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Implementation of a Sales Dashboard Using Metabase for Attendance Analysis and Sales Payroll Systems (Case Study: PT. Fiyansa)

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Abstract

In an effort to adopt digital technology, PT. Fiyansa has developed an Android application to monitor sales activities. However, the data generated by this application remains difficult to analyze regarding attendance and is insufficient for supporting decision-making. The primary factor causing this issue is the lack of adequate visualization. To address this problem, this research develops a dashboard to visualize attendance analysis and the payroll system. This dashboard generates visualizations categorized into three groups: attendance summary, sales performance analysis, and sales payroll. The attendance summary category consists of six visualizations, the sales performance analysis category comprises nine visualizations, and the sales payroll category includes three visualizations: payroll details, the three salespeople with the lowest salaries, and the three salespeople with the highest salaries. The results obtained from the dashboard analysis indicate that the level of sales salaries is significantly influenced by work attendance. This is evidenced by the analysis showing that salespeople with the highest salaries tend to have high attendance rates and a low frequency of lateness.

I. INTRODUCTION

Human Resource Management (HRM) or Human Resource Development (HRD) has undergone a significant evolution in its role within the modern business landscape. Historically, HRD functions were often confined to administrative tasks of a transactional nature, such as payroll management, attendance recording, and basic recruitment processes. However, as the complexity of the professional world has increased, the role of HRD has transformed into a strategic partner for the enterprise. The focus has now shifted toward talent management, performance enhancement, employee engagement, and strategic workforce planning to support the achievement of business objectives. This transformation is largely driven by the adoption of technology that enables the automation of routine tasks, thereby allowing HRD to focus more on data analysis for impactful decision-making[1], [2], [3], [4], [5], [6], [7].

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Although PT. Fiyansa Mulya has adopted an Android-based application to record daily sales activities, this technology has not fully addressed management's needs regarding strategic decision-making. The existing application functions solely as a data collection tool; however, the output remains a compilation of complex raw data that is difficult to comprehend rapidly. In the absence of adequate visualization, the process of analyzing the correlations between attendance, discipline, and their impact on payroll schemes becomes significantly slow and error-prone. Consequently, management encounters difficulties in observing sales performance patterns objectively and in real-time. As a result, this abundance of data becomes of low value, as it fails to be transformed into information that supports effective performance evaluation[8], [9], [10], [11], [12], [13], [14], [15], [16], [17].

To address the complexities of data analysis, this research proposes the design of a data model and the implementation of an interactive dashboard using the Metabase platform. The system aims to transform streams of validated attendance data into intuitive, real-time information visualizations. This dashboard is designed to centrally map critical HR operational metrics, including discipline trend analysis (punctuality), visit adherence patterns, and performance indicators directly correlated with payroll schemes. Through these visualizations, attendance data previously raw and fragmented can be presented as structured, transparent, and auditable insights, thereby serving as an objective foundation for management in making strategic decisions regarding sales team performance evaluation and compensation[2], [4], [6], [7], [9], [18], [19], [20], [21], [22].

II. RELATED WORKS

Utomo and Lubna[2] conducted a study regarding the application of Metabase as a sales data visualization tool within a global retail company. The study demonstrates that Metabase is capable of transforming complex sales datasets into interactive and informative visualizations, thereby enabling management to gain a better understanding of sales trends, consumer purchasing patterns, and market preferences. These analytical insights provide a strategic foundation for designing promotional policies, developing product bundling programs, and optimizing marketing strategies. These findings reinforce Metabase's role as an effective business intelligence solution, particularly in supporting data-driven decision-making within the retail sector.

Budiarti et al.[23] designed and implemented a big data information system utilizing the open-source platform Metabase to support data visualization for Civil Registration and Vital Statistics (CRVS) in the city of Surabaya. The study outlines the integration process between Metabase and the local government database, highlighting how the resulting dashboards enhanced transparency, data accessibility, and evidence-based decision-making. User evaluation also indicated a high level of satisfaction regarding the platform's ease of use, system responsiveness, and visual presentation. These findings demonstrate that Metabase serves as an effective and cost-efficient solution for government data visualization, particularly within the context of public service digitalization in Indonesia.

