Information System for Product Data Collection Using Barcode System on Android-based Devices at My Kids Store Medan

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Abstract

Data collection is the most important thing in selling goods. Accuracy and speed in the process of storing and searching data is very influential in determining company profits. This research provides an alternative in implementing the data collection process using barcodes and implemented on Android-based mobile devices. It is hoped that this research will provide results in accordance with the objectives, which is to facilitate and accelerate users in processing data in order to produce accurate and fast information.

Keywords*: barcode, barcode scanner, Android, website*

1. Introduction

Basically all humans are consumptive which causes them to always look for the things they want or need. Along with the growth of a person's culture or economy, the higher the level of consumption. The high demands cause an increase in the supply of a product. The inventory has several meanings, including:

    a. Inventory is an asset where the possibility of loss / loss most often occurs.

    b. Merchandise inventory are goods owned by the company for resale, while for manufacturing companies, including inventories are goods that will be used for the next production process.

To ensure the availability of goods, it is necessary to collect data on existing goods. Data collection of goods can be done manually by recording in a log book or recorded on a computer using appropriate data entry tools. Each recording method has advantages and disadvantages, and currently computer-based recording is widely used considering that the process of storing and searching data is faster and more accurate than manual recording. There are various kinds of input devices and ways of entering/recording data into a computer, for example keyboards, joysticks, pen readers, barcode scanners, and others. Each different input device is used in a different way. Barcode scanners will be useful if they are used to read or fill data in the form of barcodes.

We have encountered many uses of barcodes in various products circulating in the community. In addition to its uniqueness, barcodes are also not easily counterfeited. And the process of entering data using a barcode scanner will be faster and more accurate than using a keyboard. Barcode is an arrangement of black and white vertical lines of different thickness, very simple but very useful. Barcodes can be used to store specific data such as production codes, expiration dates, identity numbers, easily and efficiently. Barcodes are not only used in trading businesses, but also in libraries and clinical laboratories. If barcodes and barcode scanners are used in the process of entering data, then there must be a functioning system in processing the data that has been read previously. The system will later contain data manipulation processes such as entry or adding, editing, and deleting data. If this is created, then various obstacles related to speed and accuracy in data collection of goods can be minimized.

My Kids Store is a business unit engaged in the sale of clothing products. So far, the activities of entering and exiting goods are recorded manually in the available books.
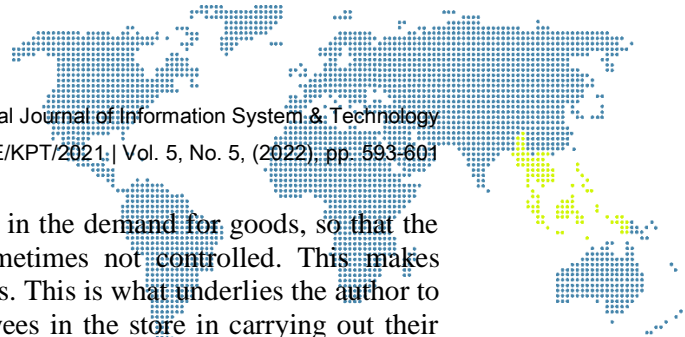
Along with the increase in time, there is an increase in the demand for goods, so that the recording of incoming and outgoing goods is sometimes not controlled. This makes difficulties in recording the availability of stock items. This is what underlies the author to create an information system that can assist employees in the store in carrying out their work so that the owner can control these activities more quickly.

The author formulates the existing problems, namely how to design, create, and implement a product data collection information system using barcodes at the My Kids Store store so that the obstacles encountered can be overcome. In order for this research to be more focused and not too broad and in accordance with the objectives achieved, the authors limit the scope of the research to the following matters:

a) The business process studied in this study is the data collection of incoming and outgoing goods at the My Kids Store store in Medan.
b) The system input device uses a barcode scanner and keyboard.
c) The resulting information system can be accessed through the My Kids Store website and through applications that embedded in Android-based mobile devices.

It is hoped that with the formulation and limitations of the research mentioned above, the objectives and benefits of the research below will be achieved:

a) Produce a system that can facilitate data collection of goods/products by using a barcode scanner.
b) Produce a system to facilitate users in processing product data so as to produce accurate information.

