



Responsive Web-Based Inventory Information System Design

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Abstract

Menteng Electricity Company, as a provider of electricity distribution services in the Jakarta area, is obliged to meet occupational safety and health standards to ensure safe and reliable working conditions. However, the lack of inventory optimization results in inconsistent manual recording, scattered facility locations, and minimal data integrity. Therefore, this study aims to design a responsive web-based inventory information system using the Next.js framework, the TypeScript programming language, and a MySQL database. It is equipped with an automatic reminder feature via short message service (SMS) to support regular monitoring. This can reduce human error.

Introduction

Menteng Electricity Company is a company that implements and provides electricity distribution services covering three administrative areas in Jakarta: Central Jakarta, part of West Jakarta, and part of South Jakarta. In conducting its business, the company is supported by the Occupational Safety and Health (OHS) and Environment and Security Divisions. Implementing OHS is crucial for the company to achieve Zero Loss and Zero Harm, which are indicators of the company's risk management strategy in providing electricity (Smirniakova et al., 2021; Wijesinghe et al., 2023; Kuzior & Kopiji, 2024; Araújo Vila et al., 2022). Therefore, Law No. 6 of 2023 concerning Job Creation states that companies are required to comply with Electrical Safety requirements with the aim of creating safe conditions free from hazards for humans and other living things (Kulor et al., 2024; Egbumokei et al., 2024; Mobarak & Alshehri, 2016; Aldrich, 1997).

Facilities and infrastructure that support OHS activities aim to help the company prevent, avoid, and minimize hazards that could harm workers, the community, and the environment (Bourahla et al., 2024; Benson et al., 2024; Frick, 2011; Ashari, 2022; Montero et al., 2009). To ensure the proper operation of OHS facilities and infrastructure, an inventory system is required. OHS facility and infrastructure inventory is part of asset management, including the recording, tracking, monitoring, and documentation of all emergency response facilities owned by the company (Zhou et al., 2024; Edwards, 2024; Mohammadi & Amador-Jimenez, 2022; Amaechi et al., 2022; Laszcz-Davis et al., 2021; Adewunmi-Abolarinwa, 2024; Prabhu et al., 2025).

Based on the internal audit results in Appendix 1, the Occupational Health and Safety Management System according to Government Regulation No. 50 of 2012, findings in criterion 6.7.2 revealed a discrepancy, including the finding that three fire extinguishers were installed with insufficient pressure. Furthermore, a discrepancy in criterion 6.7.6 indicated that emergency equipment was not monitored regularly and routinely (Damaševičius et al.,

2023; Shaik et al., 2023; Linardos et al., 2022; Halder & Afsari, 2023). In this case, the auditor provided follow-up notes for routine monitoring, starting with a data collection of the company's emergency response facilities (UP3 Bandengan Auditor Team, 2024) (Naseer et al., 2023; World Health Organization, 2025).

Manual data collection and re-entering into the system are time-consuming, risking human error and inaccurate data entry. This can damage the company's reputation. The use of information systems allows for time savings by eliminating paper use (paperless), as manual writing is considered inefficient (Sunuwar, 2024; Enakrire et al., 2024). The use of digital technology also enables more effective and real-time data integration. This not only facilitates faster decision-making but also supports companies in complying with applicable OHS standards and regulations (Adikwu et al., 2023; Mixafenti et al., 2023).

Based on these conditions, researchers intend to assist companies in creating a responsive web-based OHS infrastructure inventory information system using the Next.js Framework, the TypeScript programming language, and the MySQL database. Next.js was chosen because of its efficient front-end-backend integration, supported by server-side rendering, which accelerates access and responsiveness. MySQL excels in handling large-scale data and maintains data consistency. Combined with automatic reminders via a text messaging application, users can easily review facility readiness as a follow-up to regular emergency equipment monitoring.

Methods

The research methodology of this research was developed in a chain of interrelated processes that developed in a successive way beginning with planning and designing of the system to implementation and testing. First, the research team has determined the technical requirements that should be met to facilitate efficient development. During this stage, the virtual environment of the main development tool was a 2020 MacBook Air M1 with macOS Ventura, the main workspace during the project, where the code, interface prototyping, database design, and system testing occurred. Hardware preparation was supported with the choice of the right software tools, as well as it was viewed as an important part of the system construction regarding the aspects of different facets of its development. Figma was used in the initial design exploration, which made interface drawings and flow of user experience visible. Visual Studio code was used as the code editor in the development process and MySQL was used as the database management system where the whole inventory data structure was stored. Next.js was to be used as a framework to combine the front-end and back-end components into a unified web-based platform. At the same time, the database schema was structured with the help of DB Diagram and Prisma ORM to be sure that the interface and the data processing layer communicate with each other. ShadcnUI facilitated interface creation which made visual elements look tidy and responsive on different devices.

The study was then followed by system modeling after the preparation stage to convert ideas into formatted items that drive the implementation. In this stage, a Use Case Diagram of interactions between all actors and every system was created by the research team. Admin, HSSE Coordinator, HSSE Team Leader, HSSE Staff, and Executor were actors, and each of them had a specific access rights and scope of responsibilities to ensure that the workflow in the system would resemble the real-world one in the future. Its design developed into Activity Diagrams representing the chain of activities in the system, which showed the existence of two major processes, namely, inventory recording and emergency response facility management. Representing these flows enabled one to have a better idea of the way in which users go about switching between tasks when engaging with the system. With the layer of modeling becoming more in-depth, the design of the relationship between objects of the data was established in the form of an Entity Relationship Diagram. The ERD represented entities,

fields and relationships that were used as the basis of building the database. Through these diagrams, the development phase was done in a logical manner and no trial and error.

The development of systems was started with the translation of every design component into useful product by way of coding. This was carried out in an iterative way so that continuous development of features and reviewing could proceed. Next.js and TypeScript were used to develop business logic, authentication flow, form structure, and interaction behaviors on the user interface. The process of data storage was facilitated by MySQL, where it handled the list of items, categories of facilities, their locations, the location points, staff in command, documentation summaries, status of installation, and installation history. The inventory module was made the heart of the application. By using this module, users would input detailed information on each emergency response facility such as the serial number, specifications, and the physical location of the emergency response facility to the recent state of its use. The form has been designed in a way that it eliminates the chances of data inconsistency and allows a proper recapitulation of the readiness within the system. It featured an upload option to enable image-based recording to be attached to each registered asset, a choice made on the basis of the significance of evidence-based inventory to enhance monitoring and audit trails.