Santos et al. [24] conducted a comparative evaluation of two open-source business intelligence (BI) tools: Metabase and Redash. The study examined the key features and functionalities of both platforms, including data visualization capabilities, dashboard development, and integration with various data sources. It also explored the strengths and limitations of each tool, highlighting their potential application across diverse industries and operational settings. The findings suggest that both Metabase and Redash represent viable BI solutions for organizations, each offering distinct advantages depending on specific user requirements and implementation contexts.

Sambrani [25] applied the Dynamic Capabilities theory to the analysis of business intelligence usage in Chinese manufacturing firms. Results from the study in the *International Journal of Information Management* demonstrate that BI tools employing the “Sense-Transform-Drive” model significantly enhanced operational efficiency and firm performance (+≥20% in margin and throughput metrics), particularly when coupled with automated dashboards that aggregate attendance, field travel, and real-time KPIs.

III. METHODS

This study encompasses multiple components, including a system overview presented within the system design, along with a detailed explanation of the technical aspects involved in implementing the system. The system design describes two primary processes: data acquisition and its subsequent processing within Metabase. Data is obtained from sales representatives who log their attendance through a mobile application. This data is then captured by Metabase to be transformed into insightful visualizations.

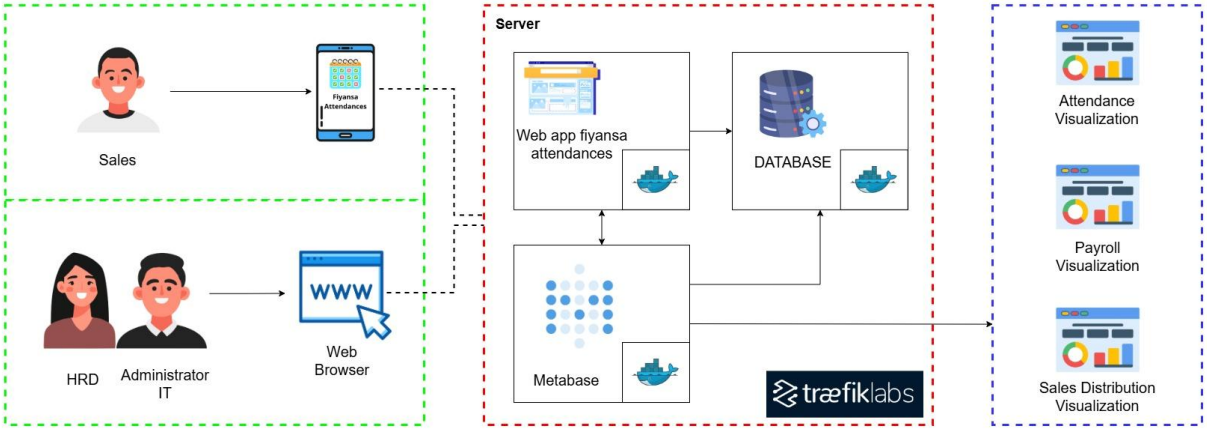

Figure 1. Design system

A. HR Features

Beyond attendance, the mobile application supports several core HR-related functions. The check-in and check-out menus record employee arrival and departure times. The activity menu allows employees to report their daily tasks during working hours. A permission menu is provided for requesting leave in specific situations such as illness, lateness, or emergency absence. All requests are forwarded to the approval menu, where Supervisors are authorized to approve or reject them according to company policies. These features ensure that attendance, activity reporting, and leave management processes are transparent, integrated, and well-documented.

B. Web Application Management

The Web Application Management component is designed as the central platform for handling permission requests and user administration within the mobile-based attendance system. Through this platform, permission requests submitted by staff employees via the mobile application such as leave applications or late arrival notifications are processed and approved by authorized personnel through the web interface. In addition to permission handling, the web application provides user administration capabilities, ensuring that only accounts registered and verified through the management system are granted access rights to the mobile application. The overall workflow of these functionalities is illustrated in the flowchart presented in Figure 2.