2. Research Methodology

According to Marshall B. Romney, Paul John Steinbart (2014: 3) in his book entitled Accounting Information System which was translated by Kikin Sakinah, Novita Puspasari, said that the understanding of the system is as follows: "System is a series of two or more components that are interrelated and interact to achieve goals (*Sistem merupakan serangkaian dua atau lebih komponen yang saling terkait dan berinteraksi untuk mencapai tujuan)*", Pratama (2018:57) [1].

"The system is a series of interdependent parts that work together to achieve certain goals *(Sistem merupakan serangkaian bagian yang saling tergantung dan bekerja sama untuk mencapai tujuan tertentu")*, Diana and Setiawati in Samuna (2017:295) [2].

"The system is basically a group of elements that are closely related to one another, which function together to achieve certain goals (*Sistem pada dasarnya adalah sekelompok unsur yang erat hubungannya antara satu dan yang lainnya, yang berfungsi bersama-sama untuk mencapai tujuan tertentu*)", Mulyadi in Pratama (2018:57) [3].

Based on the above references, it can be concluded that the system is a collection of components that are interrelated with one another to achieve the goal of carrying out an activity. According to Krismaji (2015:14) in his book entitled Sistem Informasi Akuntansi cited by Pratama (2018:57), "Information is data that has been organized and has had uses and benefits (*Informasi adalah data yang telah diorganisasi dan dan telah memiliki kegunaan dan manfaat)* [4].

"Information is data that has been managed and processed to provide meaning and improve the decision-making process" (*Informasi adalah data yang telah dikelola dan diproses untuk memberikan arti dan memperbaiki proses pengambilan keputusan*)", Risky (2016:46) [5].

According to Wardana (2018) in Muflihin (2020:92), "Information does not come from only one single data but is the result of a relationship from a collection of data that can be called a database (*Informasi tidak berasal hanya dari satu data tunggal melainkan hasil dari hubungan dari kumpulan suatu data yang dapat disebut dengan basis data*)" [6]. "Information is a notification or a collection of messages (expressions or speech) that provide meaning and useful benefits for making the right decisions (*Informasi adalah*
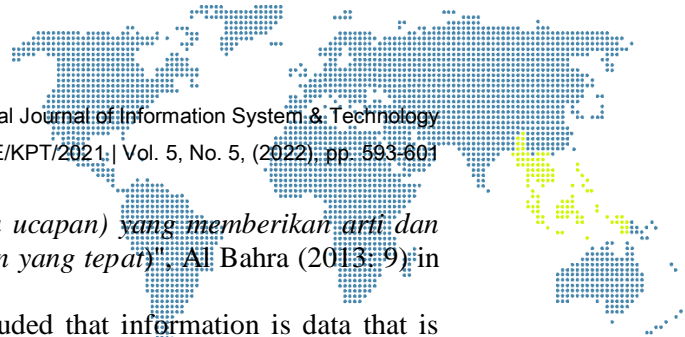
pemberitahuan atau kumpulan pesan (ekspresi atau ucapan) yang memberikan arti dan manfaat yang berguna untuk pengambilan keputusan yang tepat). Al Bahra (2013: 9) in Suwatalbessy (2018: 585)[7].

Based on the definitions above, it can be concluded that information is data that is processed to be useful in making decisions for its users. If a common thread is drawn from the notion of systems and information, it can be concluded that an information system is an integrated and complementary data collection by producing outputs that are useful for problem solving and decision making. Barcode as shown in Figure 1, is a set of codes to define letters and numbers consisting of a combination of lines with different spacing settings. The rule is a method to be able to enter data into the computer. The information on the barcode contains the encryption of a number of digits. When the barcode is scanned with a barcode scanner, the code is automatically connected to the item data that has been stored in the database. The results of the scan contain data from various products such as vendor names, product names, prices and other data according to what has been entered in the database [8].


