



Design of A Web-Based Marketing Data Information System to Improve Product Marketing Efficiency at CV San Amerta Romoro

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Abstract

Effective marketing activities require centralized, structured, accurate, and accessible information. CV San Amerta Romoro previously managed government institution data, vendor information, product data, Inaproc links, company profiles, and brochures through separate files and storage media, creating difficulties in data retrieval, updating, and information consistency. This study aimed to design a web-based marketing data information system to improve the efficiency of internal marketing information management. Data were collected through observation, interviews, and literature review, while the existing system was analyzed using the PIECES framework. System requirements were modeled using Unified Modeling Language, including Use Case, Activity, Sequence, and Class Diagrams. The system was implemented using Laravel, Filament, and Fortify, with role-based access for Admin and User/Sales. The proposed system integrates marketing data, document management, requests, and notifications within a centralized portal. Black Box Testing was conducted on authentication, data access, data management, request processing, notifications, and access control functions. The testing involved 19 functional scenarios, and all scenarios produced results consistent with the expected outputs. The system provides a structured platform for improving marketing data accessibility, retrieval efficiency, data control, and internal information management at CV San Amerta Romoro.

Keywords : Marketing Information System, Web-Based System, Marketing Data, PIECES, Inaproc.



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INTRODUCTION

Digital transformation has changed the way organizations manage information, including marketing activities and government procurement processes. Information systems function as infrastructure that connects people, procedures, technology, data, and networks to produce information for operational activities and decision-making (Asriani, Amir, & Kadir, 2024). These developments have increased organizational requirements for structured, updatable, and accessible data based on user authority. Kurniawanto and Hanafiah (2023) position marketing information systems as important instruments for managing product, promotional, sales, and marketing-environment information within digital business conditions.

The digitalization of government procurement in Indonesia has also increased the need for information readiness among suppliers of goods and services. Presidential Regulation of the Republic of Indonesia Number 12 of 2021 strengthens the use of electronic systems in government procurement, while Presidential Regulation of the Republic of Indonesia Number 17 of 2023 emphasizes the acceleration of digital transformation in government procurement. These regulatory and procedural changes require information concerning products, vendors, government institutions, and supporting marketing documents to be managed systematically. Haryanto and Azizah (2023) explain that the development of digital marketing requires organizations to adapt information management to technology-based interaction patterns and changing user needs.

Marketing data management is directly associated with an organization's ability to provide accurate and timely information to prospective customers. Anom and Ali (2023) explain that marketing information systems utilize databases and software to support marketing strategies through the

collection, processing, storage, and distribution of information. Data distributed across different files, devices, or storage media can increase retrieval time and create the possibility of inconsistent information versions. The need for organized databases is also relevant because database management systems constitute a fundamental component of organizational information storage and management (Akhtar, 2023).

CV San Amerta Romora is a company that supplies products for government institutions and requires marketing information that can be accessed by employees, particularly the sales team. The information used in these activities includes government institution data, vendor data, product data, Inaproc product links, company profiles, and brochures. Initial conditions indicate that some of this information is still stored separately on individual devices or within documents managed by different employees. Such conditions may prolong information retrieval, increase dependence on individual data holders, and prevent updated information from being distributed consistently among users.

The need for a centralized information system is also related to the development of web-based marketing catalogs and information management. Berutu and Syah (2024) demonstrate that web-based marketing information systems can be used to manage product information and support marketing activities through digital media. A website provides an access platform that can integrate data and documents into an information structure that is easier for users to operate. For CV San Amerta Romora, this approach can be directed toward the development of an internal portal that provides integrated marketing information without transforming the system into a procurement transaction platform.

Information system design requires a systematic requirements identification process to ensure that developed functions correspond to operational conditions and user needs. Franch et al. (2022) emphasize the importance of requirements engineering practices in identifying organizational requirements and translating them into software development processes. Analysis of the existing system needs to address the processes of collecting, storing, retrieving, updating, and utilizing marketing data by users. An analytical approach such as PIECES can be applied to examine performance, information, economics, control and security, efficiency, and service within an existing system, as demonstrated in the information system evaluation conducted by Aruperes and Hartomo (2025).

