The 2nd International Conference on Inovations
in Social Sciences Education and Engineering (ICoISSEE)
August 07th, 2021

Web-Based E-Tagging Information System Design at Kalbe Morinaga Indonesia Company

Rahmat Gunawan[1*], **Rini Malfiany**[2], **Hisar Desmon Sinaga**[3]

[1,2,3] *Informatics Management, STMIK Rosma, Karawang*

Author's email: rahmat@rosma.ac.id; rini@dosen.rosma.ac.idl; hisar.sinaga@mhs.rosma.ac.id
**Corresponding author: rahmat@rosma.ac.id*

Abstract. *The development of information technology is currently very fast, one of which is in the company. From the development of information technology is expected to help facilitate all existing activities in a company. This study aims to build a web-based equipment damage reporting system at Kalbe Morinaga Indonesia Company. This web-based equipment damage reporting system is used to facilitate the delivery of equipment damage found by operators around the operator's working area. Thus the design of an information system requires accurate data and information so that the designed information system can meet the needs as desired. The research method used is the System Development Life Cycle (SDLC) with the waterfall model with the stages of analysis, design, coding and testing. Meanwhile, to get the data needed in this study is to conduct interviews, observations, and documentation. The result of this research is an e-tagging information system, this system is expected to make it easier to document the tagging process in the company's operations and can reduce the time needed for reporting, processing, and verifying a finding of equipment damage at Kalbe Morinaga Indonesia Company.*

Keywords: *E-tagging, Information System, SDLC, Watefall*

1. INTRODUCTION

Kalbe Morinaga Indonesia Company is a large-scale producer company engaged in the milk powder manufacturing industry. It is located in the Indotaisei Industrial Estate, Kota Bukit Indah Cikampek (BIC) Cikampek - Karawang. Kalbe Morinaga Indonesia Company is a joint venture between Kalbe Farma Tbk Company (Indonesia)and Morinaga Milk Industry Co., Ltd (Japan) with a share composition of 70% and 30%, respectively.

Kalbe Morinaga Indonesia Company adopted a Total Productive Management (TPM) work system, one of which instructs its workers to make their own repairs to certain defects they encounter at work and writes a report on the repairs on a paper which is often called Tagging. The existing tagging consists of several colors, each color has a different function. The green tagging function is to write damage reports that can be repaired by yourself, the red tagging is for damage reports that cannot be repaired by yourself and must be repaired by the Engineering section, and the yellow tagging is to report something/work that has a risk of work accidents.

The process of recording error reports (tagging) currently at Kalbe Morinaga Indonesia Company is still running manually, namely recording on a paper. In order for error reports (tagging) to be well documented, the authors are interested in designing an e-tangging information system for Kalbe Morinaga Indonesia Company. Therefore, the purpose of this research is to develop and design a website-based e-tagging information system. Several previous studies reveal that to develop an information system can use the System Development Life Cycle (SDL) method. The SDLC method also contains several models that are most often used including the Agile Model (Hendrik & Suteja,

2021)(Pratasik & Rianto, 2020)(Malik et al., 2017), Protoype Model (Suhaimah et al., 2021)(Hidayat & Sukisno, 2019), Waterfall Model (Nurhidayat et al., 2020)(Nugraha et al., 2018)(Yulianto & Atmaja, 2018). Based on the previous research above, the author will use the waterfall model SDLC. System Development Life Cycle (SDLC) Waterfall is the process of developing or changing a software system by using the models and methodologies used by people to develop previous software systems based on best practice or well-tested methods (A.S & Salahuddin, 2011).. The result of this research is an e-tagging information system which is expected to help companies to simplify the tagging and reporting process at Kalbe Morinaga Indonesia Company.

2. LITERATURE REVIEW

2.1 Information Systems

The information system is a combination of 4 (four) main parts, namely: Software, Hardware, Infrastructure, and Human Resources who are trained to create a system that can manage data into useful information (Juliany et al., 2018). According to Jogiyanto (2005) Information system is a system within an organization that brings together the needs of daily transaction processing, support operations, managerial and strategic activities of an organization that provides certain outside parties with the necessary reports (Oktaviani et al., 2019). While the definition of information systems in his book Abdul Kadir (2003) entitled Introduction to Information Systems, namely: The information system is a framework that coordinates resources (human, computer) to convert input (input) into output (information), in order to achieve the goals company (Haswan, 2018).

