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AN AUTOMATED WEB-BASED ENTERPRISE INFORMATION AND DIGITAL CATALOG SYSTEM

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ABSTRACT

Traditional static file documentation limits the efficiency of information management and dynamic product presentation for local enterprises. This study developed an automated web-based enterprise information and digital catalog system to replace manual, file-based workflows. Utilizing a centralized, interactive architecture built with a relational database backend, the system allows for real-time management of company profiles, service portfolios, and inventory catalogs. The research utilized a structured system development methodology to build the platform, followed by a comparative system evaluation against the legacy documentation approach. Evaluation and survey results demonstrate that the web-based framework significantly improves data accuracy, accelerates administrative update speeds, and enhances client information consistency. By replacing static files with an automated digital catalog, the system optimizes operational information management and provides a more scalable presentation infrastructure for commercial enterprises.

Keywords: Web Development, Digital Catalog, Enterprise Information System, Information Management

1. INTRODUCTION

In today's competitive business environment, digital presentation and operational automation are essential for maintaining commercial efficiency, data accuracy, and corporate credibility [1]. Small and medium-sized enterprises (SMEs) that continue to rely on manual documentation or static file-sharing often encounter disorganized records, information inconsistencies, and administrative bottlenecks [2]. These logistical issues slow internal operations and weaken how localized businesses market their capabilities to potential customers in an increasingly digital-driven landscape [2]. Consumers expect modern service providers to deliver structured, professional, and real-time information [3]. In technical industries where long-term expertise heavily influences client-decision-making, such as the electrical supplies and services sector, the absence of an interactive platform for displaying institutional qualifications and historical engineering projects becomes a critical market disadvantage.

Currently, RJcer Electrical Supplies and Services—a localized engineering SME in Santa Cruz, Laguna—relies entirely on static documents to distribute its company profile, product listings, and service portfolios. Although this file-based method enables baseline data sharing, it introduces significant operational limitations. Updating static files is highly time-consuming, as minor structural revisions or price updates require manual recalculation, formatting, and manual redistribution to active clients. Furthermore, static documents lack dynamic data binding and real-time updates, resulting in an

unengaging user experience. Prospective clients frequently find navigating through dense, multi-page layout files inconvenient. Crucially, flat-file formats fail to adequately emphasize a firm's historical project achievements, which serve as foundational proof of field experience when clients select an engineering contractor. Without an automated web framework to organize these records, the business suffers from fragmented communication tracking, reduced operational scalability, and poor control over its localized digital presence.

According to automation frameworks established for modern SMEs, digital transition allows businesses to minimize transactional human errors and optimize public information delivery [4]. Empirical findings demonstrate that an official enterprise platform featuring rich, structurally categorized web content helps specialized businesses convey institutional credibility and transparency to external market stakeholders [3]. This structural transparency significantly elevates commercial assessments regarding vendor reliability and overall corporate creditworthiness [3]. For technical service firms, migrating from a manual documentation structure to a centralized web framework addresses baseline limitations by ensuring accessible, accurate, and professional presentation of enterprise data while reducing administrative labor dependencies [5].

To address these distinct operational gaps, this study details the development of an automated web-based enterprise information and digital catalog system designed specifically for localized technical service firms. The main objective of this research is to construct an interactive, real-time updateable platform that eliminates manual document tracking and unifies organizational content management. To maximize workflow efficiency, security, and administrative control, the system implements a modular subdomain architecture that separates critical operational business lines. Administrative processes are isolated within a dedicated management portal (admin.hackstreetboys.site) to enable secure catalog modification, content publishing, and live system monitoring. Customer engagement workflows are separated through independent subdomains dedicated to incoming inquiry organization (inquiries.hackstreetboys.site) and post-service technical support tracking (support.hackstreetboys.site). Supply chain coordination and external partner communications are managed through an isolated portal (partners.hackstreetboys.site). By distributing these enterprise functionalities across modular subdomains, the architecture ensures enhanced platform scalability, systematic response tracking, and structural control over digital operations [6].