To ensure stability and scalability in handling high workloads, the Web Application Management component is developed using the Laravel framework operating in worker mode through integration with FrankenPHP. This approach enables the web application to process multiple concurrent requests with low latency while maintaining smooth service delivery even under intensive usage

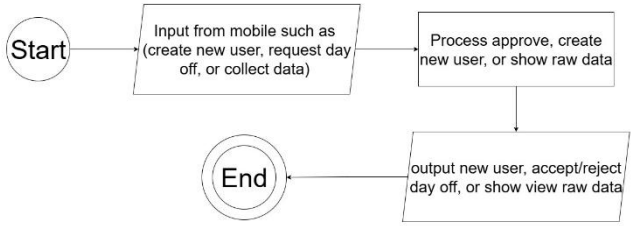

Figure 2. Flowchart for Functionality of Website Management

There are three primary roles authorized to access attendance, activity, and permission data within the web-based management system. Each role is granted distinct access rights, meaning that the menus and features provided vary according to the user's role. These roles consist of HRD, IT Administrator, and staff. The HRD role is responsible for monitoring staff attendance, approving leave requests, and overseeing work activities. Meanwhile, the IT Administrator is granted access rights that are largely similar to those of HRD, but with additional responsibilities for integrating external applications and maintaining all system features. Finally, staff members are also able to log into the web management system, although their access is strictly limited to their own personal data. The overall structure of these role-based access rights is illustrated in Figure 3.

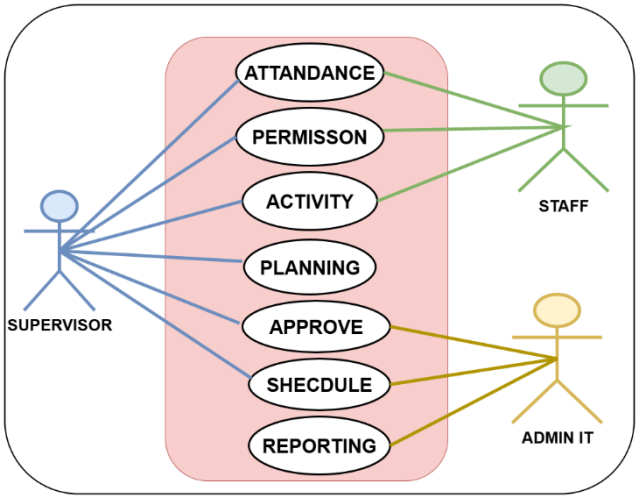

Figure 3. Use case diagram

C. Restful API

The Fiyansa Attendances API is designed as an integrated system that facilitates both authentication and attendance management in an efficient manner. The process begins with the authentication endpoint (POST /login), where users submit their credentials, including email and password, for verification. Upon successful login, the system issues a token and role information that defines the user's level of access. Subsequently, the profile endpoint (GET /profile) enables retrieval of basic user data, such as name, ID, and email. At the core of the system lies the Attendance API, which orchestrates attendance recording through two main endpoints: (POST /attendance-in) for clock-in records and (POST /attendance-out) for clock-out records. The overall workflow and interaction of these API endpoints are illustrated in Figure 4.

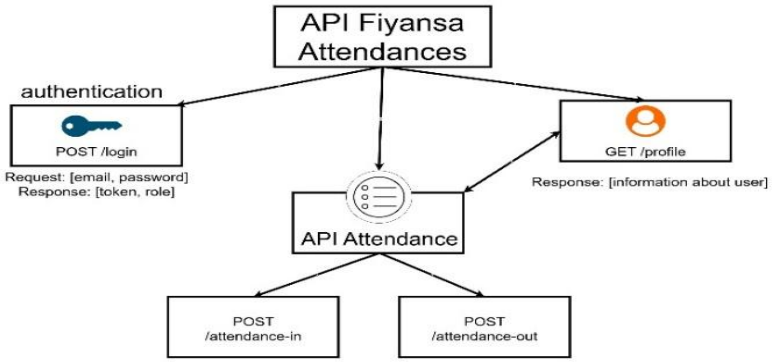

Figure 4. Mind map API fiyansa attendance

The database is the primary persistent store for both the Mobile Attendance application and the Web Management console. Figure 4 shows the revised Crow's Foot ERD with explicit primary keys (PK) and foreign keys (FK). Reference entities (cities, locations, companies, shifts) organize master data, while operational entities (users, attendances, plannings, planning_spgs, total_salary) capture day-to-day transactions. The model enforces the following cardinalities: cities → locations (1:N), cities→users (1:N), locations→companies (1:N); the association users↔companies is resolved via the junction table user_companies (also holding shift_id), and each event table—attendances and plannings references both users and companies (1:N from each parent). planning_spgs assigns SPGs (users) to companies over time, and total_salary aggregates payroll per user.