2.2 Electronic Tagging (E-tagging)

Electronic tagging is a form of surveillance that uses an electronic device that is attached to a person or object. In some jurisdictions, electronic tags that are placed above the ankles are used for people as part of their bail or probationary conditions. It is also used in health care settings and in immigration contexts. Electronic tagging can be used in combination with a global positioning system (GPS). For short-range monitoring of a person wearing an electronic tag, radio frequency technology is used (Wikipedia, 2021).

2.3 Website

Website or site can be defined as a collection of pages that are used to display text information, still or motion pictures, animations, sounds, and or a combination of all of them, both static and dynamic which form a series of interrelated buildings, each of which is each associated with page networks. The web can be defined as a tool for creating an easy global information system based on hypertext (Arifin & Handayanto, 2019). Meanwhile, according to (Serepia et al., 2019) Website or abbreviated as Web, it can be interpreted as a collection of pages consisting of several pages that contain information in the form of digital data, in the form of text, images, video, audio and other animations provided via the internet.

3. RESEARCH METHODS/METHODOLOGY

The research method used in this study is the Waterfall System Development Life Cycle (SDLC). SDLC Waterfall is the process of developing or changing a software system by using the models and methodologies used by people to develop previous software systems based on best practices or well-tested methods (A.S & Salahuddin, 2011). While the data collection methods used were literature review, by reading, studying and collecting secondary data sourced from books, literatures related to the problem under study. Interviews, namely conducting interviews with operators, the aim is to make it easier for writers to find and get the information needed. Observations namely direct observation of the system that is running on the object of research at Kalbe Morinaga Indonesia Company. Finally, documentation is used to provide information or evidence in the form of pictures or photos related to the damage reporting process. The stages of the waterfall model in this study are as follows.

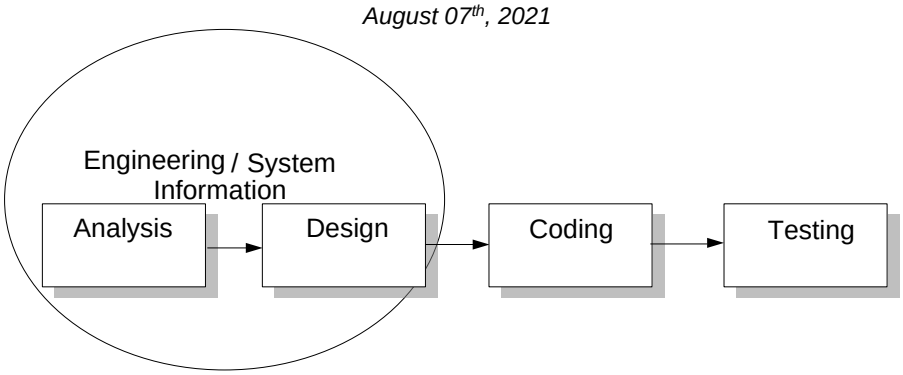

Figure 1. Stages of the Waterfall Model
Source: (Firmansyah & Udi, 2018)

4. RESULTS AND DISCUSSION

To support the application of software sales information systems at Kalbe Morinaga Indonesia Company requires the fulfillment of system requirements so that the information system can run well, including:

4.1 Requirements Analysis of Functional and Non-functional

The functional requirements of the system to be designed include the following:

a. The system can access in the form of login which consists of admin and operator.
b. This system can input damage data according to the tagging color categories, namely green, yellow and red.
c. This system can generate crash data reports.

Meanwhile, the non-functional requirements of the system to be designed include the following:

a. This system requires a computer with 8GB RAM memory specifications and 500GB hard drive.
b. This application requires a minimum of Windows 7 Operating System.
c. This application was developed with Adobe Dreamweaver CS5, PHP 7.0, HTML 5, MySQL database storage and uses Bootstrap templates.
d. There are several tools used in system design, namely context diagrams, tiered charts, data flow diagrams, database design and interface design. In making this information system design, researchers used Microsoft Office Visio.

4.2 Design System

4.2.1 Context Diagram

Context diagram is a diagram that consists of a process and describe the scope of a system. Context diagram is the highest level of DFD which describes all inputs to the system or outputs from the system. Context Diagram will provide an overview of the entire system. In a context diagram there is only one process. There must be no store in the context diagram. Context diagram contains an overview (outline) of the system to be created (Baruna & Zulkarnaini, 2020).