Vendor information management represents an important requirement because vendor data supports partner identification and the provision of information for marketing activities. Komalasari et al. (2025) demonstrate that a vendor data management application can improve information organization and provide more controlled data access. A similar concept can be implemented at CV San Amerta Romora by integrating vendor data with government institution data, products, marketing documents, and Inaproc links within a single database. This structure enables employees to access a more consistent information source when preparing communication, product presentations, and marketing activities for prospective clients.

Based on these conditions, this study focuses on designing a web-based marketing data information system to support information management efficiency at CV San Amerta Romora. The system is designed to centralize government institution data, vendor data, products and Inaproc links, company profiles, and brochures within an internal portal with differentiated access rights for Admin and User/Sales. The design covers system requirements analysis, process modeling using Unified Modeling Language, database and interface design, and functional testing using Black Box Testing. The expected outcome is a system design that can accelerate information retrieval, improve data management organization, and provide more effective information support for the company's marketing activities.

RESEARCH METHODS

This study employed a qualitative descriptive approach focused on the analysis and design of a web-based marketing data information system at CV San Amerta Romora. Data were collected through direct observation, interviews with relevant employees, and literature review. Observation was conducted to identify the existing procedures for collecting, storing, retrieving, updating, and utilizing marketing data, while interviews were used to identify user requirements, operational constraints, and system expectations. The collected data covered government institution contacts, vendor information, product data, Inaproc links, company profiles, brochures, users, and data requests. The existing system was analyzed using the PIECES framework, covering Performance, Information, Economics, Control

and Security, Efficiency, and Service, to identify operational problems and determine functional requirements for the proposed system.

The system design was developed using the System Development Life Cycle approach through requirements analysis, system modeling, database design, interface design, implementation planning, and functional testing. Unified Modeling Language (UML) was used to represent system requirements and processes through Use Case Diagram, Activity Diagram, Sequence Diagram, and Class Diagram. The proposed system was designed using Laravel as the main framework, Filament for data management, and Fortify for user authentication and email verification, with two primary access roles consisting of Admin and User/Sales. The system design integrates government institution data, vendor data, product and Inaproc links, company profiles, brochures, requests, and notifications within a centralized web-based platform. Black Box Testing was applied to examine login, authentication, data management, searching, document access, request processing, notifications, and role-based access functions by comparing expected outputs with actual system responses.

RESULTS AND DISCUSSION

Analysis of the Existing Marketing Data Management System

The analysis identified that marketing information at CV San Amerta Romora was distributed across separate files, personal devices, and communication channels used by employees. The available information consisted of government institution contacts, vendor data, product information, Inaproc links, company profiles, and brochures, with no centralized repository connecting these data elements. Kusumo and Saepudin (2023) state that fragmented information management can create limitations in data retrieval and operational coordination within organizational systems. The existing condition was assessed through the PIECES framework to establish measurable problem areas related to the performance and quality of information management.

Table 1. Existing Marketing Data Management Conditions

Data Component	Existing Storage Condition	Main Problem	Operational Impact
Government Institution Data	Separate files and employee records	Data is not centralized	Contact retrieval requires additional time
Vendor Data	Individual files or documents	Different storage locations	Difficult to identify the latest data
Product Data	Separate product files	Inconsistent organization	Product information requires manual searching
Inaproc Links	External links and separate records	Links are not integrated	Sales personnel spend additional time locating products
Company Profile	Digital document	Stored separately from other data	Repeated document retrieval is required
Brochures	Separate folders/files	Categorization is limited	Marketing materials are difficult to locate quickly

The existing storage pattern indicates a structural separation between data sources that are frequently used within the same marketing activity. Widarti et al. (2024) explain that an information system requires coordinated interaction among data, procedures, people, technology, and networks to produce usable information. The condition observed at the research site shows that the absence of an integrated repository affects the continuity of information access, particularly when employees require several data categories simultaneously.

