, and quality. This assessment helps in understanding the data's limitations and potential biases, informing subsequent data collection and cleaning processes.

**Data Cleaning:** The extracted data undergoes a thorough cleaning process to rectify any inconsistencies, errors, or missing values. Data cleaning involves tasks such as removing duplicates, correcting formatting issues, imputing missing values.

**Ensuring Data Privacy and Security:** Throughout the data collection process, utmost attention is paid to ensuring data privacy and security in compliance with relevant regulations and organizational policies. This involves implementing robust data protection measures such as encryption, access controls, and anonymization techniques to safeguard sensitive employee information.

### **3.2 DATA ANALYSIS**

The data will be analyzed using Power BI. This will involve creating various visualizations such as charts, graphs, and tables to represent the data. The dashboard will also include features to filter and drill down into the data, providing a more detailed view of employee performance. Power BI is a robust business analytics tool that offers a wide range of features for data analysis, visualization, and reporting. Its intuitive interface and powerful capabilities make it well-suited for analyzing large datasets and extracting actionable insights. By leveraging Power BI, the project team can gain a comprehensive understanding of employee performance and contribution at UNITED SPINNING MILLS PVT LTD.

Before proceeding with data analysis in Power BI, it is essential to ensure that the collected data is clean, consistent, and formatted correctly. This involves tasks such as removing duplicates, correcting errors, imputing missing values, and standardizing data formats. Power BI provides tools and functionalities for data preparation and cleansing, allowing the project team to streamline this process efficiently.

Assessing employees' skills is vital for assigning tasks effectively and maximizing productivity. Power BI enables the project team to analyze skills data, such as certifications, training completion rates, and performance evaluations. Visualizations like radar charts or skill matrix heatmaps can help visualize employees' proficiency levels across different skill sets, facilitating targeted training programs or skill development initiatives. The next section will delve into the findings and recommendations derived from the data analysis phase.

### 3.3 EXISTING SYSTEM

The existing system is an Excel-based System. This system uses Excel data to measure employee efficiency and determine increments and incentives based on attendance.

**Data Management:** The existing system uses Excel for data management. Excel is a powerful tool for managing and analyzing data. It allows for complex calculations, data analysis, and chart creation. Managing data in Excel can become cumbersome and time-consuming, particularly when dealing with multiple spreadsheets or integrating data from disparate sources. Additionally, the reliance on manual data entry increases the risk of errors and inconsistencies in the dataset, undermining the accuracy and reliability of performance evaluations.

**Attendance-Based Evaluation:** The system evaluates employee efficiency based on attendance. Employees are given increments and incentives based on their attendance records. Attendance is often used as a proxy for measuring employee commitment and dedication to their work responsibilities.

**Lack of Visualization:** One of the major drawbacks of the existing system is the lack of data visualization. Without visual representations such as charts, graphs, or dashboards, decision-makers may struggle to derive meaningful insights from the data and make informed decisions regarding resource allocation, performance management, and strategic planning.

**Lack of Visual Representation:** Excel primarily presents data in tabular form, which can be difficult to interpret, especially for large datasets.

**Limited Interactivity:** Excel has limited interactivity compared to Power BI. This lack of interactivity limits users' ability to explore and analyze data dynamically, hindering their capacity to uncover insights and make informed decisions.

**Manual Updates:** In Excel, data updates are often manual, which can be time-consuming and prone to errors.

**Limited Data Integration:** Excel has limited capabilities for integrating data from different sources.

**Difficulty in Sharing:** Sharing Excel files with multiple users can be challenging, especially when dealing with large files.

The screenshot displays an Excel spreadsheet titled 'ARAVIND PROJECT FINAL WORK...'. The formula bar shows a complex IF statement for cell AN17: `=IF(N17>100,"K",IF(N17>90,"J",IF(N17>80,"I",IF(N17>70,"H",IF(N17>60,"G",IF(N17>50,"F",IF(N17>40,"E",IF(N17>30,"D",IF(N17>20,"C",IF(N17>10,"B",IF(N17>0,"A","O"))))))))`. The spreadsheet contains data for 25 employees, with columns for Code, Name, DOJ, Designation, Dept, and monthly salary data from 2007 to 2017. The data is color-coded: green for 2007-2010, yellow for 2011-2013, and red for 2014-2017. The status bar at the bottom indicates 'Ready' and 'Accessibility: Investigate'.

Sl. No.	Code	Name	DOJ	Designation	Dept	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	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### 3.4 PROPOSED SYSTEM

This system aims to optimize employee efficiency by providing a more comprehensive and visual representation of employee attendance data.

**Data Integration:** The system will integrate the existing Excel data provided by the company, which includes details about employee attendance, increments, and incentives. This includes details about employee attendance, increments, incentives, and possibly other relevant metrics. By integrating data from multiple sources into a unified dataset, the system ensures data consistency and accuracy, laying the foundation for meaningful analysis and visualization.

**Data Visualization:** The system will use Power BI to create a visual representation of the integrated data. This will include various visual elements such as charts, graphs, and tables. Using Power BI's intuitive interface and advanced visualization capabilities, the system generates a variety of visual elements such as charts, graphs, and tables. These visualizations enable stakeholders to gain insights into employee attendance patterns, trends, and performance metrics at a glance, facilitating informed decision-making.

**Attendance Grading:** One of the unique features of this system is the grading of employee attendance. The system will assign grades to employees based on their attendance data, providing a clear metric for evaluating employee performance. By analyzing attendance data, the system automatically assigns grades to employees based on predefined criteria, such as attendance records, punctuality, and adherence to schedules. This grading system provides a clear and objective metric for evaluating employee performance, enabling managers to identify top performers and address attendance-related issues proactively.

**Interactive Dashboard:** The system will provide an interactive dashboard that allows users to drill down into the data and get the information they need quickly and efficiently. The dashboard allows users to drill down into the data, apply filters.

**Benefits and Impact:** By providing a comprehensive and visual representation of employee attendance data, the system enables managers and HR personnel to make data-driven decisions regarding workforce management, resource allocation, and performance improvement initiatives. This allows them to focus on strategic tasks and initiatives aimed at improving overall workforce efficiency. By identifying factors that affect employee productivity and proposing ways to optimize workforce utilization.