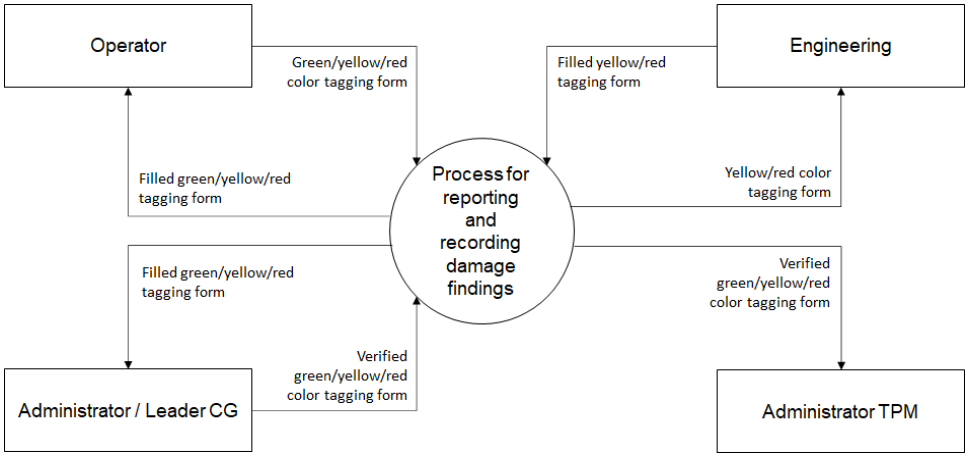

Figure 2. Context Diagram

4.2.2 Data Flow Diagram (DFD)

Data Flow Diagram is a diagram that uses notations to describe the flow of data in a system, whose use is very helpful for understanding the system logically, structured and clear. DFDs are very similar to flowcharts (Purwanto, 2020).

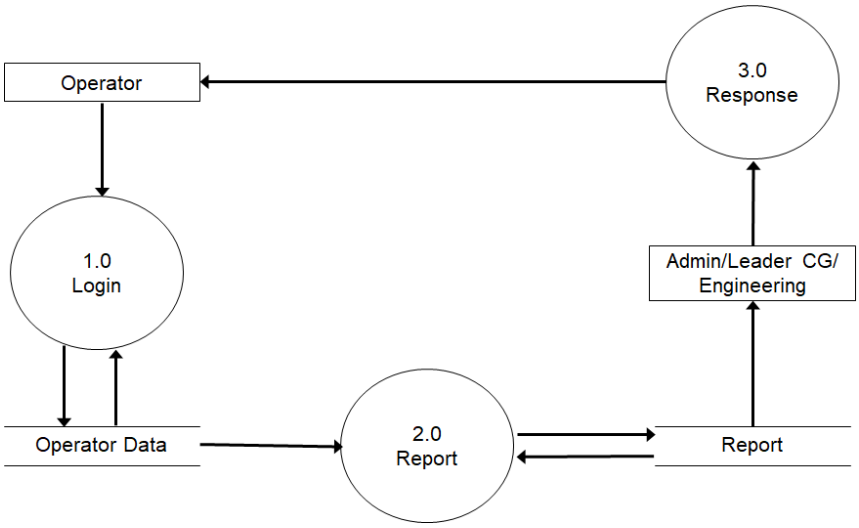

Figure 3. Data Flow Diagram (DFD)

4.2.3 Entity Relathionship Diagram (ERD)

According to Fridayanthie and Mahdiati (2016:132) concluded that, ERD (Entity Relationship Diagram) is an approach technique model that states or describes the relationship of a model. In this relationship, it is stated that the main thing from ERD is to show data objects (Entities) and relationships (Relationships), which exist in the next Entity (Priyandaru et al., 2020). ERD in this study can be seen in the image below.

