JDBIM
(Journal of Digital Business and Innovation Management)

Volume 5, Issue 1, June 2026, 262-275
ISSN 2962-3898 (Online)
DOI: 10.26740/jdbim.v5i1.77461
https://ejournal.unesa.ac.id/index.php/jdbmi/index

Digitalization of Mobile-Based Construction Material Inventory Management Using the Waterfall Model at PT Wanro Sukses Persada

Raihan Naufal Aulia[1]*, Nanang Hoesen Hidroes Abbrori[2]
[12]Department of Digital Business, Faculty of Economics, Universitas Negeri Surabaya
Jalan Ketintang, Surabaya 60231, Indonesia
raihan.22105@mhs.unesa.ac.id

Abstract

PT Wanro Sukses Persada faces constraints in construction logistics management due to a manual material recording system, which triggers various problems such as stock data inaccuracies, delayed information updates, and discrepancies between administrative records and physical conditions in the field. Therefore, this study aims to design and develop a mobile-based material stock management and monitoring application to provide real-time data and digitize the workflow. This research employs a qualitative case study method with a Software Development Life Cycle (SDLC) Waterfall model approach without the maintenance phase, where the infrastructure is built using Android Studio integrated with Firebase Realtime Database. To validate the functionality of the developed system, this study applies Black-Box Testing, focusing on testing the alignment between the software's input and output. This research produced a mobile application named "Wanro Stock App" that facilitates operational activities among management, warehouse teams, and field supervisors through features such as stock availability notifications and material request and return mechanisms. Based on the functional testing results, the developed application is capable of executing operational scenarios in accordance with the initial design, such as processing synchronous stock updates during transactions, rejecting illogical data inputs, and executing automated approval workflows. This functional alignment confirms that the Wanro Stock App has met the software's functional feasibility for implementation, making it a potential digital solution to replace the manual logistics recording method within the company.

Keywords: Black-Box Testing; Mobile Application; SDLC Waterfall; Stock Management; Stock Monitoring.

To cite this document:
Aulia, Raihan Naufal. (2026). Digitalization of Mobile-Based Construction Material Inventory Management Using the Waterfall Model at PT Wanro Sukses Persada *JDBIM (Journal of Digital Business and Innovation Management*, *Vol 5, No.1*, 262-275. DOI: 10.26740/jdbim.v5i1.77461

Received: 4 May 2026; Accepted: 29 June 2026; Published: 30June 2026

*Corresponding author
Email: raihan.22105@mhs.unesa.ac.id

Abstrak

PT Wanro Sukses Persada menghadapi kendala dalam manajemen logistik konstruksi akibat sistem pencatatan material yang masih manual, sehingga memicu berbagai masalah seperti ketidakakuratan data stok, keterlambatan pembaruan informasi, serta terjadinya selisih antara catatan administratif dengan kondisi fisik di lapangan. Oleh karena itu, penelitian ini bertujuan untuk merancang dan mengembangkan aplikasi pengelolaan dan pemantauan stok material berbasis mobile guna menyediakan data secara real-time serta mendigitalisasi alur kerja. Penelitian ini menggunakan metode studi kasus kualitatif dengan pendekatan Software Development Life Cycle (SDLC) model Waterfall tanpa tahapan pemeliharaan, di mana infrastrukturnya dibangun melalui Android Studio yang terintegrasi dengan Firebase Realtime Database. Untuk memvalidasi fungsionalitas sistem yang telah dibangun tersebut, penelitian ini menerapkan pengujian Black-Box Testing yang berfokus pada pengujian kesesuaian antara input dan output perangkat lunak. Penelitian ini menghasilkan aplikasi mobile bernama "Wanro Stock App" yang memfasilitasi aktivitas operasional antara pihak manajemen, tim gudang, dan pengawas lapangan melalui fitur-fitur seperti notifikasi ketersediaan stok serta mekanisme pengajuan permintaan dan retur material. Berdasarkan hasil pengujian fungsionalitas tersebut, aplikasi yang dikembangkan mampu menjalankan skenario operasional sesuai dengan rancangan awal, seperti memproses pembaruan angka stok secara sinkron saat terjadi transaksi, menolak input data yang tidak logis, serta menjalankan alur persetujuan secara otomatis. Kesesuaian fungsi ini menegaskan bahwa Wanro Stock App telah memenuhi kelayakan fungsional perangkat lunak untuk diimplementasikan, menjadikannya potensial sebagai solusi digital guna menggantikan metode pencatatan logistik manual di perusahaan.

