

Inventory Management Through the Storage Information System at the Village Office

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ABSTRACT

Keywords:

Inventory Management
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Inventory management plays an important role in supporting accountability and administrative effectiveness in village governance. Nevertheless, many village offices still experience difficulties in maintaining accurate inventory records due to manual documentation practices and fragmented data storage. This study aims to analyze inventory management practices in Carangrejo Village and examine the role of digital information systems in supporting village asset administration. This research employed a descriptive qualitative method through observations, interviews, and document analysis involving village officials responsible for inventory management. The findings reveal several challenges, including data redundancy, delays in reporting, difficulties in tracking assets, and limited accessibility of inventory information. To overcome these challenges, SIPACAR (Sistem Informasi Pengelolaan Inventaris Carangrejo) was implemented as a digital platform facilitating inventory recording, monitoring, and reporting. The implementation of SIPACAR improved data organization, enhanced information accessibility, and increased administrative efficiency. The study concludes that digitalization through inventory information systems can strengthen inventory governance and support transparent and accountable public services at the village level.

INTRODUCTION

The rapid advancement of information and communication technology has significantly transformed administrative systems in both private and public sectors. Governments worldwide are increasingly adopting digital technologies to improve organizational efficiency, enhance transparency, and provide better public services. Digital transformation is no longer considered merely an innovation but has become a necessity for public institutions to remain responsive and accountable in serving society (Laudon, 2022; Public & Policy, 2022).

Within the context of public administration, village governments constitute the frontline institutions responsible for delivering various administrative services and managing public assets. Village administrations are required to maintain accountability in managing financial resources, infrastructure, equipment, and other assets owned by the village. Therefore, effective asset and inventory management becomes an essential component in ensuring good governance practices.

In Indonesia, village asset administration is also regulated by the Ministry of Home Affairs through the Regulation of the Minister of Home Affairs Number 1 of 2016 concerning Village Asset Management. The regulation emphasizes that village assets should be administered systematically through activities such as recording,

inventorying, reporting, and monitoring to ensure accountability and transparency in village governance (Kementerian Dalam Negeri Republik Indonesia, 2016).

Inventory management refers to the process of recording, classifying, controlling, maintaining, and reporting organizational assets systematically. Proper inventory administration enables organizations to monitor asset availability, determine asset conditions, plan maintenance activities, and support decision-making processes (Heizer et al., 2022). In public institutions, inventory management also serves as an important instrument for ensuring accountability and transparency in asset utilization.

Despite its importance, inventory management in many village offices in Indonesia is still conducted using conventional methods. Asset records are frequently documented manually through handwritten ledgers or separate spreadsheet files. These practices often create administrative problems, such as data duplication, inconsistency of records, delays in report preparation, difficulties in tracking asset locations, and limited accessibility of information (Maghfiro & Homaidi, 2025).

The reliance on manual inventory systems may reduce administrative effectiveness and increase the potential risk of data loss. In addition, fragmented documentation practices make it difficult for village officials to monitor asset conditions accurately. Consequently, decision-making related to asset maintenance, procurement, and disposal becomes less efficient.

The Government of Indonesia has continuously encouraged public institutions, including village administrations, to adopt digital governance systems as part of the broader e-government implementation. E-government refers to the utilization of information and communication technology to improve public administration processes, enhance service delivery, and strengthen institutional transparency (United Nations Department of Economic and Social Affairs, 2024). Several studies have demonstrated that web-based inventory information systems can improve the efficiency of village asset administration and support digital transformation in local government (Aprilia et al., 2025). The implementation of digital systems in inventory management represents one of the practical applications of e-government at the village level.

Carangrejo Village, located in Ponorogo Regency, experiences similar challenges regarding inventory administration. Prior to digitalization, inventory recording was predominantly conducted manually, causing inefficiencies in data management and reporting activities. In response to these administrative challenges, the village administration developed and implemented SIPACAR (Sistem Informasi Pengelolaan Inventaris Carangrejo).

SIPACAR is a digital inventory information system designed to facilitate inventory recording, asset monitoring, and report generation processes. The system aims to centralize inventory information within a single digital platform, thereby improving data accessibility and reducing administrative errors.

