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LOAN AND RETURN INFORMATION SYSTEM QR CODE-BASED VILLAGE LIBRARY BOOK

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Abstract
The library is a facility that affects current technological advances, the Village Library is a means of supporting learning activities that play an important role in increasing educational goals in the Village Community. Library information system technology using QR codes is very useful compared to using manual or handwritten because several systems in the QR Code are able to handle library services and processes that will become more effective and efficient. However, the "Lisa" Library is located in the Kebumen Village area, Tanggamus still uses manuals so it is still difficult to manage data, find loan data and books. Lack of borrower's sense of responsibility in using library books and still accurate data so that it is not appropriate. To overcome this problem, a library information system is needed. In the current process of technological development, we want to use the QR Code web. By designing using the Waterfall and Fishbone methods as development so that this educational service can be better

1.0 INTRODUCTION

Advances in technology that are growing rapidly at this time make it easy and fast for humans to get information, manage and store data. Libraries are one of the most influential facilities for today's technological advances. In Law No. 43 of 2007 concerning Libraries, it is stated that "Libraries are institutions that manage written works, printed works, and / recorded works professionally with a standard system to meet the educational, research, preservation, information and recreational needs of the users". Knowledge from the library profiles of Kebumen, Tanggamus villages there are approximately 245 titles of books available, ranging from elementary to university lessons, namely from books on religion, social, culture, entrepreneurship, folklore and novels.[1].

According to research by Rasti Prathivi (2018), QR codes applied in the library service system are used to convert book data into a QR image installed in each book, a web-based QR Code is used to translate alphanumeric data from information on a book, QR Code has the ability to store data and speed up the service system and the correctness of the data contained in a book so that library services can run optimally[2]. According to research by Hermato & Ikhsan Firmansyah (2020) Based on research on services available in libraries, library services should be paid more attention, including borrowing or returning books in the library and searching for data, so that library admins can do it more easily by using a QR code information system. so that it can expedite the library service and does not take a long time[3]. According to research by Mughaffir Yunus, Marlina & Adrisal (2021) Applications for libraries have been designed and tested, namely in the form of online-based QR codes using the PHP and MySQL programming languages, which have been used as sources of library information,

so that information technology in village libraries is not only a process of using machine or technological control system but also creates an integrated system completeness to be able to further optimize the village library service process[4].

Library information system technology using QR codes is very useful compared to using manuals (handwritten) because several systems in the QR Code are able to speed up library services and the processes that occur will be more effective and efficient so that librarian (admin) can work comfortably and interest the students. readers and borrowers are increasing, because with this QR Code system officers and borrowers no longer use handwriting or other manual recording and there are no more difficulties in managing, storing and finding library book data

The "Lisa" (Village Literacy) library located in the Kebumen, Pugung, Tanggamus areas is a self-help library from the village community. However, this educational service still uses manuals (handwritten) so it is difficult to find borrower data and return books. Lack of a borrower's sense of responsibility in using library books and still accurate data so that it is not appropriate, In the current process of technological development we want to use QR Codes so that this educational service can be better. The purpose of information technology research using this QR Code is to make it easier for people who use library facilities, especially for book borrowers and also admins and other librarian officers in managing data on saving and borrowing books in this village, so that library staff can run quickly and well as expected. by the users.

2.0 THEORETICAL

Information System

Elisabet Yunaeti (2017) Information systems are a systematic combination of people, hardware, software, communication networks and data resources that combine, change, and expand information in an organization [5]. In Muslihudin's book, Sutabri (2005) identified an information system as a system within an organization that summarizes the operations management functions of an organization and processing requirements in daily transactions that support the organization's planned activities to prepare reports required by certain outside parties.[6]. Information system is a system of interaction between people, hardware, software, communication networks and data resources that support a function within the organization that is managerial in nature to provide the necessary reports.

Library

Sudirman Anwar DKK (2019) A library has the meaning of being a place in which there is an activity of collecting, managing, and disseminating services on all kinds of information[7]. In Hartono's book, Sulistyo Basuki (1991) that the library is a place, part of the building or the building itself that is used to store books and published books which are generally stored according to certain sheet layouts with the aim of being used by readers and not for sale[8].
The library is a place or place for a collection of books or sources of information, the library becomes one of the facilities for learning activities that play an important role in advancing the realization of educational goals.

