

Reporting Application of Groundwater Use Volume by Industrial Taxpayers (Case Study on One of The Services in Bandung District)

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Abstract

The Bandung District's Regional Revenue Agency (BAPENDA), primarily tasked with managing local taxes, currently utilizes computer technology for most of its operations, albeit not to its full potential. Currently, manual techniques that utilize paper are still utilized to report the amount of groundwater consumption by taxpayers. As a result, this can affect the accurate computation of groundwater taxes and lead to delays in distributing information regarding groundwater taxes. This study aims to develop an application that enables taxpayers to report the amount of groundwater they use efficiently. This application will also facilitate the access of groundwater usage reports by Tax Division I, hence enhancing convenience. The Final Project utilizes a descriptive research methodology, whereas the system development process employs OOAD (Object-Oriented Analysis and Design). This application system is designed using the PHP programming language and utilizes the MySQL XAMPP database. The chosen framework is CodeIgniter due to its extensive range of capabilities that facilitate the creation of robust and high-performing web applications. To summarize, this research has effectively developed an application that allows taxpayers in the Bapenda of Bandung District to submit their groundwater usage volume. This application simplifies the reporting procedure for taxpayers and assists Tax Division I in accessing groundwater usage statistics.

Keywords : Apps, Tax, Bapenda

INTRODUCTION

The ongoing advancement of technology and information has resulted in several transformations worldwide. In light of technological advancements, all facets must operate with increased speed, precision, and excellence in data processing and information presentation. Nevertheless, technology needs to be more utilized, resulting in a significant portion of data processing tasks being performed manually.

Tax is an obligatory payment made by individuals to the government while participating in activities or transactions. The allocation of taxes, as determined by tax authorities, encompasses both central and local taxes. Central taxes refer to the taxes that the central

government collects, including income and value-added tax. As stipulated by Law No. 34 of 2000, local taxes are obligatory payments made by people or companies to the local government without receiving direct equivalent compensation. These taxes are implemented by relevant legislation and regulations and are utilized to fund the functioning and advancement of the local government.

Local taxes are categorized into provincial taxes and district or city taxes. Provincial taxes encompass many types of taxes, such as motor vehicle taxes, taxes on water and air transportation vehicles, transfer taxes for motor vehicle and water transportation vehicle ownership, fuel taxes, and taxes on subsurface and surface water extraction. Conversely, district or city taxes encompass a range of taxes such as

hotel, restaurant, entertainment, advertising, street lighting, groundwater, extraction, and processing taxes for group C natural resources and parking taxes.

A specific form of local taxation is the groundwater tax. The Regent of Bandung Regulation No. 61 of 2021 outlines the Technical Guidelines for implementing Groundwater Tax Collection. This tax is imposed locally on the extraction and utilization of groundwater.

The Bandung District Regional Revenue Agency (Bapenda), primarily responsible for administrating local taxes, now utilizes computer technology for most of its operations but has yet to maximize its potential entirely. Through conducting interviews with personnel in Tax Division I, the researcher discovered difficulties in the reporting procedure of groundwater usage volume by taxpayers to Bapenda. A well-defined system is necessary to avoid possible delays in the computation of groundwater taxes by Bapenda.

Currently, taxpayers in Bandung District have yet to embrace computer technology and continue to manually submit data on groundwater usage volume to Bapenda by personally visiting the Bapenda office. This approach is seen as less effective and efficient as it can impede the calculation of groundwater taxes, leading to delayed information regarding such taxes.

According to Jogiyanto, an application refers to utilizing a set of instructions or statements organized in a specific manner within a computer system, enabling the computer to transform input data into output results. Meanwhile, Rachmand Hakim S defines it as software designed for specific functions, such as document processing,

Windows management, gaming, and similar tasks (Tri, 2020).

Information System

An Information System is a tool or method designed to transform data into usable information for decision-makers. An information system can be defined as efficiently and accurately delivering and sharing information with users who require it (Hidayat, 2019).

Taxation

Taxation is indispensable for any nation. Increased taxation leads to the construction of additional amenities and infrastructure. Hence, taxation is the fundamental pillar of a nation's progress (Thian, 2021).

Regional Tax refers to a tax imposed within a particular geographical region.

As per Law Number 28 of 2009 on Regional Taxes, regional tax is a compulsory payment made by individuals or entities to the region, as mandated by the law. This payment is not directly compensated and is utilized for the region's benefit, aiming to enhance the people's overall well-being. Regional taxes have a dual purpose of generating regional income and functioning as a regulatory mechanism.

