



Web-Based Inventory Management Information System for Catholic Church

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Abstract

The rapid development of information technology encourages organizations, including religious institutions, to implement information systems that support operational activities. Inventory management at the Catholic Church of St. John the Baptist Perawang was previously conducted manually, resulting in recording errors, data duplication, and delays in report preparation. This study aims to design and develop a web-based inventory management information system using the Waterfall software development method. The development stages include requirement analysis, system design using Unified Modeling Language (UML), implementation using PHP and MySQL, and functional testing through Black-Box testing. The resulting system is capable of centrally managing inventory data, handling borrowing, returning, transfer, damage, and repair transactions, and generating structured reports automatically. The implementation results indicate that the system improves efficiency, data accuracy, and transparency in inventory management. The system provides an effective solution for supporting asset management and operational services within the church environment.

Keywords: *Catholic Church; Inventory Management; Information System; Waterfall Method; Web-Based System*

1. Introduction

The development of information technology requires organizations to manage data effectively, in an integrated and transparent manner. Religious institutions such as churches also require structured information systems to support administrative and operational activities. Manual data management processes often lead to recording errors, data duplication, delayed report preparation, and difficulties in supervision and decision-making [1][2].

The Catholic Church of St. John the Baptist Perawang manages various assets used to support liturgical services, administration, and community activities. Based on observations and interviews, the inventory management process was still conducted manually and was not integrated into a centralized information system. This condition caused difficulties in monitoring asset conditions comprehensively and created discrepancies between recorded data and actual asset conditions.

Inventory plays a strategic role in ensuring sustainable church operations. Therefore, this study aims to design and develop a web-based inventory management information system using the Waterfall method. The system is expected to enhance efficiency, accuracy, and transparency in inventory management while simplifying data recording, monitoring, and reporting processes [3][4].

2. Research methodology

2.1. Research Approach

This study applied a system development research approach to design and implement a web-based Geographic Information System (GIS) for maternity clinics. The research focused on identifying existing problems and developing an effective information system solution.

2.2. Data Collection

Data were collected through:

1. Observation, to understand the current information management process.
2. Interviews, to identify user requirements and system needs.
3. Literature review, to support the theoretical foundation related to GIS, database systems, and system development methods.

2.3. System Development Method

This study applies a software engineering approach to design and develop a web-based inventory management information system. The system development follows the Waterfall model, which consists of requirement analysis, system design, implementation, testing, and deployment[5].

3. Result and discussion

The research resulted in a web-based inventory management information system capable of centrally managing church inventory data. The system provides features for item registration, borrowing, returning, transfer, damage reporting, repair management, and automatic report generation.

The developed system includes three user levels: Main Administrator, Administrator, and Church Leader. Each user role has different access rights. The Main Administrator manages all inventory data and transactions, the Administrator manages inventory at specific locations, and the Church Leader monitors reports without modifying data.

Functional testing results indicate that all core system features operate correctly and meet user requirements. Compared to the previous manual system, the developed system reduces recording errors, accelerates reporting processes, and improves transparency and data accuracy.

Table 1 presents the core database structure of the inventory system. The table contains essential fields such as item ID, item code, item name, category, quantity, condition, location, and additional description. The use of a primary key ensures data uniqueness and integrity, while categorized attributes allow structured and centralized data management. This table serves as the main reference for all inventory-related transactions within the system.

Table 1: Inventory table structure

No	Field Name	Data Type	Description
1	id_barang	Int	Primary key
2	kode_barang	Varchar	Unique item code
3	nama_barang	Varchar	Item name
4	kategori	Varchar	Item category
5	jumlah	Int	Quantity
6	kondisi	Varchar	Item condition
7	lokasi	Varchar	Storage location
8	keterangan	Text	Additional description

Table 2 shows the results of functional testing using the Black-Box testing method. Each main feature of the system, including login, data input, data editing, data deletion, and report generation, was tested to ensure it functions according to user requirements. The results indicate that all features operated successfully and produced the expected outputs, confirming the reliability and functionality of the developed system.

Table 2: Black-box testing results

No	Tested Feature	Expected Result	Test Result	Status
1	User login	Successful login	Valid	Pass
2	Add inventory data	Data stored in database	Valid	Pass
3	Edit inventory data	Data updated	Valid	Pass
4	Delete inventory data	Data removed	Valid	Pass
5	Print report	Report generated	Valid	Pass

The following figures present the system design and implementation results of the developed web-based inventory management information system. The diagrams illustrate user interactions and system structure, while the interface screenshots demonstrate the functional features implemented to support inventory management activities within the church environment.