The implementation of SIPACAR is expected to support more efficient inventory administration while simultaneously promoting transparency and accountability in village governance. Therefore, this study aims to analyze existing inventory management practices in Carangrejo Village and evaluate the contribution of SIPACAR in improving inventory governance.

Inventory Management in Village Administration

Inventory management is defined as a series of activities involving the planning, recording, controlling, storing, and monitoring of organizational assets to ensure their effective utilization (Heizer et al., 2022). Effective inventory systems provide accurate information regarding asset ownership, quantity, location, utilization, and condition.

In the public sector, inventory management contributes significantly to organizational accountability. Public institutions are responsible for ensuring that public assets are properly maintained and utilized in accordance with applicable regulations. Consequently, accurate inventory information is required to support auditing processes, financial reporting, and strategic planning activities (Miles, 2020).

An effective inventory management system should provide reliable, timely, and accessible information. Such systems enable organizations to minimize asset losses, optimize resource allocation, and improve operational performance.

Digitalization in Public Administration

Digital transformation has become an integral component of public sector reform. The application of digital technology allows government institutions to simplify administrative procedures, reduce operational costs, and improve service quality (Sihotang et al., 2025).

At the village level, digital transformation supports administrative modernization by facilitating document management, financial administration, population services, and inventory management. Through digital systems, village governments can improve administrative efficiency and strengthen public trust.

However, successful digital transformation requires not only technological infrastructure but also organizational readiness, human resource competence, and institutional commitment. Therefore, the adoption of digital systems should be accompanied by adequate training and continuous evaluation to ensure sustainable implementation (Sihombing & Lumbantobing, 2024; Sugyiono, 2022).

RESEARCH METHOD

This study employed a descriptive qualitative research approach to obtain an in-depth understanding of inventory management practices at the Carangrejo Village Office and to evaluate the implementation of SIPACAR (Sistem Informasi Pengelolaan Inventaris Carangrejo) in supporting village asset administration. The qualitative approach was

selected because it enables researchers to explore conventional inventory management to a digital information system.

The research was conducted at the Carangrejo Village Office, Ponorogo Regency, East Java, Indonesia, From January to March 2026. During this period, SIPACAR had been implemented as the primary platform for recording, monitoring, and reporting village inventory accuracy, and facilitates asset management by village officials.

To obtain comprehensive data, three data collection techniques were employed.

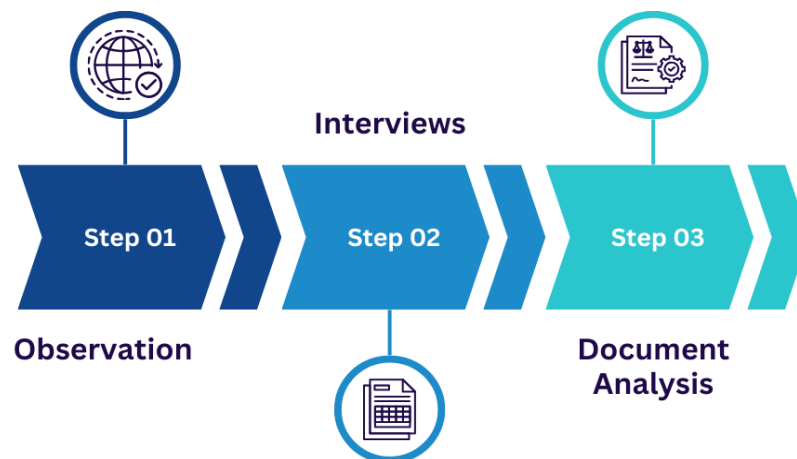


Figure 1 Research framework

Observation

Direct observations were carried out throughout the daily administrative activities involving SIPACAR. The researcher observed how village officials utilized the system during inventory recording, asset registration, borrowing and returning transactions, inventory updates, and report generation.

particular attention was given to several operational aspects of SIPACAR, including:

- User login and authentication procedures.
- Recording of new inventory items.
- Classification of assets based on inventory categories.
- Input of asset information such as inventory code, asset name, acquisition year, location, quantity, and condition.
- Borrowing and return procedures recorded through the system.
- Editing and updating inventory information.
- Automatic generation of inventory reports.
- data search and retrieval processes.
- User interaction with the application interface.