After the main features were built and the internal review showed satisfactory results of proper functioning, the research passed to the testing stage. The first testing was the Black Box Testing, which involves testing of the functional behavior without looking at the internal code of programs. The developer also simulated the user experience by running different sequences of activities that were similar to the way the system would be used in practice. All interactions, such as log in, item entry, approval process, document upload, and data export were found to be correct in accordance with expected situations. The success in all the test paths demonstrates the proper application of feature logic. The next step was Usability Testing to determine system acceptance by the users. It used 56 respondents out of 124 potential users that represent the number of the real worker population that would be operating the system. The USE questionnaire was put through a Likert scale in order to develop a feeling of usefulness, ease of use, learning convenience and satisfaction after using the system. The data obtained was analyzed in SmartPLS. It started with the analysis of convergent validity via the rating of Outer Loading above a minimum standard of 0.7 and proceeded to measure the reliability in terms of Cronbachs Alpha and composite reliability testing at equal levels. By means of this measurement process, the researchers came to a conclusion that the usability attitudes towards the system were within a proper feasibility range.

Results and Discussion

Based on the results of the problem identification found during the Occupational Safety and Health Management System (SMK3) audit, and considering the actual conditions in the HSSE Division, this table aims to examine the relationship between the root cause, potential improvement opportunities, proposed corrective actions, and the urgency based on applicable regulations as the basis for legitimizing corrective actions.

Table 1. Determining Information System Ideas Based on Problems and Urgency

No.	Main Problem	Root of the Problem	Opportunity for Improvement	Action for Improvement	Urgency
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1.	Internal Audit Findings of the Occupational Safety and Health Management System (SMK3) Element 6.7.2	Emergency response facilities are scattered without inventory or maintenance.	Able to collect scattered emergency response facilities.	Designing a system that can eliminate the constraints of the HSSE Division	Law Number 6 of 2023 concerning Job Creation, Article 44, Electricity Business Section
2.	The HSSE Division feels burdened with managing the monitoring of emergency response facilities.	Lack of instructions for company human resources regarding emergency response facilities in carrying out monitoring	Able to provide inventory facilities with effectiveness and facilitate existing human resources	Creating standard operating procedures with activities as simple as possible maximizes the involvement of existing human resources.	PP Number 50 of 2012 concerning the Implementation of SMK3 Part Element 6.7.6 and Permenaker Number 5 of 2018 concerning K3 in the Work Environment regarding the duties of K3 experts in companies

Source: Author Interview Results, 2025

Table 1 shows the formulation of this system's idea based on the identification of key issues, root causes, improvement opportunities, and possible actions, with reference to relevant regulatory urgency. Two issues raised stemmed from the SMK3 audit findings and the HSSE Division's workload related to emergency response facility management. Each issue was analyzed to identify its root cause and improvement opportunities, followed by the formulation of concrete actions, such as designing an inventory system and developing standard operating procedures (SOPs). All solutions were linked to legal bases in the form of the Job Creation Law, Government Regulation No. 50 of 2012, and Ministerial Regulation No. 5 of 2018, demonstrating that the system's idea was based on functional needs and regulatory urgency. To understand the system requirements for effective emergency response inventory in the HSSE division, interviews and observations of routine activities were conducted. The results of this needs analysis are summarized in Table 2:

Table 2. Inventory System Requirements Interview Results

No.	Aksi	Deskripsi Harapan	Kebutuhan Spesifik
1	Provision of Inventory System	An easily accessible inventory system that displays a complete list of emergency response facilities, complete with photos, specifications, and locations.	A web-based system capable of uploading photos of emergency response equipment, displaying identity details (equipment name, ID number, location), and supporting recapitulation notifications via smart messaging.
2	Provision of a Practical Emergency Response System	A system that integrates inventory in one platform, with a simple and user-friendly workflow for HSSE data management.	A responsive web-based system with no additional installation needed, dashboard for facility readiness, mobile documentation upload, and a simple guide for all officers.

Table 2 shows the results of the system requirements identification based on interviews and observations, including the required actions, a description of expectations for the system, and specific technical requirements to facilitate the inventory and integrated management of emergency response facility data within the HSSE division of the Menteng Electricity Company. To ensure that emergency response facility data is accurately, systematically, and traceably documented, an inventory form containing essential components is required. This form serves as a reference for recording, monitoring, and evaluating the condition and availability of emergency response facilities within the company, as shown in Table 3.

Table 3. Components and Descriptions of the Emergency Response Facilities Inventory Form

No.	Inventory Form Components	Description
1.	Item Name	Full name of the emergency response equipment to be inventoried
2.	Select Product Type	Type of equipment (e.g., fire extinguisher, self-contained breathing apparatus, sprinkler, hydrant, etc.)
3.	Serial Number	Unique manufacturer identification number or internal code
4.	Item Description	Brief description of condition, additional functions, or general specifications
5.	Select Location	General location of the facility (e.g., Building A, Warehouse, Front Yard)
6.	Select Location Point	Detailed location (e.g., 2nd floor, east corridor, near the elevator)
7.	Specifications	Technical information such as capacity, pressure, model, type, or size
8.	Date (dd/mm/yyyy)	Date of installation or purchase of the emergency response facility
9.	Supplier	Name of the vendor or supplier providing the item
10.	PIC	Person in Charge – name of the officer or person responsible for the facility
11.	Installation Status	Indicates whether the facility has been installed or not
12.	Upload Documentation	Option to upload photos or supporting documents (proof of installation, certificates, etc.)

Table 3 lists the components required for an emergency response facility inventory form, along with an explanation of each element's critical role in accurately recording, monitoring, and tracking the condition of emergency assets. Each component is designed to support data integration into a digital-based system, specifically for designing a responsive dashboard or website that can be accessed by the safety team and management in real time. Information such as item name, facility type, location, technical specifications, installation date, and supporting documentation will form the primary database in the facility's safety management system.

By completing this form completely and consistently, monitoring the presence and condition of emergency response facilities can be conducted more systematically, efficiently, and

evidence-based. This not only supports regulatory compliance but also drives the digital transformation of overall OHS management, in line with the company's vision as a member of the Global Top 500.

End-User Identification and Information System Activity Flow

To ensure the effective and efficient operation of the emergency response inventory information system, it is necessary to map the roles and activity flow of each end-user involved. This mapping is presented in the form of a Swimlane Diagram, which illustrates the cross-role process flow, starting from the initial user login process to the final reporting and system integration process. This identification is important for understanding the responsibilities of each party and clarifying the communication flow based on the information system (Monteiro de Carvalho, 2013; Alter, 2002; Al-Matari et al., 2022; Yoshikuni et al., 2023). The Swimlane Diagram can be seen in Figures 1 to 3.

