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Designing A Web-Based Employee Payroll Application (Case Study on One of The Raw Material Distributor Companies in West Java)

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Abstract

The fulfillment of the employees' payroll is a crucial task of the firm, ensuring the well-being of its workforce following a complete month of employment. The wage calculation system employed by a raw material distribution company in West Java currently relies on semi-computerized methods, specifically utilizing MS Excel for processing purposes. This approach is considered less efficient and susceptible to inaccuracies in its computations. This study aims to design and implement a system that can aid the organization in reducing computation errors. The author employs a qualitative descriptive methodology in their study. The author employs the OOSE (Object Oriented System Engineering) method as the chosen approach for development, emphasizing use cases. The employee payroll application was designed and implemented using the PHP programming language with the Laravel framework. The MySQL database was utilized for data storage. The anticipated outcome of the investigation into the employee payroll application is poised to provide the organization with improved efficiency and precision in processing employee wage calculations while concurrently mitigating the potential for data loss.

Keywords: *employee payroll application, salary, web, OOSE, Laravel*

Introduction

Effective employee payroll administration has emerged as a pivotal component for the success of any firm. (Autor et al., 2022; Grigsby et al., 2021; Zhao, 2020) Due to rapid technological progress, organizations are progressively using internet-based apps to enhance efficiency in managing payroll procedures. (Le Barbanchon et al., 2019; Saraswati et al., 2021) The primary objective of this study is to examine the design and execution of a web-based employee payroll application customized to meet the specific needs of a prominent raw material distribution company situated in the region of West Java. The research holds great importance due to its ability to bring about a paradigm shift in the company's approach to managing payroll processes. This, in turn, can result in improved efficiency, accuracy, and data security.

Companies that still need to fully integrate computerization into their daily operations, notably in generating reports, resort to a less efficient and time-consuming method. (Karunamoorthi et al., 2020; Kristal, 2020) In the contemporary era characterized by rapid technological advancements, organizations must embrace the changing landscape and cater to the needs of individuals who prioritize expediency and efficacy in their daily lives. (Chick et al., 2020) In contemporary society, precise data processing holds significant importance across multiple domains and is indisputably recognized as such.

An Employee Payroll Application refers to a software or computer system organizations employ to administer and mechanize compensating their workforce effectively. (Barrios et al., 2020; de Freitas et al., 2020; Garde et al., 2018) The purpose of this application is to support organizations in managing employee salary information, encompassing wage calculations, deductions, and the administration of many compensation elements. (Hasti et al., 2020; Yunita, 2018)

One essential factor to contemplate in life, specifically about employment, is the administration of payroll to meet a company's responsibility for the welfare of its workforce. In this context, the author will provide an illustrative case study of a distributor company located in

West Java, specializing in the trading business and the sale of essential raw materials.

The process of registering and calculating employee compensation at a raw material distribution company in West Java is encountering several obstacles. There are two commonly employed approaches for managing pay calculations: the semi-computerized technique and the utilization of MS Excel. The semi-computerized method involves documenting various compensation components such as overtime, deductions, absences, allowances, and loans. On the other hand, MS Excel is used as a tool for this purpose. However, it is worth noting that disbursing salaries often encounters delays due to the necessity of double-checking the recorded data to guarantee its precision. Furthermore, the organization continues to utilize a sequential transfer approach for its workforce.

The rationale behind initiating this research attempt arises from a compelling necessity for a sophisticated, technology-driven resolution to tackle the payroll difficulties encountered by the organization. Utilizing web-based apps makes it feasible to develop a cohesive and user-centric platform that streamlines the payroll procedure. Implementing this approach not only diminishes the probability of errors in computations but also offers an expeditious and dependable method for distributing salaries. Additionally, the system has been specifically engineered to incorporate state-of-the-art security protocols to protect confidential employee information, minimizing the possible hazards linked to data breaches or illegal entry.

The main aim of this study is to create, construct, and execute a web-based employee payroll system customized to meet the specific requirements of a raw material distribution company located in West Java. The primary objective of this program is to fundamentally transform payroll management within the organization, focusing on enhancing accuracy, efficiency, and data security. Furthermore, the present study aims to assess the effects of the newly implemented system on the overall efficacy of payroll operations, explicitly emphasizing the reduction of errors, streamlining processing time, and improving overall employee satisfaction.

This study aims to offer significant insights into the possible benefits and problems of implementing web-based payroll solutions in a real-world company environment by thoroughly analyzing the application's performance.

