



Making Web-Based Product And Inventory Applications Using The Laravel Framework (Case Study : Cv. Global Best Ls)

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Abstract

The process of recording product inflows and outflows is an important process in the company's inventory system. However, often the process of recording and monitoring these products is not paid attention to by the company and instead allows the manual process to continue. This can cause significant cost losses if the availability of the product is not suitable, and the product is found to be expired due to uncontrolled. The development of this new product and inventory application can replace the manual processes used to create detailed results in the inventory process series. In this study, the author used the Rapid Application Development (RAD) method in application design and the First In First Out (FIFO) method which was used to assist companies in managing the recording of product inflows and outflows. The results showed that the implementation of product and inventory applications helps companies solve problems related to the flow of goods in and out as well as product monitoring.

Keywords: inventory, first in first out, rapid application development, application, control.

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1. Introduction

In this era of very tight business competition, every company is required to be able to have quality in providing value to consumers, especially food-based business categories. In addition to the quality of the products provided to consumers, the quality of the company in ensuring the infrastructure in it will be very important to make it easier for each individual to complete their tasks properly.

CV. Global Best LS is a company engaged in the food sector, and precisely produces a traditional West Java food, namely cireng or commonly called "aci goreng" with different and unique modifications of variants. At the company CV. Global Best LS, all products produced are the result of their own production as fulfillment Request for consumers in various regions in Indonesia since 2012. However, with the increasing demand for products every year, there is a need to create an ideal and well-managed warehouse storage environment. Therefore, the need for product and inventory applications can help companies record the

supply and release of goods. Because if with the usual process (manual process) as it is now, it will be difficult to search data for goods that have so many variants.

It is very important to know if inventory control is a weak point for the company, it can be seen when the system does not work optimally when tracking [1]. That way every company, both large and growing, must store data collection in the system [2]. This affects the performance of the work completed, because the better the technology available, the faster and more efficient the activities that occur within the company [3].

In his book, Rangkuti also stated that inventory is a wealth or asset owned by a company in the form of goods with the intention of being sold within the time span of the business plan, or inventory used in the production process or goods stored for the next stage of production [4]. Information on the supply and sale of the company's goods will later become the basis for how marketing will then determine targets, as well as sales priorities for goods that must be increased first. Because the company already knows what types of

products/goods need to be raised first from other products by looking at the available stock of goods. This is reinforced by the opinion of Johns and Harding who stated that in fact inventory is an important investment decision so that it needs to be prepared when it is carried out [5].

Currently, the main method used to design product and inventory applications is Rapid Application Development (RAD). This method is centered on iterative application development accompanied by intensive feedback [6]. This method approach is very well applied in applications designed for companies, because it can prioritize the suitability of the planned functions.

This study aims to create an inventory application along with product descriptions, where the application can later facilitate the entry, expenditure, statistics of goods and stock control. Where the method used in the inventory work system will use the First In First Out (FIFO) method as the rate of goods filtration, and is expected to be a solution to the problems that exist in CV. Global Best LS.

Technological advances at this time help in social life and especially in business activities. Almost all companies are now using inventory-based technology to support their businesses to grow. The more complete and sophisticated the technology contained in a company, the easier and more efficient an activity will be carried out in the business activity.

2. Literature Review

This section explains the theoretical foundations used in research as a reference to a complete understanding of building applications. And here's the theoretical basis used:

2.1 Information System

The information system according to Marakas and O'Brien in their book is a combination of the people involved, the availability of data sources, and the existence of applicable policies and adequate procedures for storing information, retrieving, changing, and disseminating in an organization [7]. So this system itself is intended in a company or organization to process various information that can be managed in the environment, so that the resources needed will be arranged and can shorten the time in handling the processes carried out. In addition, the managed data can be used flexibly, as well as shorten the working series of existing processes.

2.2 Use Case Diagram

Use diagram is a picture of the interaction between actors or users and the running system. But that way the

use case diagram prioritizes what the system does as well as how actors use it, rather than describing how the system works internally [8].

