



DESIGN AND DEVELOPMENT OF A PARKING FEE AND LOADING UNLOADING RETRIBUTION INFORMATION SYSTEM USING C SHARP .NET AT THE TASIKMALAYA CITY TRANSPORTATION DEPARTMENT

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Abstract. The purposes of creating this system is to obtain study result on the design of a proposed information system to simplify and accelerate reporting of parking and loading and unloading fees at the Tasikmalaya City Transportation Agency. The system development method use in this study is the Prototype method, while the analysis tools used include Flowmap, Context Diagram, Data Flow Diagram (DFD), and Entity Relationship Diagram (ERD). The system design uses Microsoft Visual C Sharp.net, and the database design uses Microsoft Office Acces 2013. The result of the design of the retribution reporting data processing system prove that the proposed system has been proven to be able to help simplify and expedite the retribution reporting data processing process, so that retribution reporting data processing can be carried out effectively and efficiently.

Keywords: design; information system; parking fees.

1 Introduction

1.1 Background

In the era of globalization and rapid technological advancement, almost all sectors of life including the transportation sector have begun to utilize information technology to improve operational efficiency and effectiveness. One important aspect of the transportation sector is parking management, which serves as a significant source of Regional Original Revenue (Pendapatan Asli Daerah, PAD) for many local governments, including those managed by the Transportation Department (Dinas Perhubungan, or Dishub). The Department is responsible for regulating and supervising various aspects of transportation, including the management of parking and loading–unloading retribution fees.

Parking and loading–unloading retributions represent an important source of local revenue that supports infrastructure development and other public services. However, in practice, the management of these retributions often faces several challenges, particularly in the collection and reporting processes, which are still carried out manually. One such example is the Tasikmalaya City Transportation Department, which still applies a manual system in its reporting activities. Currently, most data recording at Dishub is conducted using logbooks and Microsoft Excel for deposit data entry.

Although Microsoft Excel assists in organizing data, a fully computerized system offers several additional advantages. First, a computerized system can increase efficiency in recording and reporting parking and loading–unloading retributions in real time, enabling staff to immediately access and monitor retribution reports and deposits that must be submitted. Second, with advanced data analysis features, Dishub can produce

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more accurate and reliable retribution reports, thereby reducing inconsistencies and minimizing errors in recording or calculation.

Third, a computerized system can improve data security, by protecting against unauthorized access and the risk of losing important information. Furthermore, the use of this system can expedite the reporting process and support better decision-making, thereby improving the quality of the retribution services provided.

Although the Tasikmalaya City Transportation Agency currently relies on manual record-keeping using Microsoft Excel, transitioning to a computerized accounting information system is essential to improve the efficiency and effectiveness of managing and reporting payments.

A previous study conducted by Ari Kurniawan Saputra and Fenty Ariani (2021), entitled “Design and Development of a Parking Retribution Revenue Data Processing System at the Metro City Transportation Department Using Borland Delphi”, revealed that the development of a computerized parking retribution information system facilitates data entry, archiving, and searching processes, making them faster, more precise, and more accurate.

Comparison of UPTD levy realization based on parking management data at the Tasikmalaya City Transportation Agency in 2023 and 2024:

Table 1. Retribution Realization

YEAR	TARGET	REALIZATION	TOTAL	%
2023	Rp 2.000.006.000	Rp 1.437.669.000	Rp 1.437.669.000	71,9%
2024	Rp 2.500.217.000	Rp 1.727.333.000	Rp 1.727.333.000	69,1%

Source: Processed by the Author, 2025

Based on parking revenue realization data for 2024, parking levy revenue has fallen short of the established target. The initial target of Rp 2,500,217,000 was only Rp 1,727,333,000, or 69.1% of the target. Compared to the 2023 target of 71.9%, there has been a decline in performance in achieving the parking levy target. Several key factors contributing to this decline include:

1. Parking attendant's inability to control

One of the main factors suspected to be causing this decline is the inability to control parking, which does not fully comply with the regulations set by the relevant agencies, such as failing to pay fees in full, charging parking fees outside the regulations, and even engaging in illegal parking practices that are not recorded in the official system. This leads to a leakage of revenue that should be received by the local government. This phenomenon is important to further investigate in order to find appropriate solutions for controlling parking attendants and efforts to increase the effectiveness of regional parking management.