Figure 1. Example of barcode

Android is a comprehensive open source platform designed for mobile devices, where all the tools and frameworks are fully available in the SQLite database for it. The Android system uses save important information that the device is turned off [9]. Android as a system, is a Java-based operating system that runs on the Linux 2.6 kernel. Android applications are developed using Java and easily adapt to new platforms. Android is a complete set of software that can be in the form of an operating system, middleware, and key applications for mobile devices. Android consists of a complete stack, from boot loaders, device drivers, and library functions, to API (Application Programming Interface) software, including SDK (Software Development Kit) applications. So, actually Android is not one particular device, but a platform that can be used and adapted to support various hardware configurations. Although the main class of devices supported by Android are mobile phones, but nowadays also used in electronic book readers, netbooks, tablets, and set-top boxes (STB) [10].

a) Literature Study
    This is done by reading the literature and checking documents, forms, reports or all files related to the research being carried out. By doing this, it is hoped that it will provide a brief understanding of the system.
b) Interview
    Is a technique that is often used in fact-finding, where the author verifies, clarifies, builds enthusiasm with users/users and involves users in determining user needs, gathering ideas and opinions.
c) Observation
    Conducting a review of the merchandise data collection process at the My Kids Store Jl. Jermal V Gg. Bijaksana No. 106, Medan City, North Sumatra. In this process, the validity of the data collected is carried out, including to find out the user's needs if in the interview the user cannot provide a clear answer.

There are several methodologies in software development, here are some opinions that define the methodology:

a) *A formalized approach to implementing the Software Development Life Cycle (SDLC),* Dennis (2012) [9]
b) *A simplified representation of a software process*, Sommerville (2015) [10].
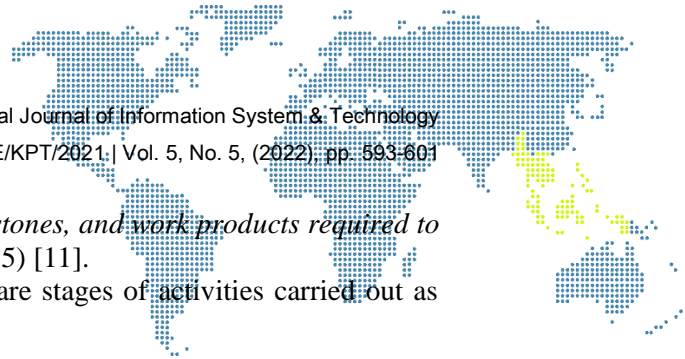
c) *A distinct set of activities, actions, tasks, milestones, and work products required to engineer high quality software*, Pressman (2015) [11].

In line with the research method carried out, there are stages of activities carried out as can be seen in Figure 2. [9].

a) Planning

The planning stage is a fundamental process in understanding why an information system should be built and describing how the project team will run it. At this stage the author sees the phenomena that are happening at this time so that there is a desire to design a system that is in accordance with the existing conditions.

b) *Analysis*

The analysis phase answers questions about who will use the system, what the system will do, and where and when the system will be used. After planning the system to be created, the author analyzes the problems that occur in the My Kids Store store and thinks of solutions that can solve the problems that are being faced there.

c) *Design*

The design phase decides how the system will operate, in terms of hardware, software, and network infrastructure, user interfaces, forms and reports, and the specific programs, databases, and files that will be required. The design process is preceded by creating a system workflow that is designed in the form of a flowchart.

d) *Implementation*

It is the final phase, where the actual system will be built. This is the phase that usually gets the most attention, because for most systems it is the longest and most expensive part of the manufacturing process. At this stage the author embeds the system on an Android-based device and creates a website that can run on a local host. After testing and repairing, the system embedded in the device can be run and the website is directly connected to the communication line via the internet so that it can be accessed anytime and from any place.

3. Results And Discussion

3.1. Result

The output of the designed system is in the form of a simple table that provides reports on incoming and outgoing goods data. The process of data entry of incoming goods and outgoing goods is carried out using a barcode scanner. For more details, the output display can be seen in Figures 2 and 3 below.