2.3 Web Application

The web application is a medium used to receive, store, and process information to progress a business. The web application itself uses a combination of scripts from the server side and also the client, where the two scripts have different functions. The script from the server side will handle the storage and data retriever, while the script is from the client side to display data and information to the user [9].

2.4 Black-box Testing

Black Box testing is a method of testing software or a system that focuses on the functionality of the system itself, especially looking at the inputs and outputs of the application whether it is in accordance with what has been designed before or has not been carried out properly.

3. Research Method

The method that will be used in this research is Rapid Application Development (RAD), which is an application development model, which consists of the following steps:

1. Define the requirements;
2. Prototype;
3. Rapid construction & feedback gathering; and
4. Finalize product/implementation.

As for stage 4, namely Finalize product/implementation, it will be described in the Results and Discussion section after the Research Methods section.

The steps of the method used in this study can be seen in Figure 1.

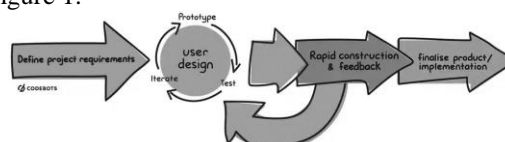


Figure 1. RAD method for application development [6]

3.1 Define The Requirement

The first stage carried out in the Rapid Application Development (RAD) method is to obtain as much data as possible as a determinant of the purpose of making the application. This is used in order to know the stages that must be completed in the project being worked on, as well as to make anticipatory steps for problems that will arise [10]. Therefore, the analysis will start from defining the goals that users want to get from the application created, namely:

“The application of the application to the company is expected to help in seeing the incoming and outgoing goods quickly and accurately. It will also be seen later on the labeling of goods from the side of the production date, so that monitoring of the product period can be seen at any time.”

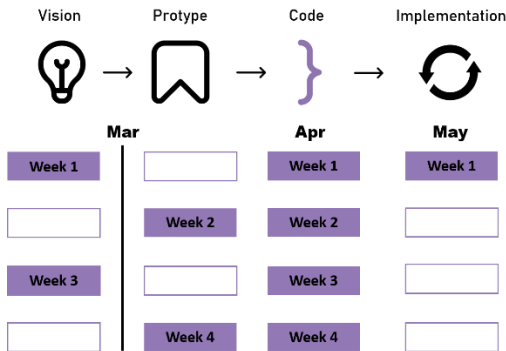


Figure 2. Application Work Timeline

Furthermore, the determination of the work schedule is determined according to the user's ability to implement it. Based on the results of the approval of all parties and seeing the goals submitted, there are four stages of the schedule in the application work, including: vision, prototype, code, implementation. The following stages include how to unite views with users about the purpose of the application that you want to build as it was done at the beginning, to how it is implemented at the end. And the timeline for working on the application can be seen in Figure 2.

3.2 Prototype

At the prototype stage, the user will see an overview of the application made in the form of a digital design so that the features that are present will be more easily captured through the flow of data submitted. Vogels [11] explains that by designing a prototype in the application development section, it can help create a suitable and extraordinary system. Because this method works efficiently in developing an idea while at the same time getting repeated feedback from users.

In this research, the prototyping is divided into three types of basic designs to represent all the designs and features from the data that has been collected previously. The first design is the dashboard design base, this is the design of the majority of the application display that is used as input as well as seeing the total development of the data at any time. The display of the first prototype can be seen in Figure 3.



Figure 3. Application Design Basics

The next series of important prototypes is the creation of the homepage as the face of the application. At this stage the user will know the function of the homepage as a display of the compiled data, from graphs to summaries of so much data to get quick information in just one page.