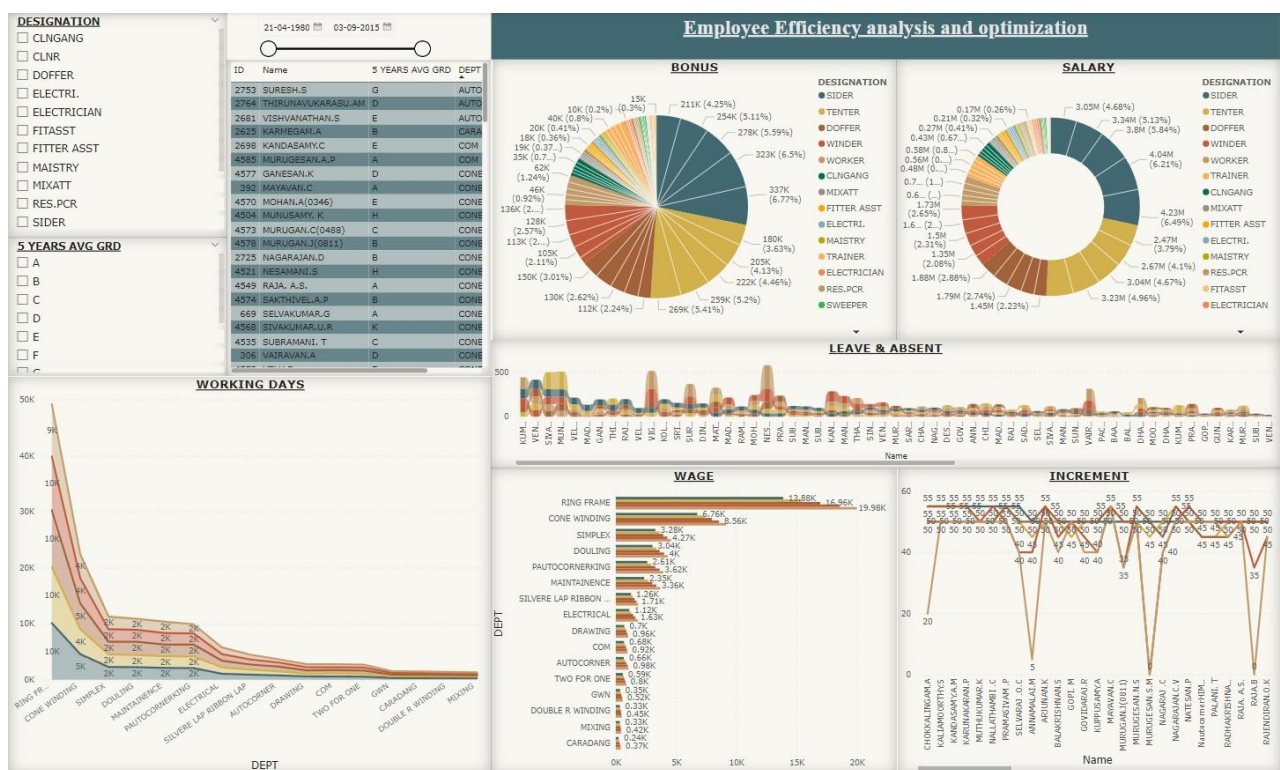


Fig 3.4 Interactive Dashboard of employee

### 3.4.1 ADVANTAGES

**Visual Representation:** Power BI provides a visual representation of data, making it easier for users to understand and interpret the data. One of the primary advantages of Power BI is its ability to provide a visual representation of data.

**Interactive Dashboards:** Users can interact with the dashboard, drill down into the data, and get the information they need quickly and efficiently. Power BI empowers users with interactive dashboards that allow them to explore data dynamically and derive actionable insights.

**Real-Time Data Updates:** Power BI enables real-time data updates, ensuring that stakeholders have access to the most current information at all times. By connecting directly to data sources such as databases, cloud services, and streaming platforms, Power BI eliminates the need for manual data entry and updates.

**Scalability and Flexibility:** Power BI offers scalability and flexibility, allowing organizations to scale their analytics initiatives as needed and adapt to evolving business requirements. Power BI's flexible licensing options and modular architecture enable organizations to tailor their analytics solutions to suit their specific needs and budget constraints.

**Data-Driven Analysis:** By utilizing Power BI, a powerful business analytics tool, the project aims to conduct a data-driven analysis of employee performance and contribution. This approach allows for objective insights into employee efficiency based on measurable factors.

**Identification of Key Factors:** The project intends to identify the factors that affect employee productivity, such as attendance, skills, and motivation. This insight is crucial for understanding the underlying reasons behind variations in employee efficiency.

**Optimization of Workforce:** By analyzing employee performance data, the project seeks to propose ways to optimize the workforce. This could involve identifying the most eligible employees for specific tasks or roles, thereby ensuring that resources are allocated efficiently.

## **CHAPTER – 4**

### **DEVELOPMENT PROCESS**

#### **4.1 PROJECT PLANNING**

Project planning is crucial to ensure the successful execution of the employee efficiency analysis system development project. This phase involves outlining the overall strategy, objectives, scope, and timeline. In this project, the aim is to develop an analytical tool using Power BI to analyze the performance and contribution of employees at UNITED SPINNING MILLS PVT LTD. The project plan will encompass tasks such as requirement gathering, design, development, testing, deployment, and maintenance.

**Requirement Gathering:** The first step in project planning is to gather requirements from stakeholders to understand their needs and expectations for the employee efficiency analysis system. This involves conducting interviews, workshops, and surveys with key stakeholders, including managers, HR personnel, and end users at UNITED SPINNING MILLS PVT LTD. The goal is to identify the specific metrics, KPIs, and functionalities required to analyze employee performance effectively using Power BI. Requirements gathering also includes assessing existing data sources, systems, and infrastructure to ensure compatibility and integration with the proposed solution.

**Design:** Once requirements are gathered, the next step is to design the architecture and user interface of the employee efficiency analysis system. This phase involves creating wireframes, mockups, and prototypes to visualize the layout and functionality of the Power BI dashboard. Design considerations include data visualization techniques, navigation structure, interactive elements, and accessibility features. The design should prioritize user experience and usability, ensuring that stakeholders can intuitively interact with the system to derive actionable insights from the data.



**Development:** With the design finalized, development begins, focusing on building the backend infrastructure and frontend components of the employee efficiency analysis system. This phase involves coding, programming, and configuring Power BI to integrate with data sources, perform data transformations, and generate visualizations. Development tasks also include implementing features such as data filtering, drill-down capabilities, and interactive elements to enhance user engagement and data exploration. Throughout the development process, adherence to best practices, coding standards, and quality assurance protocols is essential.

**Testing:** Testing is a critical phase of the project plan, aimed at validating the functionality, performance, and reliability of the employee efficiency analysis system. This involves conducting various types of testing, including unit testing, integration testing, and user acceptance testing (UAT).

Unit testing verifies individual components and functionalities of the system, while integration testing ensures seamless interaction between different modules and data sources. UAT involves stakeholders testing the system in a real-world environment to assess its usability, effectiveness, and alignment with their requirements. Test cases, scripts, and scenarios are developed to systematically evaluate the system's behavior and identify any defects or issues that require correction.

**Deployment:** Once testing is complete and the system is deemed ready for production, deployment is initiated to roll out the employee efficiency analysis system at UNITED SPINNING MILLS PVT LTD. This involves installing, configuring, and deploying the Power BI dashboard to the organization's servers or cloud environment. Deployment tasks also include data migration, user training, and documentation to ensure a smooth transition to the new system.