Figure 1 Use case diagram of main administrator

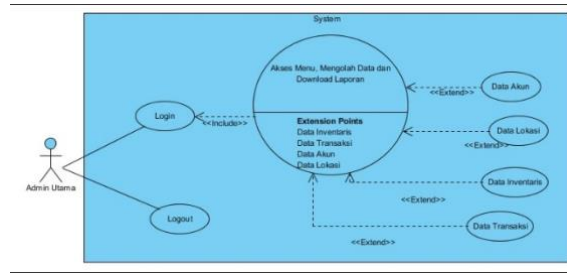


Fig 1: Use case diagram of main administrator

This actor has full access to all system functionalities, including managing inventory data, transactions, user accounts, locations, and generating reports. The diagram represents the interaction between the main administrator and the system processes.

Figure 2 Use case diagram of administrator

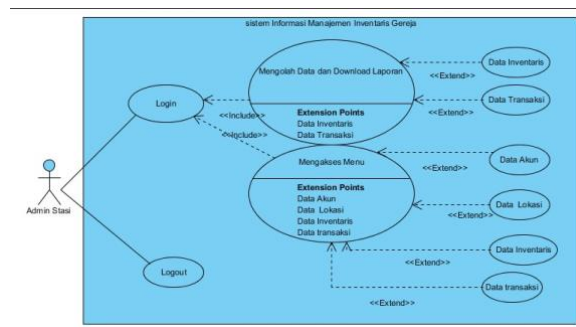


Fig 2: Use case diagram of administrator

Figure 2 presents the use case diagram for the Administrator role. The administrator manages inventory data at specific church locations or units. This role has limited access compared to the main administrator and focuses primarily on operational inventory management.

Figure 3 Use case diagram of church leader

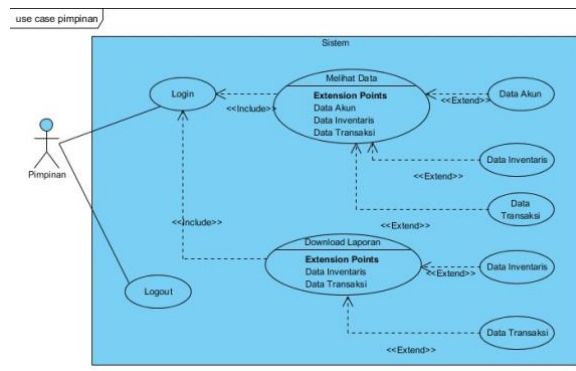


Fig 3: Use case diagram of church leader

Figure 3 shows the interaction between the Church Leader and the system. The church leader has supervisory access and can log in to view reports and monitor inventory data but does not have permission to modify or manage data. This design supports transparency and oversight.

Figure 4 Homepage interface



Fig 4: Homepage interface

Figure 4 displays the homepage of the web-based system before user login. This page provides general information about the Catholic Church of St. John the Baptist Perawang, navigation menus, and service schedule information. It serves as the public access interface of the system.

Figure 5 Login page interface



Fig 5: Login page interface

Figure 5 presents the login page of the system. Users are required to enter their username and password to access the system. The interface is designed to be simple and centered to improve usability while maintaining security through role-based authentication.

Figure 6 Administrator dashboard



Fig 6: Administrator dashboard

Figure 6 shows the administrator dashboard interface. The dashboard provides summary statistics such as total inventory items, active borrowings, and damaged items. It also includes navigation menus for account management, locations, units, and transactions. The dashboard enables real-time monitoring of inventory conditions.

Figure 7 Account management page

No	Photo	Nama	Username	Password	Alamat	No HP	Email	Status
1		admin	admin	admin_pawani	medan	082200264264	admin@gmail.com	aktif
2		Stasi St. Yohanes (Stasi Simonsen)	stasi_yohanes	stasi_st_yohanes (Stasi Simonsen)	ree	ree	stasiyoh@gmail.com	aktif
3		pastor paroki	pastor	parangan	tas	090	pastorparangan@gmail.com	aktif
4		Stasi St. Yohanes Hergigil (Stasi Jajuk)	stasi_yohanes	stasi_st_yohanes Hergigil (Stasi Jajuk)	ree	07108	yohanes@gmail.com	aktif
5		Stasi St. Agustinus (Stasi Bantak)	stasi_agustinus	Stasi St. Agustinus (Stasi Bantak)	medan	082200264264	stasi@gmail.com	aktif

Fig 7: Account management page

Figure 7 displays the account management page, which is accessible by the Main Administrator. This feature allows the management of user accounts, including adding, editing, and deleting user information according to access levels.