Primary keys are single-column IDs foreign keys enforce referential integrity (e.g., attendances.user_id → users.id, attendances.company_id → companies.id). FK columns are indexed for join efficiency, and application-level uniqueness can be applied where needed (e.g., user_companies(user_id, company_id) to prevent duplicate assignments, or attendances (user_id, date) to restrict one primary record per day). Stored attributes include face embeddings and liveness flags, GPS coordinates (lat/long), timestamps, and administrative metadata to support auditability. The schema adheres to third-normal form (3NF) to minimize redundancy while preserving straightforward query paths for the analytics layer (compliance, punctuality trends, and geospatial views). With this design, the database acts as the integration hub between on-device inference and HR dashboards, ensuring consistent, query-efficient data for both transactional operations and analytical workloads.

Furthermore, the database implementation utilizes MySQL running on Docker containers to ensure portability, scalability, and simplified system environment management. Docker enables each database instance to remain isolated, consistent, and easily replicable across development and production environments without configuration discrepancies. This approach facilitates seamless integration between the mobile application, the web-based management console, and the analytics layer, while also streamlining orchestration processes as system requirements evolve.

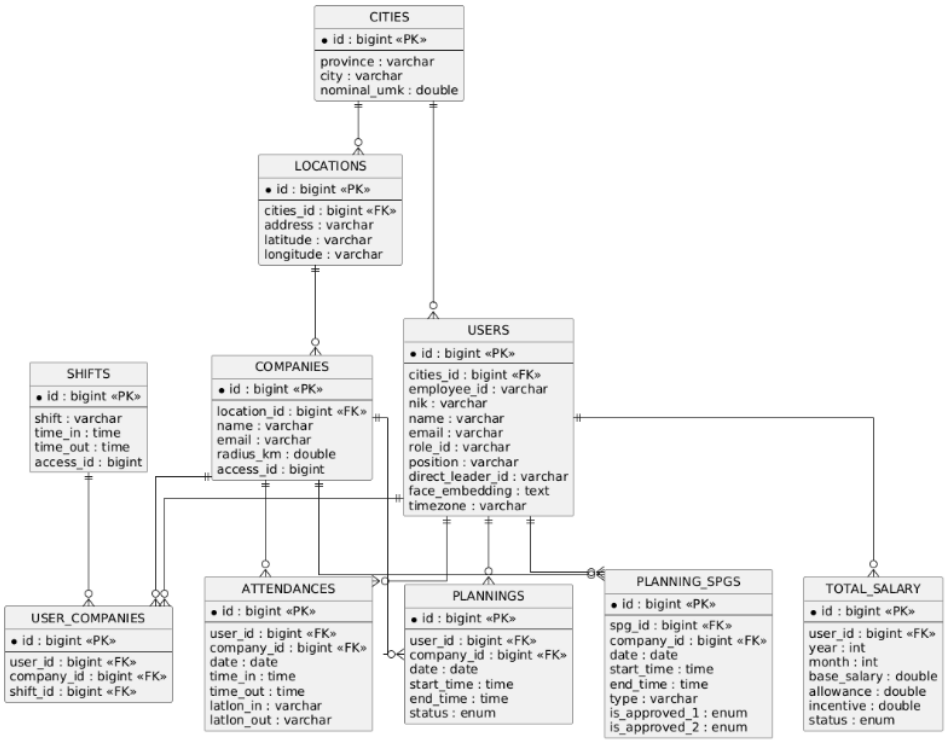

Figure 5. Crow's Foot ERD for the attendance system

D. Metabase Visualization

The role of Metabase in this system is to visualize attendance data through the development of an interactive dashboard. This dashboard is embedded into the web-based management application, enabling the HR department to effectively monitor staff performance. Through the dashboard, HR personnel can access comprehensive information, including attendance records, staff field activities, and permission statuses. The primary outputs of Metabase consist of attendance visualizations, staff activity reports, and integrated representations of leave or permission data with attendance monitoring. Consequently, when staff members submit leave requests or other types of permission, the visualization system automatically adjusts the monitoring display, thereby facilitating HR oversight. In addition, Metabase is capable of presenting spatial data visualizations that illustrate staff distribution across company branches in different geographical regions, further strengthening its role as an analytical and decision-support tool.