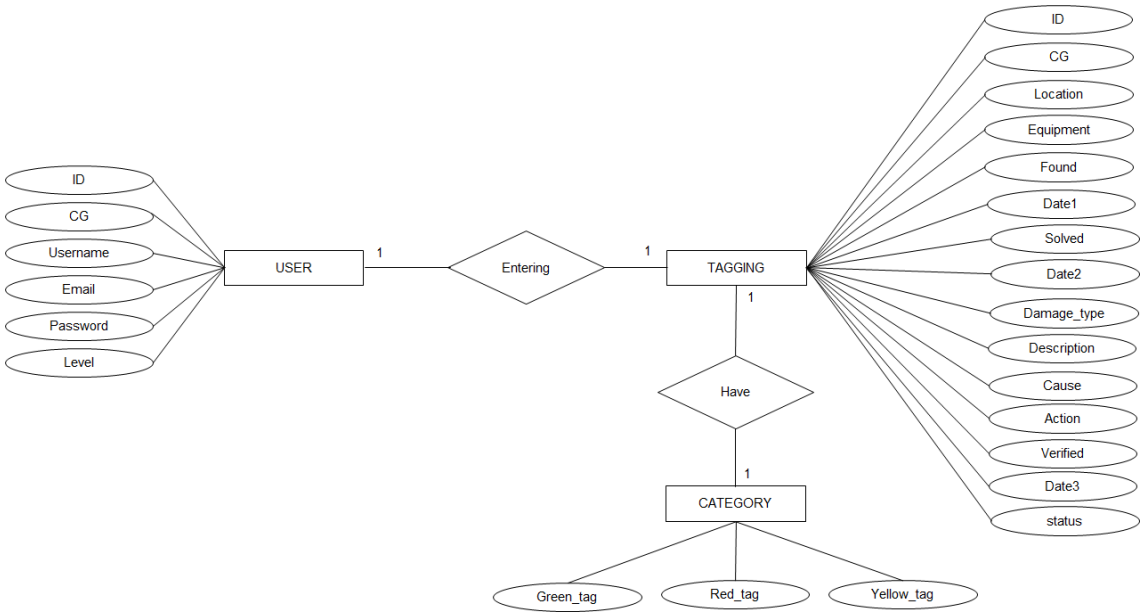

Figure 4. Entity Relationship Diagram (ERD)

4.3 Implementation

In this case, after the system has been analyzed and designed in detail, the next stage is the implementation stage. Implementation is the implementation stage and at the same time testing for the new system based on the results of the analysis so that it is ready to operate. Implementation aims to confirm the design modules, so that users can provide input to system builders.

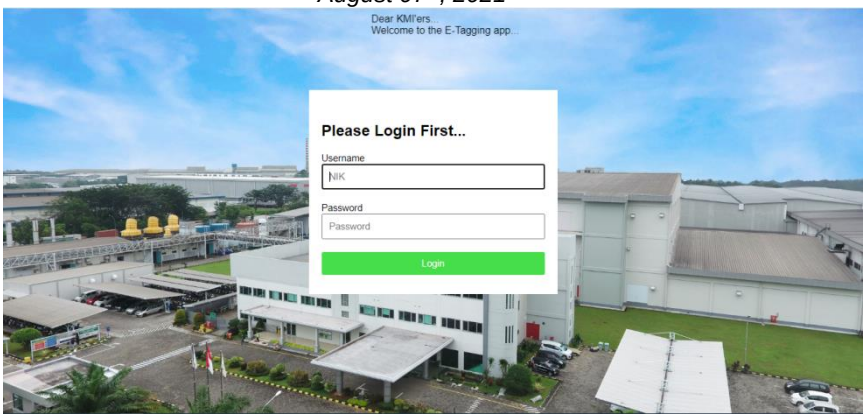

Figure 5. Login Display

On the login screen, there is a username and password that must be filled in with the stored admin data to enter the main menu of the application for reporting and recording equipment damage findings.

