



Design of the Inventory Application of CV Diva Karya Mandiri Using Rad (Rapid Application Development)

Halimah Tus Sadiyah^{1*}, Muhamad Saad Nurul Ishlah²

^{1,2}*Informatics Management Department, Universitas Pakuan, Bogor, 16143 Indonesia*

**Corresponding author email: sadiyahht@unpak.ac.id*

Abstract

CV. Diva Karya Mandiri is a CV that is engaged in the production of shoes and sandals for both women and men. In the CV, there are approximately 390 kinds of products, of which 1 product produces more than 10,000 products. There is a large number of production of shoes or sandals so that the number of products that have been produced, the number of products sold and the number of sandals and shoes stored in the warehouse cannot be controlled. At a time when product demand is high, it turns out that the number of products in the warehouse does not match the amount. This study aims to build an inventory application on the Diva Karya Mandiri. The method used in this research is the RAD method which consists of 4 stages: Planning Requirements, User Design, Construction, and Cutover. This study succeeded in building an inventory application that has 11 main menus, namely the dashboard menu which contains a summary of information on goods and user data, goods data menu, supplier menu, incoming goods menu, outgoing goods menu, lending menu, user menu, goods report menu, menu logout, account menu, logout menu. Out of the 11 menus, there are 49 inputs functions tested. The test results show that the average value of the percentage of black box testing using the boundary value analysis method is 95.92%.

Keywords: inventory, RAD, Application, website, boundary value analysis

1. Introduction

Inventory is a mean to meet consumer demand or to facilitate production process (Haratua, 2021). Inventory can also be interpreted as a supply of goods to be sold within a certain period (Vikaliana, 2020). Inventory at the company can be in the form of incoming goods data, outgoing goods data, and existing stock of goods (Fadillah, 2019; Pasaribu, 2021). Problems can arise from having too much or too little inventory in fulfilling consumer demand (Fadillah, 2019). If there is too little supply, demand cannot be fulfilled due to a shortage of supplies. This will cause consumers to be disappointed and there is a possibility that consumers will not return to buy. Likewise, inventory that is too large will result in losses for a company because it has to provide a larger place and there may be depreciation in the value of goods (Kambivi, 2020). Inventory management is needed for companies that have many products, many variants and more than one supplier (Perez, 2021). In this case, inventory management is necessary since it relates to stock and finance (Teplická, 2020). Errors in controlling the availability of goods can be detrimental to the company (Teplická, 2020) so that by managing inventory, it is expected that a company can guarantee the smooth fulfillment of consumers (Eunike, 2018).

CV. Diva Karya Mandiri is located in the Ciapus Nambo area, Bogor Regency. They engaged in the production of shoes and sandals for both women and men. There are approximately 390 kinds of products offered there, of which approximately more than 10,000 products are produced for each category. Thus, it is expected to be quite difficult in managing the stocks. At a time when product demand is high, it turns out that the number of products in the warehouse does not match the amount. This is a problem in the CV. In addition, inventory recording that is not systematic causes several products to pile up because there is no data on the number of products remaining in the warehouse. Therefore, it is important to build a shoe and sandal product inventory application with a website technology approach. Meanwhile, according to Irianti et. al (2020), inventory application is very important in a company because the management of stock of goods becomes planned, measurable, controlled, connected and systematic (Laola, 2021).

Inventory application is an application that can automatically provide empty product notifications, manage the quantity and stock of products, and can automatically print product inventory reports (Salim, 2020). Inventory

management applications are built to achieve efficiency and effectiveness in the supply chain (Inegbedion, 2019). This study aims to build an inventory application using the RAD method. The RAD method is chosen because it allows for flexibility and adaptability in the development process (Melendres, 2022; Ramelan, 2021; Ilham, 2021) and is suitable for applications that require a short and fast development time (Gupta, 2021; Viandari, 2021). This is because in the process the developer uses reusable codes from open-source repositories (Bhattacharyya, 2021).

2. Methods

In this research, we use RAD method, which is adapted from the Waterfall method (Delima, 2017; Tias, 2021; Pasaribu, 2022). This method consists of 4 stages: planning requirements, user design, construction, and cutover (Ikwunne, 2021; Gumonan, 2021; E-Recycle Bin, 2021; Alpasan, 2021).