LAPORAN BARANG MASUK

| ID	Product	Supplier	Quantity	Date
8930015670238	Jumper	CV. Aneka Cipta	100	2021-10-07
893002459025	Kaos kaki	PT. BUM	50	2021-10-10

Figure 2. Incoming Goods Report Form

The difference between Incoming Goods Report and Outgoing Goods Report is in the personnel involved in it. If the Incoming Goods Report involved is the Supplier, while in the Outgoing Goods Report involved is the Customer.

LAPORAN BARANG KELUAR

ID	Product	Customer	Quantity	Date
8930015670238	Jumper	Ela	2	2021-10-11
893002459025	Kaos kaki	Dini	5	2021-10-15

Figure 3. Outgoing Goods Report Form
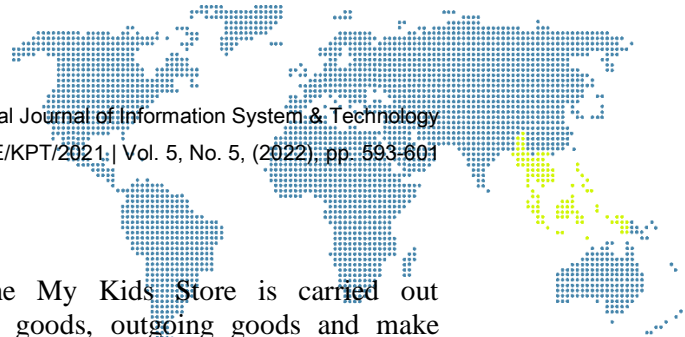
3.2. Discussion

a) Running System Analysis

In the current system, data collection at the My Kids Store is carried out conventionally where employees record incoming goods, outgoing goods and make reports. In general, all the activities carried out can be seen in Figure 5.
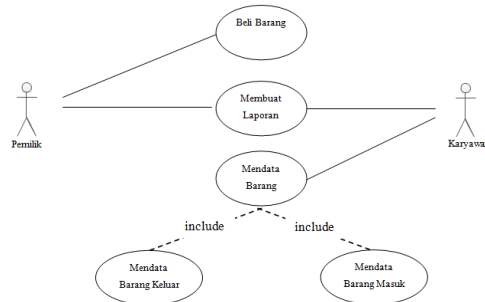

Figure 4. Use Case Diagram of a Running System

Based on the results of the analysis conducted, the current system has several weaknesses, which is:

a) Recording is done manually in a ledger where this requires accuracy and neatness so that the notes are neat and can be read easily.

b) Searching and updating data is done manually on general ledger records which takes longer than computer-based systems

c) The owner has to wait for the information report of incoming and outgoing goods from employees so it takes time to get stock data.

b) Proposed System

To overcome the obstacles above, the solutions given are as follows:

1) Create a system or application for data collection that makes it easier for owners and employees to collect data on goods.

2) The goods data collection system or application can be accessed by employees, admins or shop owners so that the goods data collection process can be done faster than the previous process.

The description of the proposed system can be seen in the flowchart contained in Figure 5 below. The entire data collection process is carried out using an Android-based cellphone or by accessing the website directly from the My Kids Store itself.
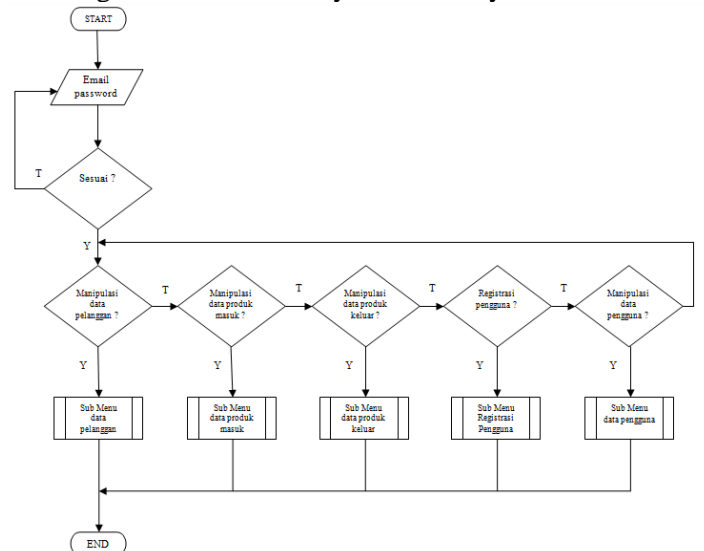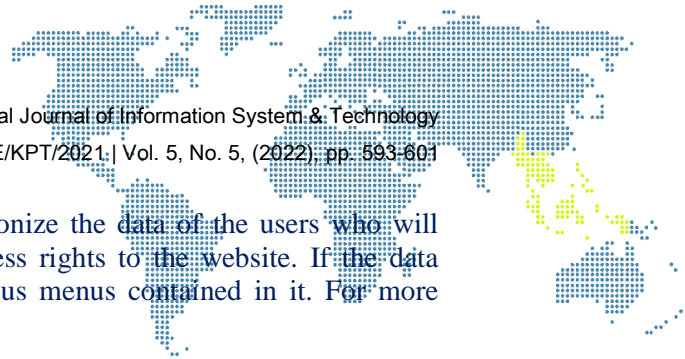