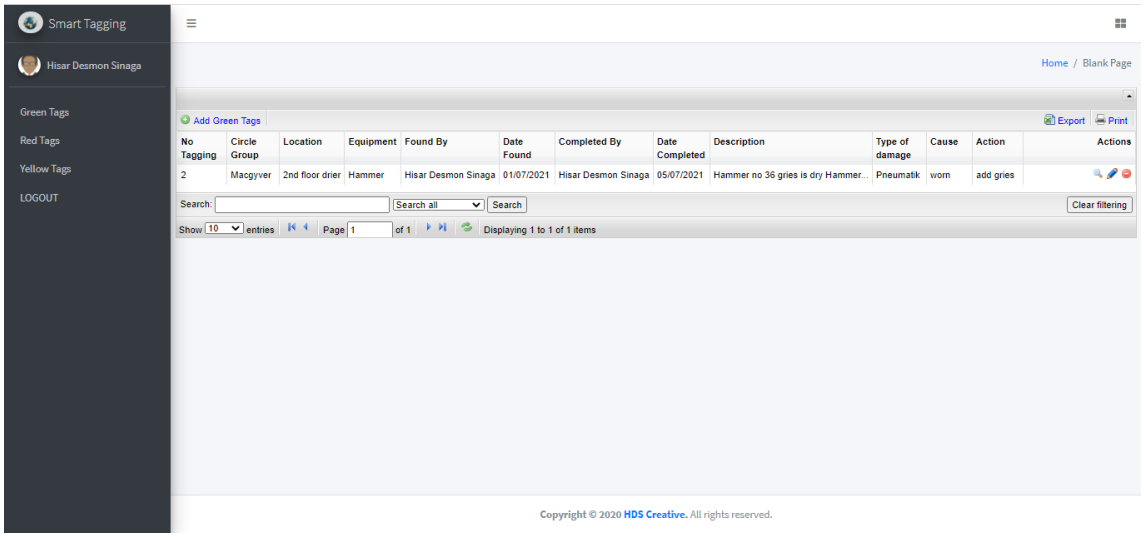

Figure 6. User Main Menu Display

The main menu display appears as the initial display after accessing the application as a user, there are four menus in the middle left to access other pages in this application.

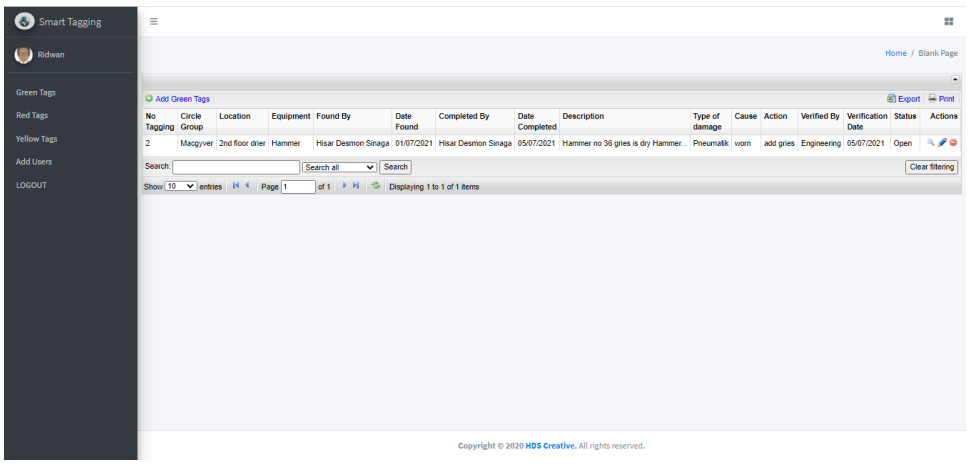

Figure Administrator Main Menu Display

The main menu display appears as the initial display after accessing the application as an administrator, there are five menus in the middle left to access other pages in this application.