IV. RESULTS AND DISCUSSIONS

The following sections briefly describe each application, including the datasets used, the software development process, and key features. Any additional background or literature differing from the first two sections is presented concisely.

A. Attendances and Activity Visualization

The attendance visualization presented in Figure 6 produces an interactive report that enables users to review staff attendance status by company, name, and date with comprehensive filtering options. This visualization is generated from queries of attendance data integrated with permission records, thereby providing an accurate representation of staff conditions, including leave requests, tardiness, absence, or early departure. Furthermore, each attendance status category is represented by a distinct symbol, which is described in detail in Table 1.

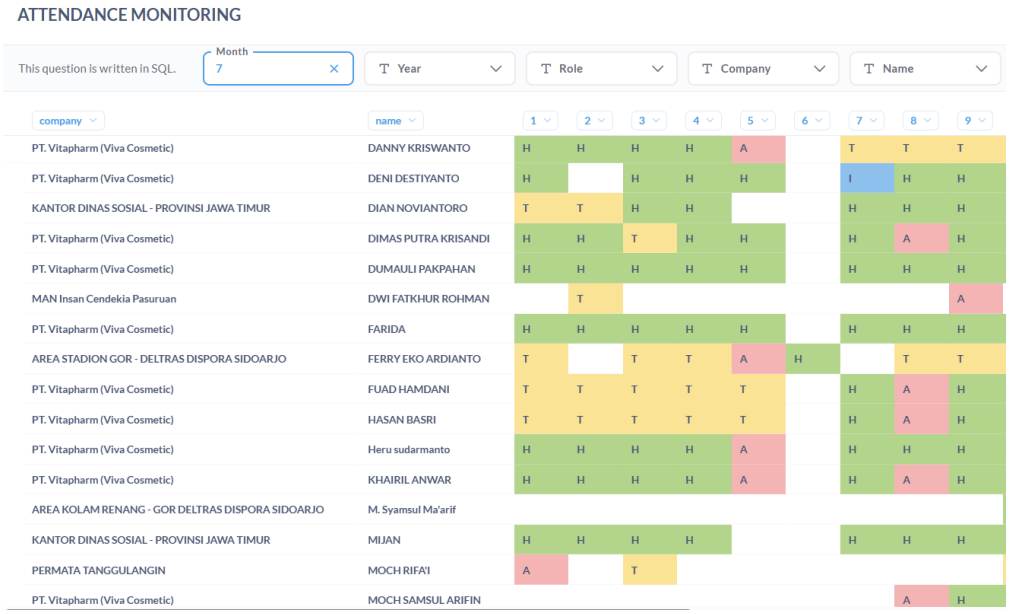

Figure 6. Visualization of attendances monitoring

Table 1. Symbol attendance

Symbol	Meaning
H	Present
T	Late
I	Permitted
A	Absent
	No record in database

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To display attendance data using query:

Input and Variable
INPUT: users (filter role=staff, optional company/name) permissions, attendances, planning_spgs company_start_times, year, month SET report = []
FOR each user IN users (role=staff): INIT row = { company, name, day_status[1..31] = ' ', Present=0, Late=0, Absent=0 } FILTER: user_permissions (by user.id) user_attendances (by user.id, year, month) user_plans (by user.id, year, month) MAP plan_by_date = { ps.date → ps.start_time } FOR day = 1..31: current_date = Date(year, month, day) status = ' ' IF current_date IN any user_permissions interval: status = 'I' ELSE IF attendance EXISTS for current_date: IF time_in NULL OR time_out NULL: status = 'A' ELSE: start_time = plan_by_date[day] OR company_start_times[user.company_id] IF time_in > start_time: status = 'T' ELSE: status = 'H' row.day_status[day] = status UPDATE counters (Present/Late/Absent) ADD row TO report SORT report by name RETURN report

In addition, each staff member can access and review their own attendance status by logging into the web-based application. Unlike the interface designed for the HR department, the staff interface is simplified to display only the individual user's attendance data. An example of this interface is illustrated in Figure 7.