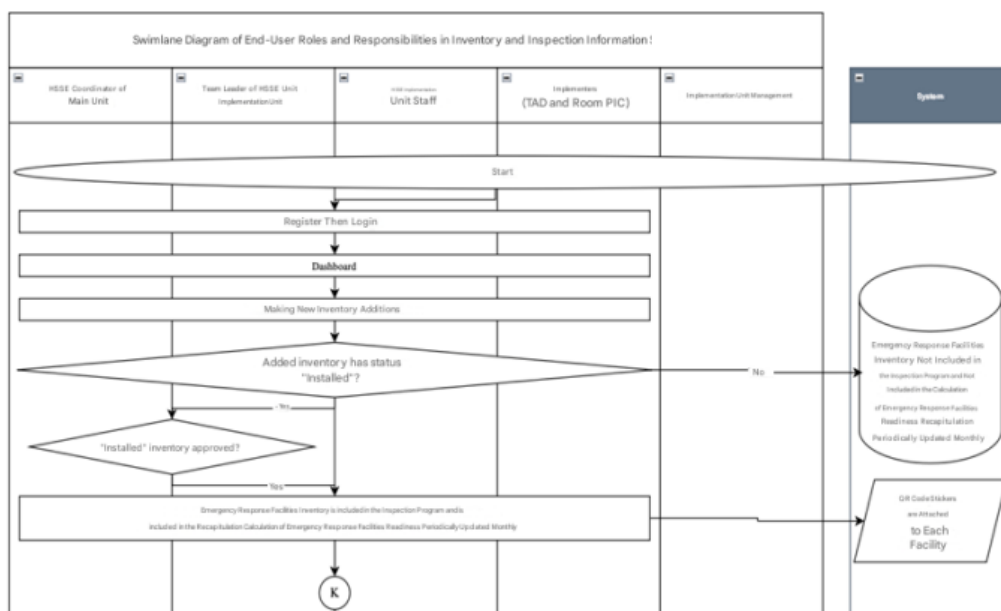


Figure 1. End-User Swimlane Diagram and Information System Activity Flow

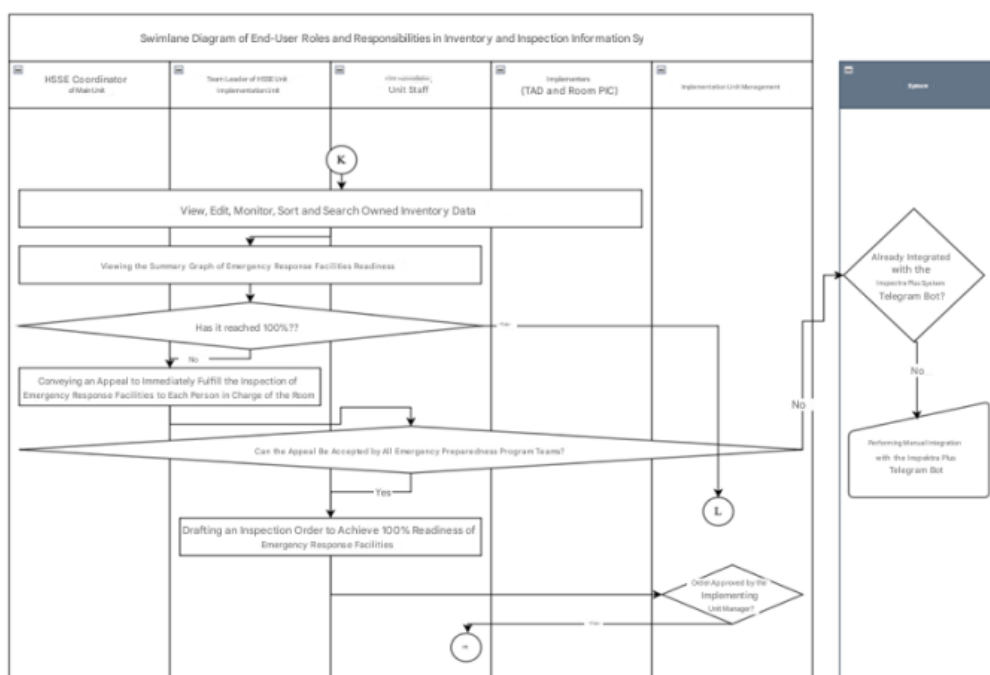


Figure 2. End-User Swimlane Diagram and Information System Activity Flow

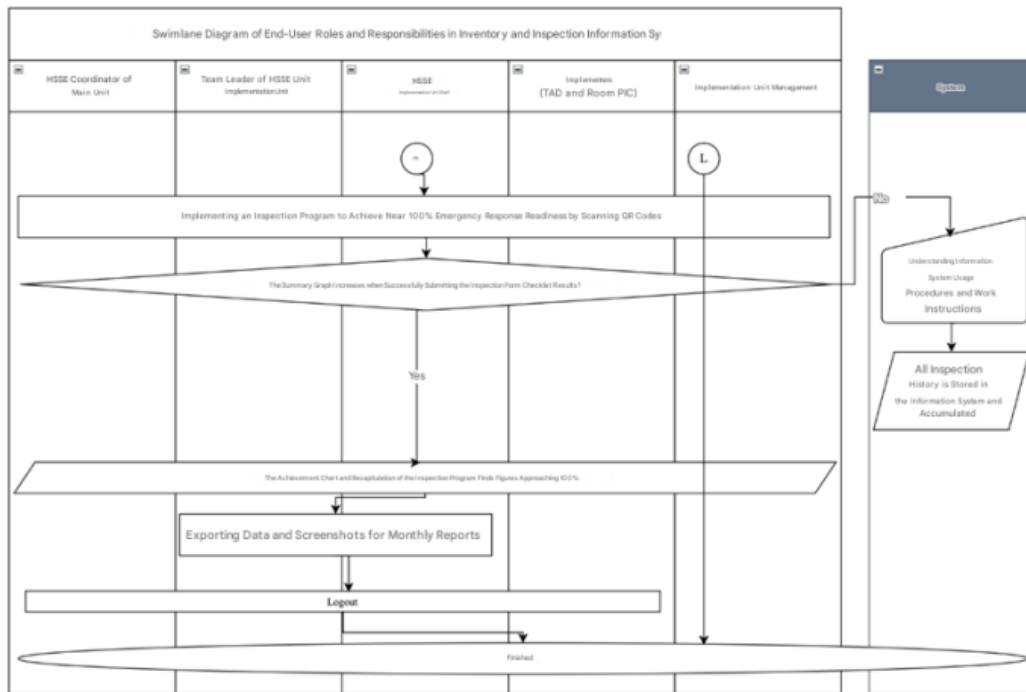


Figure 3. End-User Swimlane Diagram and Information System Activity Flow

The identification of roles and activity flows in Figures 1 through 3 provides an important foundation for planning and developing an inventory information system. By understanding the end-users involved and how the overall activity flow occurs, the system can be designed to be more targeted, responsive to user needs, and support smooth field operations. Furthermore, this mapping also helps prioritize features and ensures that ongoing business processes are digitally and efficiently accommodated.