Regional Tax Characteristics

The attributes associated with regional taxes can be succinctly described as follows (Pohan, 2021):

- 1) Regional taxes can be derived from original or central taxes allocated to the region as regional taxes.
 - 2) Regional taxes are exclusively levied within the jurisdictionally governed area.
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- 3) Regional taxes are allocated to fund regional development and government expenses.
- 4) Regional regulations and laws collect regional taxes to ensure taxpayers' compliance.

Classification of Regional Taxes

The Provincial Tax kinds include Pohan (2021). The taxes imposed include 1) Motor Vehicle Tax, 2) Motor Vehicle Transfer Tax, 3) Motor Vehicle Fuel Tax, 4) Surface Water Tax, and 5) Cigarette Tax.

The sorts of taxes that fall under the category of Regency/City Tax are: The following taxes are imposed: 1) Hotel Tax; 2) Restaurant Tax; 3) Entertainment Tax; 4) Advertising Tax; 5) Street Lighting Tax; 6) Non-Metallic Mineral and Rock Tax; 7) Parking Tax; 8) Groundwater Tax; 9) Swift Bird Nest Tax; 10) Rural and Urban Land and Building Tax; and 11) Acquisition Duty on Land and Buildings.

Groundwater Levy

Bandung Regency Regent Regulation Number 61 of 2021 outlines the Technical Guidelines for implementing Groundwater Tax Collection. Groundwater Tax refers to a local fee imposed on the extraction and utilization of groundwater. Groundwater refers to the entirety of water in the subsurface layer that holds water, including springs that naturally emerge above the surface.

The objective of the Groundwater Tax is to identify and tax the usage of groundwater resources.

The groundwater tax encompasses the extraction and consumption of groundwater.

The following are exempted from the scope of the groundwater tax: 1) The extraction or use of groundwater by the central and regional governments. 2) The extraction or use of groundwater for peasant irrigation purposes. 3) The extraction or use of groundwater for essential household needs. 4) The groundwater extraction for worship, firefighting, and non-damaging research and investigation purposes related to environmental water sources and irrigation structures and their derivatives.

Groundwater Tax: Subject and Taxpayer

The entrepreneur or corporation that obtains or utilizes groundwater is the subject of the groundwater tax and taxpayer.

The assessment of groundwater acquisition serves as the foundation for implementing groundwater taxation. The term "Net Present Acquisition" (NPA) refers to the monetary worth of water that is extracted and subject to taxation. This value is calculated by multiplying the amount of water extracted by the introductory price of water. Groundwater entrepreneurs and removing water from the ground (dewatering) are regulated by the National Pollution Agency (NPA). The quantity of non-performing assets (NPA) resulting from the presence of water during removing moisture (dewatering) is determined by measuring the amount of water discharged during drying procedures.

Rates of taxation for groundwater

The regent levies the tax at their discretion. They establish the groundwater tax rate at 20% (twenty percent) of the imposition base, and the tax amount is determined by multiplying the tax rate by NPA.

SWOT Analysis

SWOT Analysis evaluates an organization's strengths, weaknesses, opportunities, and threats. SWOT analysis is a mnemonic for four key factors: strengths, weaknesses, opportunities, and threats. The SWOT analysis is a methodology employed to assess a commercial venture's strengths, weaknesses, opportunities, and threats.

System Design

Verzello/John Reuter III states that System Design is the phase that follows the analysis of functional requirements before the implementation design. It involves illustrating the structure of a system. As defined by George M. Scott, system design is the phase of designing a system where the solution to the problem at hand is determined. This phase involves arranging software and hardware components so that the installed system fully meets the design specifications established during the system analysis stage (Azis, 2022).

Database

A Database is a structured data collection designed for efficient storage and retrieval. Yakub defines a database as a centralized facility or repository serving as a hub or meeting spot. The database aims to achieve efficiency by optimizing space utilization, ensuring high accuracy, enabling rapid processing of enormous data volumes, facilitating concurrent usage, and eliminating redundant information. A database is a compilation of data saved in storage media within a company or computer (Prehanto, 2020).

System Analysis

Mcleod defines system analysis as the process of scrutinizing an existing system in order to devise a new or improved system. As described by Jeffry L. Whitten et al., system

analysis is a problem-solving methodology that involves dissecting a system into its constituent components to examine their functionality and interrelationships, all to achieve specific objectives (Arifin et al., 2021).