Figure 5. Flowchart of the proposed system website

To access the website, it is necessary to synchronize the data of the users who will access it with the data of the users who have access rights to the website. If the data entered is correct, then the user can perform various menus contained in it. For more details, see Figures 6 and 7.
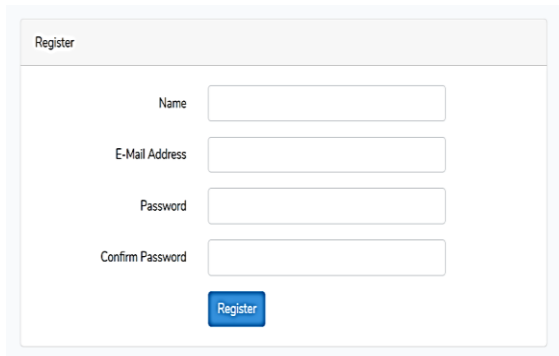

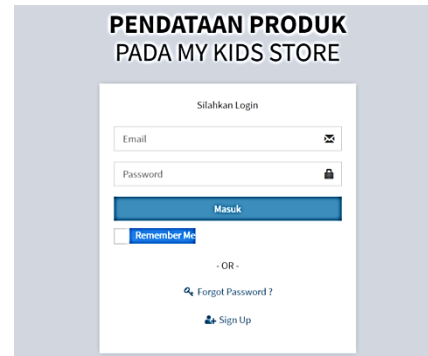**Figure 6.** User Registration Menu Display
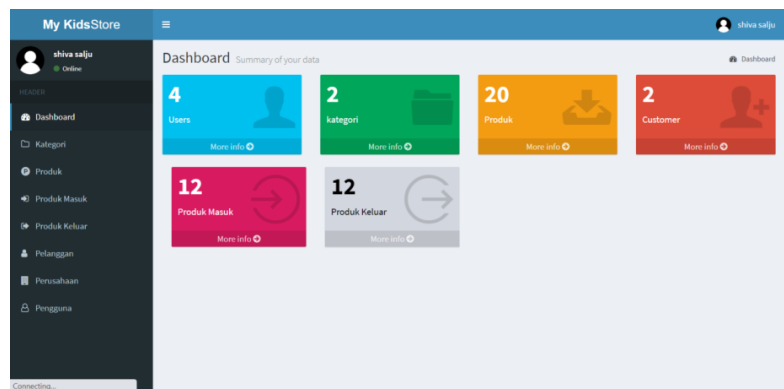