Information System Design

The interface is the display of visual elements in an information system used by users. The interface design in INSPEKTRA Plus is designed to provide an intuitive, responsive, and easy-to-use user experience. The simple yet functional interface aims to efficiently conduct emergency response facility inventories without confusing users. This sub-chapter will explain the design of the INSPEKTRA Plus information system and the features available to support end-user operational needs in implementing emergency response preparedness programs.

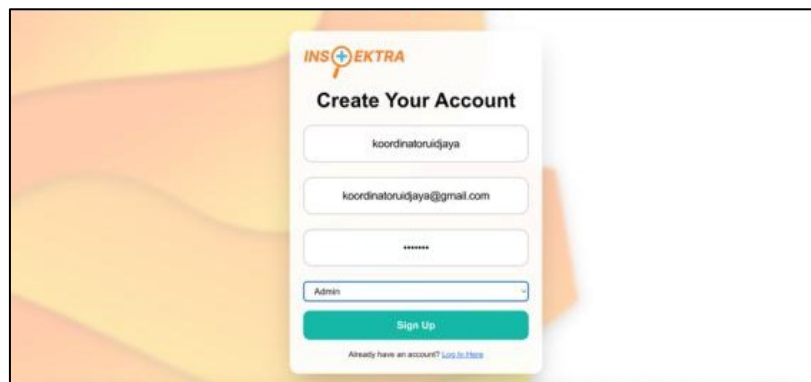


Figure 4. Sign Up Activity Interface Display

The Sign Up interface in the INSPEKTRA system is designed as the initial gateway for new users to gain access to the system. On this page, users can fill in several important information such as a username, active email address, and password, and select a user role appropriate to their function,

for example, HSSE Coordinator of the Main Unit, HSSE Team Leader, HSSE Staff, or Implementer (TAD and Room PIC). After completing all the information correctly, users click the Sign Up button to register. The Sign Up interface can be seen in Figure 4.

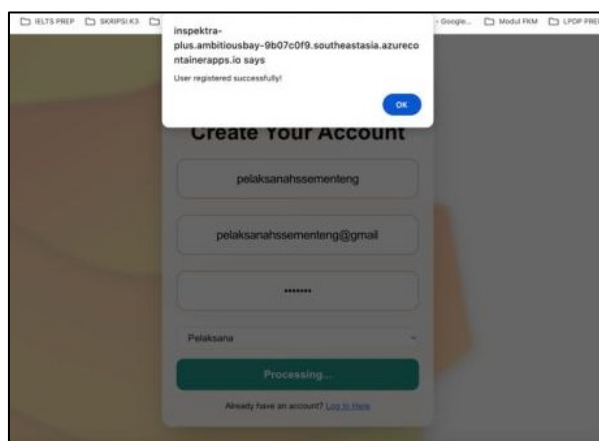


Figure 5. Successful Sign Up Notification

Next, the system will save the data to the database and display a notification, as shown in Figure 5, indicating that the registration process was successful. The user will then be automatically directed to the login page to access the system. This interface not only simplifies the process of creating an account independently but also ensures that each registered account is properly stored and has access rights appropriate to its respective role (Nie et al., 2025). This process is a crucial first step in ensuring the security, personalized access, and completeness of digital emergency response inventory data.

The INSPEKTRA login interface is designed to provide secure and efficient access to every registered user. On this page, users are asked to enter their email address and password, as previously registered. After entering these details and pressing the "Login" button, the system will verify the accuracy of the information. If the email address and password match, the user will be directed to the main INSPEKTRA system page, where they can use the various available features. The interface can be adapted to suit both PC and mobile devices, as shown in Figures 6 and 7.



Figure 6. Display of the Log In Activity Interface on a Cellphone

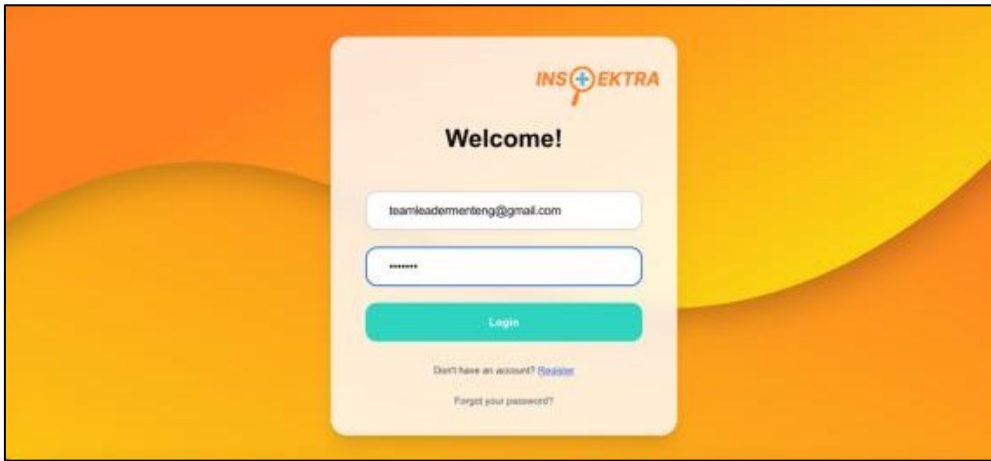


Figure 7. Display of the Log In Activity Interface on the PC

Conversely, if the entered information is incorrect, the system will automatically display a warning with an "Invalid email or password" notification as a form of access control and security. This login feature can be accessed by all user roles involved in the system, such as the HSSE Coordinator of the Main Unit, HSSE Team Leader, HSSE Staff, and Implementers (TAD and Room PIC), each of whom has authorization according to their responsibilities.

The dashboard interface is the main page that serves as the center of interaction for users after successfully logging into the system. This dashboard can be accessed and used by various sector levels, from the HSSE Coordinator of the Main Unit, HSSE Team Leader, HSSE Staff, to Implementers such as TAD and Room PIC. The display is divided into two sections: the Admin Dashboard and the User Dashboard. The difference lies in the "Approval" menu in the Admin section, as seen in Figure 8.