Table 2. PIECES-Based Identification of Existing System Problems

PIECES Aspect	Existing Condition	Identified Problem	Required Improvement
Performance	Data retrieval depends on manual searching	Retrieval process is relatively slow	Centralized search and structured menus
Information	Data is distributed across different files	Risk of inconsistent information	Centralized and regularly updated database
Economics	Employee time is spent locating files	Operational time is less efficient	Reduce repetitive manual retrieval
Control and Security	Files are managed through different storage media	Access control is not centralized	Role-based authentication and authorization
Efficiency	Similar data may be stored repeatedly	Duplicate storage and processing	Integrated master data
Service	Data availability depends on the data holder	User access is less consistent	Internal web-based information portal

The PIECES assessment demonstrates that the primary deficiencies concern data accessibility, information consistency, control, and retrieval efficiency. Pratiwi et al. (2021) describe PIECES as an analytical framework for identifying weaknesses in information systems through performance, information, economics, control, efficiency, and service dimensions, while Aruperes and Hartomo (2025) apply the framework to evaluate operational information system conditions. The findings are also consistent with Petrik, Untermann, and Baars (2024), who emphasize functional requirements for enterprise data catalogs related to data discovery, accessibility, and organization. These findings establish the requirement for a centralized information structure that allows authorized employees to locate and use marketing data without depending on individual storage locations.

The existing system also demonstrates a requirement for structured vendor and marketing information management because vendor records constitute a recurring information resource for business activities. Sawitri, Raharso, and Novalia (2025) demonstrate the application of a vendor database system to organize supplier information within an operational division, while Komalasari et al. (2025) show that vendor management applications can support more systematic data administration. The proposed information structure at CV San Amerta Romora therefore places vendor data alongside institution contacts, products, Inaproc links, brochures, and company profile documents within a unified web-based repository. Similar web-based marketing information system designs reported by Kusumasari, Haryanto, and Ihsan (2024), Laia, Waruwu, and Telaumbanua (2023), and Saputra et al. (2023) indicate the relevance of centralized web platforms for organizing marketing information and supporting user access.

The proposed structure requires clear separation between data management functions and data consumption functions so that users receive appropriate information without unrestricted modification authority. Kusyadi, Ardiansyah, and Al Islami (2021) describe system analysis and design as processes for identifying system components, relationships, deficiencies, and requirements before implementation. Palomares et al. (2021) further identify requirements elicitation as an important activity for aligning system development with actual organizational needs, while Franch et al. (2022) emphasize the role of requirements engineering practices in software development. The resulting requirement is a web-based internal portal with role-based access, structured data categories, controlled administration, and functions for requesting additional marketing information.

The technical direction of the proposed system is also supported by previous research on web-based information systems and database applications. Riski, Ridha, and Usman (2026) developed a web-based marketing information system that integrated product information and structured data management, while Sahar (2024) demonstrated the use of website-based systems for organizing service information. Permana et al. (2024) identify data, software, hardware, networks, procedures, and human resources as interconnected components of an information system, and Taipalus (2024) highlights the importance of database management performance in information system implementation. The proposed

system at CV San Amerta Romora adopts these principles by positioning a centralized database as the primary repository for marketing information, supported by web access, user authentication, administrative procedures, and controlled data management.

Design of the Proposed Web-Based Marketing Information System

The proposed system was designed as an internal web-based portal that integrates marketing data previously maintained in separate storage locations. The main data entities consist of government institution contacts, vendor contacts, product and Inaproc links, company profiles, brochures, users, requests, and notifications. Riski et al. (2026) demonstrate that web-based marketing information systems can provide structured data management and facilitate access to marketing information through an integrated platform. The system design at CV San Amerta Romora adapts this principle to the operational requirements of employees who require rapid access to marketing information.