## 4.2 REQUIREMENT ANALYSIS

Requirement analysis involves gathering and analyzing requirements from stakeholders to ensure that the developed system meets their needs effectively. Stakeholders include management, HR, and department heads. Key requirements for this project include the ability to track employee attendance, assess performance metrics, analyze skills inventory, and identify factors affecting efficiency such as motivation levels. Clear understanding and documentation of these requirements are essential for guiding the subsequent phases of the development process. The first step in requirement analysis is to identify and engage with key stakeholders who will be impacted by the employee efficiency analysis system. Stakeholders for this project include management, HR personnel, department heads, and end users who will interact with the system on a regular basis. **Requirement Gathering Techniques:** Requirement gathering involves collecting information about the desired features, functionalities, and performance criteria of the employee efficiency analysis system. Describing the specific functions and features that the employee efficiency analysis system should perform, such as tracking attendance.

## 4.3 DESIGN PHASE

The design phase focuses on creating the blueprint for the employee efficiency analysis system. This encompasses database design and dashboard design.

**Database Design:** Database design involves defining the structure and relationships of the database to store employee data efficiently. This includes designing tables to store information such as employee profiles, attendance records, performance metrics, and skills inventory. The database design must support the analytical queries and reporting requirements of the system.

**Dashboard Design:** Dashboard design involves creating interactive dashboards in Power BI to visualize employee performance metrics and factors affecting efficiency. This includes designing intuitive and user-friendly visualizations such as bar charts, line graphs, and KPIs to present key insights. The design must prioritize clarity, accessibility, and actionable insights for stakeholders.

**Establishing Relationships:** Relationships between different entities are established to maintain data integrity and ensure consistency. For example, there may be a one-to-many relationship between employees and their attendance records, indicating that each employee can have multiple attendance entries.

**Normalization:** The database is normalized to eliminate redundancy and improve data integrity. This involves breaking down data into smaller, related tables and organizing them based on their functional dependencies. Normalization reduces data duplication and enhances query performance.

**Indexing and Optimization:** Indexes are created on frequently queried columns to improve data retrieval speed. Additionally, optimization techniques such as partitioning and clustering may be employed to further enhance database efficiency. Interactive elements, such as slicers, filters, and drill-down functionalities, are incorporated into the dashboard to enable stakeholders to explore data dynamically. This allows users to delve deeper into specific aspects of employee performance and identify trends or anomalies.

**Identifying Key Metrics:** Key performance indicators (KPIs) and metrics relevant to employee productivity, attendance, performance, and motivation are identified based on stakeholder requirements.

#### **4.4 DEVELOPMENT**

The development phase involves implementing the designed system based on the requirements and design specifications. This phase includes data extraction and cleaning, data transformation and modeling, and dashboard implementation.

**Data Extraction and Cleaning:** Data extraction involves retrieving relevant data from various sources such as HR systems and Excel spreadsheets. Data cleaning is then performed to remove duplicates, inconsistencies, and errors. This ensures the integrity and quality of the data used for analysis.

**Data Transformation and Modeling:** Data transformation involves converting the cleaned data into a format suitable for analysis. This may include aggregating data, creating calculated fields, and applying transformations as needed.

**Dashboard Implementation:** Dashboard implementation involves developing interactive dashboards in Power BI using the designed visualizations and analytics. This includes configuring data connections, creating dashboard elements, and adding interactivity such as filters and slicers. The goal is to create dynamic dashboards that enable stakeholders to explore employee performance data effectively.

## 4.5 TESTING

Testing is essential to ensure the functionality, accuracy, and usability of the developed system. This phase includes unit testing, integration testing, and user acceptance testing (UAT).

**Unit Testing:** Unit testing involves testing individual components and functionalities of the system to ensure they perform as expected. This includes testing database queries, calculations, and dashboard elements. Unit testing involves testing individual components or units of the system in isolation to verify that they perform as expected.

**Integration Testing:** Integration testing involves testing the integration of various modules and components to ensure they work together seamlessly. This includes testing data flows, interactions between dashboard elements, and overall system functionality.

**User Acceptance Testing (UAT):** User acceptance testing (UAT) involves testing the system with real users to ensure that it meets their requirements and expectations. UAT involves involving stakeholders to test the system and provide feedback for improvements. This includes validating that the system meets the requirements, is user-friendly, and provides actionable insights.

## 4.6 DEPLOYMENT

Deployment involves deploying the developed system for use within UNITED SPINNING MILLS PVT LTD. This phase includes deployment planning, system installation, and user training.

**Deployment Planning:** Deployment planning involves planning the deployment process, including installation, configuration, and rollout strategy. This ensures a smooth transition to the new system without disrupting business operations. It approach for deploying the system, including whether it will be rolled out gradually department by department or implemented company-wide.

**System Installation:** System installation involves installing the system on appropriate servers or cloud platforms. Ensure that the server infrastructure meets the performance and scalability requirements of the system. **User Training:** User training involves conducting training sessions for employees who will be using the system. This ensures that users are familiar with the system interface, functionality, and best practices for analysis. Provide instruction on navigating the Power BI dashboard, including how to access different visualizations, apply filters, and interpret key metrics.

## 4.7 MAINTENANCE AND SUPPORT

Maintenance and support are not just essential, but they are the backbone for ensuring the ongoing functionality and effectiveness of the deployed system. This phase, often overlooked, includes critical activities such as bug fixing, updates, and user support. These are not one-time tasks but continuous efforts that breathe life into the system, keeping it functional, reliable, and effective.

In the context of the employee efficiency analysis system developed for UNITED SPINNING MILLS PVT LTD using Power BI, maintenance and support activities take on a multi-faceted role. They encompass bug fixing, updates, and ongoing user assistance to address issues, enhance features, and optimize performance.

# CHAPTER – 5

## SYSTEM DESIGN

### 5.1 CURRENT SYSTEM ANALYSIS

Current system analysis involves evaluating the existing processes and systems related to employee performance evaluation at UNITED SPINNING MILLS PVT LTD. This includes assessing the effectiveness, limitations, and areas for improvement of the current systems.

