International Journal of Information System & Technology
Akreditasi No. 158/E/KPT/2021 | Vol. 9, No. 1, (2025), pp. 82-92

The Use of Rapid Application Development (RAD) Model in the Development of Raw Material Inventory Information System

Nur Hidayati
Universitas Bina Sarana Informatika, Indonesia
Email: nur.nrh@bsi.ac.id

Abstract

In a company, there are several areas it manages, such as sales, purchases, inventory, marketing, production, and many other fields. Inventory, which is one of those areas, becomes a crucial center in the sustainability of the company's operations. This is because inventory has a relationship with sales and purchases, or is related to incoming and outgoing goods. Therefore, special attention is needed in this area of inventory. Inventory is not only related to goods but also to raw materials, depending on the type of company being run. In the inventory of raw materials specifically, it is essential to clearly understand the raw materials available in the company so that it can meet the company's needs in producing goods. To obtain this clear information, good information systems are certainly required. However, in reality, there are still many companies that use a manual system in managing their inventory data. This can obviously lead to several problems such as the information obtained regarding the final condition of the raw materials not being updated properly due to recording errors made on the incoming and outgoing raw materials. This condition results in the preparation of inventory reports being incorrect, thus making the information provided inaccurate. If this continues, it will negatively impact the company's survival. The company may incur significant losses and be unable to compete with other companies. Therefore, such companies need the development of a system that will transform from a manual system to a computerized system. With the hope of resolving the issues faced. In the process of developing the system, it is also necessary to choose the right model, such as the Rapid Application Development model. Because in this model, the existing stages can be carried out clearly and systematically and can have a short time estimate in the development of the system. The final result of this system development can be an inventory application that can be used to assist in managing its inventory data.

Keywords: *System development, Raw Material Inventory, RAD*

1. Introduction

Currently, many companies are established and the types of companies are also diverse. There are trading companies, service companies, and manufacturing companies. Each of these companies has its own vision and mission in running its business. With the increasing number of companies, the competition between one company and another becomes very tight. Since every company is sure to have goals and targets that it wants to achieve for the survival of its business. Therefore, to be able to compete with existing companies, it certainly requires a precise strategy to maintain its existence and even to develop the business within the company. For manufacturing companies in particular, there are several business areas within them such as sales, purchasing, inventory, production, and others. Each of these business sectors is interconnected with one another. Therefore, if one of these sectors is not performing well, it will certainly affect the performance of the other sectors.

Especially in this era of digitalization, the use of an effective information system is extremely necessary to help manage the data in each of these business sectors, so that the presented information can be quick and accurate. According to Agusvianto, information systems are useful to support the operational functions of organizations

ISSN : 2580-7250

in a managerial capacity with the organization's strategic activities and to obtain the reports needed by the relevant parties [1]. Particularly for the inventory sector. Inventory can consist of goods or raw materials. For manufacturing companies, the raw materials will eventually be produced into finished goods, which will then be distributed to parties that need them. Inventory is an important and sensitive matter within a company, as it relates to the incoming and outgoing goods of a company. Therefore, the management of inventory data must be accurate and meticulous to ensure that the information provided is correct. To support this, the implementation of an information system that can help manage the data effectively is necessary. In addition, there also needs to be inventory control. An inventory control system can be defined as a series of control policies to determine the level of inventory that must be maintained, when orders to replenish inventory should be made, and how large the orders should be [2].

However, there are still many companies that are using manual systems to manage their data. Some are still recorded by hand, their data storage is messy, and there are also problems in report generation. This certainly creates issues for those companies. If this situation is not addressed promptly, the problems for the company will continue to accumulate and could lead to significant losses. Therefore, a solution is urgently needed to resolve the existing issues. Specifically related to the raw material inventory information system, a common problem that arises is the lack of updates to the existing raw material inventory. This is caused by errors in recording the incoming and outgoing raw materials, leading to incorrect information regarding the inventory. The inventory report of raw materials also becomes inaccurate due to this issue; the information received by the company's management becomes biased, which leads to incorrect decision-making.