Library Functions

The library has several functions including the following:

1. **Information function** Libraries store various kinds of information, including printed materials, as well as other collections, so that the library can be a means to absorb various kinds of ideas from books and get information available in the library.
2. **Education function** Namely providing opportunities to continue to develop, educate yourself, and accelerate the mastery of new knowledge and skills.
3. **Cultural function** Namely, the library can be used by users as a means to advance the quality of life by utilizing various information, increasing interest in art and beauty, and encouraging the growth of creativity.
4. **Recreational function** That is, libraries increase their interest in their spare time through the use of various types of reading functions.
5. **Research function** That is, the library provides various kinds of information that aims to support activities in research
6. **Deposit function** That is, the library must store and introduce printed and recorded works published in the territory of Indonesia[9].

Libraries as Learning Resources

Learning resources can be in the form of various sources, such as data, people or formats that can be used for learning. There are two types of learning resources as measured by skills, namely:

1. Learning resources designed to be used in learning activities so that the objectives of learning can be realized. The learning resources can be in the form of books, package books, slides, films, videos and others with the aim of helping the realization of certain goals
2. Learning resources that are not designed aim to be able to assist in achieving learning objectives. Examples of these learning resources are museums, shops, community leaders, and markets

QR Code

Roni Habibi et al. (2020) QR stands for Quick Response, which is a two-dimensional code created by Denso in 1994. This two-dimensional barcode was first used in production control in automotive components. Data storage stored in QR Codes is larger than barcodes limited to one dimension, which makes using QR Codes more efficient[10]. Wing Wahyu Winarno (2010) QR code is a barcode development consisting of lines with various thicknesses[11]. QR Code is an Information System that can store data larger than a limited code, the QR code is a two-dimensional barcode that is coated with different thicknesses.

Advantages of QR Code

QR codes have a large capacity for data encoding, which can store all types of data, such as numeric data, hiragana data, alphabet data, symbols, binary codes, and so on. QR codes can also correct errors, up to 30%. Making it resistant to damage, therefore, if part of the QR code symbol is dirty or damaged, the data can still be saved and read.

3.0 METHODOLOGY

Data collection

In preparing this journal, the authors collect this data and information by:

1. **Observation**

   Andra Tersiana (2018) That is a data collection method using observation by looking directly at the state of the object to be studied with the aim of observing and understanding the object[12]. This data collection method was carried out by coming directly to the village library in Kebumen Village, Tanggamus. Seeing from the situation of libraries that still use manual systems, researchers conducted research on the use of QR Codes that can be used to help the processing system for borrowing and returning books better.

2. **Interview**

   Fadhallah (2021), namely data collection by means of communication between two or more parties face to face, namely like asking questions to the object under study[13]. This method is carried out by the researcher asking several questions to the informants in order to obtain the necessary information.

Information System Development Method

Waterfall Method

Teduh Sanubari et al (2020) The waterfall method is called the classic life cycle. This method describes a systematic and sequential approach to software development, starting with determining user requirements and progressing through several phases or stages[14].

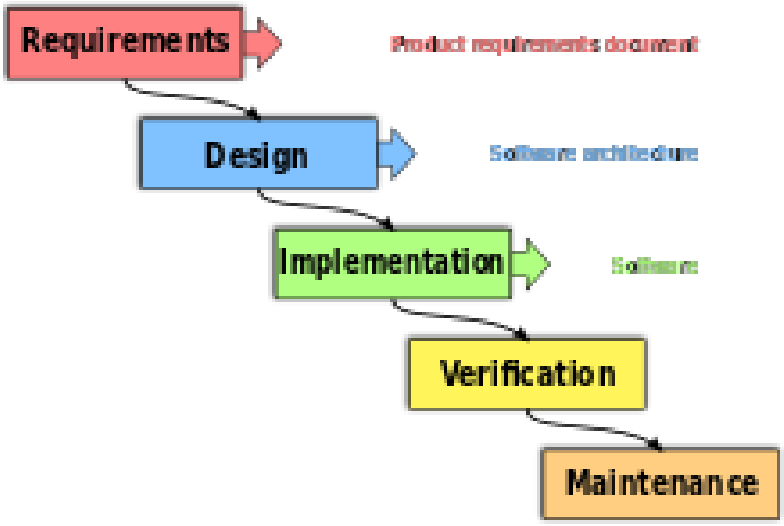

Figure 1. Waterfall Model

The stages in the Waterfall method are:

1. *Analysis*, which is the development stage of the system with the aim of understanding the software expected by the user.
2. *Design*, which is a design that is used to assist in determining hardware, system requirements, as well as to assist in defining the entire system architecture.
3. *Implementation*, is a system development from small programs called units that are integrated to the next stage.
4. *Verification*, which is the development of all units from the implementation stage which is then integrated into the system after all units have been tested.
5. *Maintenance*, is all software that has been tested then run and maintained

Fishbone research framework

Fishbone diagram is a graphic used to find a problem trigger, if the root trigger or cause of the problem is known, it will make it easier to formulate and solve the problem.[15].

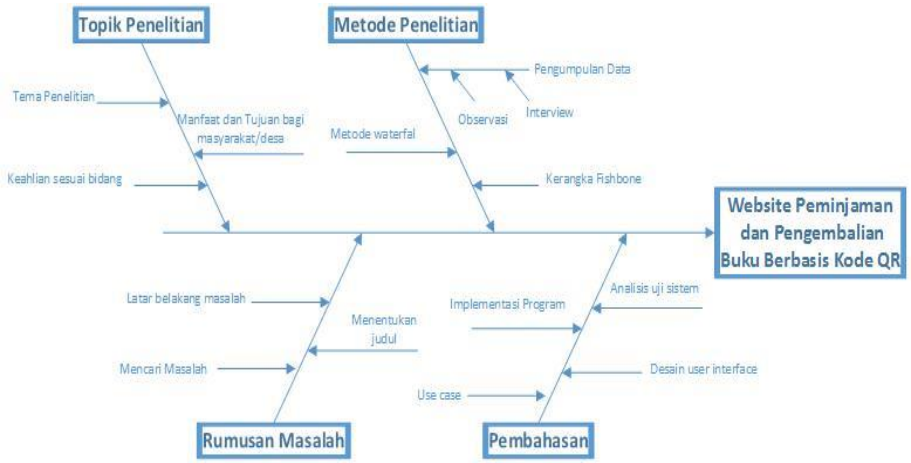

Figure 2. Fishbone Model

The stages in the Fishbone model

1. Title
   The title is in the form of a name or theme that will be used as research material, the title is interesting and unique and has never been studied by others, and can be useful for later users.
2. Determining
   The problem Contains the problem that will be used as a source to find topics to be researched and used as research titles

3. Method
   In the form of methods used by researchers in a study, ranging from data collection methods such as observation and interviews as well as other methods used by researchers
4. Design
   In the form of a system display design that aims to be used to see the process of obtaining the information needed in the preparation or solving the problems that exist in the research.

4.0 RESULANTS AND DISCUSSION

Design

The author does a design to implement an application where the Information System application is able to facilitate borrowing data services and returning library books. In processing the application, a Use Case design is made that describes the operation process in accordance with the results of the implementation that will be designed later.

Figure 3. Use Case

Interface Design

The important thing in designing a system is to do a design, namely designing the interface, where the interface design is the process of determining how the system will display the communication mechanism between users. QR Code based

1. Login Menu page, in this menu the user must fill in the Username and Password in order to enter the library application.

Figure 4. Login menu

2. Home Menu Page, this page is a page that contains the Library's Profile

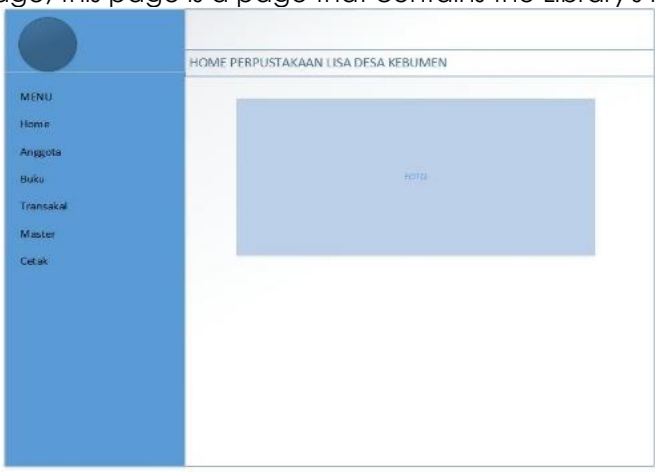

Figure 5. Home Menu

3. Member Menu Page, is a Menu Page that contains information about the identity of the borrower, such as name, place of birth date, date of registration, date of birth, active or not and actions.