The observations also examined workflow efficiency before and after SIPACAR implementation, including the reduction of manual recording activities, data duplication, and administrative errors.

Interviews

Semi-structured interviews were conducted with village officials responsible for inventory administration, including administrative staff and village secretary. The interviews guide consisted of open-ended questions designed to explore user experiences and perceptions regarding the implementation of SIPACAR.

The interviews focused on several themes:

- Existing inventory management procedures before SIPACAR
- Difficulties encountered in manual inventory administration.
- Ease of learning and operating SIPACAR.
- User satisfaction with system features.
- Perceived usefulness of digital inventory records.
- Benefits of automated reporting.
- Challenges during system implementation.
- Suggestions for future system development.

The Interview result provided qualitative evidence regarding the effectiveness, usability, and acceptance of SIPACAR from the user's perspective.

Document Analysis

Document analysis was conducted to validate observational and interview findings by examining both conventional administrative documents and digital records generated by SIPACAR.

The analyzed documents included:

- Village inventory books.
- Asset registration forms.
- Inventory mutation records.
- Borrowing and returning records.
- Inventory stock reports.
- Asset condition reports.
- Administrative correspondence related to inventory management.
- Digital reports exported from SIPACAR.
- User activity logs generated by the application.

This analysis enabled comparisons between manual administrative record and digital data managed within SIPACAR to evaluate data consistency, completeness, and accuracy.

The collected data were analyzed using the interactive qualitative analysis model proposed by Miles, Huberman, and Saldana, consisting of three interconnected stages. Data reduction involved selecting, coding, organizing, and simplifying information obtained from observations, interviews, and document analysis. The researcher categorized findings according to major themes, including inventory management

procedures, system usability, implementation challenges, administrative efficiency, and user perceptions of SIPACAR.

Data display involved presenting the organized data using descriptive narratives, comparison tables, workflow diagrams, screenshots of SIPACAR features, and thematic matrices. This process facilitated interpretation of relationships among the collected data and highlighted improvements introduced by the system.

Conclusion drawing and verification involved identifying recurring patterns, interpreting the findings, and evaluating the contribution of SIPACAR to village inventory administration. Conclusions were continuously refined throughout the analysis by comparing evidence from different data sources. To ensure the credibility and trustworthiness of the findings, methodological triangulation was applied by comparing information obtained through observations, interviews, and document analysis.

The consistency of findings was verified by examining whether:

- Observations of SIPACAR implementation corresponded with interview responses from village officials;
- Digital reports generated by SIPACAR matched manual inventory documents;
- Inventory procedures observed in practice aligned with official administrative regulations;
- Reported benefits and challenges were consistently identified across multiple participants and data sources.

The triangulation process enhanced the validity and reliability of the research findings by minimizing potential researcher bias and ensuring that conclusions were supported by multiple sources of evidence.

RESULTS AND DISCUSSION

The findings indicate that inventory management in Carangrejo Village has significantly improved following the implementation of SIPACAR (Sistem Informasi Pengelolaan Inventaris Carangrejo), a web-based inventory management system developed based on the needs identified during field observations and interviews. The system was designed to support inventory administration by integrating inventory data management, transaction recording, stock monitoring, and report generation into a centralized platform.

Prior to its implementation, inventory administration relied on manual documentation using separate books and spreadsheet files stored on individual computers. This practice often resulted in inconsistent records, difficulties in retrieving information, and inefficient administrative processes. Several challenges were identified during the study. Data redundancy frequently occurred because inventory information was recorded in multiple files by different personnel, leading to inconsistencies and complicating reporting activities. In addition, report preparation required considerable time since village officials had to manually compile data from various sources, increasing the

likelihood of human error. Asset monitoring was also ineffective because information regarding asset locations, conditions, and utilization was not regularly updated, making it difficult to identify damaged or missing assets. Furthermore, the separation of inventory documents limited information accessibility, as data could only be accessed by certain personnel.