2. Realization does not meet target

One of the main factors contributing to the decline in parking revenue realization in 2024 is the discrepancy between the established target and actual performance. The local government set a parking revenue target of Rp 2,500,217,000 in 2024, a significant increase compared to the previous year's Rp 2,000,006,000. While the target has increased, this increase has not been accompanied by an accurate analysis

of potential parking spots, vehicle growth, or service capacity. Consequently, the target has become unrealistic and difficult to achieve. From a budget planning perspective, overly optimistic target increases without a realistic improvement strategy can also contribute to low performance.

The Tasikmalaya City Transportation Agency is a regional government agency within the city of Tasikmalaya that carries out transportation duties, including managing parking through the Parking Agency Technical Implementation Unit. The regulation governing roadside parking fees is Mayoral Regulation No. 1 of 2020 concerning Roadside Parking Fees. The proceeds from these parking fees are included in Regional Original Revenue (PAD).

Locally generated revenue (PAD) plays a crucial role, so local governments must be able to manage and assess the resources within regional revenue so that they can be utilized effectively and improve the social welfare of the local community. Contributions to regional revenue, such as taxes and levies, will play a crucial role in supporting the increase in a region's PAD. Regional taxes, including parking levies, have promising prospects for increasing PAD.

Roadside parking fees and special parking fees are collected using a Regional Retribution Assessment Letter (SKRD) or other equivalent documents, such as tickets, coupons, and subscription cards. Regarding Regional Retribution, the Regional Tax and Retribution Law does not prohibit the outsourcing of retribution collection to third parties, as is regulated for Regional Tax collection. The Regional Tax and Retribution Law authorizes the respective Regional Heads to determine the procedures for implementing retribution collection, which are stipulated in Regional Head Regulations.

Loading and unloading fees in Tasikmalaya City are levied based on the weight of the goods and the type of vehicle, with different rates for each category. The loading and unloading fees regulated by the Transportation Agency (Dishub) relate to the fees charged to parties carrying out loading and unloading activities at facilities managed by the Dishub.

The Tasikmalaya City Transportation Department, as the authorized agency responsible for transportation and parking management, still faces several issues within its current system. This indicates the need for further system development to enhance its effectiveness and efficiency. Based on interviews with staff members from the UPTD Parking Unit and the PKB Division at the Tasikmalaya City Transportation Department, several problems were identified regarding the parking and loading–unloading retribution data management process, as follows:

1. Daily parking income receipts are still processed manually.
2. Receipts for loading–unloading deposits are still recorded manually.
3. The treasurer records transactions only upon receiving payments.
4. Data storage is still manual, using books and Microsoft Excel.

In this context, the author developed an application to assist the data entry process for deposit transactions through the design of a computerized parking and loading–unloading retribution system. This system utilizes Microsoft Visual C#.NET as the development software and Microsoft Access as the supporting database. The implementation of this new information system is expected to accelerate and improve the accuracy of reporting and recording deposit transactions, thereby enhancing the efficiency of the information management process for parking and loading–unloading retributions at the Tasikmalaya City Transportation Department.

1.2 Research Methods

Menurut Muhasor dkk, 2024: 27, Metode penelitian deskriptif adalah sebuah pendekatan dalam prosa penelitian yang bertujuan untuk menyajikan gambaran secara sistematis dengan gambaran secara sistematis, faktual dan tepat fakta mengenai atau fenomena karakteristik yang dikaji.

In this study, the researcher employed a prototype-based system development method. The prototype approach was chosen in response to the limitations of traditional methods such as the *waterfall model*, which requires all system requirements to be defined at the initial stage. In many cases, users often find it difficult to clearly express what they need until they can visualize or interact with an early version of the system.

According to Ni Luh Ade Mita Rahayu Dewi (2021: 152–153), the process of designing and developing an information system using the prototype model involves the following stages:

1. Requirements Gathering

At this stage, the researcher identifies the information needs for the system to be developed. This includes identifying problems or deficiencies in the existing system and determining the basic features and functions required in the new system. Developers and users collaborate to define the most urgent or essential system requirements.

2. Prototype Design

This stage involves communicating user needs to the system developer, who creates a preliminary design that includes menu features, input and output layouts, and a simple representation of both the interface and core system logic.

3. Prototype Evaluation

At this stage, the developed prototype is reviewed to ensure that the design meets user requirements and project objectives. Revisions may be made to improve the input and output layouts or to add new features as needed.