Research Method

The present study employs a descriptive research design, utilizing qualitative methodology. That qualitative descriptive research is primarily concerned with addressing research inquiries about the individuals involved, the nature of the phenomenon, its location, and how it unfolds. This approach entails a comprehensive examination of the event or experience under investigation to identify and elucidate any emergent patterns that may arise. In summary, the qualitative descriptive research method is characterized by utilizing a straightforward qualitative approach that follows an inductive trajectory. The inductive process of qualitative descriptive research involves explaining a particular process or event and deriving a conclusion as a generalization.

The employed methodologies for data collecting encompass the following:

The direct data collecting technique involves obtaining information directly from the owner of The Raw Material Distributor Companies in West Java. The act of performing firsthand observations of the environment of The Raw Material Distributor Companies in West Java. The present section comprehensively reviews the existing literature on the subject matter. It is engaging in examining books, materials, and literary works that provide relevant information to fulfill the final report about the employee payroll program.

Methodology for System Development

The author employed the Object-Oriented Software Engineering (OOSE) methodology to develop the system. OOSE is an object-oriented system development methodology that significantly emphasizes using use cases. One notable benefit of employing this approach is its utilization of

straightforward notation while simultaneously encompassing all phases within the realm of software engineering. The object-oriented method employed in this context focuses on examining system objects and places particular emphasis on using use cases. Object-Oriented Software Engineering (OOSE) encompasses a tripartite framework consisting of three distinct stages: The process of developing requirements and analytical models. The design and implementation phase is a critical stage in the project. The current step of the project involves the testing of the model.

Result and Discussion

System Implementation

The system implementation stage is the stage of describing an application system so that the application system is ready to operate. This stage is carried out after the data analysis, database, and system menu design stages are completed. The implementation stage will discuss data input design, output design, and the need for system application support devices to operate it.

Program Discussion

The program discussion is a page display of the program that has been created based on the design results in the previous chapter. The following is the display of the system's initial program before entering the user login:

1. **Financial Page View**
   a. Login Page Display

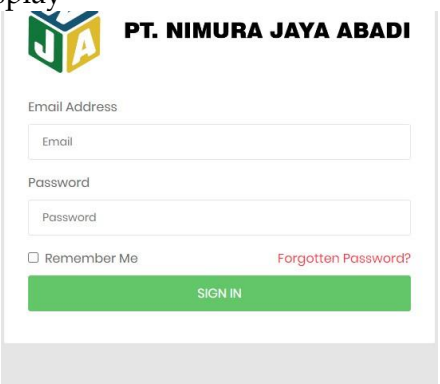

Figure 1. Login page display

b. Dashboard Page View

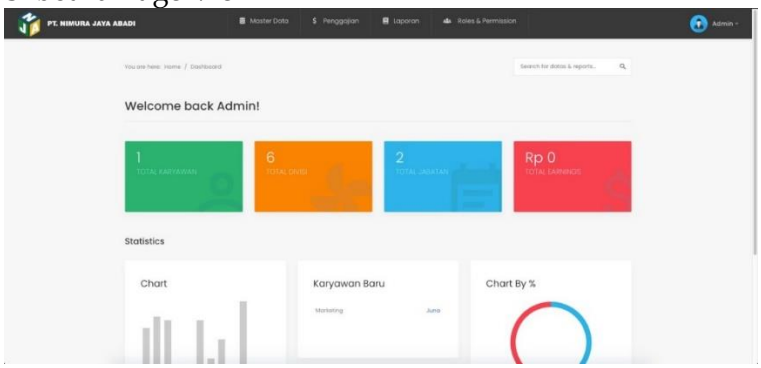

Figure 2. Dashboard page display

c. User Data Page Display

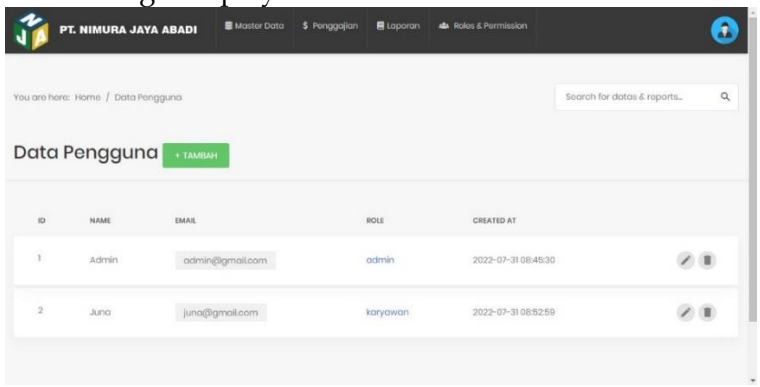

Figure 3. User Data Page Display

d. Add and Edit User Data Page Display

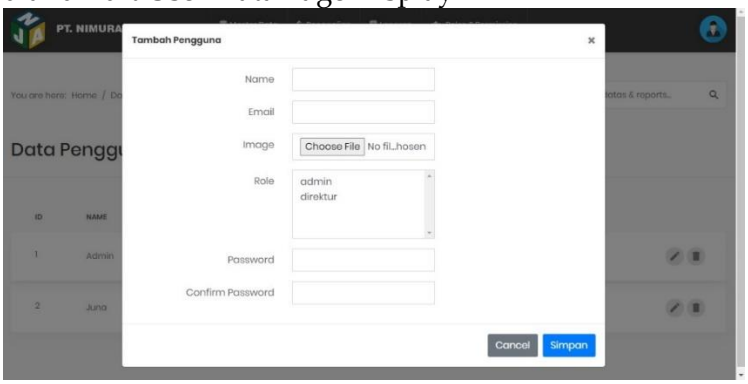

Figure 4. Add and Edit User Data Page Display

e. Division Data Page Display

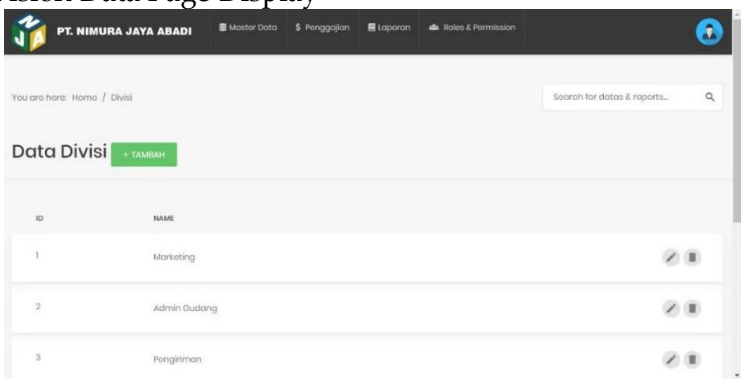

Figure 5. Division Data Page Display

f. Add and Edit Division Data Page Display

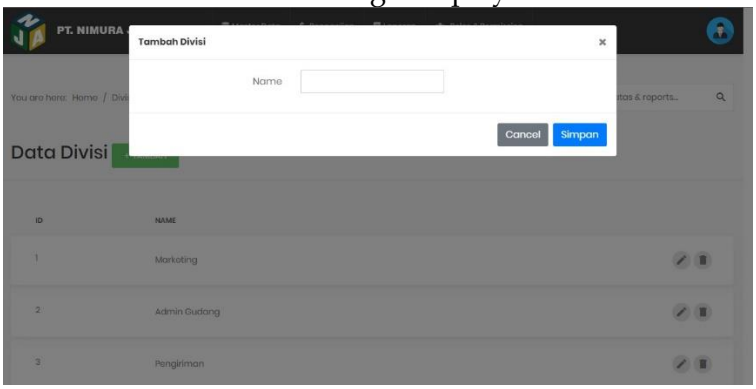