1) Requirements Planning Phase

This stage is the stage in collecting data or seeking information on system functionality requirements and what data will be used to build the system. This stage is carried out to find out who will use the system, the scope, and examine the running system

2) User Design Phase

The user design phase is the stage where the results of the analysis are then made a design in the form of a system design that will be developed. The system design will assist in defining the overall system flow. System design using UML such as class diagrams and use case diagrams.

3) Construction Phase

This stage is carried out after the design stage has been completed. This stage processes the results of the design into the software to be used, the database to be used to store data, and the applications used to interface the system.

4) Cutover Phase

7. This stage is the stage to test whether the system that has been made, functions according to plan or not. If it does not match, then the system will return to the construction stage. In this phase, black box testing is carried out. Black box testing is a test to test the function of the system that is already running according to the expected output (Sutiah, 2021). In blackbox testing, the boundary value analysis method is applied in which the analysis of the functions of $x - 1, x$ and $x + 1, y - 1, y, y + 1$ is carried out. The $x - 1$ function means that the system is tested with an input less than zero with a value of $x = 0$ and $x + 1$ is an input filled with a value greater than zero. The y value indicates the maximum limit for input filling. The $y - 1$ value is a test where the system is inputted with a value less than the maximum input limit. As for $y + 1$, the system is tested for a value that is more than the limit for the number of inputs in the inventory application (Supriyono, 2020).

3. Results and Discussion

The initial stage in developing an inventory application is planning system requirements. The result of this stage is the list of features that would support the needs of system functionality. These features are described in Table 1.

Table 1: The Features of Inventory Application

No	Function Code	Feature	Description
1	FD	Dashboard	This feature consists of information summary related to user login information, number of item models, number of suppliers, number of users, number of loan transactions, number of incoming goods, number of outgoing goods, total incoming goods transactions, total outgoing goods transactions, total loan repayments and total loans not been restored
2	FB	Menu of Goods Data	Information about all item such as product name, specification, size number, color, product unit price, stock quantity, type of item and other info Goods data can be created, read, updated and deleted
3.	FS	Menu of Supplier Data	Information about suppliers Data Supplier can be created, read, update and delete
4.	FP	Menu of Loan Data	Information about all loan data such as the name of the item borrowed, the number of items borrowed, conditions, status, date of loan and date of return. Loan data can be created, read, updated and deleted

No	Function Code	Feature	Description
5	FBM	Menu of incoming goods data	Information about all incoming goods data such as item name, quantity, entry date and supplier name. Incoming goods data can be created, read, updated and deleted
6	FBK	Menu of outgoing goods data	Information regarding all outgoing goods data such as the name of the goods, quantity, date of issue, location, name of recipient and other information. Outgoing goods data can be created, read, updated and deleted
7	FDP	Menu of User Data	Information about all user data User data can be created, read, updated and deleted
8	FL	Menu of Report	Reports can be created, read and filter
9	FA	Account Function	To update the account data, related to password
10	FLG	Login Function	To log in the application
11	FLT	Logout Function	To log out the application

After the system functionality requirements are collected, the next stage is user design. In this stage class diagrams and use case diagrams are designed. The Class Diagram is shown in Figure 1. The use case diagram is shown in Figure 2.