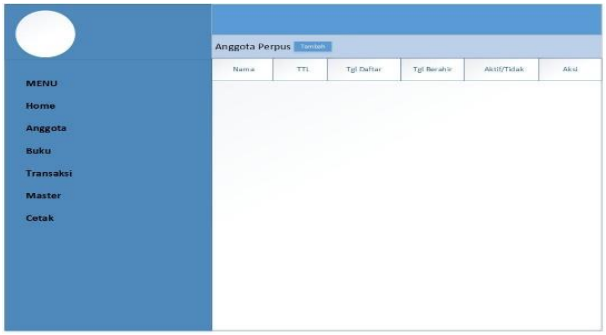

Figure 6. Member Menu

4. Book Menu Page, this page is a menu page that contains the identity of the book, such as UID, title, author, publisher, ISBN, year, stock, shelf, category, action.

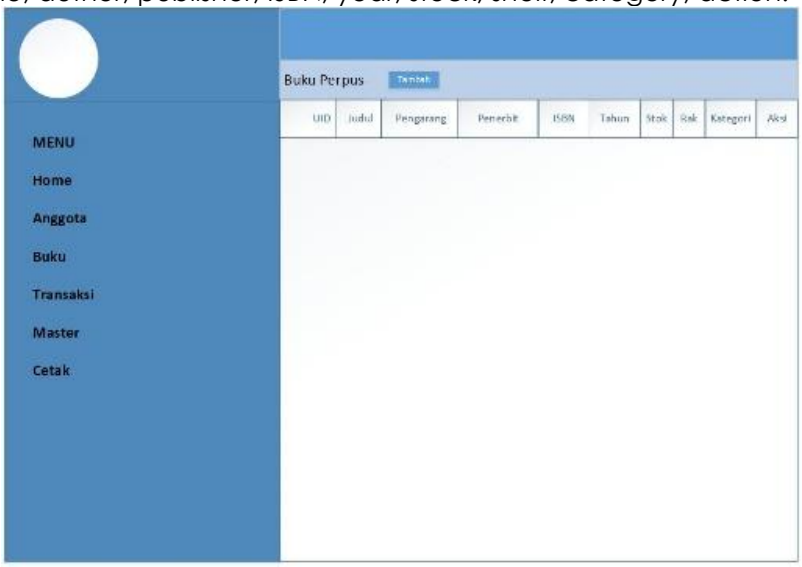

Figure 7. Book Menu

Program Implementation

The following is an illustration of the implementation of a program from a system that has been made in accordance with the interface design that has been made.

1. Login Menu page, in this menu the user must fill in the Username and Password in order to enter the library application.