PHP, short for Hypertext Preprocessor, is a server-side programming language initially created by Rasmus Lerdorf in 1994. It is overseen by the PHP Group, which can be found at <http://php.net/>. PHP is compatible with multiple operating systems, including Windows, Linux, Mac, and Unix, and can be used without cost. PHP can be implemented with several web servers, such as IIS and Apache, as well as relational database management systems like MySQL, MS SQL Server, and Oracle (Ifada, 2019).

Bootstrap refers to starting or initializing a system or program. Bootstrap is a CSS Framework that offers a cohesive set of fundamental interface components for web development (Matusea & Suprianto, 2021).

XAMPP version 2.10.3

XAMPP is a costless software that provides support for several operating systems and is a combination of multiple apps. The purpose of this server is to operate independently on a local machine. It includes the Apache HTTP Server program, a MySQL database, and language interpreters for PHP and Perl computer languages (Matusea & Suprianto, 2021).

Sublime Text is a versatile code and text editing tool compatible with multiple operating systems and utilizes Python API technology (Matusea & Suprianto, 2021).

Framework A framework, as understood in Indonesian, refers to a structured collection of libraries (Classes) that can be inherited or utilized

by modules or functions we intend to construct (Matusea & Suprianto, 2021).

Given the context above, the Regional Revenue Agency (Bapenda) of Bandung District requires a customized application to report groundwater usage levels accurately. Hence, the author's focus lies on the title: " Reporting Application of Groundwater Use Volume by Industrial Taxpayers (Case Study on One of The Services In Bandung District)."

METHOD

Methodology for System Development

The research employs the OOAD (Object-Oriented et al.) system development methodology. OOAD, or Object-Oriented Analysis and Design, is a methodology that focuses on analyzing requirements by considering the classes and objects involved in the problem. It helps in designing the software architecture by manipulating system or subsystem objects. OOAD, or Object-Oriented Analysis and Design, is a contemporary approach to problem-solving that involves constructing a model based on real-world principles and concepts (Muharni, 2021).

The topic is the Unified Modeling Language (UML) version 2.11.1. As per Fowler, Unified Modeling Language (UML) is a collection of visual symbols backed by a single meta-model that assists in describing and creating software systems, particularly those developed using object-oriented programming (OO) (Muharni, 2021).

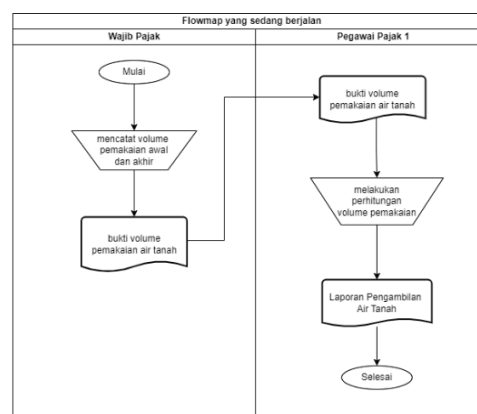
Class Idea or abstract notion.

A class serves as a design or template for an item. An object can be instantiated from a design model referred to as a class. According to this

concept, a class only needs to be instantiated once, and from that class, several objects (potentially dozens or even hundreds) with similar attributes can be generated (Muharni, 2021).

Business Process Analysis

A business process is an interconnected set of organized actions or operations to address a particular issue.



Source: Processed Data

Figure 1. Flow Map

SWOT analysis

The following is a SWOT analysis of the Groundwater Tax Usage Volume Reporting Application, explicitly focusing on the Regional Revenue Agency of Bandung Regency:

Table 1. Presents a SWOT Analysis

Strenght	Weakness
Compulsory adherence to internal tax regulations is required for reporting consumption volume. The implementation of a groundwater tax is satisfactory.	1. The process of reporting requires more time. 2. Report production delays 3. Computations that continue to rely on a calculator
Opportunities	Threaths
1. Can rapidly generate consumption volume reports. 2. Can generate reports based on specified time intervals 3. Maintain a well-structured and orderly database	Program upgrades are necessary in the event of new tax regulations.

Use case Diagrams

A use case aids in the identification of system needs and the establishment of system

boundaries. It facilitates the analysis and design of information systems by offering a thorough depiction of interactions between actors and the system.