To address these challenges, SIPACAR centralizes inventory data within a digital database that can be accessed by authorized users. The implementation results demonstrate that the system provides integrated modules for inventory data management, inventory transaction recording, inventory monitoring, and inventory reporting. These modules simplify administrative activities by reducing duplicate records, improving data consistency, facilitating stock monitoring, and accelerating report preparation.

Moreover, SIPACAR improves information accessibility, enabling users to retrieve inventory data more efficiently and support faster decision-making. The system also facilitates asset monitoring by providing up-to-date information regarding asset conditions, storage locations, and inventory movements, allowing village officials to plan maintenance activities more effectively. These findings are consistent with the indicating that digital information systems positively contribute to organizational efficiency, transparency, and accountability in public administration (Sihotang et al., 2025). Overall, the implementation of SIPACAR demonstrates that digital inventory systems can strengthen village governance by enhancing administrative performance and promoting transparent asset management practices.

Implementation of SIPACAR

SIPACAR was implemented as an integrated inventory management system that accommodates the main administrative activities carried out by village officials. The system provides several functional modules, including inventory data management, inventory transaction recording, inventory monitoring, and inventory reporting. These modules were developed based on the inventory management requirements identified during the field study to support more structured and efficient inventory administration. The implementation integrates the main inventory management activities into a single system, allowing users to manage inventory information and related transactions through a centralized interface. This integration also facilitates the organization of inventory data and provides users with easier access to information required for routine administrative activities. **Figure 2** presents the main dashboard of SIPACAR, which serves as the entry point for accessing the available inventory management functions and provides an overview of the information managed by the system.