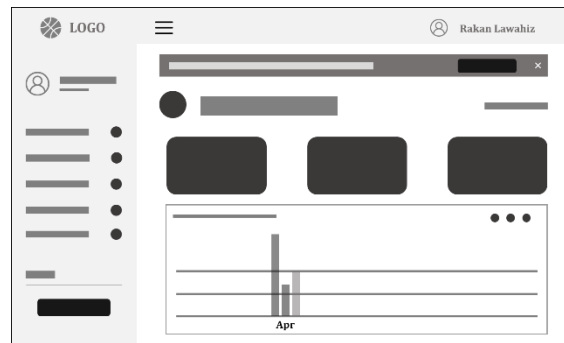


Figure 4. Prototype Section Home

The last part in the prototype building stage is to make a design on the profile section, which later this can be a vital point of user access rights as a level two user. Because on this page there is a feature to change the password of an account that has been created from the admin side. This page can also be a central point of control that is restricted to being understood by the user.

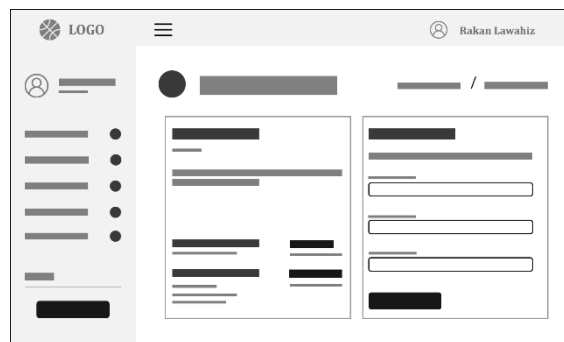


Figure 5. Prototype Profile Section

3.3 Rapid Construction & Feedback Gathering

The third stage of the research method used has entered the intensive system work stage. This relates to the implementation of the code with data that has been compiled in writing, or in the form of a prototype whose information is obtained from the user. This system was

developed through the Laravel framework with the aim of making a web-based application. With web-based applications, users can easily access them through any platform and product control will be lighter.

Along with the implementation of data on the system, feedback to the system being developed is also continuously provided to improve the work. This relates to the flow of goods method that will be applied to the application, namely the First In First Out (FIFO) method. This method is recommended because it matches the items in the CV. Global Best LS, which is easily damaged because the product's durability is very short.

Under the FIFO method, the goods that are produced earlier are sold first. As a result, all goods available in the company are the latest goods [12]. As seen in Figure 6.

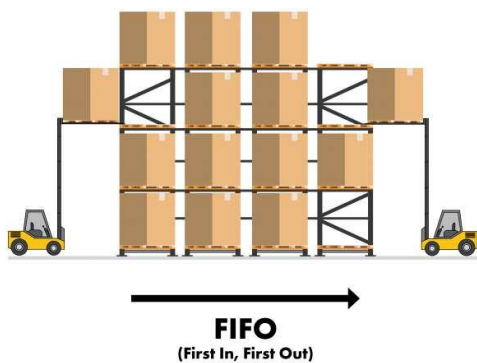


Figure 6. Inventory Flow with FIFO [13]

4. Result and Discussion[s1]

In this section, we have discussed the results of product application and inventory work along with the implementation of the system at the time of its use.

4.1 System Description

Inventory and product systems that have been designed using the stages of the Rapid Application Development (RAD) method along with system development with the Laravel framework have reached the final stage. Where the application has implemented the planned functions as follows:

1. Stores incoming and outgoing goods information regularly.
2. Displays the latest and expired items in one inventory environment.
3. Real time reports of stock information when there are incoming and outgoing goods.

Schematically, the application of the above functions can be seen in Figure 7.

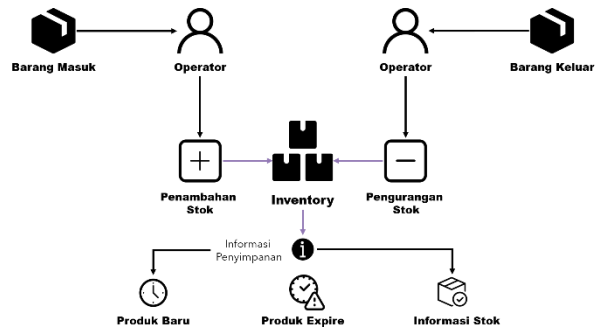


Figure 7. Inventory Application Flow

The functionality of the system on the user's ability in its settings will be illustrated through the use case diagram in Figure 8.