4. System Coding

This stage involves writing program code to build the prototype based on the established design. The process uses a programming language suitable for rapid development, focusing primarily on implementing the system's main functionality rather than optimizing for efficiency or security.

5. System Testing

This stage translates the prototype into executable software, which is then tested prior to deployment. The testing process ensures that every system component functions as expected and verifies whether the software is ready for use.

6. System Evaluation

In this phase, the completed program or system is evaluated to determine whether it meets the intended requirements. This assessment focuses on the system's effectiveness and its alignment with user needs. If deemed satisfactory, the system proceeds to implementation.

7. System Implementation

At this final stage, the fully developed and successfully evaluated system is declared feasible and ready for implementation.

The data collection techniques used in this study include the following:

1. Observation

According to Hardani (2020: 124), observation is a data collection technique that involves monitoring ongoing activities or events. Observation methods can be categorized into three types: participatory observation, overt observation, and structured observation.

2. Interview

As stated by Darmawan (2021: 5), interviews are defined as a data collection process in which the researcher obtains information through direct question-and-answer sessions with respondents or sources related to the research topic.

3. Literature Study

This method involves collecting data from theoretical sources such as articles, journals, books, and other relevant literature related to the research topic. The collected data are then processed through defining and clarification stages using *mind mapping* and synthesis techniques (Nina Adlini et al., 2022: 3).

2 Literature Review

2.1 Accounting Information System

According to Jovan Febriantoko (2024:1), an Accounting Information System (AIS) is an organizational tool that functions as part of the Department of Systems and Information Technology (SIT) and is intended to assist in the management and control of a company's economic and financial activities.

Krismiaji (2020:4), in his book "*Accounting Information System*," defines an Accounting Information System as a system used to manage data and financial transactions that generate useful information. This system supports planning, organizing, and executing business activities, as well as providing information needed by decision-makers.

Similarly, Kasmir (2020:4) states that an Accounting Information System is a tool that processes data and transactions to produce information that is useful for planning, monitoring, and controlling business operations.

Based on the three definitions above, the author concludes that an Accounting Information System is a system designed to manage financial data and transactions to generate relevant information that can be used by companies for decision-making. It encompasses the forms, records, and reports necessary to support organizational operations.

2.2 Objectives of the Accounting Information System

Every organization generally has specific objectives in implementing an accounting information system (AIS) to support financial reporting, planning, and internal control. The main objectives of implementing an AIS within an organization include the following:

1. Supporting Daily Operational Activities

The Accounting Information System assists in carrying out routine business operations by providing the required information accurately and promptly (Suryani, 2021:9).

2. Supporting Decision-Making Processes

The AIS provides relevant and accurate data that enable management to make better and more strategic decisions (Syahrizal, 2021:15).

3. Enhancing Efficiency and Effectiveness in Financial Reporting
The implementation of an AIS improves the efficiency and effectiveness of financial reporting processes, allowing financial information to be presented more quickly and accurately (Wahyuni, 2021:22).
4. Improving Internal Control through System Integration
An integrated AIS helps reduce the risk of errors and fraud by strengthening internal control mechanisms (Kasmir, 2020:7).
5. Providing Information for External Parties
The system not only benefits internal management but also provides essential information to external stakeholders such as investors, lenders, and government authorities (Suryani, 2021:12).

2.3 Design and Construction of a Retribution Information System

According to Christian in the book by Lestari et al. (2022: 5) in (Perni Henisa, 2024: 137), design is a phase in system development that involves a series of orderly steps to transform or translate the results of system analysis into a format that can be understood by a computer, namely through a programming language.

According to Hanifah (2020: 5), design is a program created to identify and organize various activities and data needed to enable a computer to complete specific tasks more effectively. This program serves as a guide in designing a system that can meet the specific needs of users, both in terms of the data required and the steps required.

Based on the two definitions above, it can be concluded that design is a crucial stage in the system development process, which functions to convert analysis results into a technical format that can be understood and executed by a computer using a programming language.

In this stage, each system element is explained in detail, including its structure, function, and how these elements interact with each other. Furthermore, the design also serves as a guideline for organizing various activities and necessary information, ensuring that the system built can optimally and efficiently meet user needs.

2.4 Understanding Parking Fees

Parking is the activity of a vehicle stopping, not moving for a certain period of time, or the driver exiting the vehicle on a road in a Regency or City. This must be marked with traffic signs or road markings as regulated in Law of the Republic of Indonesia Number 22 of 2009 concerning Road Traffic and Transportation. Parking fees, as regional revenue, are controlled by the local government (Steven Owen et al., 2023: 24).