Kata kunci: Aplikasi Mobile; Black-Box Testing; Pemantauan Stok: Pengelolaan Stok; SDLC Waterfall.

INTRODUCTION

The construction sector in Indonesia demonstrates fluctuating growth dynamics but is simultaneously accompanied by physical development intensity that continues to expand in the field, where the Gross Domestic Product (GDP) report from Badan Pusat Statistik notes that the year-on-year economic growth of this sector in the second quarter moved from 1.02% in 2022, surged to reach 7.29% in 2024, before finally moderating at the level of 4.98% in 2025 (Badan Pusat Statistik, 2022, 2023, 2024, 2025). Interestingly, amidst the fluctuations in macroeconomic percentages, the absorption of the operational workforce has actually experienced a highly consistent upward trend, as evidenced by the National Labor Force

JDBIM (Journal of Digital Business and Innovation Management)
Volume 5 Issue 1, June 2026
E-ISSN 2692-3898
Page 262-275

Situation Data which recorded a significant growth in the worker population in this sector from 8.48 million people in August 2022 to 9.54 million people in August 2025 (Badan Pusat Statistik, 2025). This continuous workforce escalation trend directly confirms that the operational volume of construction projects, especially in the housing subsector, is becoming increasingly dense and complex, thus absolutely demanding a material stock management and monitoring system that is far more precise, transparent, and measurable in the field.

In this labor-intensive industry, the material cost component heavily dominates the financing structure as it can absorb up to 60% of the total overall project budget (Umrani & Konnur, 2021), so the smooth execution of housing projects heavily relies on the accuracy level of its daily supply chain monitoring (Hasurungan & Elizabeth, 2022). Failure to manage material circulation potentially triggers storage cost losses (Purba & Rivani, 2025) and gives rise to fatal discrepancies between administrative records and the remaining physical inventory at the project site (Handoko, Erwin, Nathan, Megawan, & Gohzali, 2024). This phenomenon of managerial inability is genuinely experienced by PT Wanro Sukses Persada, where the company still carries out material governance manually using ledgers and spreadsheets with a recapitulation cycle at the end of the month, while routine purchasing is always executed at the beginning of the month. Such conventional practices trigger the creation of an information time gap that hinders leaders from making procurement decisions instantaneously (Madamidola, Daramola, Akintola, & Adeboje, 2024), moreover, this manual method frequently fails to document the transfer of material allocations across building units, which ultimately triggers data discrepancies, reporting duplication, and vulnerability to stock manipulation in the field ((Dewangga, Putra, Supuwiningsih, & Putri, 2025; A. Setiawan, Sabrina, & Ramadhan, 2025).

State of The Art

In the realm of technological intervention, various previous studies have attempted to digitize the process to accelerate the circulation of operational information, where research by Ardianti, Setiawan, and Arifin (2025), Fazillah and Devitra (2022), and A. B. Setiawan, Rachmawati, Arrahman, Natasyah, and Syeha (2021) specifically focused development on web-based stock management and monitoring systems that have proven to be highly capable of facilitating reporting centralization. However, interfaces relying on web browsers possess inherent weaknesses in terms of portability for field supervisors who demand high mobility access without having to always rely on the availability of computer devices. From a

procedural improvement perspective, the evaluation of manual stock audits (*stock opname*) by Manurung and Anshar (2023) and Ningrum and Suprihandari (2024) validated that task segregation is indeed crucial, but this procedure will continue to be at high risk of human negligence if the recording process is not automated through a digital system. Regarding information distribution automation, studies by Selnika and Muslihudin (2024) and Wahyudin, Anisyah, and Ahmaddifa (2025) have successfully proven the reliability of Firebase Cloud Messaging (FCM) service integration on mobile devices, unfortunately, the adoption of such cellular notification technology capabilities is still centralized in the public administration and correspondence service sectors, so its potential has not been maximally explored to solve the complexities of physical material stock monitoring.