Figure 6. Appearance of the Add and Edit Division Data page

g. Position Data Page Display

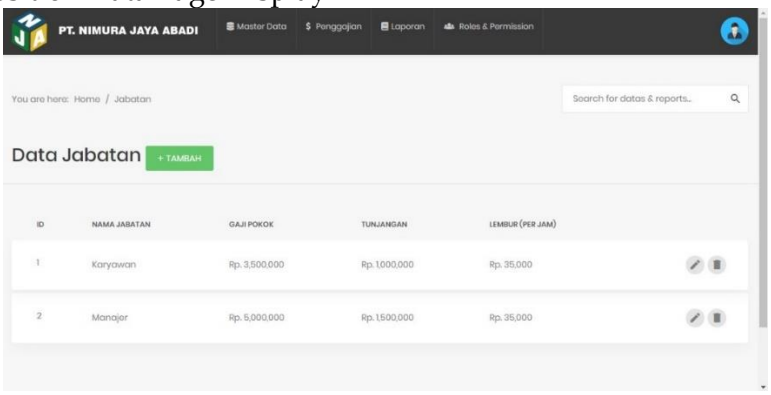

Figure 7. Position Data Page Display

h. Add and Edit Job Data Page Display

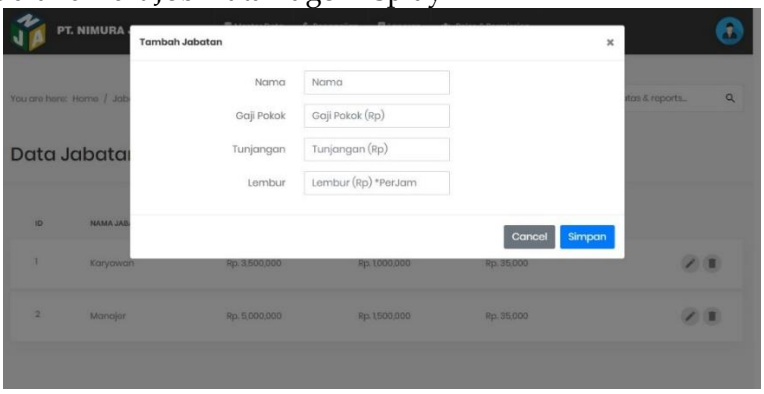

Figure 8. Appearance of the Add and Edit Job Data page

i. Employee Data Page Display

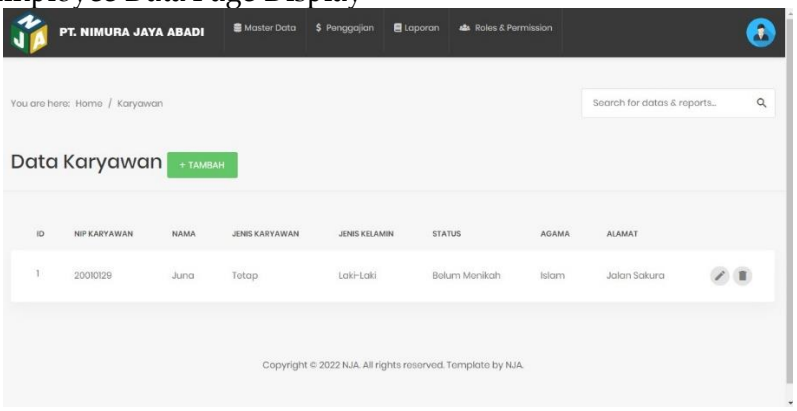

Figure 9. Employee Data Display

j. Add and Edit Employee Data Page Display

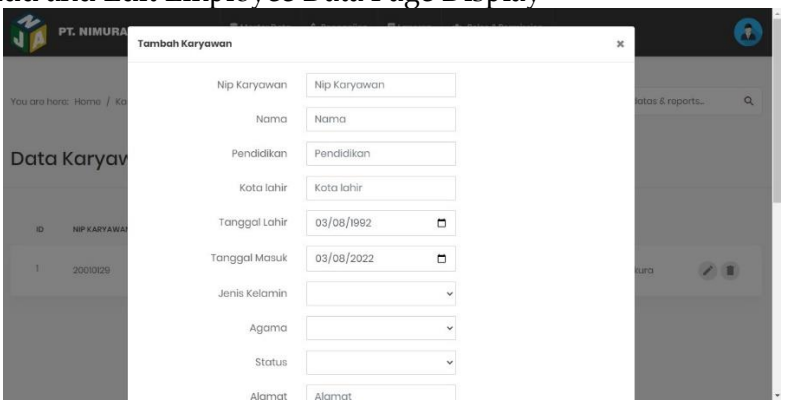

Figure 10. Appearance of the Add and Edit Employee Data page

k. Attendance Data Page Display

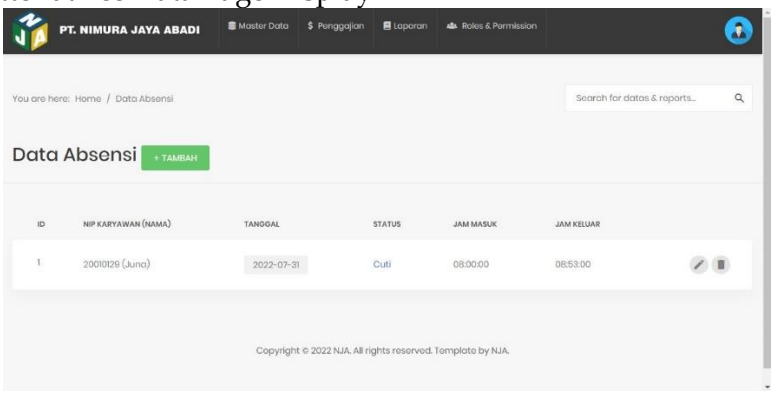