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A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ			
ID	Name	DOJ	DEPT	DESIGNATION	2015-16	2016-17	2017-18	2018-19	2019-20	2015 WKS DATA	2016 WKS DATA	2017 WKS DATA	2018 WKS DATA	2019 WKS DATA	2015 GRAD Efor 2016	2016 GRAD Efor 2017	2017 GRAD Efor 2018	2018 GRAD Efor 2019	2019 GRAD Efor 2020	5 YEARS AVG GRAD	2015 WKS Efor 2016	2016 WKS Efor 2017	2017 WKS Efor 2018	2018 WKS Efor 2019	2019 WKS Efor 2020	2015 WKS Efor 2016	2016 WKS Efor 2017	2017 WKS Efor 2018	2018 WKS Efor 2019	2019 WKS Efor 2020	2015 WKS Efor 2016	2016 WKS Efor 2017	2017 WKS Efor 2018	2018 WKS Efor 2019	2019 WKS Efor 2020	2015 WKS Efor 2016	2016 WKS Efor 2017	2017 WKS Efor 2018	2018 WKS Efor 2019	2019 WKS Efor 2020	2015 WKS Efor 2016	2016 WKS Efor 2017	2017 WKS Efor 2018	2018 WKS Efor 2019	2019 WKS Efor 2020	2015 WKS Efor 2016	2016 WKS Efor 2017	2017 WKS Efor 2018	2018 WKS Efor 2019	2019 WKS Efor 2020				
1004	CHANDRABALA A	*****	SIMPLEX	TENDER	17.5	16.0	23.0	21.0	22.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1005	MARBARA A	*****	COM WINDING	THRAINER	20.0	6.0	59.0	39.0	33.5	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1006	ENGARBARA A	*****	RING FRAME	SEDER	30.0	16.0	29.0	38.0	29.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1007	THANGARAJA K	*****	DOULING	SIDER	33.0	25.0	33.0	56.0	63.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1008	ANDHARABATHI M	*****	RING FRAME	SIDER	14.0	5.0	8.0	21.0	9.5	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1009	THANABHARATHI T	*****	RING FRAME	HAUSTRY	0.0	3.0	0.0	20.0	30.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1010	SENTHIL M	*****	RING FRAME	SIDER	2.0	1.0	13.0	2.0	1.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1011	CHOKKALINGAPPA A	*****	PATFOOT NERVEN	TENDER	0.0	0.0	0.0	5.0	7.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1012	NATEESAN P	*****	RING FRAME	SIDER	2.0	3.5	4.0	0.0	3.5	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1013	VENKATESWARLA R	*****	SIMPLEX	TENDER	0.0	0.0	0.0	32.0	7.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1014	MAHARAN C	*****	COM WINDING	VINDER	0.0	0.0	0.0	0.0	0.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1015	MAHESHWAR P	*****	DOULING	TENDER	71.0	43.0	1.0	5.0	8.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1016	RAJENDRAN K	*****	RING FRAME	SIDER	4.0	3.0	6.0	15.0	16.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1017	KALAMANDHATHI S	*****	RING FRAME	REF.PCR	0.0	0.0	0.0	0.0	0.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1018	SUBRAMANIAM P	*****	DOFFER	SEDER	38.0	13.0	20.0	22.0	22.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1019	KUPPUSWAMY A	*****	RING FRAME	DOFFER	1.0	4.0	1.0	23.0	26.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1020	RAJAMANI K	*****	SILVER LAF RIBBON LSP	TENDER	1.0	6.0	0.0	0.0	0.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1021	RAJENDRAN K	*****	MAINTENANCE	CLANSING	7.0	3.0	0.0	3.0	4.5	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1022	MURUGESWARAN S	*****	RING FRAME	DOFFER	3.0	3.0	0.0	3.0	4.5	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1023	MUTHUSWAMY K	*****	MAINTENANCE	CLANSING	1.0	0.0	0.0	5.0	6.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1024	RAJALE	*****	PATFOOT NERVEN	TENDER	2.0	15	2.0	37.0	162.0	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1025	KOMALAN	*****	DOULING	TENDER	17.5	16.0	5.0	7.0	8.5	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019

## 5.2 IDENTIFYING SYSTEM REQUIREMENTS

**Stakeholder Analysis:** Conducting a comprehensive stakeholder analysis to identify all parties affected by the implementation of the new system. This includes HR managers, department heads, employees, and IT personnel. Engaging with stakeholders through interviews, surveys, and workshops to understand their needs, expectations, and concerns regarding the new system.

**Functional Requirements:** Identifying functional requirements that describe the specific features and functionalities of the new system. This includes data capture, analysis, reporting, and visualization capabilities provided by Power BI. Ensuring that functional requirements align with the organization's goals and objectives for improving employee efficiency and competitiveness.

**Non-Functional Requirements:** Capturing non-functional requirements related to performance, security, usability, and scalability of the new system. Defining criteria for system performance, such as response time for generating reports and scalability to handle large volumes of data. Addressing security requirements to protect sensitive employee data.

**Requirements Validation:** Validating requirements with stakeholders to ensure they accurately reflect their needs and expectations. Conducting reviews and walkthroughs of requirement documents to identify any inconsistencies, ambiguities, or gaps. Incorporating feedback from stakeholders to refine and finalize the list of system requirements before proceeding to the next phase of the project.

### 5.3 SYSTEM DESIGN

System design involves creating the architectural and user interface design for the employee efficiency analysis system. This includes database design, dashboard design, and user interface design. It is a powerful business analytics tool developed by Microsoft that allows organizations to visualize and analyze their data, gaining valuable insights for informed decision-making.

**Database Design:** Database design involves defining the structure and relationships of the database to store employee data efficiently. This includes designing tables, views, and indexes to optimize data storage and retrieval.

**Dashboard Design:** Dashboard design involves designing the layout and visualizations for the Power BI dashboards. This includes selecting appropriate visualizations, arranging them in a logical manner, and adding interactivity for user.



**Analysis and Insights:** Using Power BI's analytical capabilities, we will conduct in-depth analysis to identify patterns, trends, and correlations within the data. This will involve examining factors influencing employee efficiency such as absenteeism, training effectiveness, and job satisfaction. By gaining insights into these factors, we can propose targeted interventions to improve overall productivity.

**Optimization Strategies** Based on the findings of our analysis, we will propose optimization strategies aimed at enhancing workforce efficiency and reducing operational costs. This may include restructuring work schedules, implementing incentive programs, providing additional training, or reallocating resources to high-impact areas.

ID	Name	5 YEARS AVG GRD	DEPT
4568	SIVAKUMAR.U.R	K	CONE WINDING
4566	MURUGESAN.S.M	J	DOULING
4575	VENKATACHALAM.M	I	CONE WINDING
2723	VIGNESH.A	I	RING FRAME
4559	KUMARESAN.T	H	RING FRAME
4504	MUNUSAMY. K	H	CONE WINDING
4521	NESAMANI.S	H	CONE WINDING
2753	SURESH.S	G	AUTOCORNER
330	THANGARAJ.E	F	DOULING
371	VIJAYAKUMAR.T	F	RING FRAME
4510	BALU.M	E	DOULING
4527	CHINNADURAI.K	E	RING FRAME
2698	KANDASAMY.C	E	COM
1609	MADESH KUMAR.A.	E	RING FRAME
4523	MANICKAM.K.R	E	SIMPLEX
4570	MOHAN.A(0346)	E	CONE WINDING
4552	VELU.R	E	CONE WINDING
2681	VISHVANATHAN.S	E	AUTOCORNER
4548	CHANDRAN.G	D	RING FRAME
4564	DHANASEKARAN.S.P.	D	DRAWING
2524	DINESH.M	D	ELECTRICAL
4577	GANESAN.K	D	CONE WINDING
4567	KOLANCHI.K	D	RING FRAME
654	MADESHWARAN.R	D	RING FRAME
1288	MATHESHWARAN.J	D	TWO FOR ONE
4550	MOORTHY.K.V	D	RING FRAME
1547	PRAKASAM.M	D	MIXING
4561	RAJU.M.K	D	SIMPLEX
4801	RAMAN. T	D	DOULING
2565	SRINIVASAN.R	D	PAUTOCORNERKING
4520	SUBRAMANI.P	D	RING FRAME