Regarding software design and evaluation, the adoption of the Software Development Life Cycle (SDLC) Waterfall model framework is widely recognized for its ability to maintain project scope integrity to remain compliant with rigid initial specifications Idris and Abdullah (2025), Permana, Komala, and Ruhiat (2025), and Yasir, Eka, and Simon (2023). Once the system is formed, the application of external validation using Black-Box Testing has proven to be an essential instrument in isolating functional errors in the application's input-output logic Alvaro, Darunnaja, and Yaqin (2024), Ayuningsih, Dewi, and Rohmani (2023), Dewi, Pratama, Putera, and Carudin (2022), and Frayudha, Pande, and Juwita (2024), nevertheless, such functionality testing scenarios are still very rarely focused deeply on testing dynamic stock deduction algorithms in real-time under field operational conditions that demand high-level accuracy.

Based on the review of the limitations of various previous literatures, the novelty of this article is represented through the design of the "Wanro Stock App" mobile application whose architecture is precisely dedicated to accommodating the specific workflows of housing developers, where this novelty is manifested through three main functional pillars, namely the detailed tracking of material usage history directly tied to the allocation of each housing unit, the digitalization of a tiered authorization mechanism (approval workflow) that binds field supervisors with management, and the application of an automated early warning instrument that triggers push notifications to the device screen bar when material inventory touches the critical 20% threshold or when it is completely out of stock. Therefore, this research aims to design and develop a mobile-based construction material stock management and monitoring system using the SDLC Waterfall framework, while simultaneously validating the system's functional alignment comprehensively through Black-Box Testing to ensure that the resulting software is ready to be implemented as an operational solution at project sites.

JDBIM (Journal of Digital Business and Innovation Management)
Volume 5 Issue 1, June 2026
E-ISSN 2692-3898
Page 262-275

METHODS

This research adopts a qualitative approach with a single case study design to deeply analyze the complexities of the logistics workflow at PT Wanro Sukses Persada, where the research sample was drawn using a purposive sampling technique involving three main supply chain actors, namely management representatives, the warehouse team, and field supervisors (Sugiyono, 2023). To ensure the accuracy of the gathered information, primary data collection was executed through in-depth semi-structured interviews and non-participant observations, whose validity was subsequently cross-verified through data triangulation and member checking techniques before finally being qualitatively analyzed using an interactive model proposed by Miles, Huberman, & Saldaña (2014) encompassing data reduction, data display, and conclusion drawing stages to formulate the precise functional requirements of the system.

The software construction process adopts the Software Development Life Cycle (SDLC) Waterfall model framework (Sommerville, 2016) which flows sequentially from the requirements analysis phase, system design using Unified Modeling Language (UML) which is also accompanied by Figma-based user interface prototyping, implementation, to testing, however, this research intentionally excludes the maintenance phase due to its scope limitation which is only halted at the functional validation and application handover stage. The system implementation phase utilizes the Android Studio environment with the Kotlin programming language and Jetpack Compose toolkit directly integrated with Firebase Realtime Database to facilitate synchronous data distribution, while the output data analysis and final validation stages are executed exclusively through the Black-Box Testing method in general to audit the alignment of the software's input and output logic against the initial specifications without the need to evaluate its internal algorithmic structure (Pressman, 2010).

RESULT AND DISCUSSION

Requirement Analysis

The requirement analysis phase was extracted using a qualitative case study approach during the initial phase of the Software Development Life Cycle Waterfall model through interviews and observations of management representatives, the warehouse team, and field supervisors at PT Wanro Sukses Persada. The field investigation results revealed three crucial operational problems. First, there was an instantaneous data synchronization failure due to the separation of physical recording media in