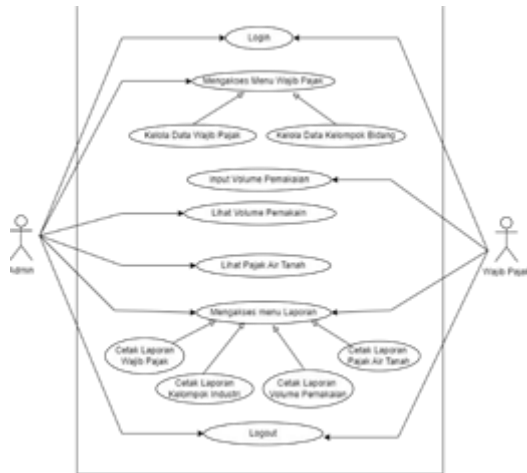


Figure 2. Usecase Diagram

Usecase Scenarios

A Use Case scenario refers to a series of events or exchanges between actors (users or external systems) and the system to accomplish specific objectives.

Tabel 2. Skenario Usecase Login

Use Case Name	Login
Actors	Admin and Taxpayers
Description	Allows actors to log in and access system services.
Precondition	Displays the login form
Postcondition	Displays the Main Page
Main flow of events	
Action Actor	System Response
1. Log in to system	

2. Displays the login form	
3 Input username and password	
4 Perform validation. username and password	a. If it is not verified it will display an error message and return to the login form b. If verified it will display the main menu

Source: Processed Data

Activity Diagrams

An activity diagram is a diagram in the Unified Modeling Language (UML) that is utilized to represent activities and the sequential progression of processes within a system or business process (Muharni, 2021).

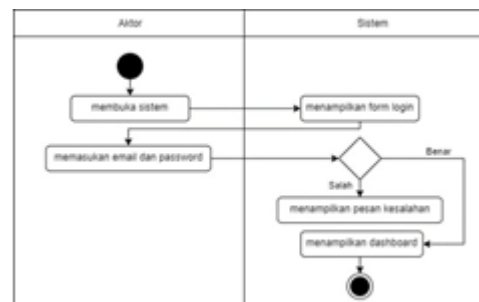


Figure 3. Activity Diagram

SYSTEM PLANNING

Sequence Diagrams

A Sequence Diagram is a graphical representation in software engineering that depicts the exchanges of messages between objects inside a system.

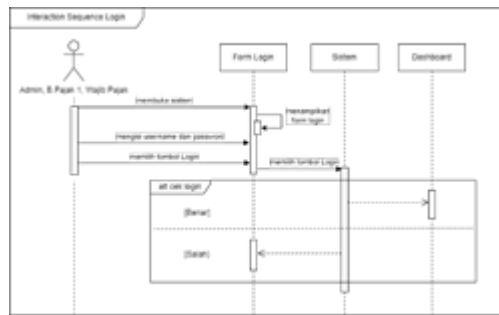


Figure 4. Sequence Diagram

Designing Class Diagrams

A Class diagram is a graphical depiction in software modeling that illustrates the connections between classes inside a system.

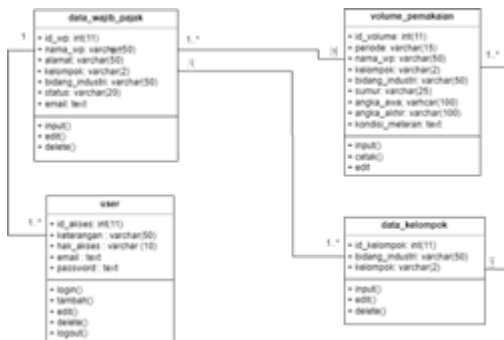


Figure 5. Class Diagram

Database Design

Table 3. Taxpayer Data Table

<i>Filed</i>	<i>Ty</i>	<i>Primar</i>
id wp	Int (11)	*
name wp	Varchar(5)	
address	Varchar(5)	
Group	Varchar(2)	
industrial sector	Varchar(5)	
status	Varchar(2)	
email	text	

Source: Processed Data

Table 4. Field Group Data

<i>File</i>	<i>Tvp</i>	<i>Primar</i>
id group	Int(11)	*
industrial	Varchar(50)	
Group	Varchar(2)	

Source: Processed Data

Table 5. Usage Volume Table

<i>File</i>	<i>Type</i>	<i>Primary</i>
-------------	-------------	----------------

id volume	Int (11)	*
periode	Varchar (15)	
name_wp	Varchar (50)	
Group	Varchar (2)	
industrial	Varchar (50)	
well	Varchar (25)	
initial_number	Varchar (100)	
final_number	Varchar (100)	
meter conditi	text	