Fig 5.3.1 Grade of the employee

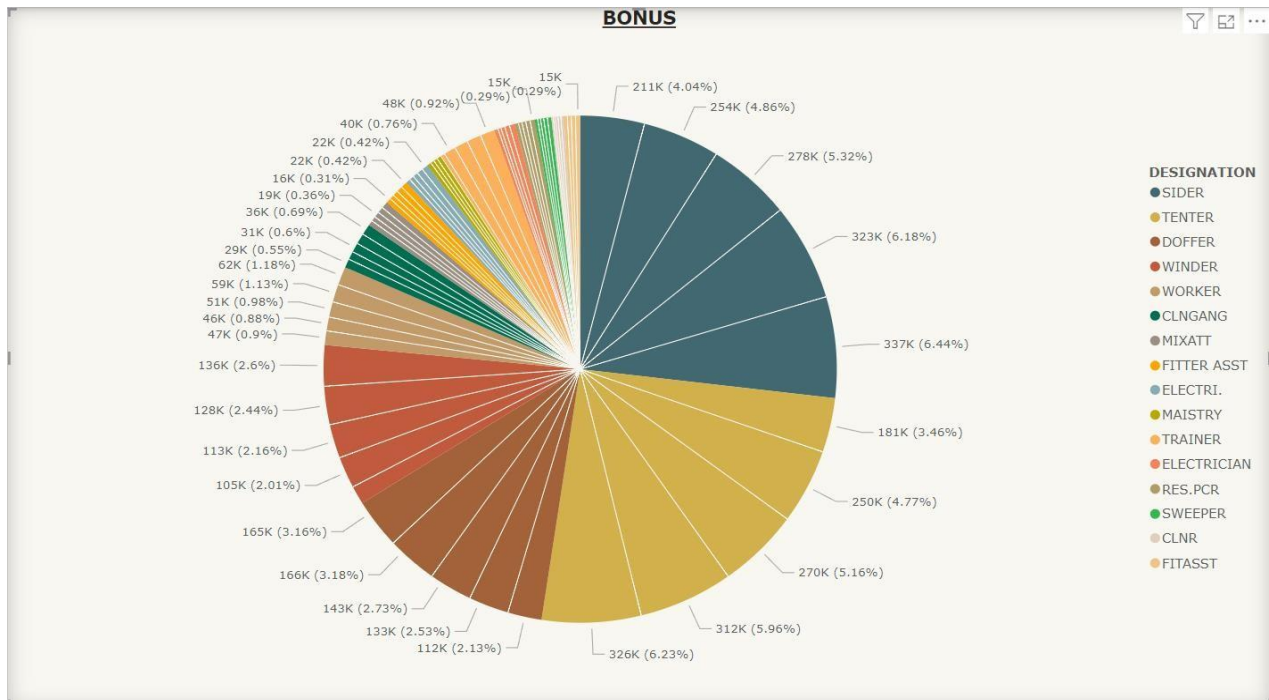


Fig 5.3.2 Bonus of the employees

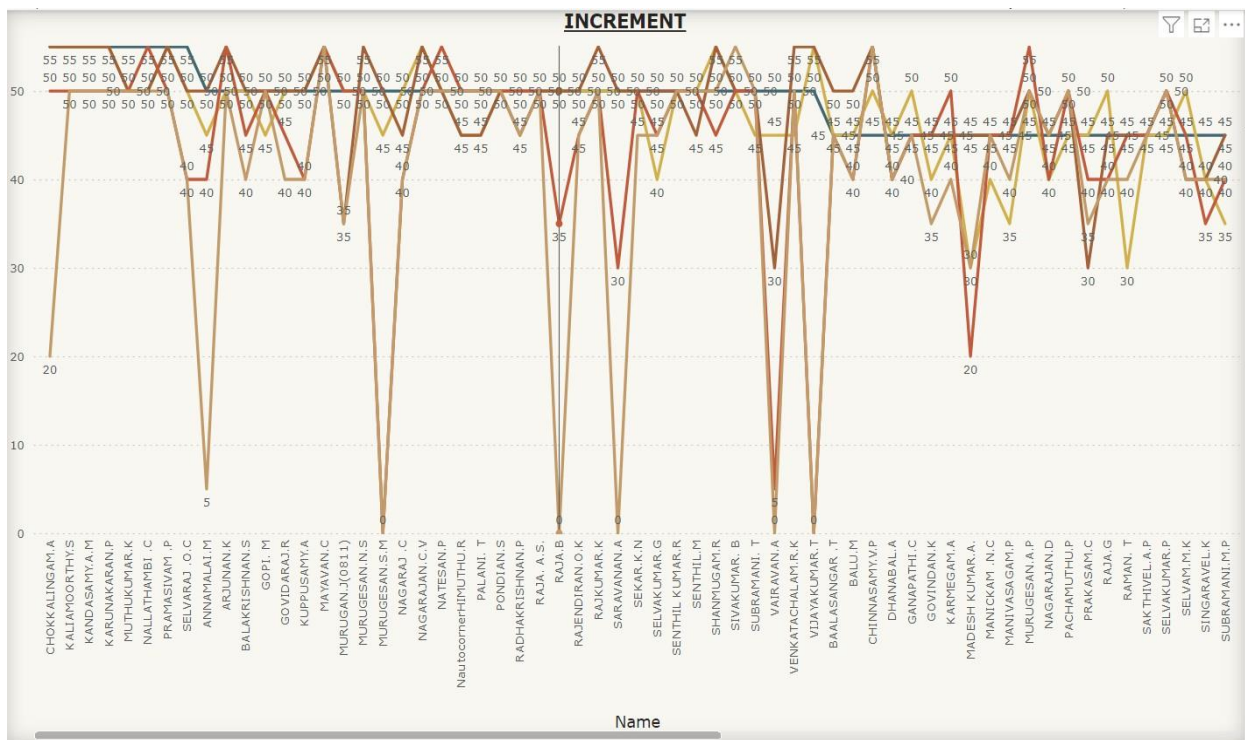


Fig 5.3.3 Increment of the employees

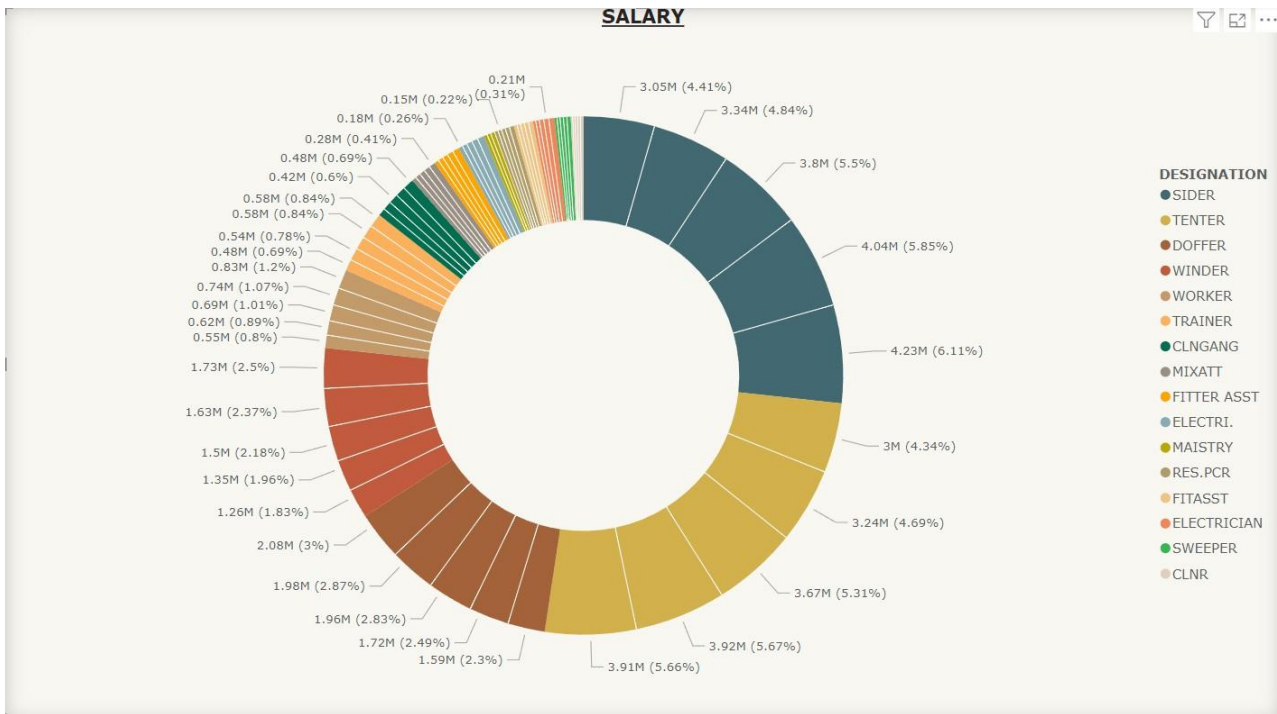


Fig 5.3.4 salary of the employees

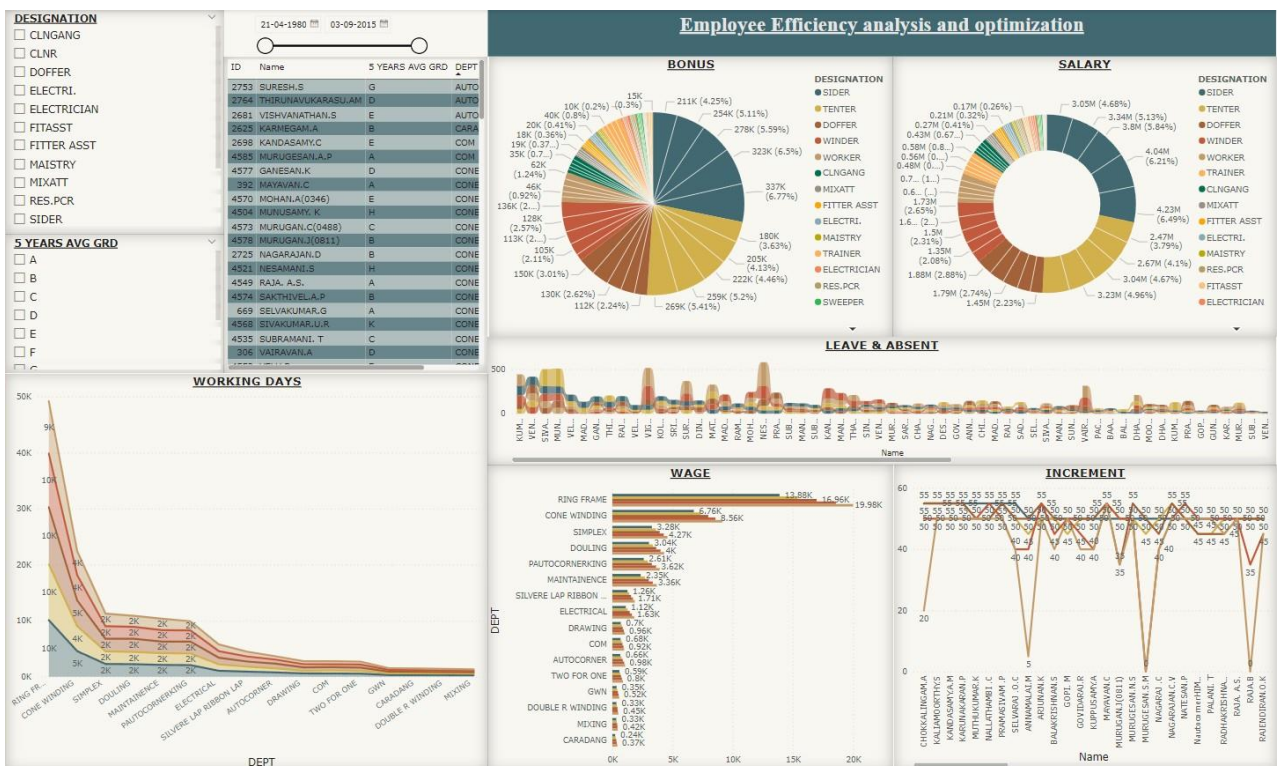


Fig 5.3.5 Dashboard of each employees

## 5.4 FEASIBILITY STUDY

Feasibility study involves assessing the technical, operational, and economic feasibility of implementing the employee efficiency analysis system. This includes evaluating factors such as technology readiness, resource availability, and cost-benefit analysis.

**Technical Feasibility:** From a technical standpoint, implementing Power BI for employee performance analysis presents several advantages. Power BI offers a user-friendly interface and robust data connectivity features, making it suitable for integrating data from various sources within the organization. Additionally, its advanced analytical capabilities enable in-depth exploration and visualization of employee-related metrics such as attendance, skills, and productivity. The technical infrastructure required for deploying Power BI, including hardware and software compatibility, is readily available within the organization, further enhancing technical feasibility.

**Operational Feasibility:** Assessing the operational feasibility involves evaluating the practicality of integrating Power BI into existing workflows and processes at UNITED SPINNING MILLS PVT LTD. While there may be initial challenges associated with data integration and dashboard development, the long-term benefits of improved decision-making and resource optimization outweigh these challenges. With proper training and support, employees can effectively utilize Power BI to gain insights into employee performance and drive operational improvements. Therefore, the project demonstrates strong operational feasibility.

**Economic Feasibility:** Evaluating the economic feasibility involves analyzing the costs and benefits associated with implementing the Power BI solution. While there will be upfront costs related to software licensing, infrastructure setup, and training, the potential cost savings from improved employee efficiency and optimized workforce management justify these investments.