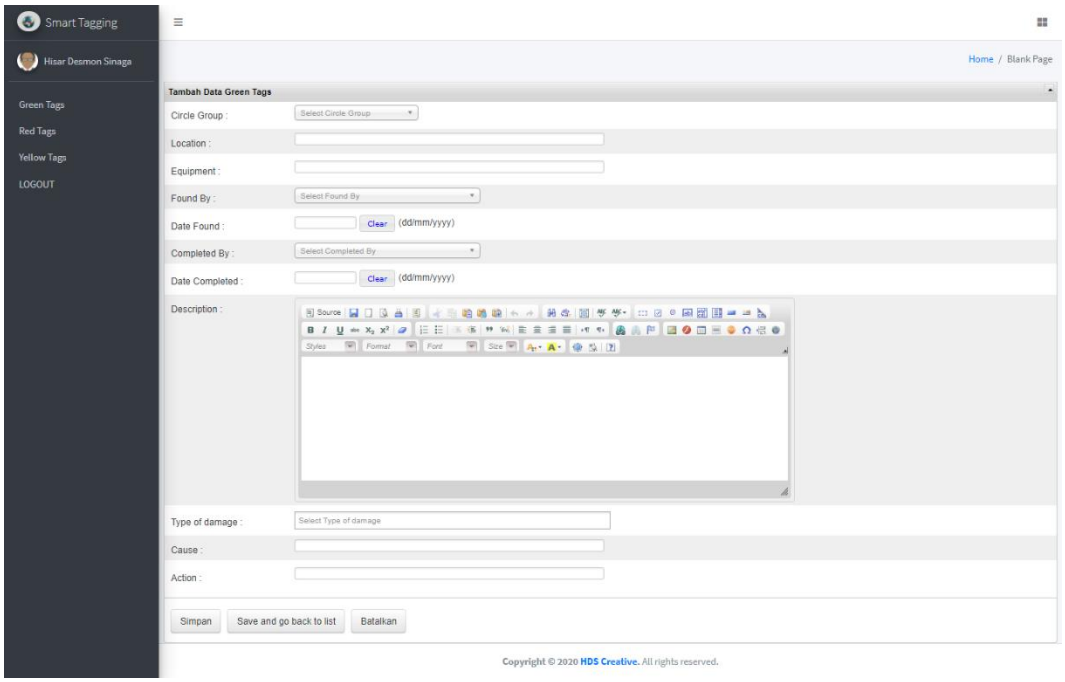

Figure 7. User Input Form Display

The input display for reporting and recording damage (Tagging) can be accessed in the dropdown menu in the middle left, this display displays input data for green tagging, red tagging, and yellow tagging, serving as evidence that the operator or user has found equipment damage in the surrounding area. where he works. The save button functions to store data on the findings of damage in the database, so that the CG administrator or leader can find out the damage report when accessing the application, and there are also edit and delete buttons to make it easier for us to manage the data that has been inputted.

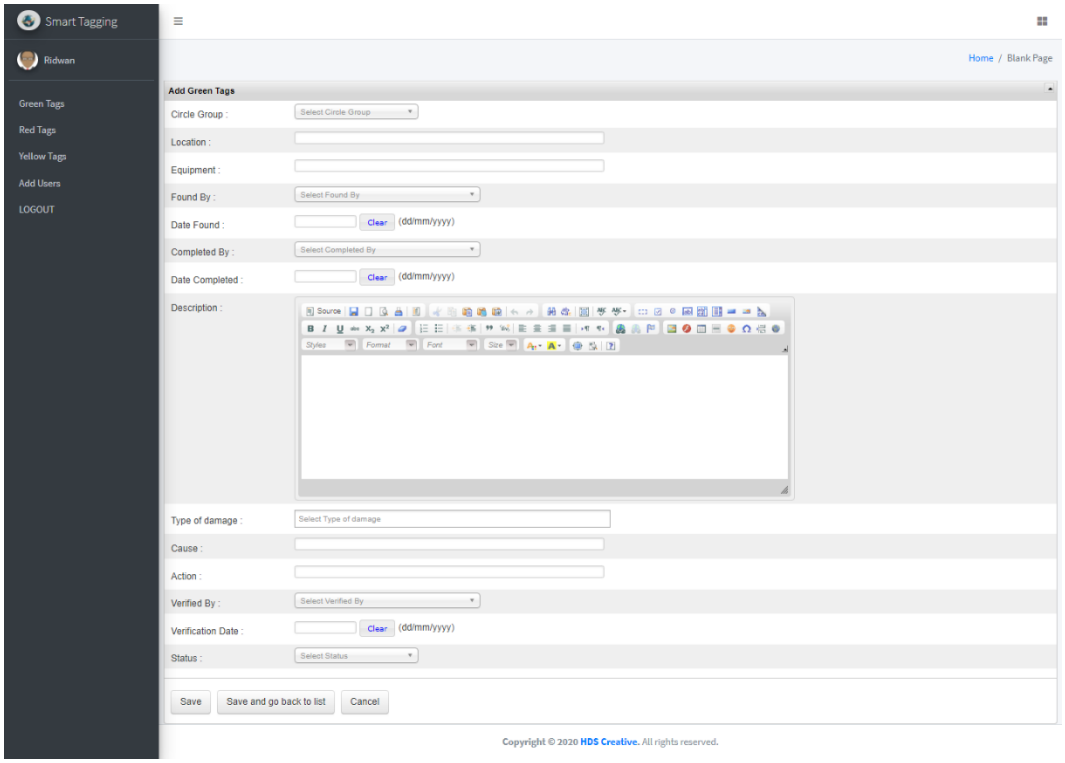

Figure 8. Administrator Input Form Display

The administrator input form display is almost the same as the user input form display, except that in the administrator input form there is a column to input the name of the administrator or CG leader who verified the data.