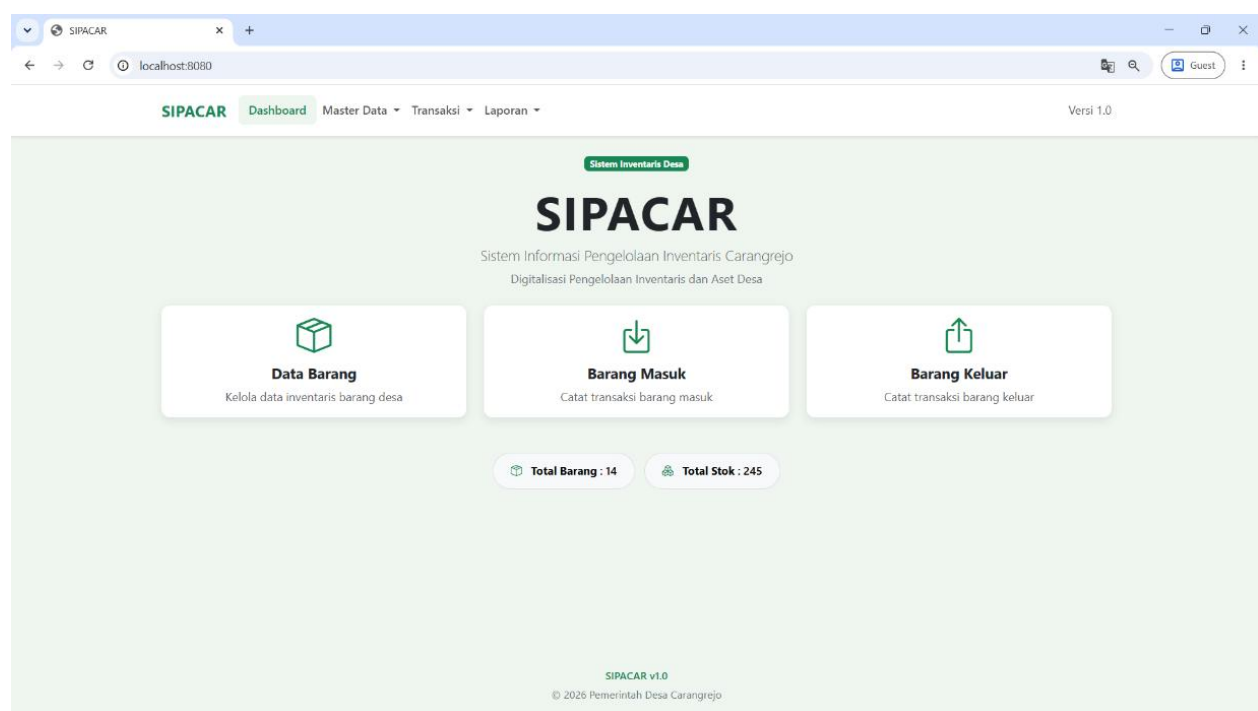


Figure 2 Main Dashboard of SIPACAR

The dashboard provides summary information on the total number of inventory items and the current stock available, allowing users to quickly monitor the overall inventory condition. The navigation menu also provides direct access to the main inventory management functions, enabling users to perform administrative activities through a centralized interface. The implementation of this dashboard provides users with an overview of inventory information while facilitating access to the system's main functions.

Inventory Data Management

One of the problems identified during the study was the absence of a centralized inventory database. Inventory records were previously maintained manually, making it difficult to organize item information and retrieve inventory data efficiently. To address this issue, SIPACAR provides an inventory data management module that centralizes inventory records within a single database. The module was designed to facilitate the recording and management of inventory information in a more structured manner, while allowing users to access and review item records through the system. Each inventory item can be recorded with relevant information, including item code, category, storage location, item condition, and stock information. **Figure 3** presents the inventory data management module implemented in SIPACAR.

Kode Barang	Nama Barang	Tempat	Kondisi	Stok Awal	Total Masuk	Total Keluar	Stok Akhir	Aksi
ATK-001	Kertas HVS A4	Gudang ATK	Baik	20	15	5	30	Detail Edit Hapus
ATK-001	Pulpen Hitam	Gudang ATK	Baik	50	25	10	65	Detail Edit Hapus
ATK-001	Map Folder	Gudang ATK	Baik	30	0	0	30	Detail Edit Hapus
ELK-001	Printer Epson L3210	Ruang Administrasi	Baik	2	0	0	2	Detail Edit Hapus
ELK-001	Laptop Lenovo Thinkpad	Ruang Sekretaris	Baik	3	1	0	4	Detail Edit Hapus
ELK-001	Proyektor Epson	Aula Desa	Baik	1	0	0	1	Detail Edit Hapus
MBL-001	Meja Kerja Kayu	Ruang Pelayanan	Baik	8	0	0	8	Detail Edit Hapus
MBL-001	Kursi Plastik	Aula Desa	Baik	40	10	4	46	Detail Edit Hapus
MBL-001	Lemari Arsip Besi	Ruang Arsip	Baik	4	0	0	4	Detail Edit Hapus
ADM-001	Buku Agenda	Ruang Sekretaris	Baik	10	5	2	13	Detail Edit Hapus
ADM-001	Ordner Dokumen	Ruang Arsip	Baik	25	0	0	25	Detail Edit Hapus
KBR-001	Sapu Lantai	Gudang Kebersihan	Baik	6	0	1	5	Detail Edit Hapus
KBR-001	Pel Lantai	Gudang Kebersihan	Baik	4	0	0	4	Detail Edit Hapus

Figure 3 Inventory Data Management Module

The inventory data management module displays inventory records in a structured table, allowing users to view the available items and their related information. The system also provides functions for adding, editing, viewing, and deleting inventory records according to the user's administrative requirements. In addition, stock information is updated based on recorded inventory transactions, including incoming and outgoing quantities. This allows the current stock to be maintained more consistently and reduces the possibility of discrepancies that may occur when inventory quantities are calculated manually.

Inventory Transaction Management

Inventory movement is managed through two transaction modules, namely incoming goods and outgoing goods. These modules were developed to ensure that every inventory movement is properly recorded and reflected in the available stock. The incoming goods module is used to record inventory received by the village, while the outgoing goods module is used to document the distribution or removal of inventory from storage. Both modules provide structured forms for recording transaction details and are connected to the inventory data management module. This integration allows changes in inventory quantities to be processed systematically and helps maintain consistency between transaction records and current stock information. **Figure 4** presents the incoming transaction module, while **Figure 5** presents the outgoing transaction module.