Source: Processed Data

Table 6. User Table

<i>Filed</i>	<i>Tvp</i>	<i>Primar</i>
Id akses	Int (11)	*
informasi	Varchar(50)	
access	Varchar(10)	
email	text	
password	text	

Source: Processed Data

Menu Structure Design

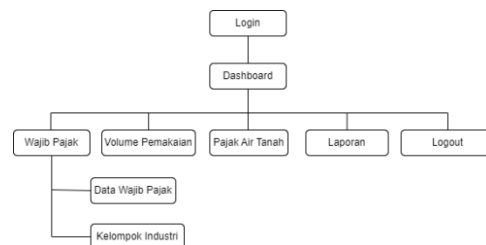


Figure 6. Admin Menu Structure



Figure 7. Taxpayer Menu Structure

Interface Design

Interface or UI design is a critical stage in creating systems, applications, or products. The

Ananta,
Reporting Application of Groundwater Use Volume by Industrial Taxpayers
(Case Study on One of The Services in Bandung District)

objective is to establish a remarkable user experience.



Figure 8. Login Interface Design



Figure 9. Interface Design

Dashboard

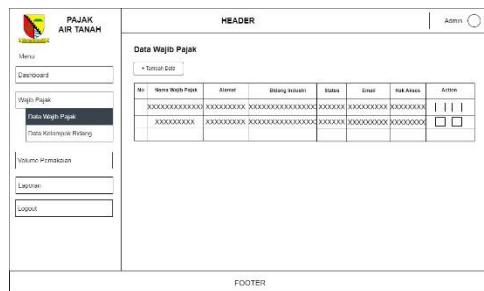


Figure 10. Data Interface Design Taxpayer

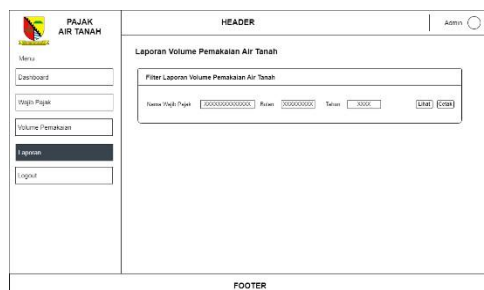


Figure 11. Volume Interface Design

Usage



Figure 12. Report Interface Design

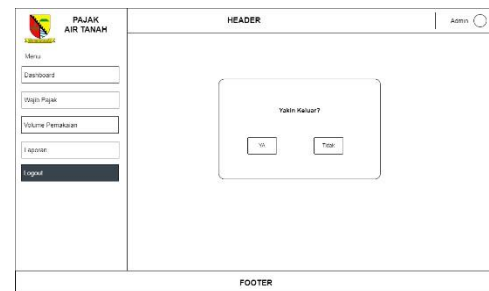


Figure 13. Logout Interface Design

RESULT AND DISCUSSION

SYSTEM IMPLEMENTATION

Hardware Implementation and Software

Table 7. Device Implementation

Hard

No	Hardware	Specification
1	Monitors	LCD 14 Inchi
2	Processors	Intel Caleron
3	Harddisk	500 GB HDD
4	Keyboard	Standard
5	Mouse	Standard
6	Memory (RAM)	2 GB DDR
7	Printers	Epson L320

Table 8. Software Implementation

No	Software	Minimu m Req	Recomende d Req
1	Operatin g System	Windows 7 (64bit)	Windows 10 (64bit)
2	Browser	Firefox	Google Chrome
3	Web Server	Xampp 3.2.2	Xampp 3.2.4
4	Sublime Text	Standard	Standard

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Interface Implementation

Interface implementation means determining how a previously developed program will be visually presented on a webpage.