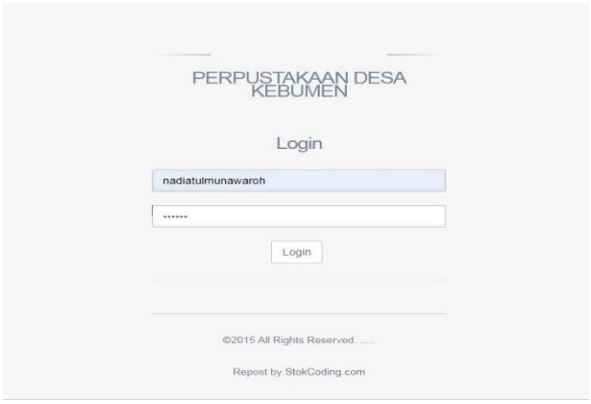

Figure 8. Login menu

2. Home Menu Page, this page is a page that contains the Library's Profile

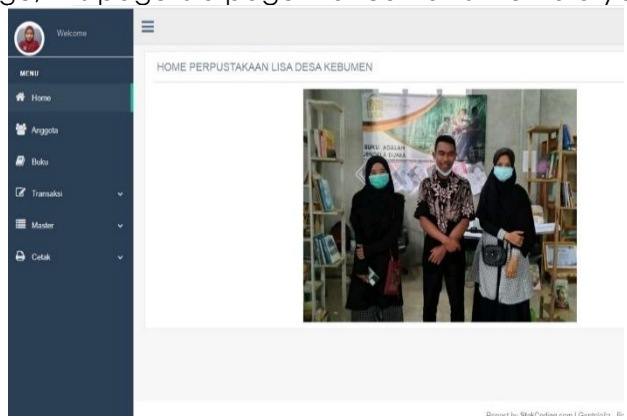

Figure 9. Home Menu

3. Member Menu Page, is a Menu Page that contains information about the identity of the borrower, such as name, place of birth date, date of registration, date of birth, active or not and actions.

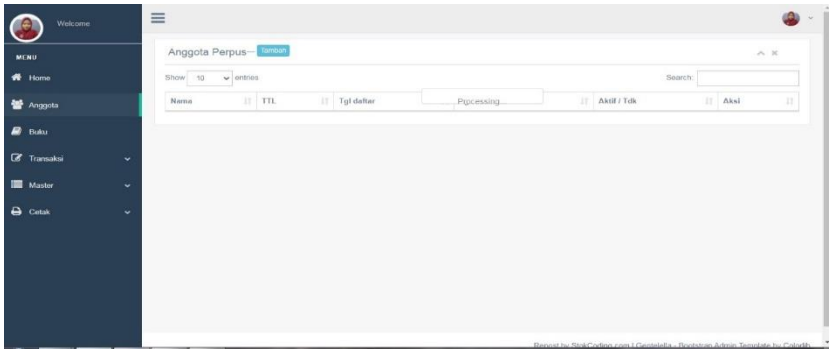

Figure 10. Library Member Menu

4. Book Menu Page, this page is a menu page that contains the identity of the book, such as UID, title, author, publisher, ISBN, year, stock, shelf, category, action.

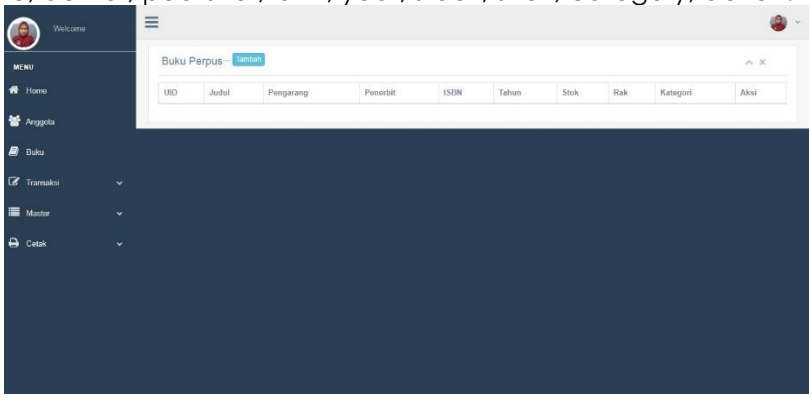

Figure 11. Library Book Menu

5. Transaction Menu page.
   Contains Borrower Transactions, Returns and library income.

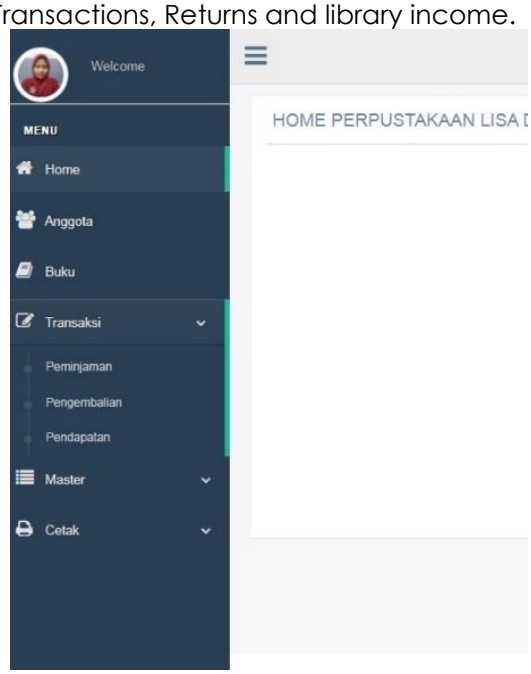

Figure 12. Transaction Menu

6. Borrower Transaction Sub Menu
   The borrower transaction sub menu contains data on book borrowers, such as member and book barcodes, name, book title, borrowed date, return date.