According to W.J.S Poerwardarminta Dlam (Nawir, 2020: 57), parking can be defined as a situation where a vehicle stops or remains stationary for a certain period of time in a specific location, usually due to a need or activity carried out by the driver or passengers.

According to Regional Regulation No. 5 Article 1 of 2004 of Tasikmalaya City, levies are regional levies as payment for services specifically provided or rendered by the Regional Government for the benefit of individuals or entities. The retribution period is a specific time period that serves as the deadline for retribution payers to utilize services from the Regional Government.

From the three definitions above, the author can conclude that parking fees are defined as the activity of stopping a vehicle for a certain period of time on the road, either because the driver exits the vehicle or for other reasons.

Regulations must govern this activity, and appropriate road signs or markings must be in place. Parking generates regional revenue through levies administered by the local government. These levies are collected in return for services provided by the local government, and their use is limited by the levy period.

2.5 Understanding Loading and Unloading Fees

According to Regional Regulation No. 5 of 2004, Article 2, the loading and unloading levy is a regional levy as payment for services and the use of loading and unloading areas. Loading and unloading is the activity of unloading and loading goods from vehicles. A loading and unloading area is a portion of the roadside designated for unloading and loading goods, or other locations designated by the Mayor.

3 Problem Analysis

3.1 Document Analysis

The documents used in the retribution reporting process at the Tasikmalaya City Transportation Department include the following:

1. Officer Data
2. Parking Fee Revenue Data
3. Loading and Unloading Fee Revenue Data

3.2 Technology Analysis

The system requirements and specifications that support the operation of the retribution information system are as follows:

1. **Hardware**
 - a. Laptop
 - b. Intel Core i3 3.00 GHz Processor
 - c. 4.00 GB RAM or higher
 - d. Storage Memory
 - e. Keyboard
 - f. LCD Monitor
2. **Software**
 - a. Windows 10 Operating System
 - b. Microsoft Access 2003 Database
 - c. Microsoft Visual C#
3. **Brainware**
User (Administrative Staff)

4 Results and Discussion

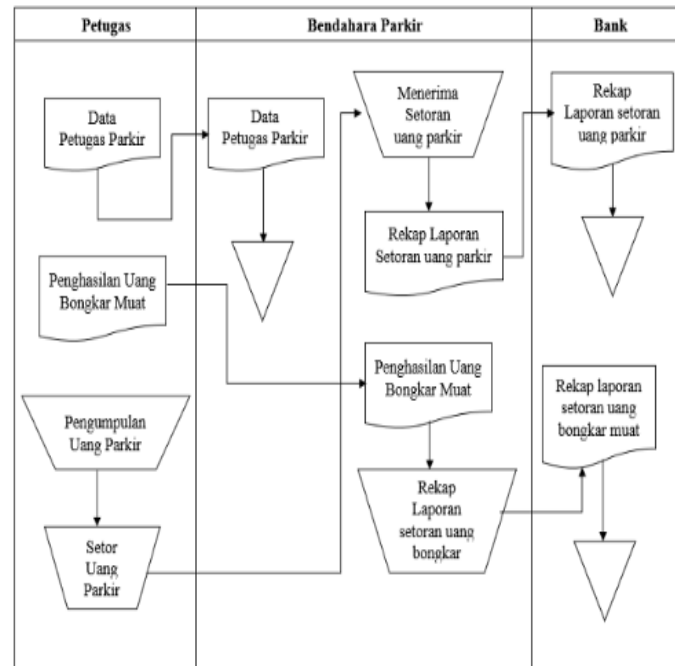


Figure 1. Flowmap of the current parking and loading–unloading fee reporting process.