Figure 11. Display of the Attendance Data Page

l. Add and Edit Attendance Data Page Display

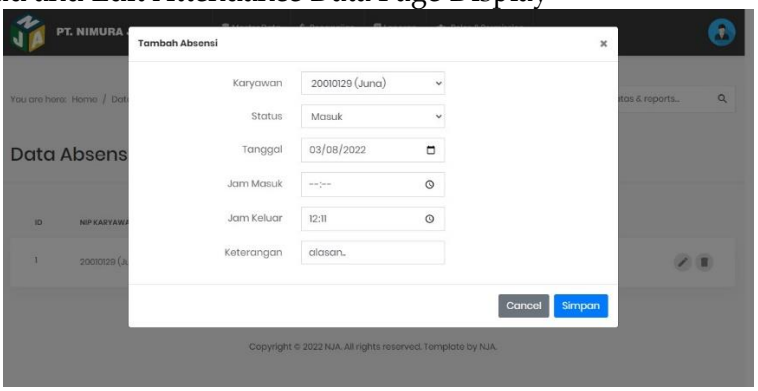

Figure 12. Appearance of the Add and Edit Attendance Data page

m. Loan Data Page Display

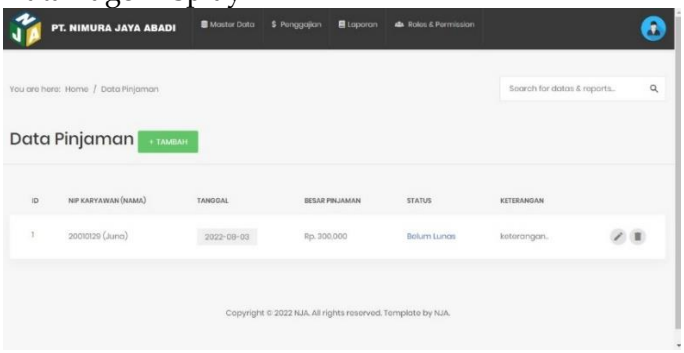

Figure 13. Loan Data Page Display

n. Add and Edit Loan Data Page Display

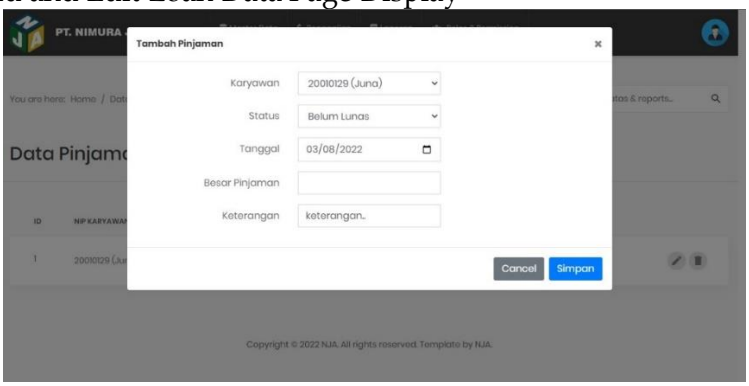

Figure 14 Appearance of the Add and Edit Loan Data page

o. Overtime Data Page Display

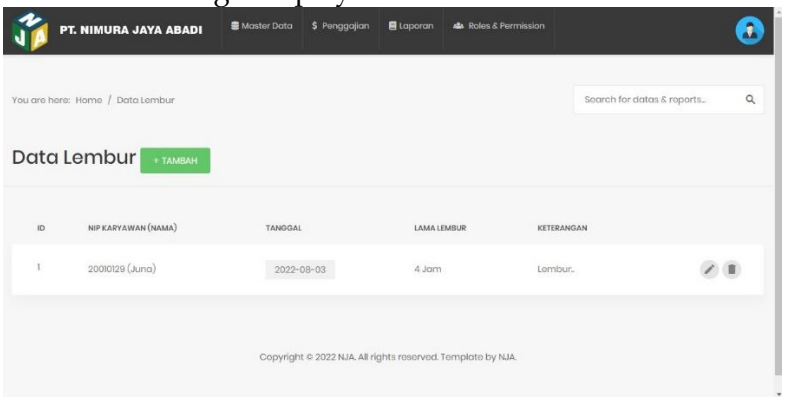

Figure 15. Overtime Data Page Display

p. Add and Edit Loan Data Page Display

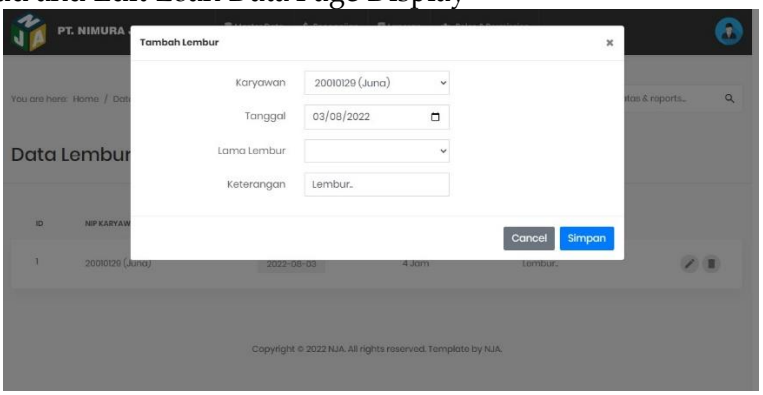