No	Item Name	Type of Facility	Serial	Location	Point	Specification	Purchase Date	Supplier	PIC	Status	Action
1	TEST Detector 1- 22 APRIL 2025	APAP	225	Building B	Building B - Next to the Finance Manager's Room	ceppe	2025-04-22T00:00:00.000Z	PT A B C	Mr. Rizwan Gedung	Installed	Detail, Edit, Delete, QR
2	Sprinkler Test 24 April 2024	sprinkler	882723	Building C	Building C - Next to the Manager's Room	Sprinkler Test 24 April 2024	2025-04-24T00:00:00.000Z	PT A B C	Mr. Rizwan (room 1)	Installed	Detail, Edit, Delete, QR
3	Hydrant Building Test April 24, 2024	building_hydrant	882723	Building D	Next to floral decorations	Hydrant Building Test April 24, 2024	2025-04-24T00:00:00.000Z	PT A B C	Father	Installed	Detail, Edit, Delete, QR
4	Hydrant Yard Test April 24, 2024	hydrant_page	882723	Building E	Next to the floral decorations	Hydrant Test Page April 24, 2024	2025-04-24T00:00:00.000Z	PT A B C S	Mr Arjo	Installed	Detail, Edit, Delete, QR

Figure 8. Dashboard Interface View for Admin

The primary goal of designing this interface is to provide a centralized, informative, and user-friendly platform for managing the entire lifecycle of emergency response facilities, from inventory to periodic monitoring. All of these activities occur within the web-based platform as users carry out their tasks and responsibilities related to emergency response facility readiness.

No	Item Name	Type/Category	Serial number	Location	Location Point	Specification	Purchase Date	Supplier	PIC	Status	Action
1	TEST Detector 1- 22 APRIL 2025	APAP	225	Building B	Building B - Next to the Finance Manager's Room	compe	2025-04-22T00:00:00.000Z	PTABC	Mr. Rizwan Gedung	Installed	Detail, Edit, Delete, QR
2	Sprinkler Test 24 April 2024	sprinkler	882723	Building C	Building C - Next to the Manager's Room	Sprinkler Test 24 April 2024	2025-04-24T00:00:00.000Z	PTABC	Mr. Rizwan (room 1)	Installed	Detail, Edit, Delete, QR
3	Building Hydrant Test April 24, 2024	building_hydrant	882723	Building D	Next to floral decoration	Building Hydrant Test April 24, 2024	2025-04-24T00:00:00.000Z	PTABC	Father	Installed	Detail, Edit, Delete, QR
4	Hydrant Yard Test April 24, 2024	hydrant_page	882723	Building E	Next to the floral decoration	Hydrant Yard Test April 24, 2024	2025-04-24T00:00:00.000Z	PTABC S	Mr. Aryo	Installed	Detail, Edit, Delete, QR

Figure 9. Dashboard Interface Display for User

Additionally, other menus, such as "Upload," direct users to the new location data entry page, "Overview" to visualize the facility readiness summary data in graphical form, and "Approval" to approve new items. Figure 9 shows the dashboard view for users, without an "Approval" menu in the sidebar. Both Admins and users can manage their accounts through the "Profile" menu and exit the system through "Log Out."

The "Action" column in each row of item data contains several functional buttons. The "Details" button displays complete item information, "Edit" allows data adjustments, and "Delete" removes the item from the list. This allows the entire emergency response facility management workflow to be carried out efficiently and integrated through this dashboard interface.

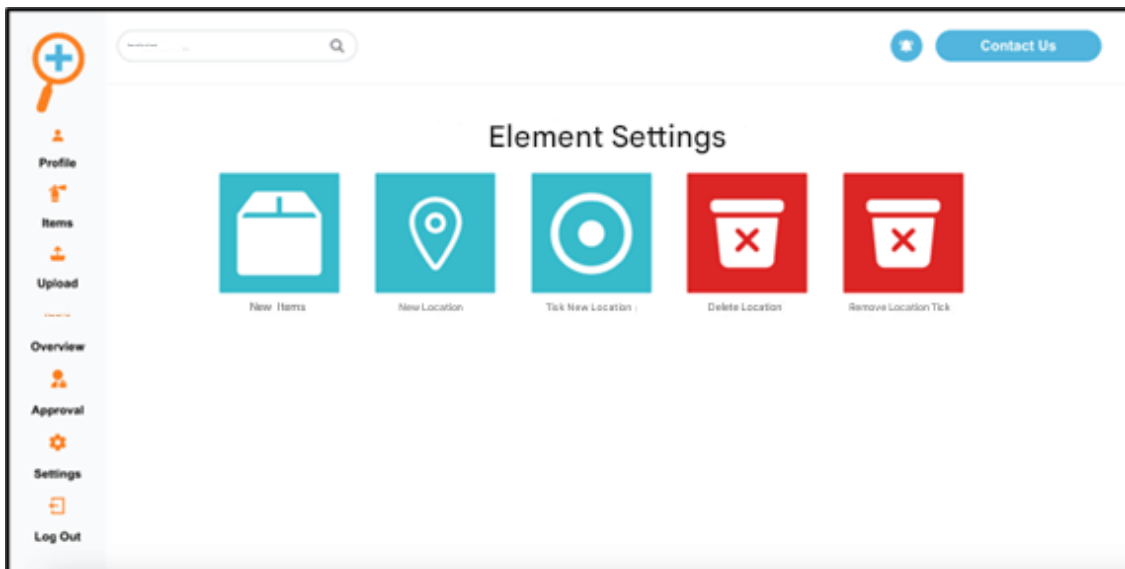


Figure 10. Display of the Location Attribute and Location Point Addition Activity Interface

The attribute addition workflow is implemented through a series of forms on the "Element Settings" page and is divided into two stages. The first stage is adding a general location, such as a building name. The actor will enter the location name in the field provided on the "Add Location" page, then click the "Save" button. As feedback, the system will display a "Location added successfully!" notification if the data is saved successfully, or a failure notification if the entered location already exists in the database.