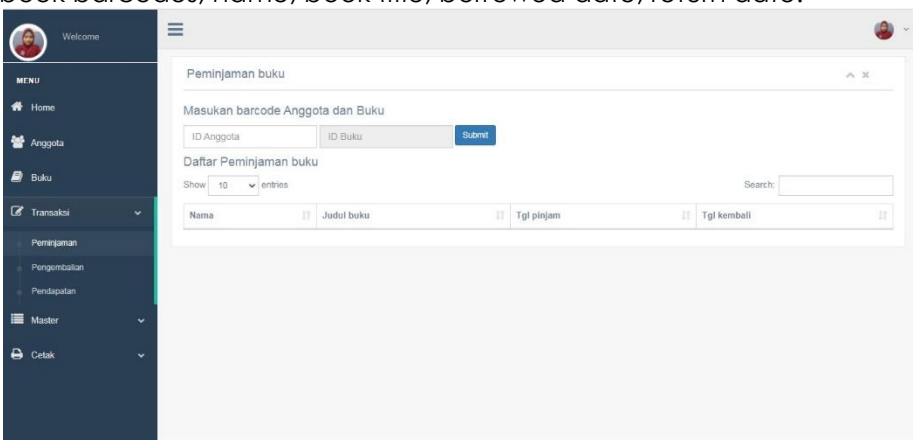

Figure 13. Lending Transaction Menu

7. Return Transaction Sub Menu.
   Contains instructions for entering Member ID and Book ID.

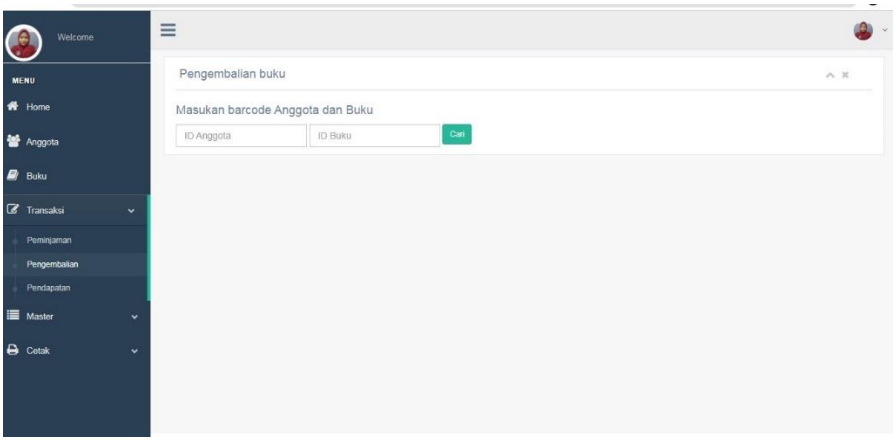

Figure 14. Return Transaction Menu

8. Income Transaction Sub Menu.
   Represents library income and contains about, name, title, time, late, and the amount to be paid