With the presence of such conditions, if they continue for a long time, it could result in the company experiencing losses or even being unable to compete with other companies and unable to maintain its existence in the business world. Therefore, immediate action is needed by seeking the right solution to address the arising problems. One of the ways is by developing an information system. The development of this information system can involve the transformation from a manual system to a computerized system. By developing an information system, it is hoped that the existing problems will be resolved quickly and the objectives and targets of developing the information system can be achieved.

In developing an information system, careful planning is essential. This is because it relates to the funds expended and the time required for the implementation of the system. In addition, it requires the involvement of experts or system developers who can assist in identifying the needs necessary to improve the system. Therefore, there must also be intensive communication between system developers and users to ensure that the steps taken by the developers are correct and that the established goals can be achieved. It is hoped that the efforts to develop the information system will facilitate the management of data related to raw material supplies, thus minimizing existing problems or even preventing the recurrence of similar issues as currently faced.

In order for the development of the raw material inventory information system to align with the objectives to be achieved, it is necessary not only to understand the existing information systems and to determine the required needs, but also to pay attention to the selection of the right model in the effort to build the information system. Why is it important to determine the right model? This is because it ensures that the steps taken in developing the system are clear and structured. So that in its implementation, it can be adjusted according to the steps that have been determined. The effort to transition the information system from manual to computerized may also utilize methods or methodologies previously used by researchers, resulting in a

new system ready for implementation, known as the SDLC (Software Development Life Cycle) [3].

Models such as waterfall, iterative, RAD, prototype, spiral, scrum, and agile are included in the models present in the SDLC. After studying each of these models, the RAD (Rapid Application Development) model is found to be the most suitable for the development of this raw material inventory information system. By choosing the RAD model, the steps to be taken will be clearly visible, in addition to that, planning for the time and costs required can also be made. Thus, system developers can carry out their tasks as agreed with the users and the expectations of having this information system developed so that the existing problems can be resolved quickly, and the initial objectives in developing this raw material inventory information system can also be realized in accordance with what was established at the beginning of this project.

The following is research that has been conducted by previous researchers related to the development of an information system for raw material inventory from several journal, such as: Desain Sistem Informasi Persediaan Bahan Baku Produksi Dan Bahan Jadi Pada CV. Bunga Palm Berbasis Website [4], Perancangan Sistem Informasi Persediaan Bahan Baku Berbasis Website Pada PT. Multi Mortar [5], Persediaan Barang Pada Toko Nivico [6], Sistem Informasi Persediaan Barang dengan Metode Perpetual Pada Toko Mebel Sidarta Berbasis Web [7], Perancangan Sistem Informasi Persediaan Barang Berbasis Web Pada Kidsnbear [8], Implementasi Metode Rapid Application Development Dalam Pengembangan Pengembangan Sistem Informasi Integrated-Sales [9], dan Perancangan Sistem Informasi Inventory Dengan Barcode Scanner Berbasis Web [10].

2. Research Methodology

The type of research used in the development of this raw material inventory information system is qualitative. Data collection is based on results from interviews, observations, and literature studies. Interviews are conducted by meeting face-to-face with the parties to be interviewed as sources to obtain the necessary data and information. Before conducting interviews, an agreement on time and place is made first. Meanwhile, observation is a direct observation of the activities carried out in the raw material inventory information system. The data and information obtained will be recorded or documented to be used as a basis for the next stage. The literature study is an activity to search for references related to information system development so that it can be used to facilitate the discussion and provide gaps that exist in order to bring novelty to this writing.

After obtaining the necessary data, the next step is to analyze and develop an inventory information system for raw materials. In the development of the information system, as explained in the background, the author uses one of the SDLC models, namely the Rapid Application Development (RAD) model. The RAD model is one that requires a short development time in the process of building the information system because this model has an incremental nature. The RAD model is also an adjustment of the waterfall model that has a high-speed version, where each component or part of the software will be developed in more detail. Therefore, it is necessary for the system development team to understand how to determine the required needs and set boundaries in the software so that the information system development process can be carried out in a short time as targeted. In the RAD model, the system development team is grouped into several teams, and each team can work on its tasks in parallel [3]. The following are the stages in the Rapid Application Development (RAD) model:

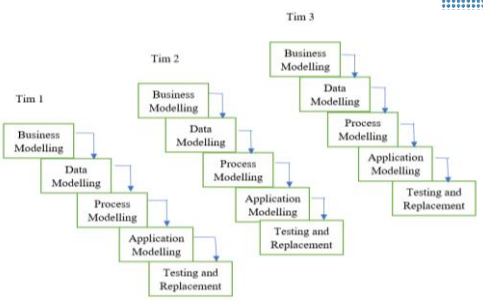

Figure 1. RAD Model

Description of the image [3] :

(a) Bussiness Modelling

In this stage of business modeling, the modeling of business functions is initiated, which is used to determine the completeness of the data and information needed, related to business processes, who will create that information, what information is required and will be created, how the flow of information is generated, and what processes will be related to that information.