4.4 Testing System

Black Box testing is an application testing that discusses the outside of a software application, which starts from the appearance to the input action. The analogy is like when we see a black box, we only see the outer appearance, without knowing what is behind the black package. It's the same with black box testers, evaluating only from the outside (interface), functionality without knowing what actually happens in the process, the details in this case only knowing input and output. The following are the results of testing the application for reporting and recording equipment damage findings using the Black Box Testing method.

Table 1. Black Box Test Results

No.	Testing Scenario	Expected results	Test result	Conclusion
1	Username and password are not filled then click the Login button.	The outline of the username and password field will turn red.	According to expectations	Valid
2	Type the username and password are not filled or empty then click the Login button.	The outline of the password field will change to red and the sentence “please fill out this field” appears.	According to expectations	Valid
3	Username is not filled or empty and type the password according to the database.	The outline of the username filling box will turn red and the sentence “please fill out this field” appears.	According to expectations	Valid
4	Type in the username and/or password that does not match the database, then click the Login button.	The system will refuse and display the message "Oops.. the username or password you entered is wrong".	According to expectations	Valid
5	Type in the appropriate username and/or password for the database, then click the Login button.	The system will receive login access and then display the main user page.	According to expectations	Valid
6	Do click on the Green Tagging button.	Displays a green tagging report page, fill in, save, edit and delete.	According to expectations	Valid
7	Do click on the Red Tagging button.	Displays a red tagging report page, fill in, save, edit and delete.	According to expectations	Valid
8	Do click on the Yellow Tagging button.	Displays the yellow tagging report page, fills in, saves, edits and deletes.	According to expectations	Valid
9	Do click on the Green Tagging button.	Displays the green tagging report page, fills in, saves, edits, deletes and verifies the green tagging data inputted by the user.	According to expectations	Valid

No.	Testing Scenario	Expected results	Test result	Conclusion
10	Do click on the Red Tagging button.	Displays the red tagging report page, fills in, saves, edits, deletes and verifies the red tagging data inputted by the user.	According to expectations	Valid
11	Do click on the Yellow Tagging button.	Display the yellow tagging report page, fill in, save, edit, delete and verify the yellow tagging data inputted by the user.	According to expectations	Valid
12	Click on the Add User button.	Displays the system user data page, fills in, saves, edits and deletes.	According to expectations	Valid

CONCLUSION

Kalbe Morinaga Indonesia Company is a manufacturing company that adopts the Total Productive Management (TPM) work system and is also one of the companies that are pioneers in implementing the 4.0 industrial revolution in Indonesia. In the Total Productive Management work system, the workers are asked to make their own repairs on certain damages they encounter at work and write the repair report on a paper which is often called Tagging. However, the reporting system is deemed not in accordance with the values of industry 4.0 and sometimes when writing a repair or damage report there are obstacles such as the tagging paper running out and the existence of double tagging data so there are costs that are just wasted because the double data is one of the papers. must be discarded because it cannot be deleted. Therefore, the researchers designed an e-tagging information system which is expected to facilitate the operations of Kalbe Morinaga Indonesia Company in processing damage data, such as recording damage and making reports to make it faster, more effective and efficient.

REFERENCES

A.S, R., & Salahuddin, M. (2011). *Modul Pembelajaran Rekayasa Perangkat Lunak (Terstruktur dan Berorientasi Objek)*. Modula.

Arifin, Z., & Handayanto, A. (2019). Sistem Informasi Koperasi Simpan Pinjam Berbasis Website Pada Dinas Koperasi, Usaha Kecil Dan Menengah Provinsi Jawa Tengah. *Science And Engineering National Seminar 4*.

Baruna, P., & Zulkarnaini, I. (2020). Pemasaran Ukiran Kayu Toko Arena Profil Menggunakan Web. *Jurnal Teknologi Terapan and Sains*, *1*(2).