Barang Masuk
Pencatatan transaksi barang masuk

Kode Barang: ADM-001 - Buku Agenda
Kategori: Arsip dan Dokumen
Nama Barang: Buku Agenda
Tempat: Ruang Sekretaris
Kondisi: Baik
Jumlah Masuk:
Tanggal: dd/mm/yyyy
Keterangan: Contoh: Pembelian ATK bulan Juni

Riwayat Barang Masuk

Tanggal	Kode	Nama Barang	Jumlah	Keterangan
2026-07-06	ADM-001	Buku Agenda	5	Kebutuhan Administrasi
2026-07-05	ELK-001	Laptop Lenovo Thinkpad	1	Pengadaan perangkat kerja

Figure 4 Incoming Transaction Module

The incoming transaction module provides a form for recording newly received inventory along with relevant transaction information. The recorded incoming quantity is used to update the available stock of the corresponding inventory item. This enables newly received items to be directly reflected in the inventory records without requiring users to manually recalculate the stock.

Barang Keluar
Pencatatan transaksi barang keluar

Kode Barang: ADM-001 - Buku Agenda
Kategori: Arsip dan Dokumen
Nama Barang: Buku Agenda
Tempat: Ruang Sekretaris
Kondisi: Baik
Jumlah Keluar:
Tanggal: dd/mm/yyyy
Diambil Oleh: Contoh: Bapak Ahmad
Keperluan: Contoh: Rapat Desa
Keterangan: Contoh: Dipinjam untuk kegiatan rapat desa

Riwayat Barang Keluar

Tanggal	Kode Barang	Nama Barang	Jumlah	Diambil Oleh	Keperluan	Keterangan
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Figure 5 Outgoing Transactions Module

The outgoing transaction module is used to record inventory distributed or removed from storage. In addition to the quantity of items issued, the module records supporting information such as the recipient, purpose, and additional remarks. The outgoing quantity is automatically deducted from the corresponding inventory stock, allowing village officials to monitor the remaining stock based on the transactions recorded in the system. This automated stock adjustment helps minimize administrative errors that may occur when inventory movements are calculated manually.

Inventory Monitoring

In addition to inventory recording, effective inventory management requires continuous monitoring of item conditions and transaction history. SIPACAR supports this requirement through the inventory detail module, which presents comprehensive information for each inventory item in a single interface. The module provides information related to inventory identity, category, storage location, current condition, and available stock, as well as the transaction history associated with the item. By integrating these types of information, the system allows village officials to review the current status of an inventory item and trace changes in its stock over time. **Figure 6** presents the inventory detail and transaction history module implemented in SIPACAR.