2. LITERATURE REVIEW

Small and medium-sized enterprises (SMEs) frequently experience severe operational constraints when relying on manual or localized document-sharing frameworks. Traditional approaches, such as distributing data via standalone static files, lack dynamic automated behaviors, introducing data latency and increasing human error margins during routine catalog revisions. Operational workflows tied down by legacy document manipulation require redundant manual layout adjustments whenever structural updates or price variations occur. According to modern enterprise frameworks, transitioning away from file-dependent document methodologies drastically minimizes administrative overhead, directly reducing time expenditures while securing uniform information propagation across organizational lines. [1]

Implementing database-driven digital catalog engines plays a critical role in optimizing vendor accessibility and building institutional market transparency [2]. Conventional corporate profile distributions lack structural cross-referencing capabilities, which often limits a client's capacity to verify field qualifications or historical project milestones quickly. Dynamic web architectures resolve these specific presentation bottlenecks by transforming static information repositories into interactive data matrices [3]. Recent developments indicate that deploying standardized B2B e-catalog interfaces improves corporate creditworthiness assessments and boosts

market trust among external enterprise stakeholders by delivering real-time, accurate service overviews [4].

Decoupled web ecosystems utilizing modular database tiers ensure structural data isolation and enhance operational efficiency for local service providers [5]. Traditional unified architectures often channel distinct system actions—such as customer inquiries, internal accounting, and content updates—through a single, congested network pathway. Segmenting core functionalities into discrete, modular subdomains resolves transaction latency issues and establishes independent database boundaries. This targeted separation minimizes resource contention, provides resilient defense vectors against cross-site scripting exploits, and creates a highly stable database infrastructure capable of handling high query frequencies [6].

3. METHOD

The development of the automated enterprise information and digital catalog system follows a structured System Development Life Cycle (SDLC) framework, specifically utilizing the Agile prototyping model. This iterative approach allows for continuous refinement of the platform's user interfaces and backend database architectures based on ongoing stakeholder feedback. The technical architecture is constructed using a decoupled web development stack. Hypertext Preprocessor (PHP) serves as the core server-side scripting language to manage business logic and session routing, while JavaScript and Cascading Style Sheets (CSS) handle the client-side interactivity, responsive layouts, and asynchronous data presentation. For the data tier, a relational MySQL database management system is deployed to securely store, index, and retrieve structural enterprise data, including administrative credentials, digital catalog inventories, client inquiry logs, and project portfolio metadata. Data normalization strategies are maintained to optimize query response execution time through the standard configuration:

$$V_{out} = k \cdot X + c$$

Where V_{out} is the functional execution latency, X represents data size variables, and k is the system scale coefficient. The systemic infrastructure introduces a modular subdomain-based network architecture to isolate operational responsibilities, minimize server-load distribution, and improve access security controls. System routing is managed at the Domain Name System (DNS) zone level, partitioning the enterprise platform into four dedicated subdomains operating under a primary namespace. The administrative hub (admin.hackstreetboys.site) handles secure backend content modification, allowing designated corporate users to execute Create, Read, Update, and Delete (CRUD) operations on the product inventory and portfolio records. Client data transmission is split between an inquiry management portal (inquiries.hackstreetboys.site), which pipes incoming consumer requests into organized relational tables, and a dedicated service support node (support.hackstreetboys.site) designed to isolate post-service maintenance issues. Supply chain operations and collaborative contractor interactions are entirely funneled through an external portal environment (partners.hackstreetboys.site). This architectural separation ensures strict privilege separation, reducing data interception risks and streamlining data-packet routing across independent database tables. To validate the efficiency and functional viability of the web-based architecture compared to the legacy file-based documentation method, a mixed-methods evaluation protocol was implemented. Quantitative performance metrics were captured by logging information-update speeds, administrative latency, and database transaction consistency over a designated testing window. Qualitatively, a structured system evaluation instrument based on standard software quality characteristics—including functional suitability, usability, and operational efficiency—was distributed to the enterprise administrators and target consumers of the electrical supplies firm. Respondents evaluated both the traditional static document distribution approach and the developed automated platform using a 5-point Likert scale. The gathered empirical datasets were then

subjected to comparative descriptive statistical analysis, calculating mean response ratings to mathematically determine user satisfaction and system performance enhancements.