Figure 8 Location management page

No	Kode Lokasi	Nama Lokasi	Alamat	Nomor	Status
1	00001	Medan	Jl. Raya Medan - Perumahan NIKEDS Tumbang Rea, Tumbang Kabanjoran Blok Mbu 2005	0822 0760 0000	aktif
2	00002	Stasi St. Yohanes (Stasi Simonsen)	Jl. Sumatra No. 2	08220048000	aktif
3	00003	Stasi St. Yohanes Hergigil (Stasi Jajuk)	Jl. Sumatra No. 3	08220048000	aktif
4	00004	Stasi St. Agustinus (Stasi Bantak)	Jl. Sumatra No. 4	08220048000	aktif
5	00005	Stasi St. Yohanes (Stasi Bantak)	Jl. Sumatra No. 5	08220048000	aktif
6	00006	Stasi St. Yohanes (Stasi Bantak)	Jl. Sumatra No. 6	08220048000	aktif

Fig 8: Location management page

Figure 8 presents the location management page. This page allows the Main Administrator to manage data related to church stations or branches where inventory items are stored and monitored.

Figure 9 Inventory data page

No	Kode Barang	Nama Barang	Kategori	Lokasi	Jumlah	Status	Tgl Pengambilan	Kondisi	Sumber	Bergas	Salahgunung	Nama Akun	Aksi
1	10000	Alas & Sadel Gereja	Bangunan	Paroki	0	1	2000-01-01	Lama	Bel	Ag 0		Ag 0	Edit Hapus Tambah Data
2	10000	Patung	Bangunan	Paroki	1	1	2000-01-01	Lama	Bel	Ag 0		Ag 0	Edit Hapus Tambah Data
3	10000	Stik Bergas 2 Wns	Bangunan	Paroki	1	1	2000-01-01	Lama	Bel	Ag 0		Ag 0	Edit Hapus Tambah Data
4	10000	Stik Bergas 2 Wns	Bangunan	Paroki	2	2	2000-01-01	Lama	Bel	Ag 0		Ag 0	Edit Hapus Tambah Data
5	10000	Kubang	Bangunan	Paroki	3	1	2000-01-01	Lama	Bel	Ag 0		Ag 0	Edit Hapus Tambah Data
6	10007	Tempat Paroki	Bangunan	Paroki	1	1	2000-01-01	Lama	Bel	Ag 0		Ag 0	Edit Hapus Tambah Data
7	10008	Tempat Paroki	Bangunan	Paroki	0	1	2000-01-01	Rusa	Bel	Ag 0		Ag 0	Edit Hapus Tambah Data

Fig 9: Inventory data page

Figure 9 shows the inventory data management page. This page allows administrators to manage all inventory records, including adding new items, updating item information, and deleting outdated records.

Figure 10 Unit management page

No	Kode Unit	Nama Unit	Kategori	Aksi
1	UR01	Stipa		Edit Barang Edit Hapus
2	UR02	Lama		Edit Barang Edit Hapus
3	UR03	Patung		Edit Barang Edit Hapus

Fig 10: Unit management page

Figure 10 illustrates the parish unit management page. This feature allows administrators to manage unit information associated with inventory items, ensuring proper categorization and tracking.

Figure 11 Borrowing transaction page

No	No Peminjaman	Tanggal Pinjam	Lokasi Pinjam	Kode Barang	Nama Barang	Jumlah	Status	Lokasi Pinjam	Nama Peminjam	Kategori	Status	Nama U
Tidak ada data												

Fig 11: Borrowing transaction page

Figure 11 presents the borrowing transaction page. This feature records borrowing activities, including borrower information, borrowed items, borrowing date, and return status. It ensures accurate tracking of item usage.

Figure 12 Return transaction page

No	No Pengembalian	Tanggal Kembali	No Peminjaman	Lokasi Pinjam	Kode Barang	Nama Barang	Jumlah	Status	Peminjam	Kondisi Barang	Status
1	P00000001	01-09-2020	P00000001	Stasi St. Petrus (Bungas Paroki)	88000	Alas Keras	2	Unit	shahala	Rusak Ringan	cekris

Fig 12: Return transaction page

Figure 12 displays the return transaction page. This page records returned items and updates inventory status automatically, ensuring data consistency between borrowing and inventory records.