Table 3. Main Data Components of the Proposed System

Data Component	Main Attributes	Primary User	Main Function
Company Profile	Title, description, document	User, Admin	Access and manage company information
Brochure	Category, file, description	User, Admin	Provide marketing materials
Contact Office	Institution, contact person, position, region, phone	User, Admin	Facilitate institution contact retrieval
Contact Vendor	Vendor name, contact person, category, phone	User, Admin	Provide vendor information
Link Inaproc	Product name, category, URL	User, Admin	Provide access to product information
User	Name, email, role, profile	User, Admin	Manage system accounts
Request	User, request content, status	User, Admin	Record additional data requirements
Notification	User, request, status, message	User, Admin	Inform request status

The system architecture separates general information access from administrative data management through differentiated user roles. User/Sales accounts are intended to retrieve marketing information, access documents, submit data requests, and monitor request status, whereas Admin accounts manage master data and process submitted requests. Laia et al. (2023) emphasize the importance of aligning web-based marketing system functions with organizational marketing activities, while Saputra et al. (2023) apply system design to translate marketing requirements into functional information services. The role separation also provides a control mechanism for preventing unauthorized modification of marketing data.

Table 4. Role-Based Access Structure

System Function	User/Sales	Admin
Registration and Login	✓	✓
Email Verification	✓	✓
View Company Profile	✓	✓
View and Download Brochure	✓	✓
View Government Institution Contacts	✓	✓
View Vendor Contacts	✓	✓
View Inaproc Product Links	✓	✓
Submit Data Request	✓	✓
View Personal Request Status	✓	✓

View All User Requests	—	✓
Approve or Reject Request	—	✓
Manage Users and Roles	—	✓
Manage Company Profile	—	✓
Manage Brochures	—	✓
Manage Institution Contacts	—	✓
Manage Vendor Contacts	—	✓
Manage Inaproc Links	—	✓

The UML design translates the identified requirements into structured relationships among actors, processes, and data objects. The Use Case Diagram identifies User and Admin as the principal actors, while the Activity Diagram represents authentication, data access, request submission, and administrative approval processes. Kusyadi et al. (2021) explain that system design uses structured modeling to represent system functions and relationships before implementation, and Permana et al. (2024) emphasize the relationship between system components in producing integrated information services. The Class Diagram further establishes relationships among CompanyProfile, Brosur, ContactOffice, ContactVendor, LinkInaproc, User, Request, and Notification, with the User–Request relationship represented through the user_id attribute.

Table 5. UML Model and Functional Representation

UML Model	Main Elements	Functional Representation
Use Case Diagram	User, Admin, system functions	Defines actor interaction with system functions
Activity Diagram	Authentication, dashboard, data access, request	Represents operational workflow
Sequence Diagram	User, Admin, system, database	Represents interaction sequence between components
Class Diagram	User, Request, Notification, master data classes	Represents data structure and relationships
Database Design	Tables and relational attributes	Stores and connects system information
Interface Design	Login, dashboard, master data, request	Provides user interaction with system

The interface design emphasizes direct access to frequently used marketing information through structured menus and pages. Company profile and brochure pages provide access to documents, ContactOffice provides searchable institution information, while request and notification pages support controlled communication between User and Admin. Sahar (2024) identifies web interfaces as an effective medium for organizing and presenting service information, while Kusumasari et al. (2024) demonstrate the application of web-based systems for organizing marketing information. The proposed interface therefore positions information retrieval, document access, and request management as primary functions rather than transaction processing.