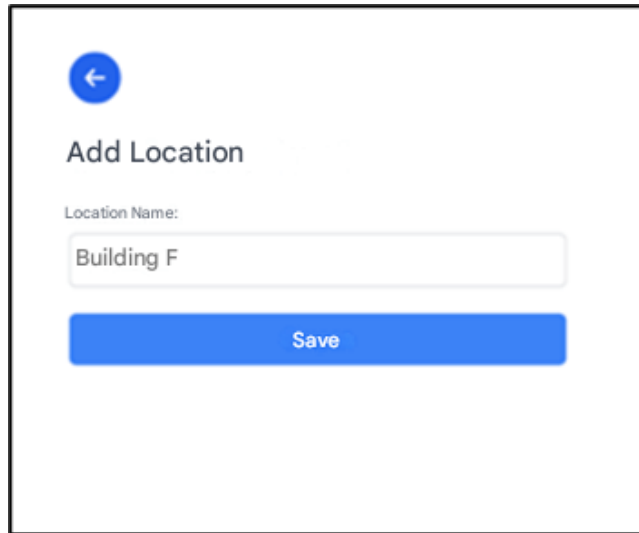


Figure 11. Display of the Location Attribute Addition Activity Interface

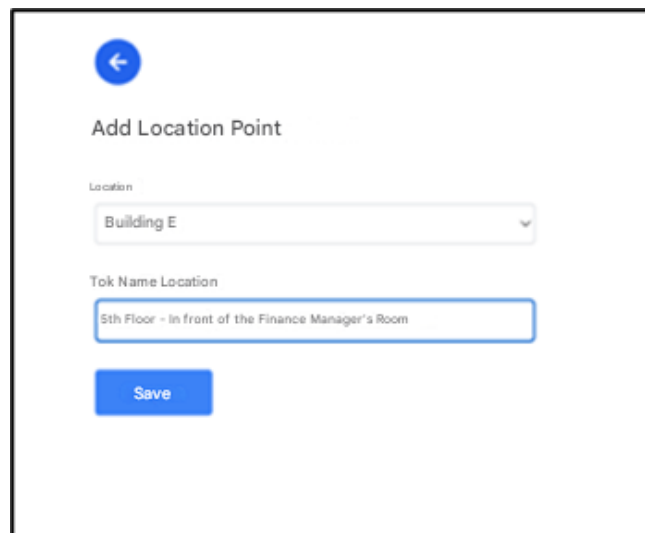


Figure 12. Display of the Location Point Attribute Addition Activity Interface

The second step is to add a more specific location point within the general location that has been created. The actor will select the general location from the dropdown menu, then type in a more detailed location point name, for example, "5th Floor - In Front of the Finance Manager's Office," and then press the "Save" button. Similar to the previous process, the system will provide a notification "Data saved successfully" if successful, or a failure notification if the entered data is detected as duplicate. With this workflow, the system ensures that each new inventory item can be linked to valid, officially registered location data.

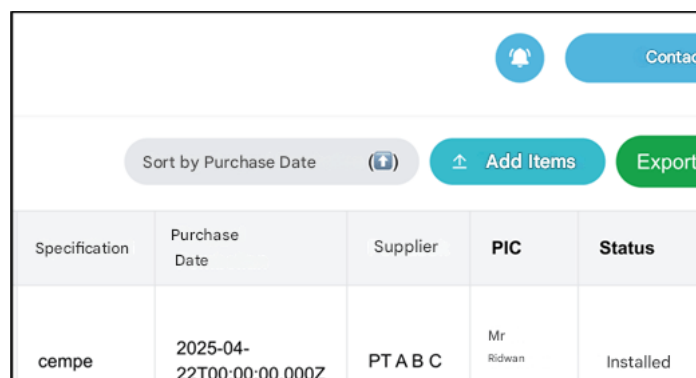


Figure 13. Display of the "Add New Item" Button Menu

The inventory process begins by filling in the data on the "Add New Item" form. The actor selects "Facility Type" from a dropdown menu that provides 11 specific categories, including Self-Contained Breathing Apparatus (SCBA), Portable Fire Extinguisher (APAB), Sprinkler, Hydrant, and others. Next, the actor selects the "Location" and "Location Point" for the facility from a pre-existing list. To maintain flexibility and completeness, the system provides a "+ Add Location/New Location Point" option directly on this form, allowing new locations to be added directly if they are not already registered in the database.

The actor then completes a series of fields, including "Item Name" (recommended format: "Facility Type - Location - Location Point"), a unique "Serial Number," a "Description" of the general condition, technical "Specifications," the date of purchase or installation, the name of the "Supplier," and the person in charge or "PIC" for monitoring. A crucial step is determining the "Installation Status." If you select "Installed," the item will automatically be included in the routine inspection program, and its calculation will affect the facility readiness summary chart. Conversely, if the status is "Not Installed," the item will be recorded as reserve inventory stored in the warehouse and will not be included in the operational readiness summary.

Figure 14. Display of the "Add New Item" Inventory Form

Once all data has been filled in and supporting documentation (if any) has been uploaded, the actor presses the "Submit" button. The system will notify "Data saved successfully" or "Save failed" if duplicate data is detected. Successfully saved items do not immediately appear in the main list but are instead placed in a queue in the "Approval" menu for validation and approval by the Admin, ensuring a verification process before new inventory data is declared active.

No	Nama Item	Jenis Sarana	Nomor Seri	Lokasi	Task	Type of Location	Purchase Date	Supplier	PIC	Status	Aksi
1	CO2 JARUM BUILDING 6 FLOOR 1 NEAR MANUFACTURING ROOM	APAP	1111	Building E	Lantai 6 - Ruangan Manajer Keuangan	CO2 5 Kg. tekanan 150 bar	2025-06-12T00:00:00.000Z	PT RIAN ANTARA	Mr. Ridwan, Security Guard E	Installed	Approve / Reject
2	CO2 JARUM BUILDING 6 FLOOR 2 NEAR MANUFACTURING ROOM	APAP	1111	Building E	Lantai 2 - Dekat Ruang Manajer Keuangan	CO2 5 Kg. tekanan 150 bar	2025-06-12T00:00:00.000Z	PT RIAN ANTARA	Pub. As Setiawan Building E	Installed	Approve / Reject
3	CO2 JARUM BUILDING 6 FLOOR 3 NEAR MANUFACTURING ROOM	APAP	1111	Building E	Lantai 3 - Ruangan Panel Listrik	CO2 5 Kg. tekanan 150 bar	2025-06-12T00:00:00.000Z	PT RIAN ANTARA	Mr. Ridwan, Security Guard E	Installed	Approve / Reject

Figure 15. Inventory Approval Activity Interface Display

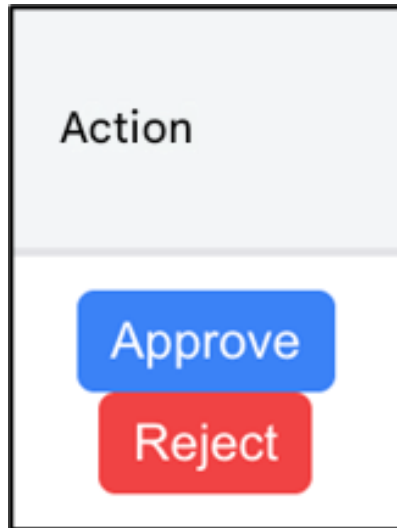


Figure 16. Display of the Action Section Inventory Approval Activity Interface

This activity centers on the "Admin Approval" page, where approvers are presented with a table containing a queue of submitted items awaiting validation. To facilitate the verification process, the table displays comprehensive information for each item, including Item Name, Facility Type, Serial Number, Location, Specifications, PIC, and Installation Status. Each row contains an "Action" column containing two functional buttons: "Approve" and "Reject."