Figure 13 Damage data page

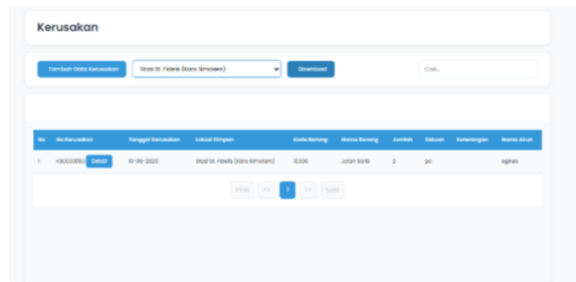


Fig 13: Damage data page

Figure 13 shows the damage reporting page. This feature allows administrators to record items that are damaged, including condition details and relevant notes, helping maintain accurate inventory conditions.

Figure 14 Repair data page

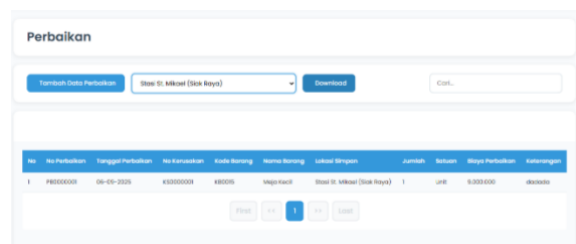


Fig 14: Repair data page

Figure 14 presents the repair management page. This feature records repair history and maintenance activities for damaged items, enabling proper asset lifecycle management.

Figure 15 Transfer transaction page

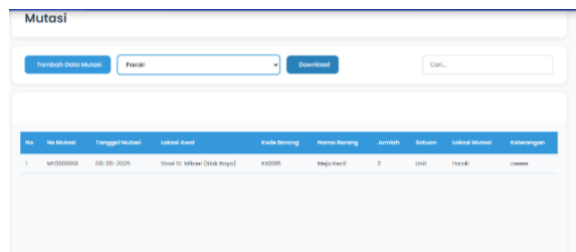


Fig 15: Transfer transaction page

Figure 15 illustrates the transfer transaction page. This feature records the movement of inventory items between different church locations, ensuring traceability and location accuracy.

Figure 16 Inventory report output

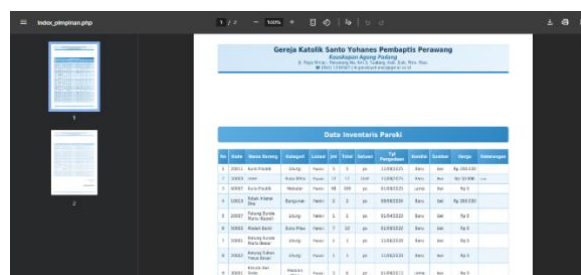


Fig 16: Inventory report output

Figure 16 displays an example of the generated inventory report. The report is derived from stored inventory data and presents structured information for monitoring and administrative purposes. This feature supports decision-making by providing accurate and printable reports.

The system interface includes a homepage, login page, dashboard, account management page, location management page, inventory data page, unit management page, borrowing transaction page, return transaction page, damage data page, repair data page, transfer transaction

page, and reporting page. The dashboard presents summary statistics of total inventory, active borrowings, and damaged items to support real-time monitoring. Overall, the implementation demonstrates that a web-based system significantly enhances organizational asset management efficiency, consistent with previous studies [6][7].

4. Conclusion

The study successfully designed and implemented a web-based inventory management information system for the Catholic Church. The system meets user requirements and provides structured, centralized, and accurate inventory management. The implementation improves efficiency, minimizes manual recording errors, enhances transparency, and supports better supervision and decision-making. The developed system provides an effective solution for church asset management and operational support.

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References

- [1] J. Hutahaean, *Konsep Sistem Informasi*. Yogyakarta: Deepublish, 2016.
- [2] G. Sugiama, *Manajemen Aset dan Inventaris*. Bandung: Alfabeta, 2013.
- [3] R. S. Pressman, *Software Engineering: A Practitioner's Approach*. New York: McGraw-Hill, 2015.
- [4] Sommerville, *Software Engineering*. Boston: Pearson, 2016.
- [5] A. Wahid, "Analysis of the Waterfall Method for Information System Development," 2020.
- [6] N. Oktaviani et al., "Web-Based Inventory Information System," 2019.
- [7] S. Rosa and M. Shalahuddin, *Rekayasa Perangkat Lunak*. Bandung: Informatika, 2018.