Firmansyah, Y., & Udi, U. (2018). Penerapan Metode SDLC Waterfall Dalam Pembuatan Sistem Informasi Akademik Berbasis Web Studi Kasus Pondok Pesantren Al-Habib Sholeh Kabupaten Kubu Raya, Kalimantan Barat. *Jurnal Teknologi Dan Manajemen Informatika*, *4*(1). https://doi.org/10.26905/jtmi.v4i1.1605

Haswan, F. (2018). Perancangan Sistem Informasi Pendataan Penduduk Kelurahan Sungai Jering Berbasis Web Dengan Object Oriented Programming. *Jurnal Teknologi Dan Open Source*, *1*(2), 92–100. https://doi.org/10.36378/jtos.v1i2.23

Hendrik, B., & Suteja, B. R. (2021). Identifikasi Risiko Program Maintenance dalam Pengelolaan Proyek Berbasis Agile Menggunakan Pohon Klasifikasi. *Jurnal Teknik Informatika Dan Sistem Informasi*, *7*(1), 296–306. https://doi.org/10.28932/jutisi.v7i1.3545

Hidayat, T., & Sukisno, S. (2019). Rancang Bangun Sistem Penerimaan Mahasiswa Baru Online Dengan Model Sdlc Metode Prototipe Di Universitas Islam Syekh-Yusuf. *Jurnal Penelitian Dan Karya Ilmiah*, *18*(2), 161–177. https://doi.org/10.33592/pelita.v18i2.49

Juliany, I. K., Salamuddin, M., & Dewi, Y. K. (2018). Perancangan Sistem Informasi E-Marketplace Bank Sampah Berbasis Web. *Seminar Nasional Teknologi Informasi Dan Multimedia 2018*, 19–24. https://doi.org/10.1111/j.1365-2621.2009.02155.x

Malik, R. F., Fachrurrozi, M., & Prabowo, R. (2017). Menggunakan Metode Agile Dengan Konsep Model-View-Controller Data Access Object. *Seminar Ilkom*, 65–69.

Nugraha, W., Syarif, M., & Dharmawan, W. S. (2018). Penerapan Metode Sdlc Waterfall Dalam Sistem Informasi Inventori Barang Berbasis Desktop. *JUSIM (Jurnal Sistem Informasi Musirawas)*, *3*(1), 22–28. https://doi.org/10.32767/jusim.v3i1.246

Nurhidayat, R., Agustina, N., & Sutinah, E. (2020). Penggunaan Metode SDLC Waterfall dalam Pembuatan Program Pengajuan Kartu Kredit. *Journal of Information System, Applied, Management, Accounting Amd Research*, *4*(4), 199–206.

Oktaviani, N., Widarta, I. M., & Nurlaily. (2019). Sistem Informasi Inventaris Barang Berbasis Web Pada Smp Negeri 1 Buer. *Jurnal JINTEKS*, *1*(2), 160–168.

Pratasik, S., & Rianto, I. (2020). Pengembangan Aplikasi E-DUK Dalam Pengelolaan SDM Menggunakan Metode Agile Development. *CogITo Smart Journal*, *6*(2), 204. https://doi.org/10.31154/cogito.v6i2.267.204-216

Priyandaru, H., Kurniawan, I., Walim, & Tabrani, M. (2020). Manajeman Informasi Persediaan Barang Berbasis Web Pada Cv H. Syaridin Karawang. *Jurnal AKSARA PUBLIC*, *4*(3), 1–9.

Purwanto, H. (2020). Analisis Kepuasan Penumpang Terhadap Layanan Free Wifi Di Terminal Bandara Udara Xyz Dengan Menggunakan Regresi Linier Dan Spss. *Jurnal Sistem Informasi) Universitas Suryadarma*, *7*(1). https://doi.org/10.35968/jsi.v7i1.386

Serepia, S. R., Julianti, M. R., & Fauzi, D. L. (2019). Sistem Informasi Pelatihan Departemen Training PT Gajah Tunggal Tbk Berbasis Web. *Sisfotek Global*, *9*(1).

Suhaimah, A., Triayudi, A., & Esthi Handayani, E. T. (2021). Cyber Library: Pengembangan Perpustakaan Online Berbasis Web Menggunakan Metode Prototyping (Studi Kasus Universitas Nasional). *Jurnal JTIK (Jurnal Teknologi Informasi Dan Komunikasi)*, *5*(1). https://doi.org/10.35870/jtik.v5i1.199

Wikipedia. (2021). *Electronic tagging*. Wikipedia. https://en.wikipedia.org/wiki/Electronic_tagging

Yulianto, S. V., & Atmaja, A. P. (2018). Rancang Bangun Sistem Informasi Kurikulum 2013 Tingkat Sekolah Dasar Berbasis Web dengan SDLC Waterfall. *Jurnal Sisfo Inspirasi Profesional Sistem Informasi*, *07*(02), 149–164.