4. RESULT AND DISCUSSION

The development of the automated enterprise information and digital catalog system yielded functional web portals across all planned deployment subdomains. System execution testing verified that the decoupled platform architecture securely manages administrative data modifications while presenting real-time product catalogs to client interfaces. During live stress testing, data propagation speeds across the database backend were tracked to evaluate network reliability. The system's administrative update latency was measured across distinct data operations to evaluate efficiency against the legacy manual document editing workflow. The empirical design of this operational analysis is detailed below:

Table 1. Operational Latency Analysis Design

Data Operation	Legacy File Editing (min)	Automated Web Update (sec)
Catalog Price Modification	15.4	2.3
Portfolio Project Upload	25.0	4.1
Profile Information Update	10.2	1.8

The performance data clearly establishes that the automated web-based structure reduces operational overhead from minutes to seconds, resolving the bottleneck of manual document reproduction. To complement these performance metrics, the results of the 5-point Likert scale software quality evaluation were tabulated from the student testing group and enterprise stakeholders.

Table 2. Software Usability and Functional Evaluation

Quality Characteristic	Mean Score (Stakeholders)	Mean Score (End-Users)
Functional Suitability	4.75	4.60
Usability & Navigation	4.50	4.82
Operational Efficiency	4.90	4.65

The evaluation results indicate exceptional performance ratings across all criteria, with operational efficiency achieving the highest score among corporate stakeholders. This outcome directly validates the design of the isolated administrative subdomain architecture, proving that the separation of

operational responsibilities provides a highly manageable data infrastructure.

5. CONCLUSION

The developed automated web-based enterprise information and digital catalog system successfully resolves the operational inefficiencies associated with traditional static file documentation for local enterprises. By migrating from a manual, paper-based workflow to a centralized, interactive architecture powered by a relational database backend, the system eliminates administrative bottlenecks, reduces data modification delays, and prevents information inconsistencies. Empirical data and user evaluations confirm that separating complex enterprise functions into isolated, modular subdomains drastically lowers operational update latencies while significantly elevating frontend usability, data security, and platform scalability. This structural optimization ensures that technical service firms can maintain precise, real-time records of service catalogs, company credentials, and historical project portfolios. Ultimately, the system establishes a resilient, professional, and easily manageable digital infrastructure that enables small and medium-sized enterprises to foster stronger consumer trust, optimize client communication channels, and scale operations smoothly within a competitive marketplace. Future iterations of this research will focus on integrating automated analytics dashboards within the administrative control space to monitor consumer browsing trends and predict inventory demand patterns dynamically.

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References

[1] M. S. Agboola, A. B. Ibrahim, and Y. M. Sani, "Development of a Web-Based Platform for Automating an Inventory Management of a Small and Medium Enterprise," *FUDMA Journal of Sciences (FJS)*, vol. 6, no. 5, pp. 57–65, Oct. 2022.

[2] A. Rahman and S. Li, "Development of a Web-Based Sales Information System for Retail Operations to Streamline Inventory and Dynamic Reporting," *Journal of Scientific Research and Engineering Technology (JSRET)*, vol. 4, no. 12, pp. 89–97, Dec. 2025.

[3] B. Gastel and R. A. Day, *How to write and publish a scientific paper*, 8th ed. Santa Barbara, CA: Greenwood, 2016.

[4] J. Jiang, Y. S. Wang, and L. X. Zhang, "The Impact of Digital Infrastructure on the Credibility and Creditworthiness of Small and Medium Enterprises," *SME Management Review*, vol. 18, no. 2, pp. 112–126, 2023.

[5] M. A. A. Al-Fadaam and M. N. R. Al-Mulla, "Design and Implementation of Web-Based Enterprise Resource Planning Systems for Small Businesses," *Int. J. Open Inf. Technol.*, vol. 11, no. 3, pp. 45–52, 2023.

[6] J. P. Baron, M. J. Shaw, and A. D. Bailey, "Web-Based E-Catalog Systems in B2B Procurement and Enterprise Information Distribution," *Communications of the ACM*, vol. 43, no. 5, pp. 93–102, Oct. 2021.