## **5.5 SYSTEM IMPLEMENTATION STRATEGY**

System implementation strategy involves planning the deployment and rollout of the employee efficiency analysis system. This includes defining implementation milestones, resource allocation, and change management strategies. Effective implementation of the Power BI analytics tool at UNITED SPINNING MILLS PVT LTD requires careful planning, stakeholder engagement, resource allocation, and training. By following a structured implementation strategy and continuously monitoring and evaluating the system, the organization can achieve its goal of improving employee efficiency and competitiveness. The first step in the implementation strategy is comprehensive project planning. This involves defining project objectives, scope, timelines, and resource requirements. Key stakeholders including senior management, IT personnel, HR representatives, and end-users will be involved in the planning process to ensure alignment with organizational goals and priorities. A detailed project plan will be developed, outlining specific tasks, milestones, and deliverables. Once the data is prepared, the next step is dashboard development. Interactive dashboards will be designed using Power BI to visualize key metrics and performance indicators related to employee productivity.

## **5.6 RISK ANALYSIS**

Risk analysis involves identifying potential risks and challenges associated with the development and implementation of the employee efficiency analysis system. This includes assessing risks related to technology, resources, and organizational change. Risk analysis involves identifying potential risks and challenges that may arise during the implementation and operation of the new system. This includes technical risks such as compatibility issues or data security concerns, as well as organizational risks such as resistance to change or lack of user adoption. Strategies for mitigating these risks are developed to ensure a smooth implementation process

**Data Quality and Integration:** One of the primary risks associated with implementing Power BI for employee performance analysis is the quality and integration of data from various sources. Inaccurate or incomplete data can lead to flawed insights and incorrect conclusions.

**User Adoption and Training:** Another potential risk is the resistance to change and lack of user adoption among employees. Despite the benefits of Power BI, some employees may be unfamiliar with the tool or hesitant to embrace new technologies. To address this risk, comprehensive user training sessions will be conducted to familiarize employees with Power BI's features and functionality. Additionally, ongoing support and guidance will be provided to address any issues or concerns raised by users during the implementation process.

**Technical Challenges:** Technical challenges such as software bugs, compatibility issues, or infrastructure limitations may arise during the implementation of Power BI. To mitigate this risk, thorough testing will be conducted prior to full-scale deployment to identify and resolve any technical issues. Furthermore, close collaboration with IT personnel and Microsoft support resources will be leveraged to address technical challenges in a timely manner and ensure the smooth operation of the Power BI solution. Thorough planning, effective communication, and proactive risk mitigation strategies will ensure that the project achieves its objectives of improving efficiency, reducing costs, and enhancing competitiveness.

## **5.7 SYSTEM EVALUATION**

System evaluation involves assessing the effectiveness and performance of the implemented system in improving employee efficiency and achieving the company's goals. This includes measuring key performance indicators (KPIs), gathering feedback from stakeholders, and identifying areas for further improvement. The system evaluation phase assesses the performance and effectiveness of the implemented system. Key performance indicators (KPIs) such as employee productivity, accuracy of data, and user satisfaction are monitored and evaluated over time. Feedback from users and stakeholders is collected to identify areas for improvement and optimization.

## **CHAPTER – 6**

### **SYSTEM TESTING**

System testing is a critical phase in the development and implementation of any business analytics solution, such as the utilization of Power BI for analyzing employee performance at UNITED SPINNING MILLS PVT LTD. This phase aims to verify that the system functions as intended and meets the specified requirements. In the context of this project, system testing involves assessing the effectiveness, reliability, and usability of the Power BI solution in analyzing employee productivity and contributing to the company's objectives of cost savings and competitiveness enhancement.

#### **6.1 TEST PLANNING**

Before conducting system testing, it is essential to develop a comprehensive test plan outlining the objectives, scope, and methodologies of the testing process. The test plan for the Power BI solution at UNITED SPINNING MILLS PVT LTD should include, Identification of test scenarios: Define various scenarios to simulate real-world usage of the system, such as analyzing attendance patterns, assessing skill levels, and evaluating motivational factors. Develop specific test cases for each identified scenario, specifying the inputs, expected outputs, and acceptance criteria.

#### **6.2 TEST EXECUTION**

Once the test plan is in place, the system testing phase proceeds with the execution of test cases to evaluate the functionality and performance of the Power BI solution. Test case execution run the predefined test cases using sample data sets to analyze employee performance metrics, identify trends, and generate insights.

#### **6.3 TEST EVALUATION**

Once the test execution phase is complete, the next step is to evaluate the test results and assess the overall effectiveness of the Power BI solution. This involves comparison with requirements verify whether the system meets the specified

requirements. Review the generated reports, dashboards, and visualizations to ensure that they accurately reflect the analyzed employee performance data and provide meaningful insights. User acceptance testing: Involve end-users and stakeholders in reviewing the system and gathering feedback on its usability, relevance, and effectiveness in addressing their needs and objectives. Through meticulous planning, execution, and evaluation of the testing process, valuable insights have been gained into the effectiveness, reliability, and usability of the Power BI solution in achieving the project objectives of identifying factors affecting employee productivity and proposing strategies for workforce optimization.

Provide an overview of the test outcomes, including any issues encountered, successes achieved, and lessons learned during the testing process. Recommendations for improvements: Suggest enhancements or modifications to the Power BI solution based on the identified gaps or areas for optimization. Lessons learned: Document key insights, best practices, and challenges encountered during the system testing phase to inform future projects and initiatives. By conducting thorough system testing, it can ensure the reliability, accuracy, and usability of the Power BI solution for analyzing employee performance and achieving its objectives of cost savings and competitiveness improvement. The system testing phase involved comprehensive test planning, including the identification of test scenarios, selection of test cases, allocation of resources, and establishment of the testing environment. Test execution was conducted with rigor, focusing on the execution of predefined test cases, error detection, troubleshooting, and performance evaluation.

Throughout the testing process, the Power BI solution demonstrated its ability to analyze employee performance metrics, identify trends, and generate actionable insights to inform decision-making. The insights gained from system testing will inform future enhancements and optimizations to further maximize the value delivered by the Power BI solution in driving organizational success.



## **6.4 RECOMMENDATIONS FOR IMPROVEMENTS**

Based on the outcomes of the system testing phase, it's important to identify recommendations for enhancements or modifications to the Power BI solution. This could involve addressing any identified gaps or areas for optimization, such as improving data accuracy, increasing processing speed, or enhancing user experience. Exploring opportunities to enhance data integration capabilities is another key area. This could involve streamlining the process of collecting, transforming, and analyzing employee performance data from multiple sources, perhaps by automating data collection or implementing more efficient data transformation techniques.

Investigating advanced visualization techniques and best practices can also help to enhance the clarity, interactivity, and effectiveness of the reports and dashboards generated by the Power BI solution. This could involve using more sophisticated chart types, incorporating interactive elements, or applying design principles to make the visualizations more intuitive and engaging. Performance tuning measures should be implemented to optimize the responsiveness and scalability of the Power BI solution. This is particularly important when dealing with large volumes of data, as it ensures fast query execution and efficient resource utilization.

Documenting key insights, best practices, and challenges encountered during the system testing phase is crucial. This not only helps to inform future projects and initiatives but also contributes to the organization's knowledge base and promotes a culture of learning and continuous improvement. Emphasizing the importance of thorough test planning is also key. This ensures a structured and comprehensive approach to system testing, including the identification of test scenarios and development of test cases. It also helps to ensure that all aspects of the Power BI solution are thoroughly tested and validated before deployment.