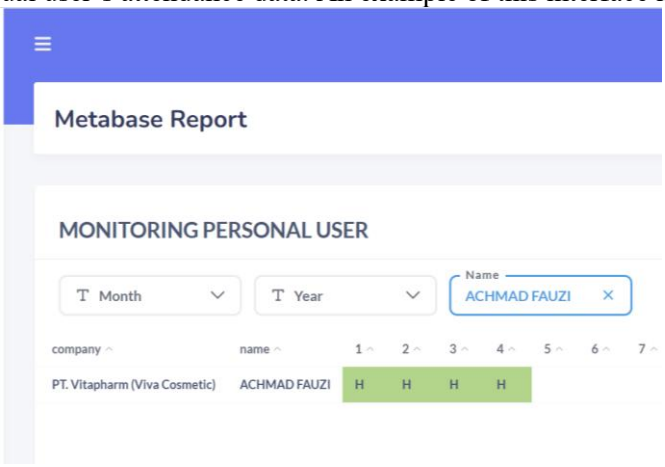

Figure 7. Personal attendance data

Furthermore, the staff role within the system includes access to reviewing their recorded activities through the web interface. The activity list is generated from query results visualized using Metabase and embedded into the website, as illustrated in Figure 8. An example of the activity data accessible to users is presented in **Error! Reference source not found.**. The displayed activity records are specific to each

individual user and include details such as name, activity date, activity description, and the location where the activity was performed.

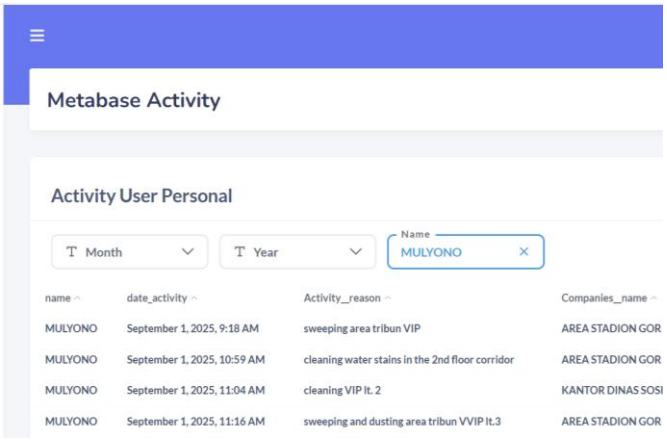

Figure 8. Personal activity for staff

B. Attendance and Payroll Analysis

Based on the previous visualization results, an analysis will be conducted regarding the influence of high and low salary levels on the attendance of sales personnel. The researcher will carry out this analysis.

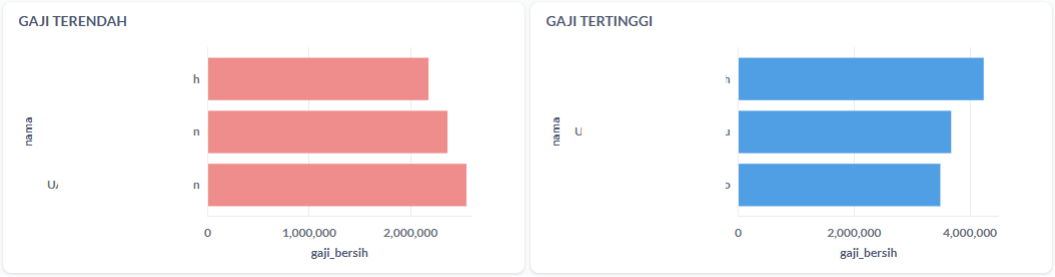

Figure 9. Higest salary in June

In June, three employees with the lowest salaries and three employees with the highest salaries were selected. These six individuals, whose data were used for visualization, all hold the role of Sales, or Beauty Advisor as referred to in the system. Since personal names may not be disclosed, the researcher created initials for the purpose of analysis. The initials used in each visualization presented in Figure 4.65 are described in Table 2.