(b) Data Modelling

In the data modeling stage, it is a continuation of the first stage, which is modeling the necessary data so that it can define attributes and relate one piece of data to another.

(c) Process Modelling

In the process modeling phase, the implementation of business functions is started as defined in the previous phase.

(d) Application Modelling

In the application modeling stage, it is an implementation of the data modeling and process modeling stages, where the program application will be created according to the specified data, both from the database design and from the interface design.

(e) Testing and Replacement

In the testing and replacement phase, it involves testing the parts or components that have been created by the system development team. If the testing is successful, then the system development team will proceed to develop other parts or components.

This RAD model is suitable for use if it meets the following conditions: [3], Team members in the system development team have reliable experience in developing similar software, and the system developers have system components that can later be used to assist in building the information system.

3. Results and Discussion

3.1. Ongoing System Analysis

Every company that has an inventory information system, especially for raw materials, certainly has its own policies and provisions in implementing that information system, so the workflow of the raw material inventory information system may vary from one company to another. Below, the author takes one example of the business process of the raw material inventory information system applied at CV. Aifa Cutaka Plastik:

The warehouse informs the Admin that the head office will send raw materials to CV. Aifa Cutaka Plastik. Then the Admin contacts the driver to pick up the raw materials from the head office. Through the warehouse, when the driver is about to pick up the raw materials, the warehouse will provide the raw materials and the delivery note to the driver. After the driver has returned to CV. Aifa Cutaka Plastik, the delivery note which serves as proof of receipt of the goods is given to Accounting, while the raw materials

brought by the driver will be received by the Admin. The Admin will then process the calculation of the raw materials and record it as the receipt of incoming raw materials. Next, the Admin informs the Management Section about the raw materials that have been received. The management section that receives the information will then carry out the sorting. In the sorting process, if there are any raw materials that are not good, they will be returned to the warehouse, while good raw materials will proceed to the next stage, which is the assembly process. The raw materials that have been assembled will then be made into pipettes, which will subsequently undergo spraying after sterilization, followed by wrapping. After that, the management section will inform the Admin that the raw materials received have been transformed into finished goods and have been wrapped. Upon receiving this information, the Admin will then inform the central office through the warehouse that the admin will send the finished goods. The Admin will schedule the shipment, and after the schedule is determined, the Admin will contact the Driver to deliver the goods to the Warehouse and provide proof of shipment in the form of a delivery receipt. After the Admin provides the delivery receipt and the goods, the Admin will record the goods that have been dispatched. Then the driver will deliver the goods and the delivery receipt to the headquarters to be received by the warehouse. Once received by the warehouse, the warehouse will provide its signature and give a signed copy of the delivery receipt to the Driver. Subsequently, the Driver will give the signed copy of the delivery receipt to Accounting. The Admin will create an inventory report containing information about the raw materials that come in and the goods that go out. This report will be given to the Warehouse Manager. Based on the business process of the inventory information system, the Activity diagram can also be depicted. This Activity diagram represents the workflow of a system [11]. In this business process, it can be concluded that there are several parts involved in the inventory information system such as the warehouse, admin, management section, driver, and warehouse head. The documents that flow include delivery notes for goods receipt, delivery notes for goods shipment, inventory books, and inventory reports. The illustration of the Activity Diagram is as follows:

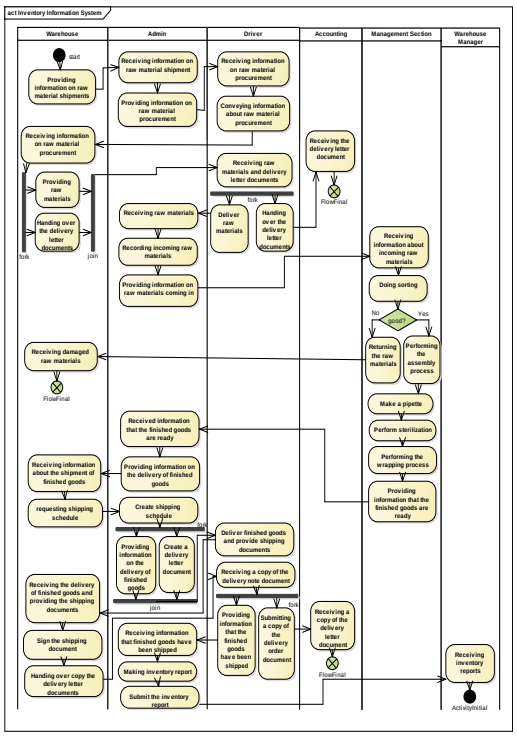

Figure 2. Activity Diagram

3.2. Rapid Application Development

1. Bussiness Modelling

In this stage of business modeling, it is used to determine the business functions that will be required so that the system development process can begin. Based on the business process flow that has been discussed from the inventory information system, the next step for the system development team is to determine the necessary requirements, both from the system and from the users. These requirements will be tailored to what is needed in the development of the inventory information system with the hope of accommodating what the users need so that the current issues with the system can be resolved effectively. Therefore, there needs to be intensive communication between users and the system development team so that the development team can provide the best solutions for users in solving their problems, and the results obtained in the form of a new system to be implemented at that location can operate according to the original objectives. The system development team must truly understand the conditions of the existing system so that it will facilitate determining the needs of the system and users in the process of building the information system [11]. After understanding the current system in operation, the necessary requirements for the development of the inventory information system can be determined as follows:

a. Admin can login
b. Admin managing goods data
c. Admin managing warehouse data
d. Admin managing user data
e. Admin managing incoming goods data
f. Admin managing outgoing goods data
g. Admin managing product return
h. Admin accessing inventory reports
i. Warehouse Manager can login
j. Warehouse Manager accessing inventory reports

Based on the above requirements, it can be concluded who can access the new system and what can be done in the new system. A use case diagram can be defined as a diagram used to describe the behavior of the system to be created or to depict the system's functionality [12]. The following is the depiction of the Use Case Diagram:

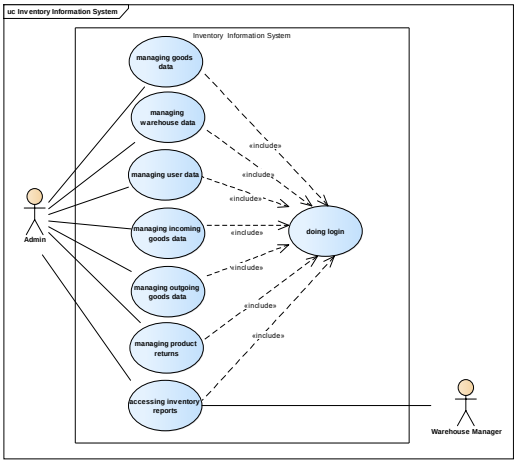

Figure 3. Use Case Diagram

2. Data Modelling

In this stage of data modeling, the design of the data model is determined, which will later be used in creating an inventory information system application. This data model represents the structure of the database being created, which contains several tables.

These tables have been designed according to the needs required in the development of the system. To illustrate this data model, a diagram called a Class Diagram can be used. A class diagram essentially contains information about data structure and how one class can relate to another class. So, it's like building a new house, the first step taken is to lay its foundation, and in order for the foundation to be strong, it must have gone through thorough planning and be tailored to the necessary requirements. [13]. With the creation of a class diagram, one can detail the class names, the attributes used, and also the methods or operations and the constraints present in those relationships. [12]. In the depiction of the class diagram of the inventory information system, there are 9 classes namely WarehouseClass, UserClass, GoodsClass, IncomingGoods, OutgoingGoods, DetailIncomingGoods, DetailOutgoingGoods, GoodsReturn, and DetailGoodsReturn. Here is the complete depiction of the class diagram:

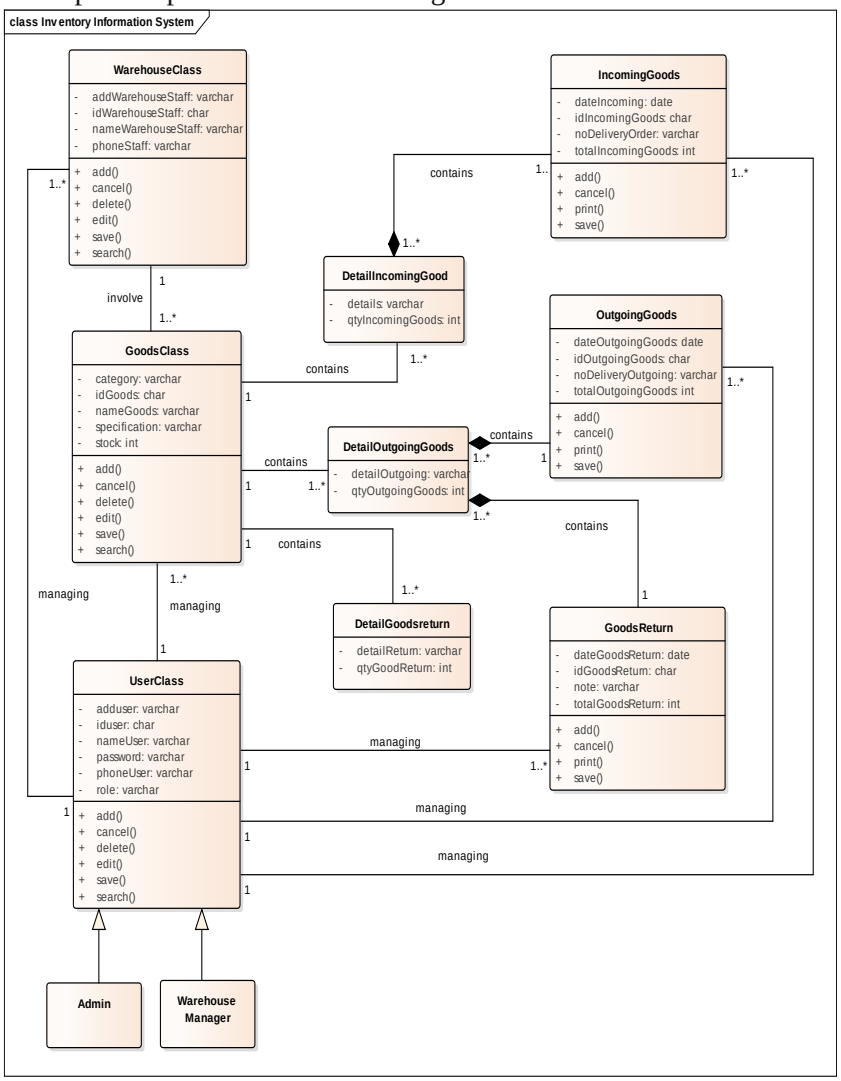

Figure 4. Class Diagram

3. Process Modelling and Application Modelling

The next stage is a combination of the process modeling stage and the application modeling stage. Why are these two stages discussed together? Because these two stages are carried out continuously, where the process modeling stage is the implementation of the previous two stages, namely the business modeling stage and the data modeling stage. This is then followed by the application modeling stage, where the implementation from the process modeling stage is realized in the form of application program development. In

the application modeling phase, the programming language to be used later and the software for creating the database must already be determined. However, before the application program is created, a user interface design, known as UI/UX, must be developed. The UI/UX that is created must, of course, meet the needs of the system and the users and be user-friendly. With this design, it will make it easier for users to use the application, and thus the data management is expected to be as desired. The UI/UX design used in the development of the inventory information system is as follows:

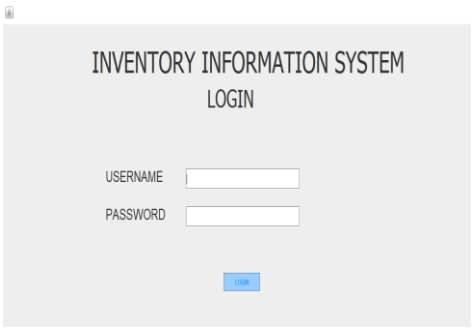

Figure 5. Login User Interface

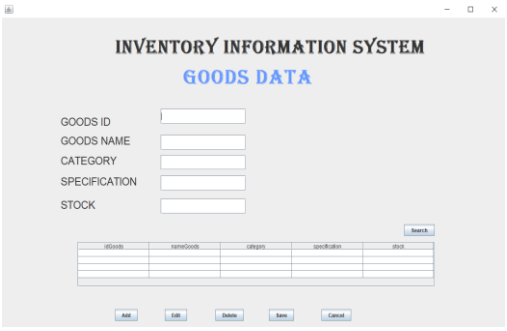

Figure 6. Goods Data User Interface

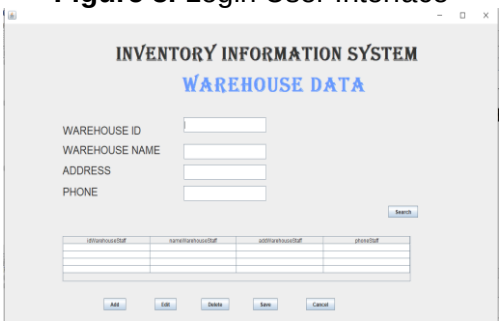

Figure 7. Warehouse Data User Interface

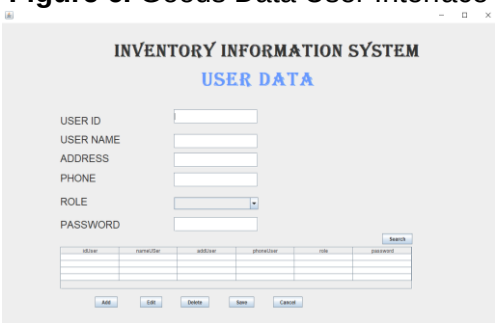

Figure 8. User Data User Interface

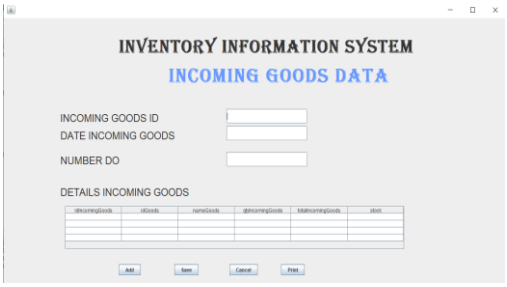

Figure 9. Incoming Goods User Interface

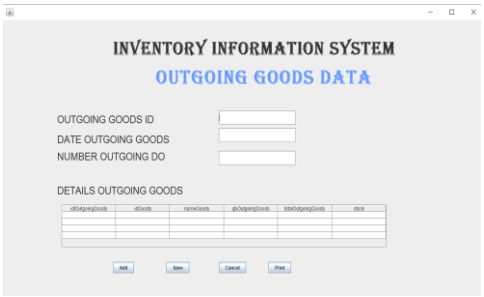

Figure 10. Outgoing Goods User Interface

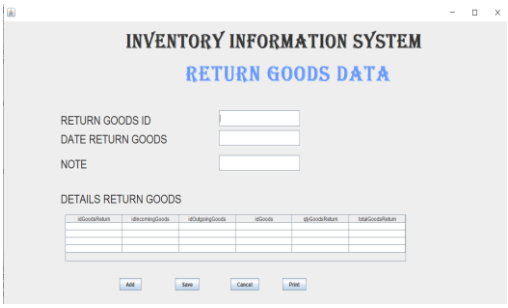

Figure 11. Return Goods User Interface

After the UI/UX design and database design have been created, the application development can proceed. In the development of this inventory information system, MySQL software is used for database creation and the Java Netbeans programming language is used to create the program script. Below is an example of the user interaction with the newly created system, illustrated in the form of a Sequence Diagram. When illustrating the sequence diagram, it is necessary to revisit the UI/UX and database design.