Figure 16. Appearance of the Add and Edit Loan Data page

q. Payroll Data Page Display

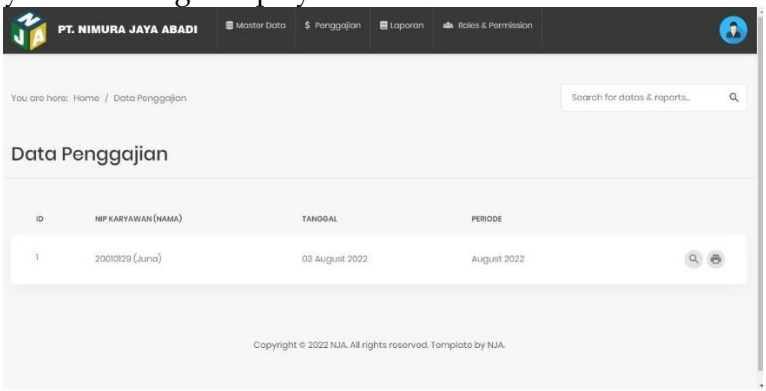

Figure 17. Payroll Page Display

r. Payroll Data Preview Page Display

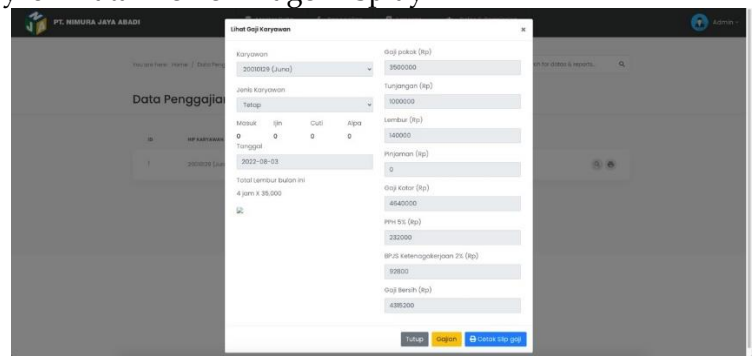

Figure 18. Payroll Data Preview Page Display

s. Payroll Data Print Page Display

PT. NIMURA JAYA ABADI

Nip Karyawan : 20010129 Divisi : Marketing
Nama Karyawan : Jusa Jabatan : Karyawan

No	Keterangan	Jumlah
1.	Gaji Pokok	Rp. 3,500,000
2.	Tunjangan	Rp. 1,000,000
3.	Lembur	Rp. 35,000
		(+)
		Rp. 4,535,000
4.	Pinjaman	Rp. 300,000
5.	PPH	Rp. 217,000
6.	BPJS	Rp. 86,800
		(-)
		Rp. 4,036,200