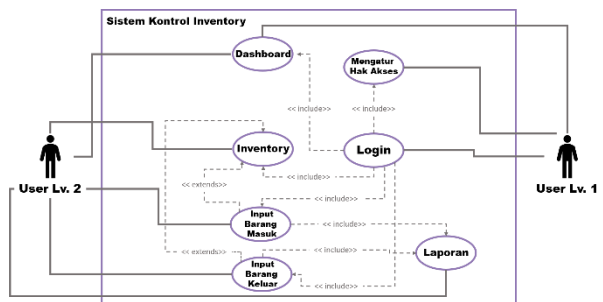


Figure 8. Inventory Control System Use Case

4.2 System Testing

System testing is a stage that is carried out to find out that the system has been successful in implementing the system design that has been made before. Testing on this system was carried out using a black box and obtained the results as shown in Table 1.

Table 1. Black-box Testing

Name	Expected Result	Test Results
Register	User data is stored in the database so that the user has access rights to be able to enter the application.	(✓) Success
Sign In	The account is well-validated by the system and goes to the main page of the application.	(✓) Success
Main Page	Go to the main page of the application. The application page also displays expired products, total production per month, total goods out per month, and top products per month.	(✓) Success

Register Product Displays data on the list of goods to be produced. The data entered on the day, the table column will be green. Furthermore, if the data expires or passes 4 days from the day of the product, the table column will be red. Displays data on the list of goods to be produced. The data entered on the day, the table column will be green. Furthermore, if the data expires or passes 4 days from the day of the product, the table column will be red.

(✓) Success

Input Product Displays data on incoming goods that have been produced. The data entered on the day, the table column will be green. The stock on the Item List page will increase according to the amount of production entered.

(✓) Success

Output Product Displays outgoing item data. The data entered on the day, the table column will be green. The stock on the Item List page will decrease according to the amount of production entered.

(✓) Success

Create a report Displays data on incoming and outgoing goods according to the date entered. Download the Excel/pdf file.

(✓) Success

The conclusion of the test for product and inventory applications can be seen from the results of black box testing carried out in the previous stage. Where this web-based product and inventory application does not indicate minor results on user requests to the system itself, even though it has done 7 tests on various pages. This concludes that the system is in accordance with the expected goals.

4.3 System Implementation

The system implementation part is the result of system design that has been analyzed according to the needs that have been informed.

1. Home View

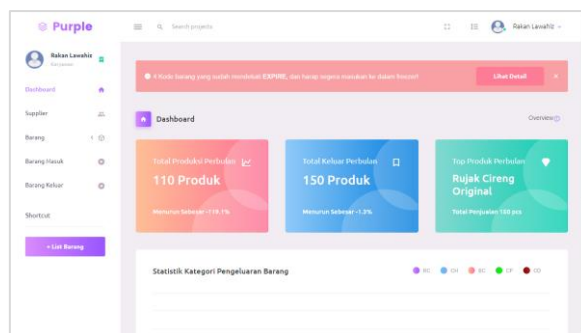


Figure 9. Home View

The homepage presented in the application will provide users with a summary of the data without having to open each page. This includes how the product expires, the total production in one month, the total product expenditure in one month along with the graph and the last one is the featured product in one month of sales. In other words this page is the application control room.

2. Storage View

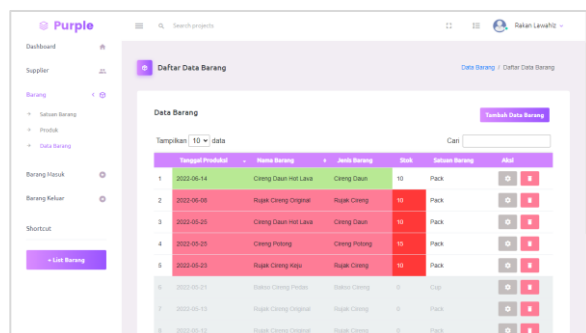


Figure 10. Storage View

Storage or inventory pages are used in this series of applications as item detail information. Starting from real time stock information, information on incoming goods marked in green in the table column, and lastly, expired goods which are red in the column.