Table 6. Proposed Interface and Operational Function

Interface	User/Sales Function	Admin Function
Login	Authenticate account	Authenticate account
Dashboard	Access available information	Monitor system activities
Company Profile	View/download document	Add, edit, delete document
Brochure	View/download brochure	Add, edit, delete brochure
Contact Office	Search institution contact	Add, edit, delete contact
Contact Vendor	Search vendor information	Add, edit, delete contact

Inaproc	Access product links	Add, edit, delete product links
Request	Submit and monitor request	Review and process request
Notification	View request status	Generate status notification
Settings	Update profile and avatar	Update profile and account data

System Implementation and Functional Testing

The proposed system was implemented as a web-based internal marketing data management platform using Laravel as the application framework, Filament as the administrative interface, and Fortify for authentication and email verification. The implementation integrates government institution contacts, vendor information, product data, Inaproc links, company profile documents, brochures, requests, and notifications into a centralized application environment. Riski et al. (2026) reported that web-based marketing information systems can improve the organization and accessibility of marketing data through structured digital management. The implementation at CV San Amerta Romora applies a comparable structure while emphasizing internal information retrieval and controlled access rather than direct procurement transactions.

Table 7. System Technology and Implementation Components

Component	Technology	Implementation Function
Application Framework	Laravel	Handles application logic, routing, and system structure
Administrative Panel	Filament	Provides data management interface for Admin
Authentication	Laravel Fortify	Handles login, registration, and authentication
Email Verification	Fortify	Verifies registered user accounts
Database	Relational Database	Stores structured marketing and user data
Web Browser	Chrome, Edge, Firefox, or equivalent	Provides system access
User Interface	Web-based Interface	Presents information and system functions
Access Control	Role-Based Access	Separates User/Sales and Admin privileges

The implementation applies centralized database management to reduce dependence on individual files and storage locations. Each major information category is represented as a structured data resource, allowing Admin users to create, update, delete, and maintain records through the management interface. Taipalus (2024) identifies database performance and organization as important considerations in information system implementation, while Petrik et al. (2024) emphasize structured data discovery and accessibility within enterprise data environments. The resulting database structure supports consistent access to marketing information and provides a foundation for future expansion of search, filtering, and reporting functions.

Table 8. Database Resource Implementation

Resource	Stored Information	Administrative Operation
CompanyProfile	Company identity and profile documents	Create, read, update, delete
Brosur	Brochure files and categories	Create, read, update, delete
ContactOffice	Institution and contact information	Create, read, update, delete
ContactVendor	Vendor and contact information	Create, read, update, delete
LinkInaproc	Product names, categories, and URLs	Create, read, update, delete
User	Account, email, and role information	Create, read, update, delete
Request	User requests and processing status	Read, update, process

Notification	Request status information	Create, read, manage
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The authentication mechanism establishes an access boundary between authorized employees and the internal marketing database. Users are required to register or log in, complete email verification, and access functions according to their assigned role, while Admin users receive additional privileges for data management and request processing. PT Indonesia Asahan Aluminium (2022) presents vendor management systems as structured environments requiring controlled registration and information management, while Permana et al. (2024) identifies users and procedures as essential components of information systems. The implementation of role-based access at CV San Amerta Romora therefore supports both operational accessibility and control over sensitive internal information.

Table 9. Authentication and Access Control Testing

Test Function	Input/Condition	Expected Result	Status
Registration	Valid user information	Account is created	Passed
Registration	Incomplete/invalid information	Validation message appears	Passed
Login	Valid email and password	User enters system	Passed
Login	Invalid credentials	Access is rejected	Passed
Email Verification	Valid verification process	Account becomes verified	Passed
User Access	User role selected	User functions are displayed	Passed
Admin Access	Admin role selected	Administrative functions are displayed	Passed
Restricted Access	User attempts Admin function	Access is denied	Passed
Logout	Logout command selected	Session is terminated	Passed

Black Box Testing was applied to evaluate the functional behavior of the implemented system without examining the internal source code. The testing focused on whether system inputs produced outputs consistent with the specified requirements, including authentication, data management, document access, request processing, notifications, and role-based authorization. Sawitri et al. (2025) applied functional testing to a vendor database application, while Sahar (2024) used web-based system development to provide structured information services. The testing approach is appropriate for verifying whether the proposed system performs its externally observable functions according to the defined operational requirements.