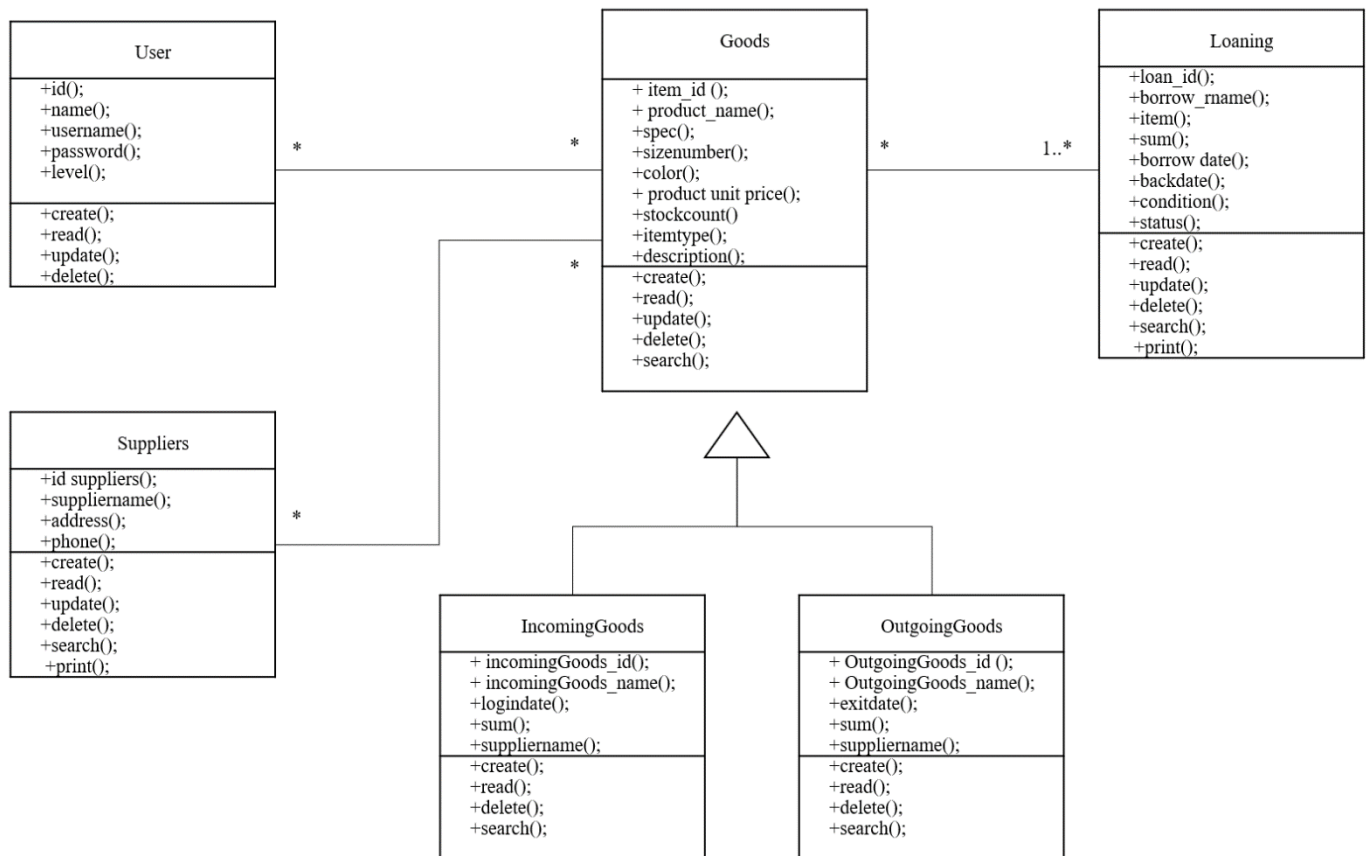


Figure 1: Class Diagram of Inventory Application of CV Diva Karya Mandiri

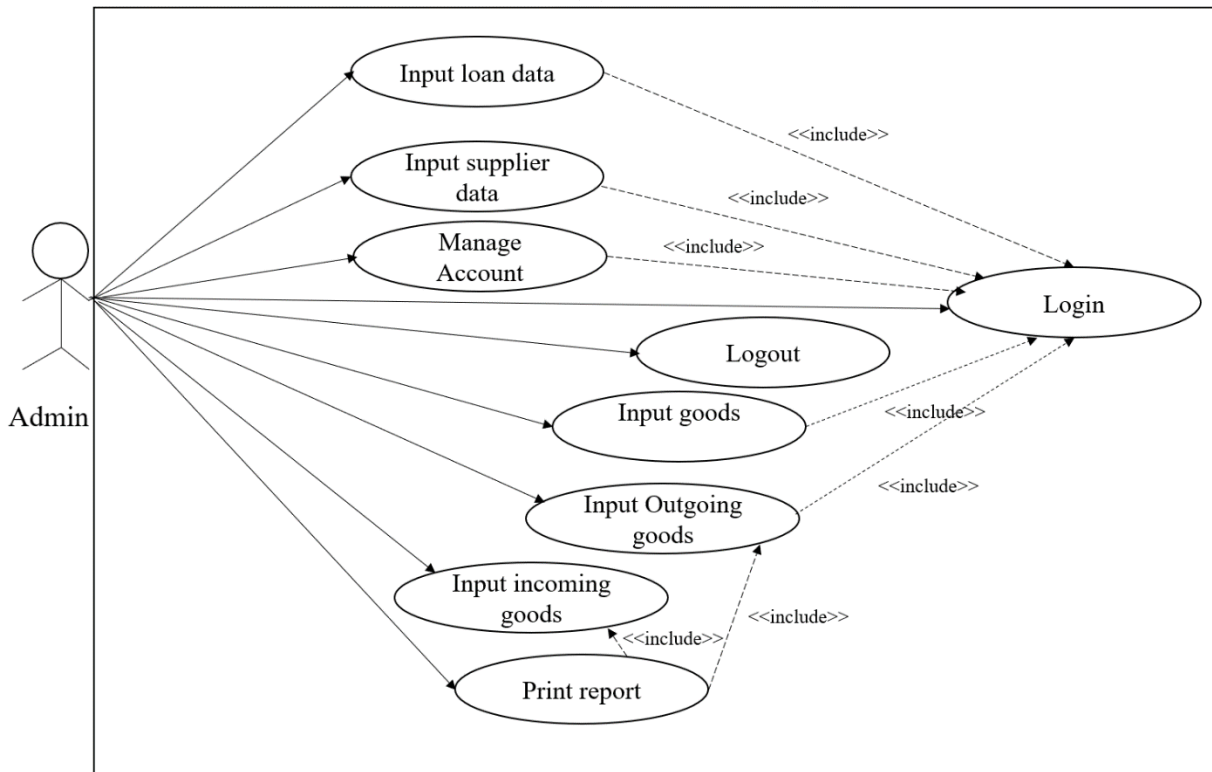


Figure 2: Use Cases Diagram of Inventory Application of CV Diva Karya Mandiri

The next stage after the user design phase is the construction phase. This phase is the implementation phase based on the user design. It utilizes the PHP language and database connection through MySQLi. There are several tools used in this phase as well, namely: XAMPP, Web Browser and Notepad++. The hardware specification used to build the inventory application is a Core i7 Intel Atom laptop. The result of the construction phase is an inventory application consisting of the functions in Table 1.

This application consists of 2 access rights, namely Admin and Operator access rights. The difference is that the admin can access all data in the inventory application. However, Operator can only access information on goods data, suppliers, loan data, incoming and outgoing goods data. Admins and Operators are required to login first to access the inventory application. In the inventory application there is a main page, namely the dashboard. It consists of information summary regarding detailed user login information, number of item models, number of suppliers, number of users, number of loan transactions, number of incoming goods, total outgoing goods, total incoming goods transactions, total outgoing goods transactions, total loan disbursement and the total loan has not been returned. The main page of the inventory application Dashboard can be seen in Figure 3.