Penerima 03 August 2022

Jusa Slip Gaji

Figure 19. Payroll Data Print Page Display

t. Report Page View

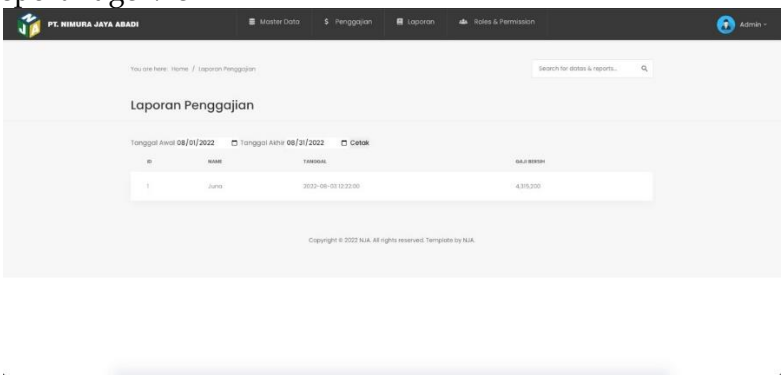

Figure 20. Report page display

u. Payroll Report Print Page Display

PT. NIMURA JAYA ABADI

id	name	tanggal	gaji bersih
1	Jusa	2022-08-03 12:22:00	4,315,200
			4315200

Figure 21. Printed Payroll Report Page Display

2. Employee Page Views

a. Login Page Display

Figure 22. Login Page Display

b. Dashboard Page View

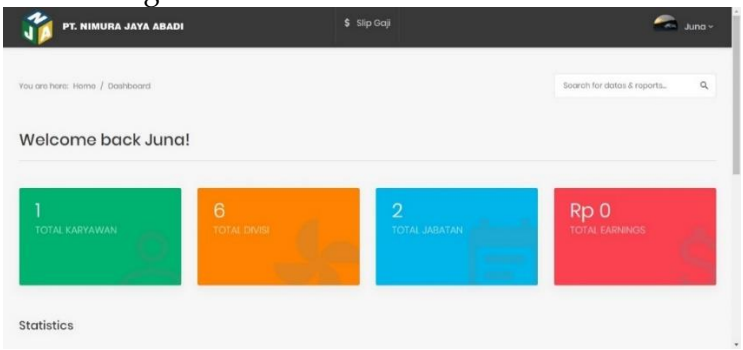

Figure 23. Dashboard page display

c. Payroll Page View

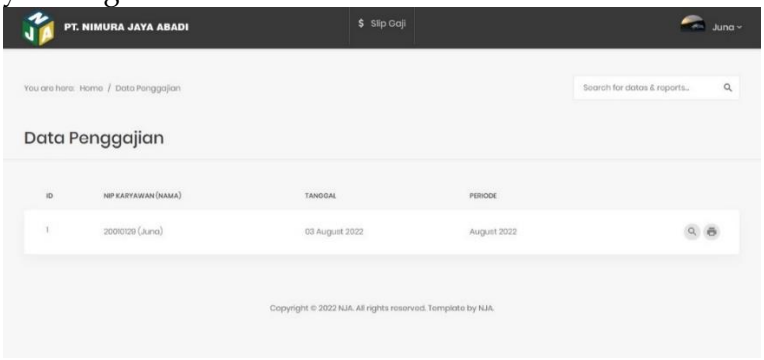

Figure 24. Payroll Page Display

d. Payslip Preview Page View

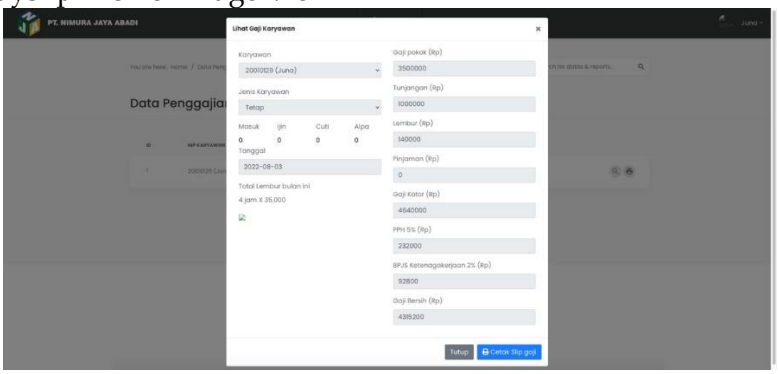

Figure 25. Payslip Preview Page View

e. Printed Salary Slip Page Display

Figure 26. Printed Salary Slip Page View

System Implementation

The system implementation stage is the stage of describing an application system so that the application system is ready to operate. This stage is carried out after the data analysis, database, and system menu design stages are completed. The implementation stage will discuss data input design, output design, and the need for system application support devices to operate it.

1. Division Table
   The division table is used to store division data which contains the division ID, division name and when the data was created and edited.
   Database Name: payroll

Table Name: division
System Menu: Division

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	id	int(10)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
☐	2	name	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
☐	3	created_at	timestamp			Yes	NULL			Change Drop More
☐	4	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 27. Division

2. Attendance Table
   The attendance table is used to store employee attendance data which contains attendance ID, user ID, employee absence status, date, clock in, clock out, information as well as when the data was created and edited.
   Database Name: payroll
   Table Name: attendance
   System Menu: Attendance

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	id	int(10)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
☐	2	user_id	int(10)		UNSIGNED	No	None			Change Drop More
☐	3	status	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
☐	4	tanggal	date			No	None			Change Drop More
☐	5	jam_masuk	time			No	None			Change Drop More
☐	6	jam_keluar	time			No	None			Change Drop More
☐	7	keterangan	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
☐	8	created_at	timestamp			Yes	NULL			Change Drop More
☐	9	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 28. Absenteeism

3. Position Table
   The position table is used to store position data containing position ID, position name, gaps, allowances, overtime and when the data was created and edited.
   Database Name: payroll
   Table Name: position
   System Menu: Position