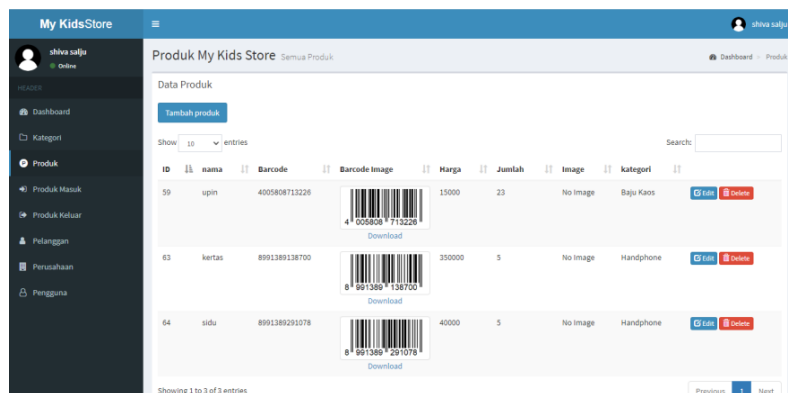**Figure 7.** User Login Menu Display

Figure 8. Main Menu Display

a. Home is the main display in the goods data collection system.
b. Category data is data that will display all available product categories.
c. Product data is data that displays all products in 1 (one) category.
d. Incoming and outgoing product data will display incoming and outgoing product information.
e. User data is data from all users of the goods data collection system.

Figure 9. Product Menu Display

a. The product data menu will display all product data on the goods data collection system.

b. In the product menu data there are product names, barcode images, prices, quantities and categories in the goods data collection system.
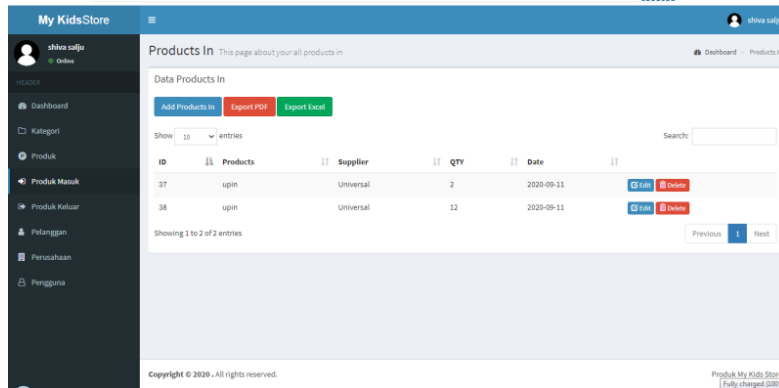

Figure 10. Product Menu Display Login

The product menu display displays all product data that has been successfully entered into the goods data collection system in the system. Meanwhile the Outgoing Product Menu Display will display all product data that has successfully exited into the goods data collection system on the system whose appearance can be seen in Figures 11 and 12.
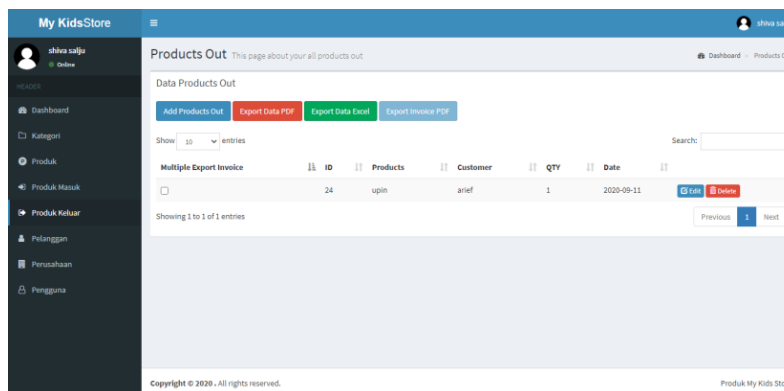