the warehouse and spreadsheet recapitulations in the office, which triggered reporting lags and the loss of daily inventory oversight control. Second, there was a lack of material allocation traceability caused by verbal instruction habits and undocumented cross-unit logistics transfers, making it difficult for the company to precisely calculate the actual cost burden for each building. Third, the fragile validation mechanism for goods requests and returns, which heavily relied on the physical presence of the manager, slowed down the construction duration and was prone to recording manipulation. To respond to these root problems, the functional requirement specifications were designed to demand the system to accommodate a centralized history recording of material allocations and returns for each housing unit, digitalize the tiered authorization through an approval workflow scheme mandating management validation before the warehouse team executes physical instructions or sorts leftover item viability, and embed an automatic stock adjustment algorithm to trigger the delivery of push notification warnings to user devices when the inventory quantity plummets to the twenty percent critical limit or is depleted. Furthermore, in the non-functional requirements domain, the reporting lag constraint is resolved through the application of the Firebase Realtime Database architecture to guarantee instantaneous mobile-based data synchronization, while the manipulation vulnerability loophole is tightly sealed by implementing role-based access control to strictly restrict menu navigation according to the authority profile of each supply chain actor.

System Design

The system design phase converts operational requirement specifications into a software architecture blueprint using the Draw.io software to construct Unified Modeling Language models and the Figma platform to design an interactive interface prototype. The use case diagram modeling maps the specific authorities of the three main actors where the management is tasked with managing user and housing project master data as well as validating approvals. Furthermore, the field supervisor has access to submit material allocations per building unit while simultaneously processing leftover material returns, whereas the warehouse team is authorized to execute the physical issuance of goods and sort material viability during the return submission process.

To guarantee operational reliability, the activity diagram is structured to systematically map the interaction flow and data synchronization between user entities. In the monitoring function, the system automatically calculates the remaining inventory by integrating the initial allocation data of the building unit with the actual field usage history. During the request submission cycle, the system accommodates a dynamic authorization

JDBIM (Journal of Digital Business and Innovation Management)
Volume 5 Issue 1, June 2026
E-ISSN 2692-3898
Page 262-275

process, where the management can approve, reject, or adjust the requested material quantity before it is forwarded as preparation instructions for the warehouse team. To prevent recording inaccuracies, the field usage recording process is equipped with a system validation mechanism that will halt the transaction if the entered amount exceeds the remaining balance of the related unit. In the return procedure, the system facilitates the warehouse team to conduct item viability sorting digitally, ensuring that only materials in good condition are added back to the central inventory. This entire chain of logistics transactions is integrated with an automatic stock adjustment that will trigger the delivery of push notification warnings when the inventory touches the twenty percent critical limit or is depleted.

As the architecture completion, the visual interface design is mapped into a series of main functional screens to ensure the application adaptability to the high mobility of project workers before entering the coding phase. This interface construction includes the login page to filter role-based access rights which connects directly to the homepage as the operational asset summary dashboard. Centralized material tracking is accommodated through the inventory and unit monitoring pages. The system also integrates the submission page for field supervisors to request or return materials, as well as the confirmation page for management and the warehouse team to execute approvals and return sorting. The physical recording process is facilitated by the field usage page for actual consumption at the project site and the warehouse stock addition page as the central recording track for logistics procurement.

Implementation

The implementation phase realizes the visual interface design and system logic into a functional Android application form using the Android Studio integrated development environment. The operational logic code writing is structured using the Kotlin programming language while the interface layout elements are built declaratively through the Jetpack Compose framework. The entire application architecture is centrally integrated with the Firebase ecosystem which encompasses credential authentication services, real-time databases along with Firestore for logistics history management, and cloud messaging services to facilitate the automatic delivery of early warnings.