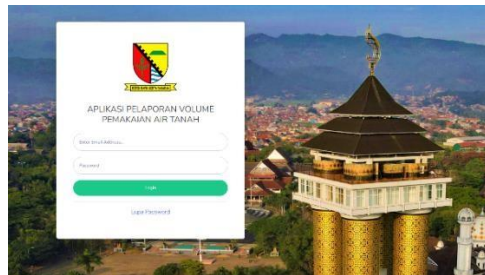


Figure 14. Implementation of the Login Form Interface

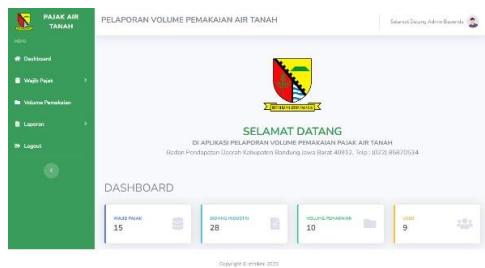


Figure 15. Dashboard Interface Implementation

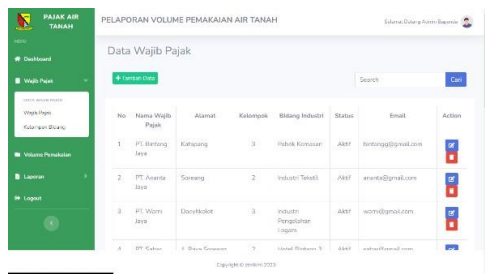


Figure 16. Data Interface Implementation

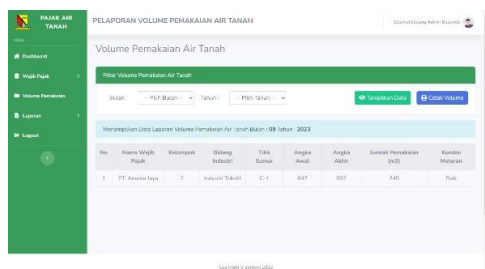


Figure 17. Implementation of the Usage Volume Interface

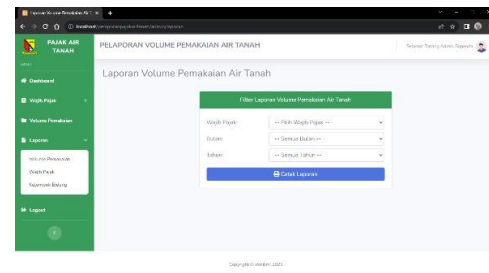


Figure 18. Implementation of the Report Interface

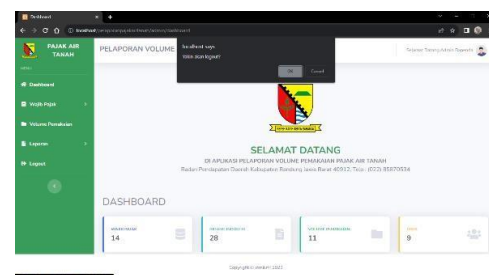


Figure 19. Logout Interface Implementation

Implementasi Database

The database implementation represents the program's database table structure, which is derived from the design outcomes discussed in the preceding chapter.

#	Nama	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id_wajib_pajak	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
2	nama_wajib_pajak	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
3	alamat	varchar(255)	utf8mb4_general_ci	No	None				Change Drop View
4	kelompok	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
5	bidang_industri	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
6	status	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
7	email	text	utf8mb4_general_ci	No	None				Change Drop View

Figure 20. Taxpayer Data Database Implementation

#	Nama	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id_industri	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
2	bidang_industri	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
3	kelompok	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View

Figure 21. Implementation of Industrial Sector Group Data Database

#	Nama	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id_wajib_pajak	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
2	nama_wajib_pajak	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
3	alamat	varchar(255)	utf8mb4_general_ci	No	None				Change Drop View
4	bidang_industri	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
5	kelompok	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
6	nama_industri	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
7	volume_pakai	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
8	volume_pakai	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View
9	nama_industri	varchar(100)	utf8mb4_general_ci	No	None				Change Drop View

Figure 22. Implementation of the Usage Volume Database

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	INT(11)			No			AUTO_INCREMENT	Change
2	username	VARCHAR(255)	utf8mb4_general_ci		No				Change
3	password	VARCHAR(255)	utf8mb4_general_ci		No				Change
4	email	VARCHAR(255)	utf8mb4_general_ci		No				Change
5	status	TINYINT(4)	utf8mb4_general_ci		No				Change

Figure 23. User Database Implementation

CONCLUSION

Based on the findings and discourse presented in the preceding chapter, numerous deductions can be made as follows: Creating an application that simplifies and streamlines the process of reporting groundwater usage volume for taxpayers, thereby minimizing the complexity and the risk of errors associated with manual reporting. This application enables taxpayers to submit their groundwater usage volume online from any location, eliminating the need to physically visit the Bapenda office and saving time. The Department of Taxation I can efficiently retrieve and oversee the recorded data on groundwater usage volume taxpayers provide. Thanks to the system's advanced computerization, this expedites gathering information and generating reports on groundwater usage. Constructing a web-based application that offers precise and readily available digital reporting history yields enduring data administration and analysis advantages.

Suggestions for future system development include improving this program by incorporating additional capabilities that are now unavailable and exploring the potential for adjusting tax rates in compliance with government rules.

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