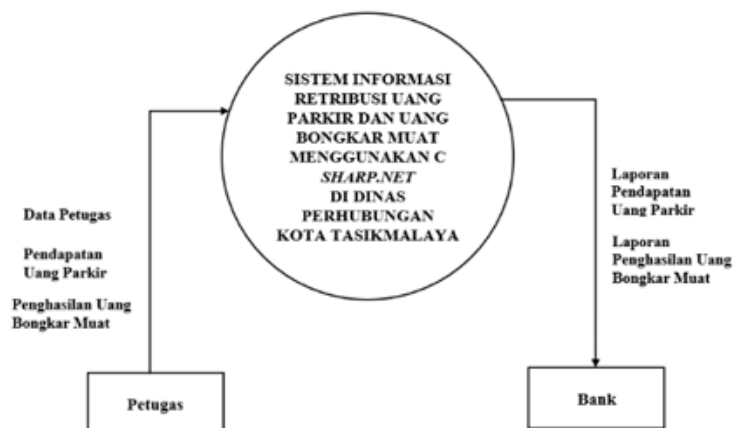


Figure 2. Flowmap of the current parking and loading–unloading fee reporting process

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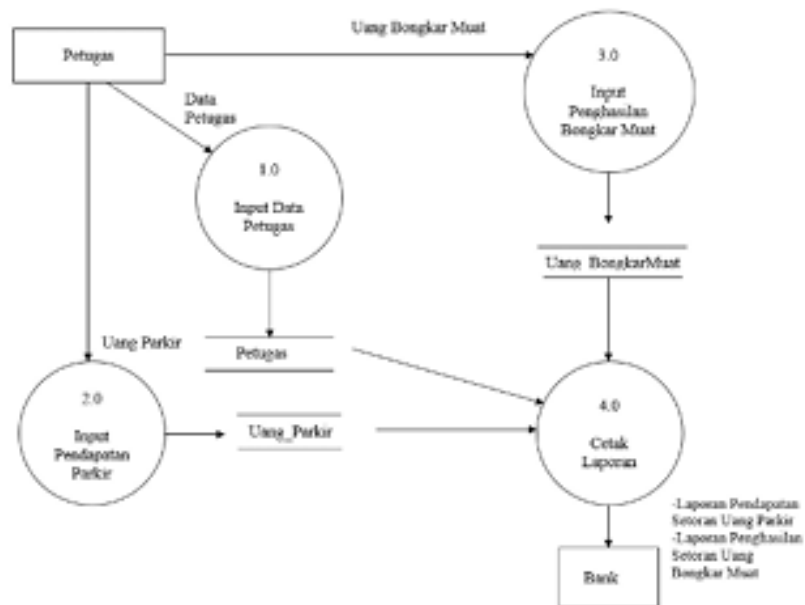


Figure 3. Data Flow Diagram (DFD) of the proposed system

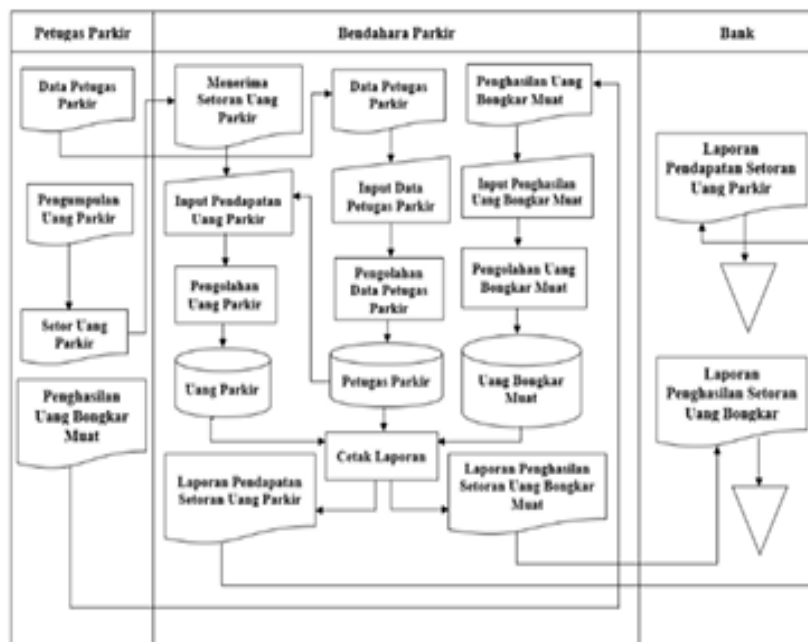


Figure 4. Flowmap of the proposed computerized system



Figure 5. Entity Relationship Diagram (ERD) of the database design

4.1 Screen Design

Figure 6. Login Screen Design

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Figure 7. Main Menu Screen Design