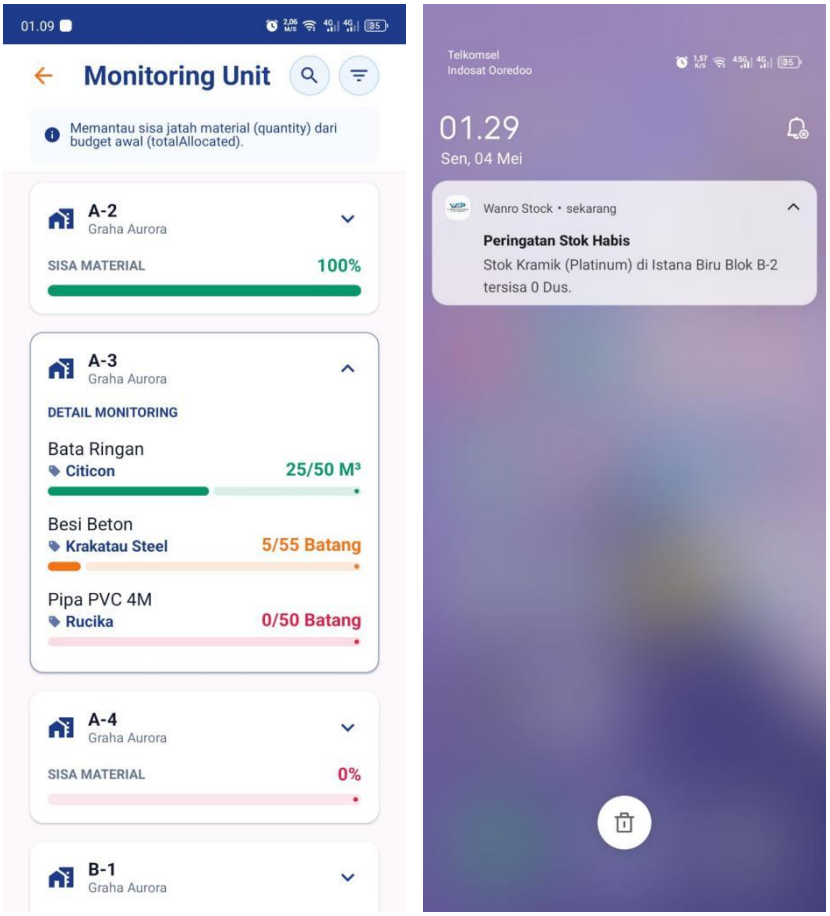

Figure 1. Unit Monitoring Interface and Material Inventory Early Warning

The implementation of the authentication module relies on role-based access control which dynamically renders the navigation menu arrangement on the homepage according to the specific authorities of the management, the warehouse team, or the field supervisor immediately after the login process is validated. In the asset tracking domain, the unit monitoring page implements interactive layout components capable of expanding the details of the remaining material percentage metrics per building to present a comprehensive evaluation of physical consumption efficiency at the project site. The reliability of this tracking is reinforced by the integration of an early warning algorithm that automatically triggers the delivery of push notifications to user device screens exactly when the inventory quantity shrinks to critical limits or is depleted.

JDBIM (Journal of Digital Business and Innovation Management)
Volume 5 Issue 1, June 2026
E-ISSN 2692-3898
Page 262-275