3. Incoming Item Information Display

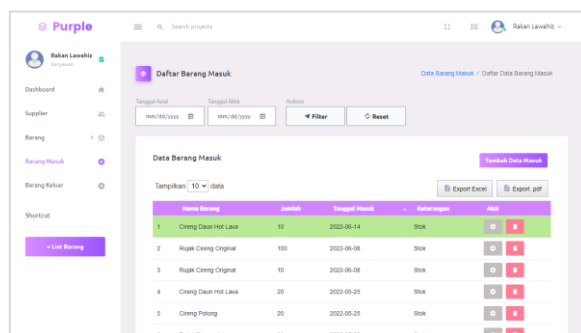


Figure 11. Incoming Item Information Display

The incoming goods information page is a place to record production results in accordance with the requested goods. Where the production results that occur

on the day, will be distinguished in green in the column so that users are easy to control incoming goods.

4. Outgoing Goods Information Display

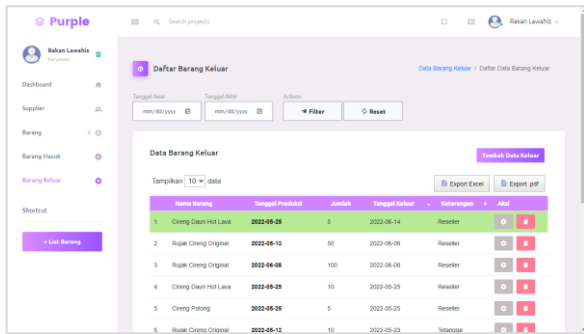


Figure 12. Outgoing Goods Information Display

On the information page of goods out, will be used by users in recording the activity of goods out of the company. In this recording activity, the FIFO method plays a very large role, where even though the variants of the goods are very diverse, the application is able to prioritize the old goods to come out in each variant.

5. User Profile Display

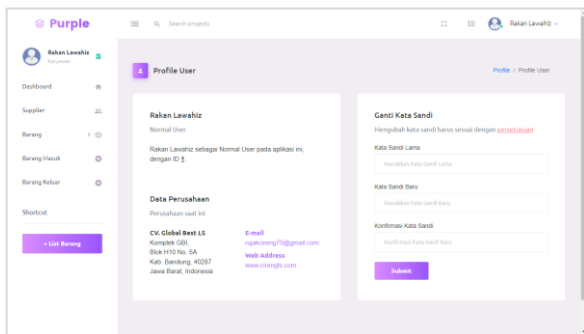


Figure 13. User Profile Display

Data regarding the user will be displayed on this page, it relates to the user name, user code and also company data. As well as a vital control room to be able to change user access to this application.

4.4 PIECES Analysis of the Proposed System

PIECES analysis of the proposed system is a way of identifying the magnitude of the impact given by the design of the new system by comparing the old system used by the company [14].

Table 2. PIECES Analysis of the Proposed System

Analysis	Old System	Proposal System
Performance	Management of production results, stock of goods, and condition of goods is done manually in	The proposed system is designed to be able to accurately record production results,

writing which takes a lot of time. stock and condition of goods in a timely manner.

Information

The information provided is considered inaccurate and very long in the delivery of production results, stocks, and goods out. The proposal system can provide data in real time to help with the delivery of reports quickly.

Economy

Running with the old system costs a considerable amount of money for constant book turnover. The new system will cost a lot of money upfront for the hardware, with the benefit of being more cost-effective in the long run.

Control

Data surveillance is very low when files are available very much just for the same purpose. The proposed system can carry out data control well, where data can be stored in a data-base.

Efficiency

The transfer of data from writing in Excel and then through the printing process will take a very long time in reviewing reports. The proposed system can generate data directly in Excel or print options through a printer.

Services

The old system was very difficult in providing optimal service for users at the time of searching for goods. Services in searching for goods will be optimized to make data for leaders in quick corrections.