Table 10. Black Box Testing of Core System Functions

Test Function	Test Scenario	Expected Output	Result
Company Profile	User opens company profile	Profile document is displayed	Passed
Brochure	User selects brochure	Brochure is displayed/downloaded	Passed
Contact Office	User searches institution data	Relevant contact data is displayed	Passed
Contact Vendor	User opens vendor data	Vendor information is displayed	Passed
Inaproc Link	User selects product link	Inaproc destination is accessible	Passed
Add Data	Admin submits valid data	New record is stored	Passed
Edit Data	Admin modifies existing record	Updated data is stored	Passed

Delete Data	Admin deletes selected record	Record is removed	Passed
Submit Request	User submits valid request	Request status becomes pending	Passed
Approve Request	Admin approves request	Status changes to approved	Passed
Reject Request	Admin rejects request	Status changes to rejected	Passed
Notification	Request status changes	User receives status notification	Passed

The testing results indicate that the principal functions of the proposed system operate according to the defined requirements. The centralized data structure enables users to retrieve marketing information through designated pages, while Admin users can maintain master data and process requests through the administrative panel. Laia et al. (2023) and Saputra et al. (2023) emphasize the role of web-based information systems in supporting structured marketing activities and improving information accessibility. The implementation and testing results indicate that the proposed system provides an operational basis for reducing manual information retrieval and improving the organization of marketing data at CV San Amerta Romora.

Table 11. Functional Testing Summary

Functional Category	Number of Tested Functions	Passed	Failed	Interpretation
Authentication	5	5	0	Authentication functions operate correctly
Marketing Data Access	5	5	0	Marketing information can be accessed
Data Management	3	3	0	Admin data operations operate correctly
Request Management	3	3	0	Request workflow operates correctly
Notification	1	1	0	Status notification operates correctly
Access Control	2	2	0	Role restrictions operate correctly
Total	19	19	0	All tested functions passed

The functional testing produced 19 tested functions, with all tested functions recorded as passed and no functional failure identified during the test scenarios. The result indicates that the implemented functions are consistent with the requirements established during system analysis and design. Kusyadi et al. (2021) state that system testing provides a basis for determining whether designed functions correspond to specified requirements, while Palomares et al. (2021) emphasize the importance of accurate requirements identification in producing systems that respond to organizational needs. The proposed system therefore provides a functional internal platform for centralized marketing data management, although further evaluation through user acceptance testing can be conducted to measure usability and user satisfaction under routine operational conditions.

CONCLUSION

The research resulted in the design and implementation of a web-based marketing data information system for CV San Amerta Romora. The system centralizes government institution contacts, vendor information, product data, Inaproc links, company profile documents, brochures, requests, and notifications within a single internal platform. The system applies role-based access between User/Sales and Admin, allowing User/Sales to retrieve marketing information and submit data requests, while Admin manages master data, users, and request approval. The implementation of

Laravel, Filament, and Fortify provides an integrated technical structure for application management, administrative data processing, and authentication. PIECES analysis identified weaknesses in performance, information management, control, efficiency, and service within the existing system, supporting the requirement for centralized digital data management. Black Box Testing showed that 19 tested functions operated according to the defined requirements, with 19 functions passing and no failed test cases.

The proposed system provides a structured mechanism for improving the accessibility, consistency, and management of marketing information at CV San Amerta Romora. Centralized storage reduces dependence on separate files and individual data holders, while role-based authorization limits administrative operations to authorized users. The request and notification features also provide a documented mechanism for submitting and monitoring additional data requirements. The system is designed as an internal marketing information platform and does not replace procurement transaction systems or Inaproc itself. Further development may include advanced search and filtering, audit logs, broader reporting functions, and User Acceptance Testing to evaluate usability and user acceptance during operational implementation.

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