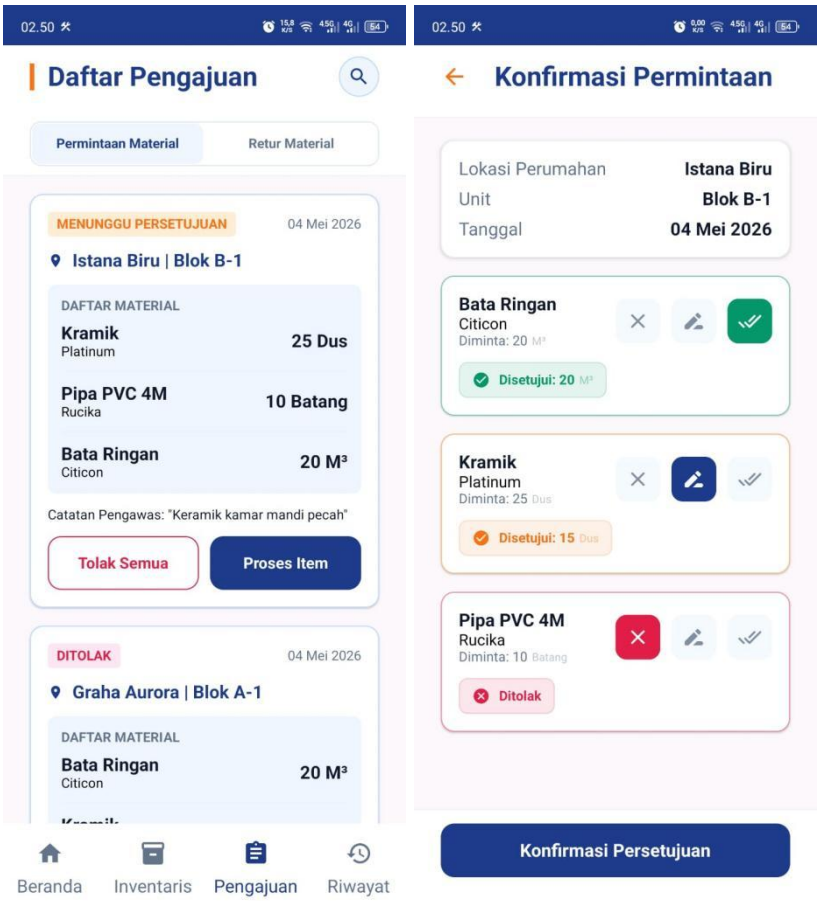

Figure 2. Submission List Interface and Approval Confirmation Authorization

In the transactional domain, the implementation of the submission list and approval confirmation pages accommodates a robust tiered authorization process. This workflow is equipped with smart filtering instruments and instantaneous stock validation to lock the accuracy of quantity inputs, while simultaneously facilitating management to approve, reject, or adjust material requests in detail per item row. The system algorithms in these transactional modules apply batch commit methods to guarantee the absolute integrity of the database tracking records when documents are authorized. As an operational completion, the application also facilitates direct recording through the field usage page, warehouse stock addition through an independent identity code generator, and the automation of data recapitulation extraction into digital report documents using a smart sorting algorithm before being directly archived into the user device storage.

Testing

The testing phase evaluates the functional reliability of the system using the Black-Box Testing method to validate the conformity of application inputs and outputs without inspecting the background code structure. Testing simulations were conducted directly by representatives of operational entities consisting of management, the warehouse team, and field supervisors to ensure the application is capable of responding to various real-use scenarios in the project environment. The scope of this testing includes authentication gate verification, stock monitoring accuracy, validation of request document authorization workflows, up to the precision of automatic calculations in the field usage and digital reporting modules.

Table 1. Blackbox Testing Results

	Testing Module	Total Scenario	Success	Failure
1	Authentication Module	4	4	0
2	Homepage Module	4	4	0
3	Monitoring Module (Inventory & Unit)	10	10	0
4	Submission Module (Request & Return)	9	9	0
5	Management Module (Master Data)	7	7	0
6	Warehouse Module (Stock Addition)	6	6	0
7	Field Usage Module	5	5	0
8	Reporting Module	3	3	0
	Total	**48**	**48**	**0**

Empirically, the findings from the development and testing of the Wanro Stock App prove that the digitalization of the material stock monitoring workflow utilizing mobile-based technology is capable of eliminating the information time gap that previously always rooted in the manual ledger recapitulation practices of PT Wanro Sukses Persada at the end of the month. The successful implementation of early warning notifications and real-time tiered authorizations grants project leaders full control over logistics procurement decisions, while simultaneously drastically suppressing physical manipulation vulnerabilities. This achievement empirically addresses the limitations in the studies conducted by Ardianti et al. (2025) and Fazillah & Devitra (2022), whose previous inventory systems still heavily relied on web browser access with minimal portability.

CONCLUSION

The conclusion of this research affirms that the design and development of the Wanro Stock App utilizing the Software Development Life Cycle Waterfall model framework has successfully created a precise and responsive mobile-based construction material stock monitoring solution to accommodate the high operational dynamics at the PT Wanro

JDBIM (Journal of Digital Business and Innovation Management)
Volume 5 Issue 1, June 2026
E-ISSN 2692-3898
Page 262-275

Sukses Persada project site. The software implementation, which combines the reliability of the Kotlin programming language, the flexibility of the Jetpack Compose interface, and the synchronization infrastructure of Firebase Realtime Database, has proven capable of eliminating the information time gap issues that have always been inherently tied to manual ledger recapitulation routines. Through Black-Box testing across forty-eight test scenarios which yielded a one-hundred percent functional success rate without any technical errors, the application is empirically validated to be capable of executing its main feature pillars flawlessly, ranging from specific material allocation tracking per housing unit and the application of a tiered authorization system binding field supervisors with management, to the automated execution of early warning notifications when goods availability touches the critical threshold. Overall, the adoption of this high-portability technology not only successfully closes the vulnerability gap of physical logistics manipulation in the field but also facilitates project leaders in determining material procurement decisions instantaneously with a fully accountable level of data accuracy. As a long-term implication, this system has fully met the operational requirement specifications, with recommendations for future research allocated to the maintenance phase to evaluate server stability and system scalability alongside the surge in logistics transaction volume in the future.