Table 2. Initials of Sales Persons with the Highest and Lowest Salaries

Higest Salary		**Lowest Salary**	
Name	**Salary**	**Name**	**Salary**
PA	Rp. 4.237.794	PX	Rp. 2.177.193
PB	Rp. 3.675.812	PY	RP. 2.364.520
PC	Rp. 3.488.484	PZ	RP. 2.551.848

Salary deductions are applied when sales personnel commit attendance violations, such as frequent lateness. The higher the number of late occurrences, the greater the salary deduction will be.

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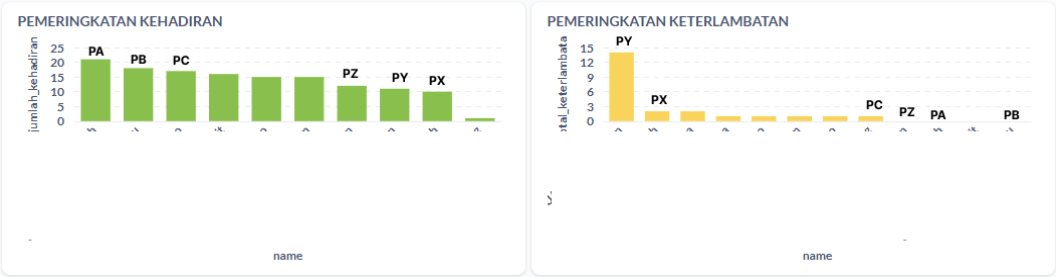

Figure 10. June Ranking Visualization

Next, a comparison of attendance and lateness between the lowest and highest salary groups was conducted. The comparison is presented in Table 3 and Table 4 as a validation of the rankings shown in Figure 9 relative to Figure 10.

Table 3. Validation of Highest Salary Ranking Based on Attendance

Higest Salary				
Name	**Present**	**Late**	**Ranking**	**Status**
PA	21	0	1	Valid
PB	18	0	2	Valid
PC	16	0	3	Valid

Table 4. Validation of Lowest Salary Ranking Based on Attendance

Lowest Salary				
Name	**Present**	**Late**	**Rangkin**	**Status**
PX	10	2	1	Valid
PY	11	14	2	Valid
PZ	12	0	3	Valid

The results of the analysis show that the ranking visualization of sales salaries has a significant influence on their attendance behavior. As shown in Table 3, PA holds the highest rank among those with the lowest salaries, with a higher attendance rate compared to other sales personnel such as PB and PC. Furthermore, in Figure 4.65, PX occupies the lowest salary rank because it has the lowest attendance score compared to PY and PZ.

V. CONCLUSIONS AND RECOMMENDATIONS

The implementation of a Metabase-based dashboard at PT. Fiyansa Mulya has successfully yielded three strategic visualization categories: attendance consolidation, sales performance analysis, and payroll systems. Drawing upon analysis conducted during the June period, this dashboard provides a comprehensive insight into the correlation between employee disciplinary adherence and received remuneration.

Data validation across payroll visualizations and attendance records reveals a significant correlation between disciplinary conduct and remuneration levels. This is substantiated by a comparative analysis of the highest-earning sales cohort (PA, PB, and PC) versus the lowest-earning cohort (PX, PY, and PZ). The top-tier income group consistently demonstrates high attendance rates (reaching 21 days) accompanied by zero instances of tardiness. Conversely, the lowest-income group is directly proportional to minimal attendance (as low as 10 days for PX) or a high frequency of tardiness (reaching 14 instances for PY), which automatically triggers substantial salary deduction mechanisms.

Consequently, the generated visualizations extend beyond the mere presentation of administrative data; they objectively substantiate that attendance levels and punctuality are the pivotal determinant variables influencing sales remuneration. Furthermore, the dashboard has demonstrated its efficacy in validating the transparency of the payroll system and facilitating the oversight of employee adherence to corporate policies.

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