Figure 17. Graphic Interface Display of Emergency Response Facility Readiness Recapitulation

The main interaction on this page begins when the user selects the month and year they wish to analyze. Once the period is specified, the system automatically processes the data and displays a dynamic bar graph. Each bar on the graph represents the readiness level per building, calculated as a percentage. The calculation logic is very specific to ensure the data presented truly reflects operational readiness: a building's readiness level will only increase based on the number of facilities with the "Installed" status and all inspection elements scored "True." Facilities with the "Not Installed" status or with even one inspection element scored "False" will not contribute to the percentage score, thus providing an inaccurate picture.

In addition to visualization, this dashboard also features an instant reporting feature. A "Send to Telegram" button, when clicked, automatically sends a summary of the readiness data a list of buildings and their percentage scores to the integrated Telegram account. This feature facilitates the rapid and efficient dissemination of performance information to stakeholders.

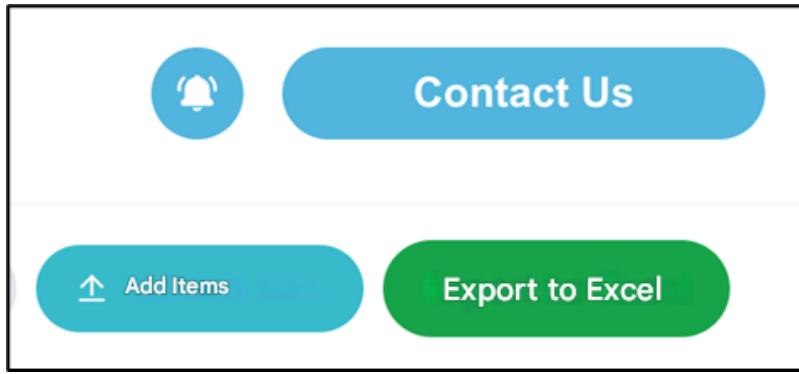


Figure 18. Display of Data Export Activity Menu Options

The system provides several methods for exporting data depending on user needs. The first and most important method is through the "Export to Excel" button available on the "Data Items" page. With a single click, users can download a spreadsheet file containing all complete and structured emergency response equipment inventory data, including details such as item name, location, specifications, PIC, and status.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	
1	id_item	nama_item	nomor_ser	nama_lokasi	id_lokasi	deskripsi	jenis_sarana	spesifikasi	tanggal_per_pemakaian	gambar	PIC	status	nama_sasaran	updateability
2	9	TES2	20000122	Geubung B	Geubung B	1 tes	alat ukur	ANAP	2023-06-12T 07: A B C	https://huar Pak Ridwan Geubung	TRUC	waridard@gmail.com		
3	10	Sprinkler	1es	882723	Geubung C	Geubung C	5	Sprinkler	1es	2023-06-24T 07: A B C	https://huar Pak Ridwan Geubung C	TRUC	domyentiana@student.ppp.ac.id	
4	11	Hidran	Bangi	882723	Geubung D	Di samping	1	Hidran	Bangi	2023-06-24T 07: A B C	https://huar Bopak	TRUC	domyentiana@student.ppp.ac.id	
5	12	Hidran	hidran	882723	Geubung E	Di samping	1	Hidran	Bangi	2023-06-24T 07: A B C	https://huar Bopak Arjo	TRUC	domyentiana@student.ppp.ac.id	
6	13	Kotak	PKM	Ta	882723	Geubung F	Geubung F	Kotak	PKM	2023-06-24T 07: A B C	https://huar Bopak Arjo	TRUC	domyentiana@student.ppp.ac.id	
7	14	Ruang	MNS	882723	Geubung G	Samping	5	Ruang	MNS	2023-06-24T 07: A B C	https://huar Bopak Arjo	TRUC	domyentiana@student.ppp.ac.id	
8	15	Ruang	Bangi	882723	Geubung H	Samping	5	Ruang	Bangi	2023-06-24T 07: A B C	https://huar Bopak Buah	TRUC	domyentiana@student.ppp.ac.id	
9	16	Sarana	salan	882723	Geubung I	Ruang	5	Sarana	salan	2023-06-24T 07: A B C	https://huar Bopak Buah	TRUC	domyentiana@student.ppp.ac.id	
10	17	SCBA	1517	2	Geubung J	Geubung Pns	SCBA	1517	2	2023-06-24T 07: A B C	https://huar Pak Buah	TRUC	domyentiana@student.ppp.ac.id	
11	18	SPM	1517	2	Geubung K	Ruang	1	SPM	1517	2	2023-06-24T 07: A B C	https://huar Pak Buah	TRUC	domyentiana@student.ppp.ac.id
12	19	SCBA	1517	2	Geubung L	Geubung Pns	SCBA	1517	2	2023-06-24T 07: A B C	https://huar Pak Buah	TRUC	domyentiana@student.ppp.ac.id	
13	20	tes	222	Geubung B	Geubung B	1	tes	222	2023-05-20T 07: A B C	https://huar J	TRUC	hfhuna@gmail.com		
14	21	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
15	22	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
16	23	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
17	24	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
18	25	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
19	26	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
20	27	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
21	28	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
22	29	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
23	30	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
24	31	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
25	32	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
26	33	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
27	34	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
28	35	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
29	36	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
30	37	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
31	38	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
32	39	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
33	40	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
34	41	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
35	42	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
36	43	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
37	44	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
38	45	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
39	46	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		
40	47	tes	128	Geubung B	Geubung B	1	tes	128	2023-05-12T 07: A B C	https://huar 128	TRUC	hfhuna@gmail.com		

Figure 19. Excel Download View in Data Export Activity

Ms. Room

Sort by Created At (▼)

id	transceiver	backup	verification	visual	personnel	notification	equipment	provision	capabilities	power	availability
5	true	true	true	true	true	true	true	true	true	true	true
6	true	true	true	true	true	true	true	true	true	true	true
7	true	true	true	true	true	true	true	true	true	true	true
9	true	true	true	true	true	true	true	true	true	true	true

Figure 20. Inspection Activity History Recording Display

For more specific data, such as the history of emergency response facility inspection reports, users can access the "Inspection Detail" page for the item in question. This page displays a history table detailing the results of each inspection by element, the data of which can be copied or screen-captured for in-depth analysis. A third method is to export visual data, where users can open the Readiness Overview graph page and take a screenshot. This graph is highly effective for use in presentations or visual reports for teams and management.

Black Box Testing and Usability

In Black Box Testing, of the 12 main activity flows tested by simulating the roles of the four actors, 100% of all tasks and sub-tasks performed were "SUCCESSFUL." This finding demonstrates that no errors or functional failures were encountered during testing, and the actual results of each process fully align with the designed expectations. Therefore, the

Inspektra Plus Information System has passed the functional testing phase and proven technically reliable. These satisfactory results serve as the basis for evaluating the system from a user perspective through Usability Testing.