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	id	int(10)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
☐	2	name	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
☐	3	gapok	int(11)			No	None			Change Drop More
☐	4	tunjangan	int(11)			No	None			Change Drop More
☐	5	lembur	int(11)			No	None			Change Drop More
☐	6	created_at	timestamp			Yes	NULL			Change Drop More
☐	7	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 29. Position

4. Overtime Table
   The overtime table is used to store overtime data which contains overtime ID, user ID, date, length of overtime, description and when the data was created and edited.
   Database Name: payroll
   Table Name: overtime
   System Menu: Overtime

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	id	int(10)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
☐	2	user_id	int(10)		UNSIGNED	No	None			Change Drop More
☐	3	tanggal	date			No	None			Change Drop More
☐	4	lama_lembur	int(11)			No	None			Change Drop More
☐	5	keterangan	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
☐	6	created_at	timestamp			Yes	NULL			Change Drop More
☐	7	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 30. Overtime

5. Loan Table
   The loan table is used to store loan data which contains loan ID, user ID, loan status, date, loan size and when the data was created and edited.
   Database Name: payroll
   Table Name: loan
   System Menu: Loans

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	id	int(10)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
☐	2	user_id	int(10)		UNSIGNED	No	None			Change Drop More
☐	3	status	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
☐	4	tanggal	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
☐	5	besar_pinjaman	int(11)			No	None			Change Drop More
☐	6	keterangan	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
☐	7	created_at	timestamp			Yes	NULL			Change Drop More
☐	8	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 31. Loans

6. User Table
   The user table is used to store user data containing user ID, name, email, password, photo, nip, education, city of birth, date of birth, date of entry, gender, religion, marital status, address, type of employee, division ID, position. ID, leave position, and when the data was created and edited.
   Database Name: payroll
   Table Name: users
   System Menu: User

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(10)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
3	email	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
4	password	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
5	image	varchar(191)	utf8mb4_unicode_ci		No	user.png			Change Drop More
6	nip	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
7	pendidikan	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
8	kota_lahir	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
9	tgl_lahir	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
10	tgl_masuk	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
11	jk	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
12	agama	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
13	status	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
14	alamat	text	utf8mb4_unicode_ci		No				Change Drop More
15	jenis_karyawan	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
16	divisi_id	int(11)			No	None			Change Drop More
17	jabatan_id	int(11)			No	None			Change Drop More
18	jatah_cuti	int(11)			No	None			Change Drop More
19	remember_token	varchar(100)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
20	created_at	timestamp			Yes	NULL			Change Drop More
21	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 32. User

7. Tabel Penggajian
   The report table is used to store data containing the payroll id and when the data was created and edited.
   Database Name: payroll
   Table Name: payroll
   System Menu: Payroll

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(10)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	created_at	timestamp			Yes	NULL			Change Drop More
3	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 33. Payroll

8. Report Table
   The report table is used to store data containing report ID, user ID, month, year, basic salary, allowances, overtime, loans, PPH, BPJS, net salary and when the data was created and edited.
   Database Name: payroll
   Table Name: report
   System Menu: Reports

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(10)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	user_id	int(10)		UNSIGNED	No	None			Change Drop More
3	bulan	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
4	tahun	varchar(191)	utf8mb4_unicode_ci		No	None			Change Drop More
5	gapok	int(11)			No	None			Change Drop More
6	tunjangan	int(11)			No	None			Change Drop More
7	lembur	int(11)			No	None			Change Drop More
8	pinjaman	int(11)			No	None			Change Drop More
9	pph	int(11)			No	None			Change Drop More
10	bpjs	int(11)			No	None			Change Drop More
11	gaji_bersih	int(11)			No	None			Change Drop More
12	created_at	timestamp			Yes	NULL			Change Drop More
13	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 34. Report

Conclusion

In conclusion, the presented evidence supports the stated hypothesis.

The results obtained from the investigation conducted on the Employee Payroll Application of The Raw Material Distributor Companies in West Java are outlined as follows: The process of documenting and calculating employee payroll of The Raw Material Distributor Companies in West Java is now conducted using a semi-computerized system. The generation of employee salary reports frequently encounters delays due to the ongoing utilization of semi-computerization. The process of calculating employee compensation remains susceptible to errors.

The following recommendations are suggested:

Based on the findings above, the organization should deploy technologies that facilitate the documentation of employee attendance information to enhance the integration with this application and optimize its utilization. Furthermore, it is recommended that the organization enhance the existing web-based application by transforming it into an Android-based application for smartphones since this technology is presently experiencing a surge in popularity.

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