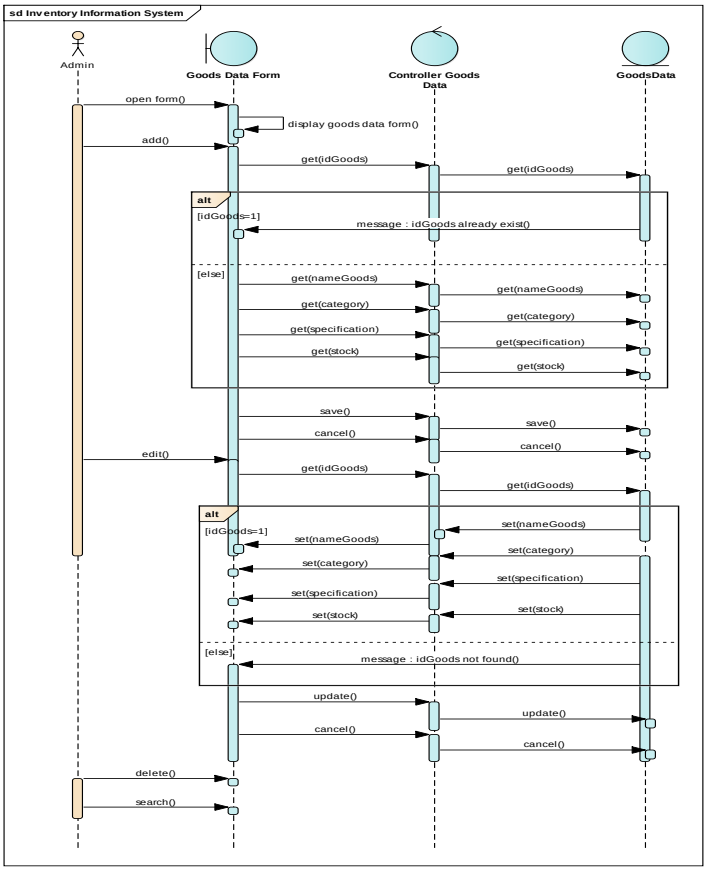

Figure 12. Goods Data Sequence Diagram

4. Testing and Replacement

The last stage in this Rapid Application Development (RAD) model is the testing and replacement stage. Once the program application has been completed in the process modeling and application modeling stages, the program application is ready for testing. This testing is conducted to see if there are no errors in the program application. If there are no errors or bugs, the next test is carried out using the operational data owned by the company. The testing is performed using the Blackbox testing method. By using this method, it will be observed whether the input and output during the testing of the program application meet the expectations or not. If there are any discrepancies, it will certainly be noted for the system developers. However, if it is already as expected, the next step is that the new system is ready to be implemented. This new system will replace the current system in the hope of making it easier for users to manage inventory data and resolve existing issues. The following is one example of testing using the black box testing method:

Table 1. Login Testing

No	Testing Scenario	Test Case	Output	Testing Result	Note
1	Doing clear data of username and	Username and Password	System will denied aceess and system	According to expectations	Valid

No	Testing Scenario	Test Case	Output	Testing Result	Note
	password, then click login	(empty)	show message "Not Found username and Password"		
2	Input with correct username and empty password, then click login	Username (Sistem123) Password (empty)	System will denied aceess and system show message "Wrong Password"	According to expectations	Valid
3	Username empty and input the correct password, then click login	Username (empty) Password (123456)	System will denied aceess and system show message "Wrong username"	According to expectations	Valid
4	Input wrong username and password, then click login	Username (hai) Password (pass)	System will denied aceess and system show message "Wrong username and Password"	According to expectations	Valid
5	Input with the correct username and password, then click login	Username (Sistem123) Password (123456)	System successful and will show main course	According to expectations	Valid

4. Conclusion

The inventory information system within a company, if its data management is still conducted manually, can lead to negative impacts for that company, especially in today's digitalization era. Inadequate management of inventory data can create new problems, such as inaccurate information regarding the stock of raw materials or goods available in the company. If this issue is not resolved promptly, it will affect the company, leading to significant losses. If the company incurs many losses and struggles to compete with others, bankruptcy may befall the company. Therefore, before the worst impacts are felt by the company, improvements are necessary. In this case, there is a need to develop a system that will transform from a manual system to a computerized system. The result of building this information system is a new system equipped with application programs that support users in managing data related to inventory. Thus, the goals and targets in developing the information system, especially for inventory, can be achieved. To support the success of the development of this information system, it is necessary to select the appropriate model, such as the use of the Rapid Application Development (RAD) model. The RAD model clearly outlines the stages that will be carried out and is accompanied by a short time estimate due to the grouping of the system development team. This research, of course, still has many shortcomings, so it needs to be further developed by future researchers to obtain even better results.