After the system passes functional testing, the next evaluation stage is Usability Testing. This measurement focuses on four main dimensions of usability: Usefulness, Ease of Use, Ease of Learning, and Ease of Satisfaction. The usability assessment consists of eight questions with 61 respondents. The following calculation is used to obtain the usability percentage:

Percentage of Usability (%)

$$= \frac{(1 \times n) + (2 \times n) + \dots + (4 \times n) + (5 \times n)}{5 \times \Sigma \text{ Respondents} \times \Sigma \text{ Question}} \times 100\%$$

Percentage of Usefulness Eligibility (%)

$$= \frac{(1 \times 0) + (2 \times 9) + (3 \times 50) + (4 \times 238) + (5 \times 191)}{5 \times 61 \times 8} \times 100\%$$

Percentage of Usefulness Eligibility (%)

$$= \frac{(0) + (18) + (150) + (952) + (955)}{5 \times 61 \times 8} \times 100\%$$

Percentage of Usefulness Eligibility (%)

$$= \frac{2075}{2440} \times 100\%$$

Percentage of Usefulness Eligibility (%)

$$= 0,85040 \times 100\% = 85\%$$

Based on the usefulness assessment calculations, the feasibility score was 85%. This value falls within the 81.00-100 scale, indicating that the Menteng Electricity Company (INSPEKTRA+) emergency response facility inventory and inspection information system is highly suitable for use by the company where the research was conducted.

The ease-to-use assessment consisted of 11 questions with 61 respondents. The following is the calculation used to obtain the eligibility percentage for the ease-to-use aspect:

Easy to Use Eligibility Percentage (%)

$$= \frac{(1 \times n) + (2 \times n) + \dots + (4 \times n) + (5 \times n)}{5 \times \Sigma \text{ Respondents} \times \Sigma \text{ Question}} \times 100\%$$

Easy to Use Eligibility Percentage (%)

$$= \frac{(1 \times 0) + (2 \times 1) + (3 \times 63) + (4 \times 387) + (5 \times 220)}{5 \times 61 \times 11} \times 100\%$$

Easy to Use Eligibility Percentage (%)

$$= \frac{(0) + (2) + (189) + (1548) + (1100)}{5 \times 61 \times 11} \times 100\%$$

Easy to Use Eligibility Percentage (%)

$$= \frac{2839}{3355} \times 100\%$$

Easy to Use Eligibility Percentage (%)

$$= 0,84619 \times 100\% = 84,6\%$$

Based on the ease-of-use assessment, a feasibility score of 84.6% was obtained. This score falls within a scale of 81.00-100, indicating that the emergency response facility inventory

and inspection information system at the Menteng Electricity Company (INSPEKTRA+) is highly suitable for use by the company where the study was conducted.

The ease-of-learning assessment consisted of four questions with 61 respondents. The following is the calculation used to obtain the feasibility percentage for the ease-of-learning aspect:

Percentage of Easy-to-Learning Feasibility (%)

$$= \frac{(1 \times n) + (2 \times n) + \dots + (4 \times n) + (5 \times n)}{5 \times \Sigma \text{ Respondents} \times \Sigma \text{ Question}} \times 100\%$$

Percentage of Usefulness Eligibility (%)

$$= \frac{(1 \times 0) + (2 \times 8) + (3 \times 49) + (4 \times 97) + (5 \times 90)}{5 \times 61 \times 4} \times 100\%$$

Easy to Learning Eligibility Percentage (%)

$$= \frac{(0) + (16) + (147) + (388) + (450)}{5 \times 61 \times 4} \times 100\%$$

Easy to Learning Eligibility Percentage (%)

$$= \frac{1001}{1220} \times 100\%$$

Easy to Learning Eligibility Percentage (%)

$$= 0,82049 \times 100\% = 82\%$$

Based on the easy-to-learn assessment, a feasibility score of 82% was obtained. This score falls within the range of 81.00-100, indicating that the emergency response facility inventory and inspection information system at the Menteng Electricity Company (INSPEKTRA+) is highly suitable for use by the company where the research was conducted.

The satisfaction assessment consisted of seven questions with 61 respondents. The following is the calculation used to obtain the feasibility percentage for the satisfaction aspect:

Percentage of Feasibility Satisfaction (%)

$$= \frac{(1 \times n) + (2 \times n) + \dots + (4 \times n) + (5 \times n)}{5 \times \Sigma \text{ Respondents} \times \Sigma \text{ Question}} \times 100\%$$

Satisfaction Eligibility Percentage (%)

$$= \frac{(1 \times 0) + (2 \times 0) + (3 \times 86) + (4 \times 213) + (5 \times 128)}{5 \times 61 \times 7} \times 100\%$$

Satisfaction Eligibility Percentage (%)

$$= \frac{(0) + (0) + (258) + (852) + (640)}{5 \times 61 \times 7} \times 100\%$$

Satisfaction Eligibility Percentage (%)

$$= \frac{1750}{2135} \times 100\%$$

Satisfaction Eligibility Percentage (%)

$$= 0,81967 \times 100\% = 81,9\%$$

Based on the satisfaction assessment calculations, the feasibility score was 81.9%. This score falls within the 81.00-100 scale, indicating that the emergency response facility inventory and inspection information system at the Menteng Electricity Company (INSPEKTRA+) is highly suitable for use by the company where the study was conducted.

Usability calculations combine Usefulness, Ease of Use, Ease of Learning, and Ease of Satisfaction, resulting in a single score representing the system's holistic feasibility.

Usability Feasibility Percentage (%)

$$= \frac{\text{Observed scores}}{\text{Expected score}} \times 100\%$$

Usability Percentage (%)

$$= \frac{(2075)+(2839)+(1001)+(1750)}{(2440)+(3355)+(1220)+(2135)} \times 100\%$$

Usability Percentage (%)

$$= \frac{7665}{9150} \times 100\%$$

Usability Percentage (%)

$$= 0,83770 \times 100\% = 83,7\%$$

Based on the usability assessment calculations, a feasibility score of 83.7% was obtained. This score falls within the 81.00-100 scale, indicating that the emergency response facility inventory and inspection information system at the Menteng Electricity Company (INSPEKTRA+) is generally considered highly suitable for use by the company where the research was conducted.

Conclusion

The Menteng Electricity Company successfully designed an emergency response equipment inventory information system through needs mapping, workflow design, database development, and the creation of a responsive web interface using Next.js and TypeScript. The system supports four user categories with varying access rights and features a database inventory menu as its main feature, which contains all emergency response equipment information in an integrated manner and is easily accessible via PC or mobile devices.

Suggestion

It is recommended that system development be directed at integration with IoT sensors for automatic updates, the addition of real-time reporting features, increased data security and access rights management, and performance optimization to remain responsive on low-speed internet networks

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