5. Conclusion

Based on the research process that has been discussed previously, it can be concluded that:

1. The application of Rapid Application Development (RAD) for applications made as a system implementation in the company is very appropriate. This is due to regular feedback and making applications according to company needs.
2. The approach of the First In First Out (FIFO) method on the topic of inventory management shows that with this approach, it can produce a good work process flow by looking at the condition of the goods in the CV company. Global Best LS.

3. The implementation of product and inventory applications by looking at the comparison features of the old system in the company shows that the application can provide more efficient data information.

6. References

- [1] E. R. Ahmed, T. T. Y. Alabdullah, L. Ardhani, and E. Putri, "The Inventory Control System's Weaknesses Based on the Accounting Postgraduate Students' Perspectives," *JABE (JOURNAL Account. Bus. Educ.*, vol. 5, no. 2, p. 1, Mar. 2021, doi: 10.26675/jabe.v5i2.19312.
- [2] P. P. Gokhale and M. B. Kaloji, "A Study on Inventory Management and Its Impact on Profitability in Foundry Industry at Belagavi, Karnataka," *Int. J. Latest Technol. Eng. Manag. Appl. Sci.*, vol. 7, no. 9, pp. 29–31, 2018, [Online]. Available: www.rsisinternational.org
- [3] A. Budiman, Alhamidi, E. Iswandy, and R. Asmara, "Perancangan Sistem Informasi Penjadwalan Produksi Pada Toko Perabot," *J. Sains dan Inform.*, vol. 8, no. 1, pp. 9–15, 2022, doi: 10.22216/jsi.v8i1.977.
- [4] R. Freddy, *Manajemen Persediaan : Aplikasi di Bidang Bisnis*. Jakarta: RajaGrafindo Persada, 1995.
- [5] D. T. Johns and H. A. Harding, *Manajemen Operasi*. Jakarta: Penerbit PPM, 2001.
- [6] C. Chien, "What is Rapid Application Development (RAD)? | Codebots," 2020. <https://codebots.com/app-development/what-is-rapid-application-development-rad> (accessed Nov. 05, 2022).
- [7] J. A. O'Brien and G. M. Marakas, *Introduction To Information System - Fifteenth Ed*, 15th ed. New York: McGraw-Hill, 2010.
- [8] "Use-case diagrams - IBM Documentation," 2021. <https://www.ibm.com/docs/en/rational-soft-arch/9.7.0?topic=diagrams-use-case> (accessed Nov. 05, 2022).
- [9] "Examples of Web Applications Around Us | AsiaQuest Indonesia," 2021. <https://aqi.co.id/en/news/contoh-contoh-web-application-di-sekitar-kita> (accessed Nov. 05, 2022).
- [10] H. Aliya, "Rapid Application Development: Pengertian dan Langkahnya - Glints Blog," 2021. <https://glints.com/id/lowongan/rapid-application-development-adalah/#.Y2YJTGNP201> (accessed Nov. 05, 2022).
- [11] R. Vogels, "Website Prototyping: How to Develop a Prototype for Your Website!" <https://usersnap.com/blog/website-prototype/> (accessed Nov. 05, 2022).
- [12] A. Khalid Khan, S. Mohammad Faisal, and O. Abdullah Al About Assistant Professor, "an Analysis of Optimal Inventory Accounting Models-Pros and Cons," *Eur. J. Accounting, Audit. Financ. Res.*, vol. 6, no. 3, pp. 65–77, 2018, [Online]. Available: www.eajournals.org
- [13] "FIFO vs LIFO Inventory Flow - Advance Storage Products." <https://advancestorageproducts.com/fifo-vs-lifo-inventory-flow/> (accessed Nov. 05, 2022).
- [14] A. Anwardi, A. Ramadona, M. Hartati, T. Nurainun, and E. G. Permata, "Analisis PIECES dan Pengaruh Perancangan Website Fikri Karya Gemilang Terhadap Sistem Promosi Menggunakan Model Waterfall," *J. Rekayasa Sist. Ind.*, vol. 7, no. 1, p. 57, 2020, [Online]. Available: <https://jrjsi.sie.telkomuniversity.ac.id/JRSI/article/view/380>