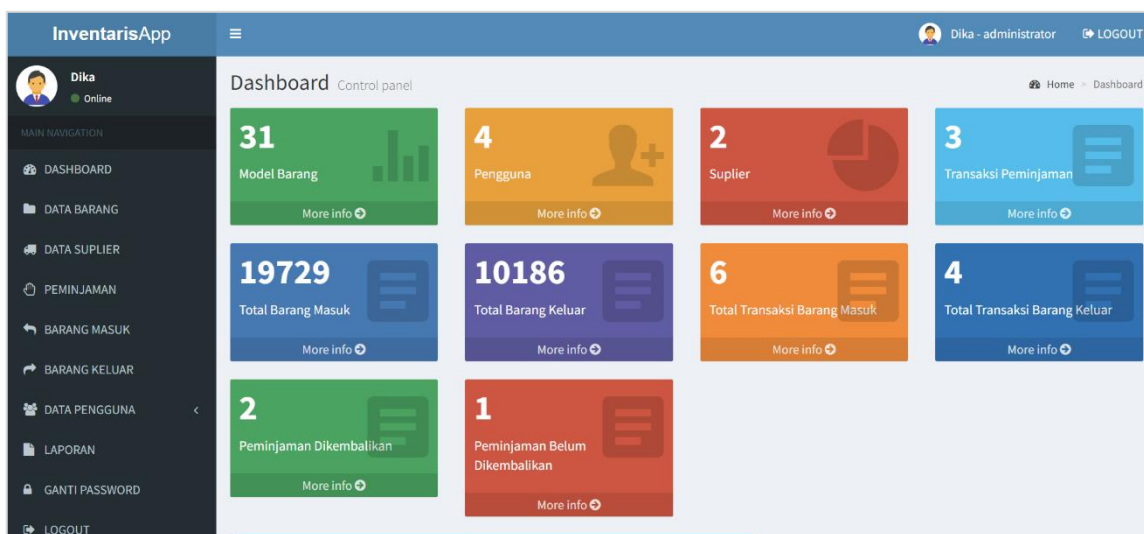


Figure 3: Main page Dashboard of Inventory App.

Another admin page is the item data page. It consists of information on the item data name and detailed specifications of the item from various shoes and sandals. On this page we are allowed to do CRUD operations (Create, Read, Update, Delete) and searching. The item data page can be seen in Figure 4.

NO	NAMA PRODUK	SPESIFIKASI	NOMOR UKURAN	WARNA	HARGA SATUAN PRODUK	JUMLAH STOK	JENIS BARANG	KETERANGAN
1	Sendal Wanita HAE CHAN Sandal Slop Wanita Tali Belakang AB 10	Tali Belakang	AB 10	HITAM,CREAM,SALEM,HIJAU MINT,DAN TAN,MOCCA	40642	23990	Sendal	PU Sintetic L(amira premium)
2	Sendal Wanita Platform Upper Ban Dua Brukat	•Sol : karet Non Slip	AB 08	Hitam, Tan dann Cream	40788	15920	Sendal	Bahan : PU Sintetic L(amira premium),

Figure 4: Goods Page (Admin Access)

Next page is the Supplier data admin page. It consists of information on the names of data suppliers who supply data to CV Diva Karya Mandiri. On this page, both the admin and the operator can perform CRUD operation on supplier data. There is also a new lending button to allow users to add a new lending record. On that page, we can see the name, item, number of items borrowed, lending date, return date and item status when borrowed. The condition of the borrowed goods is checked first, then the condition and status of the goods are inputted into the inventory application. This is to ensure that the item returned is the same as the condition of the item borrowed. The condition of the goods can be inputted by the operator with the term "good", or not good.

On the lending data page the operator can perform CRUD to manage borrowing data. The operator can input the status of the loan with the term "loan" or "returned". This page provides information on the number of data items that are being borrowed and the number of data items that have been returned. Other features on this page are the search and print PDF features for loan data reports. The display of the lending data page can be seen in Figure 5.

NO	NAMA	BARANG	JUMLAH	KONDISI	TGL.PINJAM	TGL.KEMBALI	STATUS	OPSI
1	Renaldi	Sendal Wanita HAE CHAN Sandal Slop Wanita Tali Belakang AB 10	10	Baik	2022-08-18	2022-08-22	Di Kembalikan	⚙️ 🗑️
2	SULAIMAN	Sendal Wanita HAE CHAN Sandal Slop Wanita Tali Belakang AB 10	10	Baik	2022-08-03	2022-08-05	Di Kembalikan	⚙️ 🗑️
3	Dori	Sandal Jepit Wanita Sandal Karakter BEAR ALY 01	10	Baik	2023-01-03	2023-01-07	Di Pinjam	⚙️ 🗑️

Showing 1 to 3 of 3 entries

Previous 1 Next

Figure 5: Lending Page (Admin Access)

The incoming goods data admin page is an information page regarding incoming goods data, the amount of incoming goods data, and the name of the incoming goods supplier. The incoming goods page can be seen in Figure 6. Following the incoming goods page is the outgoing goods data admin page. It contains data on outgoing goods, total outgoing data, location, recipient, and other information. The outgoing goods data page can be seen in Figure 7.