REFERENCES

Alvaro, M. Z., Darunnaja, M. A., & Yaqin, M. A. (2024). Black Box Testing on a Mini ERP System: A Strategy for Bug Detection and Minimisation. *Journal of Computing and Data Science (JOCDAS)*, *2*(1), 19–31. https://doi.org/10.18860/jocdas.v2i1.28059.g11556

Ardianti, F. A. E., Setiawan, R., & Arifin, M. (2025). Sistem Informasi Manajemen Logistik Dan Peralatan Kebencanaan Multi Posko Web-Based. *DECODE: Jurnal Pendidikan Teknologi Informasi*, *5*(2), 612–624. https://doi.org/10.51454/decode.v5i2.1233

Ayuningsih, D. P., Dewi, I. N., & Rohmani, A. (2023). Scrum Framework Implementation of Fish Mobile Auction Module in Pasar Iwak Marketplace. *Sinkron : Jurnal dan Penelitian Teknik Informatika*, *8*(2), 752–761. https://doi.org/10.33395/sinkron.v8i2.12096

Badan Pusat Statistik. (2022). *Pertumbuhan Ekonomi Indonesia Triwulan II-2022*. Jakarta. Retrieved from https://www.bps.go.id/id/pressrelease/2022/08/05/1913/ekonomi-indonesia-triwulan-ii-2022-tumbuh-5-44-persen--y-on-y-.html

Badan Pusat Statistik. (2023). *Pertumbuhan Ekonomi Indonesia Triwulan II-2023*. Jakarta. Retrieved from https://www.bps.go.id/id/pressrelease/2023/08/07/1999/ekonomi-indonesia-triwulan-ii-2023-tumbuh-5-17-persen--y-on-y-.html

Badan Pusat Statistik. (2024). *Pertumbuhan Ekonomi Indonesia Triwulan II-2024*. Retrieved from https://www.bps.go.id/id/pressrelease/2024/08/05/2381/ekonomi-indonesia-triwulan-ii-2024-tumbuh-3-79-persen--q-to-q---ekonomi-indonesia-triwulan-ii-2024-tumbuh-5-05-persen--y-on-y---dan-ekonomi-indonesia-semester-i-2024-tumbuh-5-08-persen--c-to-c-.html

Badan Pusat Statistik. (2025). *Pertumbuhan Ekonomi Indonesia Triwulan II-2025*. Jakarta.

Dewangga, I. M. B. T., Putra, K. D. P. S., Supuwiningsih, N. N., & Putri, N. made D. K. (2025). Perancangan Aplikasi Pengelolaan Data Inventory Daging Berbasis Mobile Menggunakan Framework Flutter (Studi Kasus : UD. Puspa). *Prosiding Seminar Hasil Penelitian Informatika dan Komputer (SPINTER)*, *2*(1), 859–864. Bali: Institut Teknologi dan Bisnis STIKOM.

Dewi, E. H. K., Pratama, I. S., Putera, A. S., & Carudin. (2022). Black Box Testing Pada Aplikasi Pencatatan Peminjaman Buku Menggunakan Boundary Value Analysis. *STRING (Satuan Tulisan Riset dan Inovasi Teknologi)*, *6*(3), 315–324. https://doi.org/10.30998/string.v6i3.11958

Fazillah, M. R., & Devitra, J. (2022). Sistem Informasi Pemantauan Inventory Stock Opname Berbasis Web Pada Sbu-Teh Kemasan PTPN VI. *Jurnal Manajemen*

Sistem Informasi, *7*(4), 644–655. https://doi.org/10.33998/jurnalmsi.2022.7.4.689