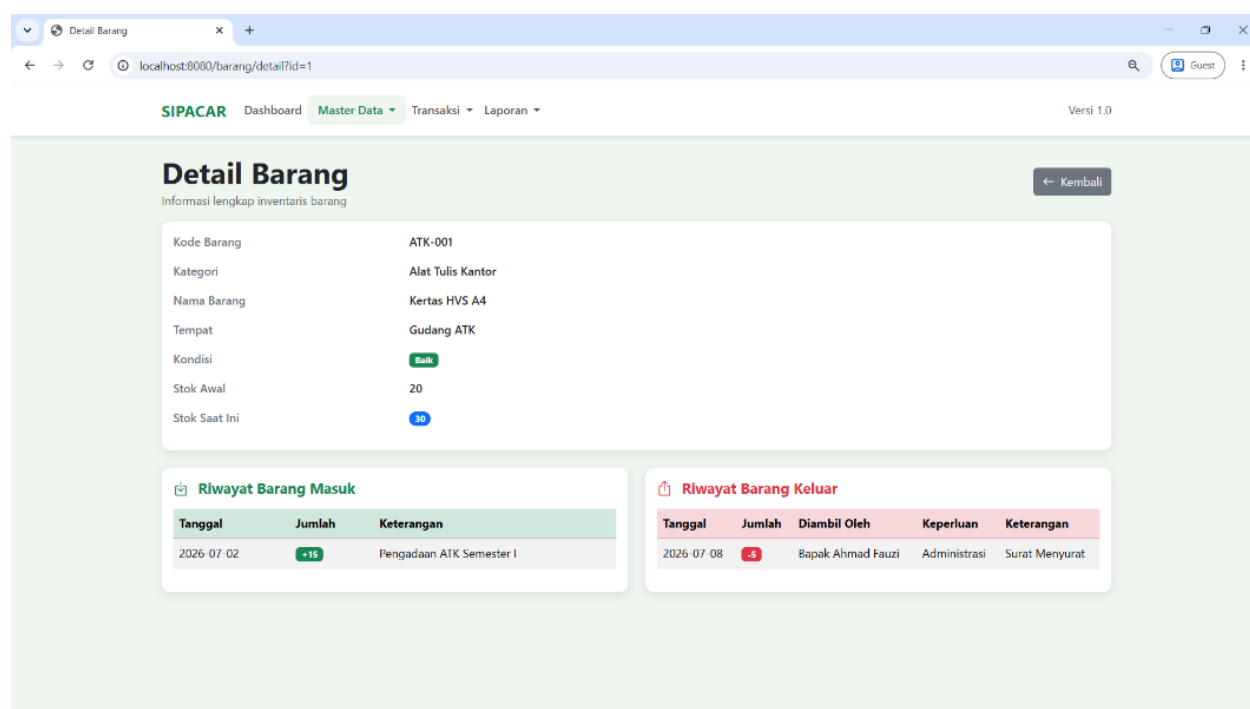


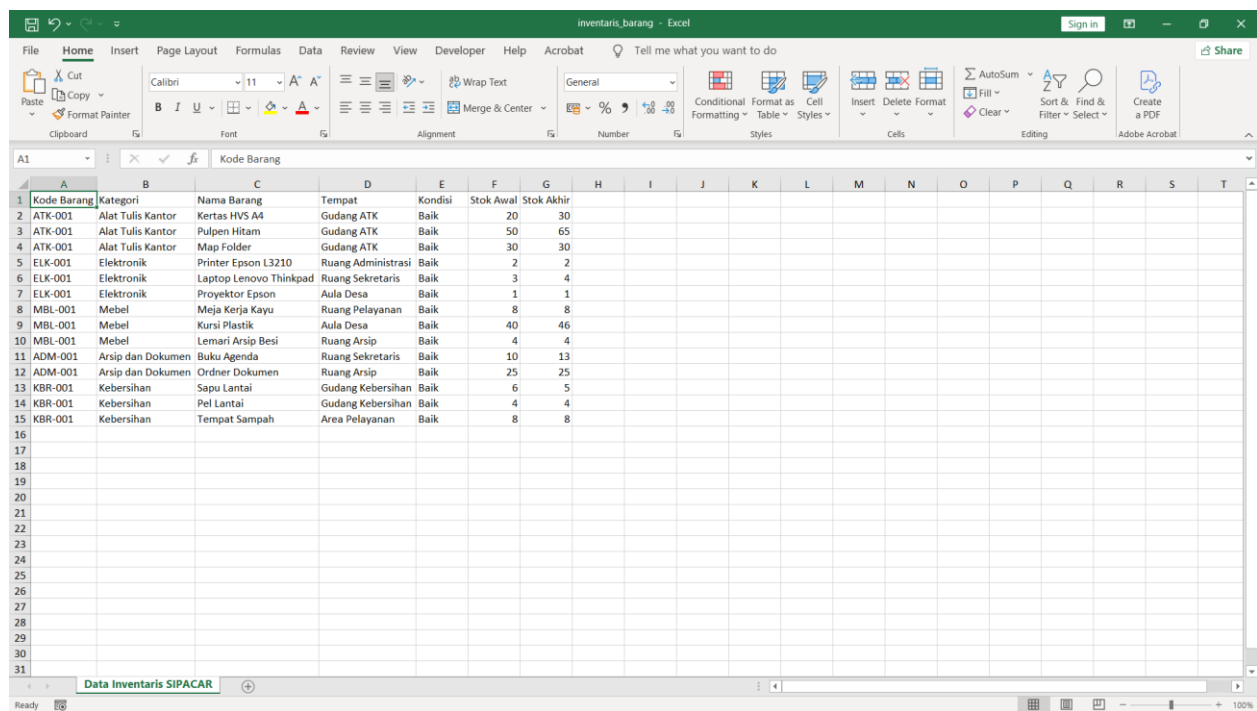
Figure 6 Inventory Detail and Transaction History