## **CHAPTER – 7**

### **SYSTEM IMPLEMENTAION**

System implementation marks a crucial phase in the project lifecycle, where the theoretical concepts and plans are translated into tangible solutions. In the context of this project, the implementation phase involves deploying Power BI to analyze the performance and contribution of employees at UNITED SPINNING MILLS PVT LTD. This section elaborates on the steps involved in the system implementation process.

#### **7.1 DATA COLLECTION AND PREPARATION**

The first step in system implementation is the collection and preparation of relevant data. This encompasses gathering employee data from various sources within the organization, including HR records, attendance logs, performance evaluations, and skills assessments. The data collected should be comprehensive, accurate, and structured to facilitate effective analysis using Power BI.

#### **7.2 DATA INTEGRATION AND MODELING**

Once the data is collected, the next step is to integrate it into the Power BI platform and model it for analysis. This involves transforming raw data into a format suitable for analysis, performing data cleansing to remove inconsistencies or errors, and structuring the data model to enable meaningful insights. Power BI offers robust data modeling capabilities, allowing for the creation of relationships, calculations, and measures to support analysis.

#### **7.3 DASHBOARD AND REPORT DEVELOPMENT**

With the data integrated and modeled, the focus shifts to the development of dashboards and reports within the Power BI environment. Dashboards are interactive visualizations that provide an overview of key performance metrics, while reports offer detailed insights into specific aspects of employee performance.

## **7.4 IMPLEMENTATION OF ANALYTICAL MODELS**

In addition to basic reporting and visualization, advanced analytical models can be implemented within Power BI to gain deeper insights into employee performance. This may include predictive analytics models to forecast future performance trends, sentiment analysis to gauge employee satisfaction levels, or anomaly detection to identify unusual patterns in behavior. The implementation of analytical models enhances the sophistication and predictive capabilities of the Power BI solution.

## **7.5 USER TRAINING AND ADOPTION**

An integral aspect of system implementation is user training and adoption. Employees and stakeholders within the organization need to be familiarized with the Power BI platform and its functionalities to effectively utilize it for decision-making purposes. Training sessions can be conducted to demonstrate how to access and interpret dashboards, generate custom reports, and leverage analytical tools within Power BI.

## **7.6 MONITORING AND OPTIMIZATION**

Once the Power BI solution is implemented, ongoing monitoring and optimization become essential to ensure its continued effectiveness and relevance. This involves tracking key performance metrics to understand how well the solution is meeting its intended goals. These metrics could include user engagement levels, the speed of data processing, or the accuracy of the insights generated. Soliciting feedback from users is another crucial aspect of this process. Users are the ones interacting with the dashboards and reports on a daily basis, and their input can provide valuable insights into how the solution can be improved. This feedback can be gathered through surveys, interviews, or user testing sessions.

Identifying areas for improvement or enhancement is a continuous process. As users interact with the solution, they may uncover bugs, usability issues, or new requirements that were not initially considered. These need to be addressed in order to keep the solution effective and relevant.

## **CHAPTER – 8**

### **CONCLUSION**

In wrapping up, the introduction of the Power BI-centric system for employee performance analysis at our organization signifies a pivotal stride towards a more streamlined and data-centric approach to managing our workforce. The meticulously developed dashboard, crafted for detailed attendance data scrutiny and performance grading, has emerged as a pivotal solution to the challenges identified within our existing system. The outcomes of this project underscore the concrete advantages brought forth by our proposed system, showcasing its potential to redefine performance evaluation and optimize our workforce. Through the integration of modules covering salary management, grade assignments, attendance tracking, and increment processes, our system provides a comprehensive perspective on employee performance, equipping our management with the insights needed for well-informed decisions. The visual representation of attendance trends using Power BI has empowered our organization with real-time insights, facilitating prompt interventions and enhanced strategic planning.

## **CHAPTER – 9**

### **FUTURE ENHANCEMENT**

Future enhancements for the project could include the implementation of advanced analytics techniques, integration of additional data sources, and the development of predictive models to further optimize employee efficiency and productivity at UNITED SPINNING MILLS PVT LTD.

**Predictive Analytics for Performance Improvement:** Integrate predictive analytics models into Power BI to forecast future employee performance based on historical data, current trends, and external factors. Utilize machine learning algorithms to identify patterns and predict potential performance bottlenecks or areas of improvement. Develop a performance scorecard that dynamically adjusts based on real-time data inputs, providing managers with actionable insights for proactive interventions.

**Real-time Monitoring and Feedback Systems:** Implement real-time monitoring dashboards within Power BI to track employee activities, productivity levels, and engagement metrics. Integrate feedback mechanisms such as pulse surveys or sentiment analysis tools to capture employee sentiments and satisfaction levels. Enable managers to provide instant feedback and coaching through the Power BI platform, fostering continuous improvement and addressing issues promptly.

**Skills Gap Analysis and Training Recommendations:** Enhance the analytics capabilities to perform a comprehensive skills gap analysis across the workforce. Develop algorithms to recommend personalized training programs and learning resources for employees based on their skill deficiencies and career aspirations. Establish partnerships with online learning platforms or training providers to deliver curated content directly through the Power BI platform, promoting skill development and career advancement.

**Employee Wellness and Engagement Initiatives:** Integrate wellness metrics such as stress levels, work-life balance, and health indicators into the employee efficiency analysis. Leverage data insights to design targeted wellness programs and initiatives that address specific pain points identified within the workforce. Implement gamification elements within Power BI to incentivize participation in wellness activities and foster a culture of employee engagement and well-being.

**Benchmarking and Comparative Analysis:** Expand the scope of analysis to include benchmarking against industry peers and best practices. Incorporate external data sources and industry benchmarks into the Power BI dashboard for comparative analysis of key performance indicators. Enable executives and HR leaders to gain actionable insights into the company's competitive positioning and identify areas for improvement to maintain or surpass industry standards.

**Advanced HR Analytics for Talent Management:** Develop advanced HR analytics capabilities within Power BI to support strategic talent management initiatives. Utilize predictive models to identify high-potential employees, flight risks, and succession candidates within the organization. Integrate talent analytics with workforce planning and recruitment strategies to ensure alignment with long-term business objectives.

**Dynamic Resource Allocation and Optimization:** Implement dynamic resource allocation algorithms that leverage real-time data to optimize staffing levels and task assignments. Enable managers to make data-driven decisions on resource allocation, balancing workload distribution and skill requirements effectively. Integrate with project management tools and scheduling systems to streamline operations and maximize resource utilization across departments and projects.

**Ethical and Privacy Considerations:** Establish robust data governance policies and protocols to ensure ethical use of employee data and protect individual privacy rights. Implement anonymization techniques and access controls within Power BI to safeguard sensitive employee information. Conduct regular audits and compliance checks to mitigate risks associated with data privacy regulations and maintain trust and transparency with employees.

## **CHAPTER-10**

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