References

[1] H. A. Ginting And Hermansyah, "Sistem Informasi Persediaan Barang Gudang Pada Tewangi Indonesia," *Infotech J.*, Vol. 8, No. 2, P. 141, 2022.

[2] I. R. Juwita, M. W. Wardana, And E. Khikmawaty, "Analisis Persediaan Stok Barang Dagang Dengan Menggunakan Metode Economic Order Quantity Pada Hybrid Computer Di Kota Agung," *J. Rekayasa, Teknol. Dan Sains*, Vol. 8, No. 1, Pp. 1–53, 2024, [Online]. Available: Http://Ejurnalmalahayati.Ac.Id/Index.Php/Teknologi/Index

[3] R. A. Sukamto And M. Shalahuddin, *Rekayasa Perangkat Lunak Terstruktur Dan Berorientasi Objek*. Bandung: Informatika, 2018.

[4] A. Rahmawati And T. Rahayu, "Pperancangan Sistem Informasi Persediaan Bahan Baku Berbasis Web Pada Yukikage Restaurant," In *Seminar Nasional Mahasiswa*

Ilmu Komputer Dan Aplikasinya (Senamika), 2022, Pp. 227–236. Doi: 10.56995/Sintek.V1i2.3.

[5] S. Saryani, F. Junior, And S. Petriyansyah, "Perancangan Sistem Informasi Persediaan Bahan Baku Berbasis Website Pada Pt. Multi Mortar," *J. Inf. Technol. Eng. Sci.*, Vol. 2, No. 1, Pp. 38–48, 2022, Doi: 10.63494/Jites.V2i1.34.

[6] Alvin, J. Pahlevi, M Riza, Informatika, D. Rekayasa, K. Jakakom, And Liyono, "Persediaan Barang Pada Toko Nivico," *J. Inform. Dan Rekayasa Komput. (Jakakom)*, Vol. 5, No. April, Pp. 1375–1383, 2025, Doi: 10.33998/Jakakom.V5i1.

[7] R. Saputra, S. Sumarlinda, And W. Wijiyanto, "Sistem Informasi Persediaan Barang Dengan Metode Perpetual Pada Toko Mebel Sidarta Berbasis Web," *Jtim J. Teknol. Inf. Dan Multimed.*, Vol. 6, No. 2, Pp. 147–160, 2024, Doi: 10.35746/Jtim.V6i2.544.

[8] G. Agustin And H. A. B. Sidik, "Perancangan Sistem Informasi Persediaan Barang Berbasis Web Pada Kidsnbear," *J. Inf. Technol. Comput. Sci.*, Vol. 8, No. 2, Pp. 560–569, 2025, Doi: 10.37338/Jaab.V3i2.194.

[9] Haryanto Tanuwijaya, T. Tjandrarini, Edo Yonatan Koentjoro, And Rendy Maharddhika, "Implementasi Metode Rapid Application Development Dalam Pengembangan Sistem Informasi Integrated-Sales," *J. Ekon. Manaj. Sist. Inf.*, Vol. 6, No. 3, Pp. 1602–1618, 2025, Doi: 10.38035/Jemsi.V6i3.4163.

[10] R. N. Zhafira, C. Rizal, And N. Nuranisah, "Perancangan Sistem Informasi Inventory Dengan Barcode Scanner Berbasis Web," *J. Minfo Polgan*, Vol. 13, No. 2, Pp. 2493–2499, 2025, Doi: 10.33395/Jmp.V13i2.14531.

[11] Munawar, *Analisis Perancangan Sistem Berorientasi Objek Dengan Uml*. Bandung: Informatika, 2018.

[12] Y. Sugiarti, *Dasar-Dasar Pemrograman Java Netbeans (Database, Uml, Dan Interface)*. Bandung: Pt. Remaja Roskadarya, 2018.

[13] A. Nugroho, *Pemrograman Berorientasi Objek Menggunakan C++*. Yogyakarta: Andi Offset, 2017.