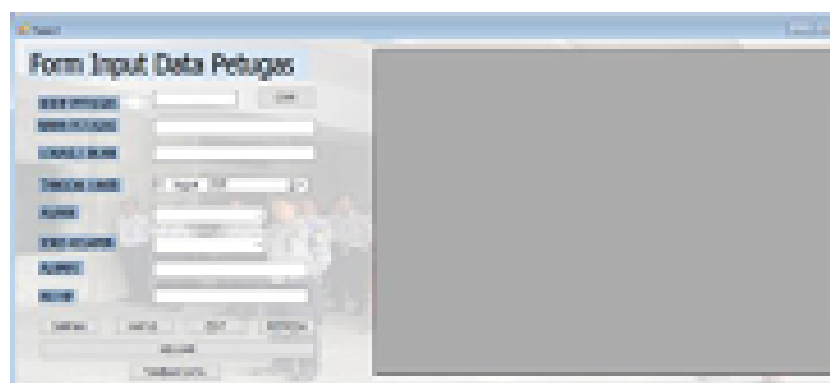


Figure 8. Officer Data Input Screen Design

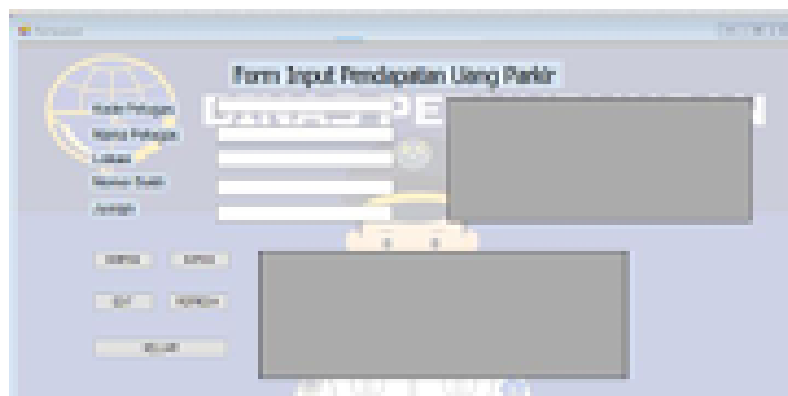


Figure 9. Parking Revenue Input Screen Design

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Figure 10. Vehicle Data Input Screen Design

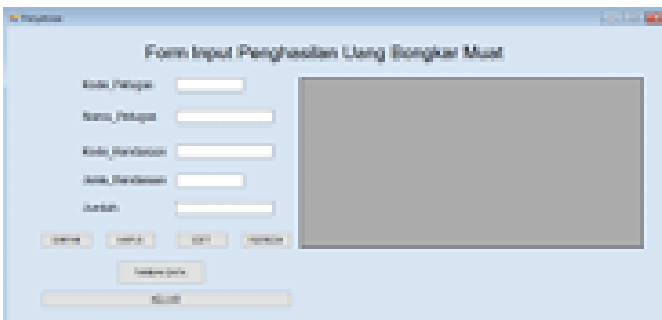


Figure 11. Loading and Unloading Income Input Screen Design

No. Urut	Jenis Kendaraan	Kode Kendaraan	Nama Kendaraan	Jumlah
1	Motorcycle	AB123456	AB123456	10000
2	Motorcycle	AB123456	AB123456	10000
3	Motorcycle	AB123456	AB123456	10000
4	Motorcycle	AB123456	AB123456	10000

Figure 12. Parking Deposit Revenue Report Screen Design



Figure 13. Loading and Unloading Deposit Income Report Screen Design

5 Conclusion

5.1 Conclusion

Based on the background and discussions presented earlier, several conclusions can be drawn as follows:

1. The existing system for managing parking and loading–unloading retributions at the Tasikmalaya City Transportation Department still relies on manual processes using Microsoft Excel.
2. The system proposed by the author, using Microsoft Visual C Sharp.net, has proven effective and efficient in simplifying and streamlining the design of a parking and loading/unloading fee system at the Tasikmalaya City Transportation Agency.

5.2 Suggestions

Based on the research findings and the problems identified, the author provides the following recommendations:

Because the information system developed by the author using Microsoft Visual C Sharp.NET has proven effective and efficient, it is recommended that this system be used to simplify and expedite the design of the parking and loading and unloading fee system at the Tasikmalaya City Transportation Agency.

Future researchers are encouraged to compare the parking and loading–unloading retribution recording systems between Tasikmalaya City and other cities that have already implemented more advanced digital or reporting systems. Such comparisons could provide deeper insights into best practices that may be adopted for further improvement.

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