NO	NAMA BARANG	TANGGAL MASUK	JUMLAH	NAMA SUPLIER	OPSI
1	Sandal Wanita HAE CHAN Sandal Slop Wanita Tali Belakang AB 10	2022-10-16	1000	CV. Diva Store	
2	Sandal Wanita Platform Upper Ban Dua Brukat Mutiara Sandal Wanita Kekinian AB 08	2022-10-16	1000	CV. Diva Store	
3	FlatShoes Wanita CLARY RD 02	2022-10-16	1000	Bengkel Ciapus Nambo	
4	Sneaker Cewek DV 83	2022-10-16	1000	Bengkel Ciapus Nambo	
5	Sandal Wanita Platfrom Sandal Kokop SIlang DN 05	2022-10-16	1000	CV. Diva Store	

Figure 6: Incoming Goods Page (Admin access)

Barang Keluar + Barang Keluar Baru

Search:

NO	NAMA BARANG	TANGGAL KELUAR	JUMLAH	LOKASI	PENERIMA	KETERANGAN	OPSI
1	Sandal Wanita HAE CHAN Sandal Slop Wanita Tali Belakang AB 10	2022-10-15	180	Ciomas	Heru	Penjualan Offline	
2	Sandal Wanita Platform Upper Ban Dua Brukat Mutiara Sandal Wanita Kekinian AB 08	2022-10-13	106	Bogor	Agus	Penjualan Offline	
3	Sneaker Cewek DV 83	2022-10-14	9800	Ciomas	Deri	Penjualan Offline	

Figure 7: Outgoing Goods Page (Admin access)

Besides its main purpose on managing item data, there is also a special page for printing item data reports in the platform. It's located in the report menu. Operator can print reports with date filter. The report print page can be seen in Figure 8.

1/8/23, 4:47 AM Administrator - Aplikasi inventaris CV Diva Karya Mandiri

CV. Diva Karya Mandiri
 Jl. Nambo, Sukajaya, Kecamatan Tamansari, Kabupaten Bogor 16610
 Hp. 0821-15528084, 0821-6524-1358

LAPORAN

DARI TANGGAL : 2022/10/10
SAMPAI TANGGAL : 2023/01/03
JENIS : barang_masuk

NO	NAMA BARANG	TANGGAL MASUK	JUMLAH	NAMA SUPLIER
1	Sandal Wanita HAE CHAN Sandal Slop Wanita Tali Belakang AB 10	2022-10-16	1000	CV. Diva Store
2	Sandal Wanita Platform Upper Ban Dua Brukat Mutiara Sandal Wanita Kekinian AB 08	2022-10-16	1000	CV. Diva Store
3	FlatShoes Wanita CLARY RD 02	2022-10-16	1000	Bengkel Ciapus Nambo
4	Sneaker Cewek DV 83	2022-10-16	1000	Bengkel Ciapus Nambo
5	Sandal Wanita Platform Sandal Kokop SIlang DN 05	2022-10-16	1000	CV. Diva Store
6	Sandal Jepit Wanita Sandal Karakter BEAR ALY 01	2023-01-03	14729	CV. Diva Store

Print 1 sheet of paper

Destination HP Ink Tank 310 serie:

Pages All

Copies 1

Layout Portrait

Color Color

More settings

Figure 8: Print Goods Data Reports in the Inventory Application

The last phase in system development using RAD is the Cutover phase. This phase is the testing phase. The result is based on Black box testing using the boundary value analysis method. It can be seen in Table 2.

Table 2: The results of the blackbox system testing used the boundary value analysis method

Information	Input	Boundary Value Function	Input Value	Expected Output	Meet Expectation (a)	Outside Expectation (b)	Success Rate = $(a/(a+b))*100\%$
Range of Value	x=0	x-1	-1	Cannot Receive negative value	43	6	87.75%
		x	0	Receive Zero	49	0	100%
		x+1	2	Receive value of 2	49	0	100%
Average Percentage							95.92%

There are 49 inputs in total to test the application using black box testing. Based on result in Table 2, it is known that the average value of the percentage of black box testing using the boundary value analysis method is 95.92%. There are 5 functions in the inventory application that are not in accordance with the expected output.

4. Conclusion

This study aims to build an inventory application on the Diva Karya Mandiri. The method used in this research is the RAD method which consists of 4 stages: Planning Requirements, User Design, Construction, and Cutover. This study succeeded in building an inventory application that has 11 main menus, namely the dashboard menu which contains a summary of information on goods and user data, goods data menu, supplier menu, incoming goods menu, outgoing goods menu, lending menu, user menu, goods report menu, menu logout, account menu, logout menu. Out of the 11 menus, there are 49 inputs functions tested. The test results show that the average value of the percentage of black box testing using the boundary value analysis method is 95.92%

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