Figure 11. Product Menu Display Out

Meanwhile, for systems embedded in cellular phones, user data synchronization is not carried out considering that system implants will only be carried out on trusted devices. Cell phones are used to enter data for goods that have barcodes. The camera on the cellphone functions as a barcode scanner where every data reading will activate various menus contained in the system. For a clearer picture of the system embedded in mobile devices, see the flowchart contained in Figure 12 below.
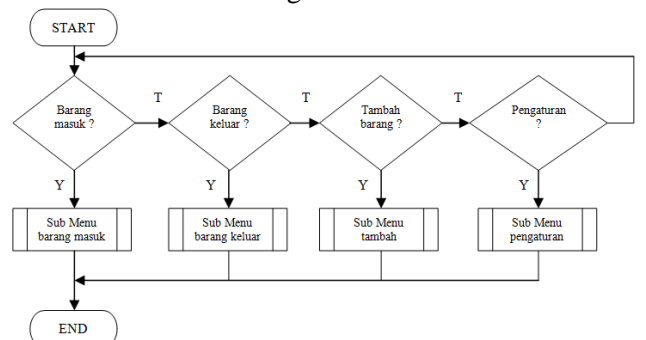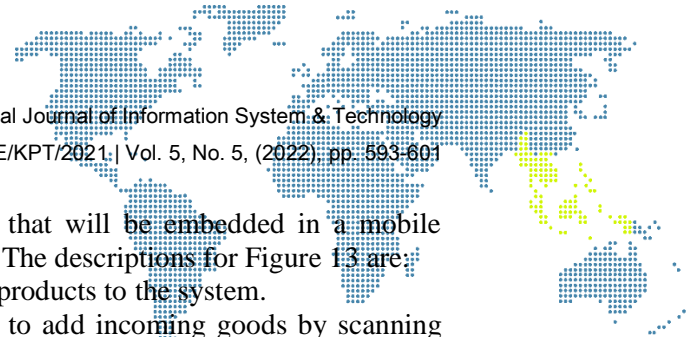

Figure 12. Flowchart of the system to be embedded on a mobile device

The representation of the system flowchart image that will be embedded in a mobile device can be seen clearly in Figures 13, 14, and 15. The descriptions for Figure 13 are:

    a. The Add Product button is used to add products to the system.

    b. The Incoming Goods button functions to add incoming goods by scanning the barcode on the goods to be inputted so that they can be recorded on the system.

    c. The Goods Out button functions to collect data on outgoing goods on the system using barcode technology.

The incoming goods menu display will display a form that can be used to collect data on incoming goods such as: barcode number, the number of incoming goods can be seen in Figures 14 and 15 below:
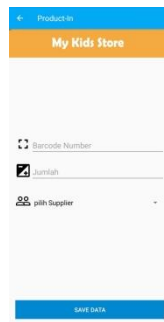
Figure 13. User Main Menu Display

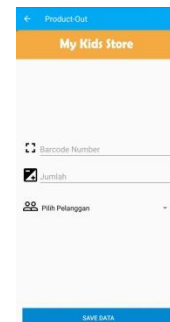**Figure 14.** Incoming Item Menu Display

Figure 15. Display Item Menu Out

    a. **Barcode number** is filled with the number of the barcode of the goods that have been entered, the barcode will automatically appear when the barcode is scanned.

    b. **Amount** is inputted with the number of incoming or outgoing goods so that the total number of incoming or outgoing goods can be known.

    c. **Select Supplier**, filled with the name of the provider/supplier of incoming goods.

    d. **Select Customer**, filled with the name of the customer who purchased the item.

4. Conclusion

In the description of the series starting from the process of creating an item data collection system at the My Kids Store by utilizing barcode technology, Data collection using barcodes has been successfully created and functions are designed according to company needs. The implementation of the goods data collection information system on Android-based mobile devices can run well, and can be used to assist all data collection processes for incoming and outgoing goods. For future system development, The system can be further developed by adding a feature regarding the return of goods if there are goods that are damaged and are not worthy of entering the store. The process of entering data into the system can be developed using input devices other than a keyboard and barcode scanner.

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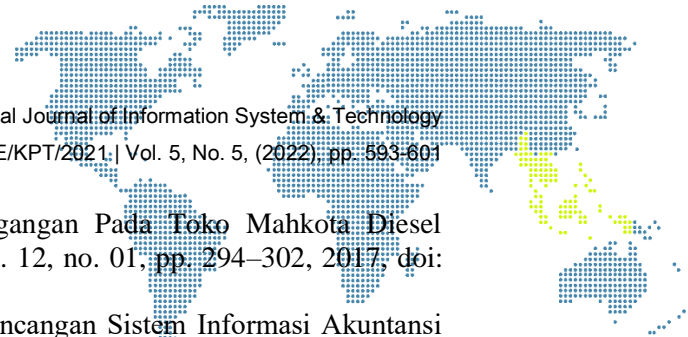
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