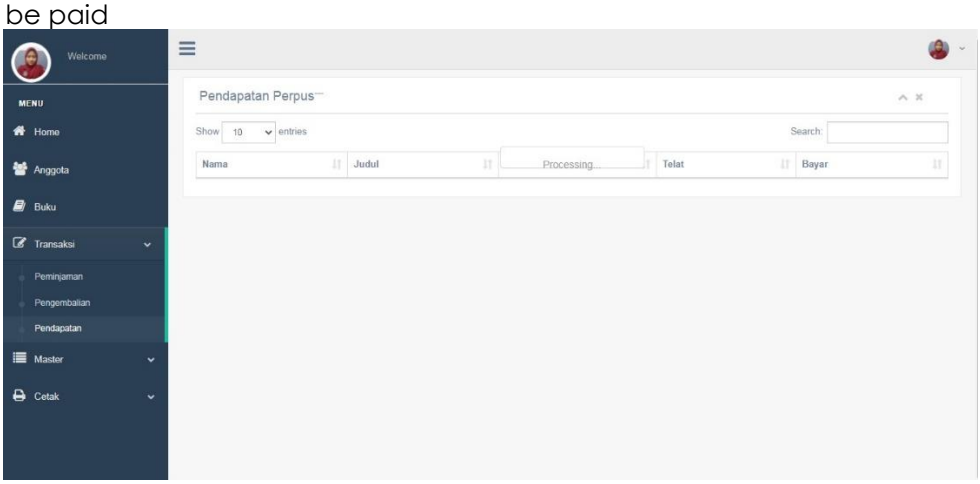

Figure 15. Income Transaction Menu

9. Master Menu Page.
   Is a page that contains sub menu categories, shelves, fines.

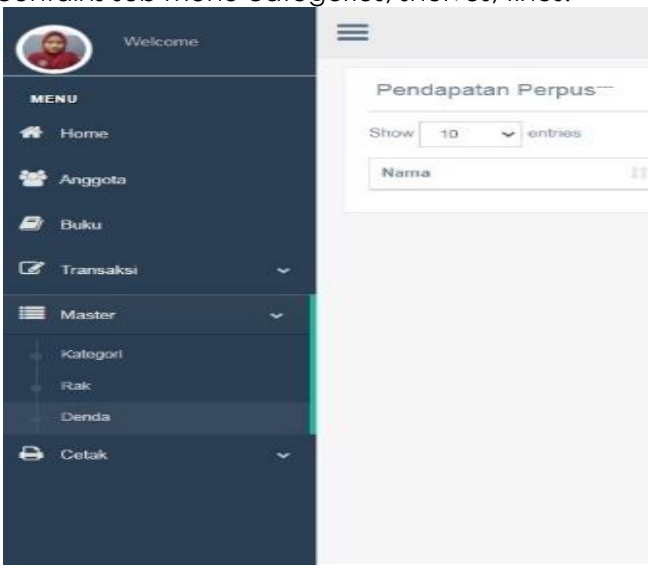

Figure 16. Master Menu

System Test Results Analysis

In this section is the implementation of the system test results from all the system pages that have been created. Where borrowers can view library data. From the system that has been tested, we can find out whether the system can run or not. If it can run then running and if not then an error. The following is an analysis of the system test results below.

Table 1. System Test Results

No	Tested menu	Run	Error	Description
1	Login Menu	Run		Username and Password
2	Home Menu	Run		The main page containing the library's profile
3	Member Menu	Run		Contains about the identity information of the name of the borrower
4	Book Menu	Run		Contains the identity of the book to be borrowed
5	Transaction Menu	Run		Contains Borrower Transactions, Returns and Income

6	Master Menu	Run	Contains Criteria, Shelf and Fines Sub Menu
7	Print Menu	Run	Contains About Sub Menu Books, Print Members, Print Revenue

From the analysis of the system test results in table 1 that the menus that have been tested produce running (running). The following are menus that have been tested and running and their descriptions:

1. Login menu page containing information about Username and Password
2. Home menu page which contains the main page after logging in containing the company's profile
3. The Member Menu page contains information about the identity of the borrower such as Name, TTL, Registration Date, End Date, Active / Inactive and Action
4. Book Menu page contains book descriptions such as UID, Book title, Author, Publisher, ISBN, Year, Stock, Shelf, Category and Action
5. Transaction Menu page contains borrower transactions, returns and income
6. The Master Menu page contains criteria, shelves, and fines sub menus
7. The Print Menu page contains book sub menus, Print Members and Print Income

5.0 CONCLUSION

From the results of research that has been done about the use of an information system application to facilitate services at the waterfall-based village library, it can be concluded several things, namely, the borrower information system and the return of village library books have been successfully designed. Libraries using QR Codes are very useful compared to using manuals or handwriting, because some systems in the QR Code are able to speed up library services and the processes that occur will become more effective and efficient so that library staff can work comfortably and the interest of readers and borrowers will increase. In this study, the researcher designed a library information system application using the PHP and MySQL programming languages, the testing of this application system can be seen in table 1, where the library application system testing has been running, so that borrowers can see the data available on the library web page.

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