The inventory detail module displays the information of a selected inventory item together with its incoming and outgoing transaction history. This allows users to identify the changes in inventory quantity and review the transactions associated with a particular item. The availability of detailed inventory information and transaction history

in a single interface facilitates inventory monitoring and supports more transparent and systematic inventory administration.

Inventory Reporting

Another challenge identified during the manual inventory management process was the preparation of inventory reports, which required considerable time because inventory data had to be compiled manually. To improve administrative efficiency, SIPACAR provides an export feature that generates inventory reports in Microsoft Excel format. The feature allows users to generate reports directly from the inventory data stored in the system without having to re-enter or compile the information manually. The generated report contains relevant inventory information, including item identification, category, stock information, and inventory condition. **Figure 7** presents the inventory report export feature implemented in SIPACAR.



Kode Barang	Kategori	Nama Barang	Tempat	Kondisi	Stok Awal	Stok Akhir
ATK-001	Alat Tulis Kantor	Kertas HVS A4	Gudang ATK	Baik	20	30
ATK-001	Alat Tulis Kantor	Pulpen Hitam	Gudang ATK	Baik	50	65
ATK-001	Alat Tulis Kantor	Map Folder	Gudang ATK	Baik	30	30
ELK-001	Elektronik	Printer Epson L3210	Ruang Administrasi	Baik	2	2
ELK-001	Elektronik	Laptop Lenovo Thinkpad	Ruang Sekretaris	Baik	3	4
ELK-001	Elektronik	Proyektor Epson	Aula Desa	Baik	1	1
MBL-001	Mebel	Meja Kerja Kayu	Ruang Pelayanan	Baik	8	8
MBL-001	Mebel	Kursi Plastik	Aula Desa	Baik	40	46
MBL-001	Mebel	Lemari Arsip Besi	Ruang Arsip	Baik	4	4
ADM-001	Arsip dan Dokumen	Buku Agenda	Ruang Sekretaris	Baik	10	13
ADM-001	Arsip dan Dokumen	Ordner Dokumen	Ruang Arsip	Baik	25	25
KBR-001	Kebersihan	Sapu Lantai	Gudang Kebersihan	Baik	6	5
KBR-001	Kebersihan	Pel Lantai	Gudang Kebersihan	Baik	4	4
KBR-001	Kebersihan	Tempat Sampah	Area Pelayanan	Baik	8	8

Figure 7 Inventory Report Export

The inventory report export feature allows users to download the available inventory data in a structured Microsoft Excel format. The exported report can be used for inventory documentation, data review, and preparation of administrative reports required by the village office. By providing the report directly from the system, this feature reduces repetitive data entry and helps maintain consistency between the inventory records stored in SIPACAR and the generated administrative reports.

CONCLUSION

This study examined inventory management practices at the Carangrejo Village Office and identified several challenges associated with manual inventory administration, including data duplication, reporting delays, limited accessibility of inventory information, and difficulties in monitoring inventory conditions and stock availability.

To address these challenges, SIPACAR (Sistem Informasi Pengelolaan Inventaris Carangrejo) was developed and implemented as a web-based inventory management information system. The implementation results demonstrate that the system supports centralized inventory data management, transaction recording, inventory monitoring, and report generation within a single platform. These capabilities contribute to improved data consistency, more efficient administrative processes, enhanced information accessibility, and greater transparency in inventory management.

Overall, the findings indicate that the implementation of SIPACAR provides an effective approach to supporting inventory governance at the village level. Future work may include the development of additional features such as user authentication, role-based access control, graphical inventory analytics, and integration with other village administrative information systems to further enhance inventory management services.

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