Frayudha, A. D., Pande, I. R., & Juwita, M. B. (2024). Implementation of Black Box Testing with the Application of Equivalence Partitioning Techniques in the M-Magazine Android Application at Semen Gresik High School. *Elinvo (Electronics, Informatics, and Vocational Education)*, *9*(1), 134–143. https://doi.org/10.21831/elinvo.v9i1.70382

Handoko, M., Erwin, Nathan, Megawan, S., & Gohzali, H. (2024). Pengelolaan Stok Barang Menggunakan Aplikasi Mobile Dan Web. *Jurnal SIFO Mikroskil (JSM)*, *25*(2), 21–38. https://doi.org/10.55601/jsm.v25i2.1262

Hasurungan, M., & Elizabeth, T. (2022). Sistem Informasi Manajemen Persediaan Bahan Baku Pembangunan Rumah Pada PT. Clara Jaya. *MDP Student Conference*, 338–345. Palembang.

Idris, M. F., & Abdullah, S. (2025). Perancangan Sistem Informasi Perpustakaan Berbasis Web Menggunakan Metode Waterfall (Studi Kasus: SMPN 185 Jakarta Selatan). *Kohesi: Jurnal Multidisiplin Saintek*, *10*(5). https://doi.org/10.8734/Kohesi.v1i2.365

Madamidola, O. A., Daramola, O. A., Akintola, K. G., & Adeboje, Olawale. T. (2024). A Review of Existing Inventory Management Systems. *International Journal of Research in Engineering and Science (IJRES)*, *12*(9), 40–50. Retrieved from www.ijres.org

Manurung, N., & Anshar, K. (2023). Analisis Penyebab Terjadinya Ketidaksesuaian Stock Opname Antara Sistem Dengan Aktual Spare Part di Warehouse PT XYZ. *Prosiding Seminar Nasional Teknik Industri [SNTI]*, *5*. Retrieved from https://proceedings.unimal.ac.id/snti/article/view/440

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative Data Analysis: A Methods Sourcebook* (3rd ed.). SAGE Publications.

Ningrum, M. D., & Suprihandari, M. D. (2024). Implementasi Stock Opname Dalam Meningkatkan Pengendalian Intern Pada Koperasi Karyawan (Studi Kasus Koperasi Karyawan PT. Platinum Ceramics Industry Lebaniwaras, Kec. Wringinanom, Kab. Gresik). *Journal of Economics, Business, Management, Accounting and Social Sciences (JEBMASS)*, *2*(4), 217–222. https://doi.org/10.63200/jebmass.v2i4.145

Permana, A. I., Komala, I. R., & Ruhiat, A. (2025). Perancangan Sistem Informasi Nilai Berbasis Website Menggunakan Metode Waterfall (Studi Kasus MTS Al-Hikmah Cicelot). *Journal Artificial: Informatika Dan Sistem Informasi*, *3*(2), 172–185. https://doi.org/10.54065/artificial.861

Pressman, R. S. (2010). *Software Engineering: A Practitioner's Approach* (7th ed.). McGraw-Hill.

Purba, R. S., & Rivani. (2025). Analisis Penerapan Metode EOQ dalam Pengelolaan Manajemen Persediaan (Studi Kasus pada Royal Folding Gate Cabang Jatinangor). *Forum Bisnis dan Kewirausahaan*, *15*(1). https://doi.org/10.35957/forbiswira.v15i1.10115

Selnika, D., & Muslihudin, M. (2024). Implementation of Mobile Government in Banjar Negeri Village to Improve Services. *JLASA (Journal of Law and State Administration)*, *2*(2), 57–67. https://doi.org/10.56327/jlasa.v2i2.133

Setiawan, A. B., Rachmawati, W., Arrahman, A. T., Natasyah, N., & Syeha, F. N. (2021). Aplikasi Monitoring Stok Barang Berbasis Web Pada PT. Intermetal Indo Mekanika. *ADI Bisnis Digital Interdisiplin (ABDI Jurnal)*, *2*(2), 93–99. https://doi.org/10.34306/abdi.v2i2.254

Setiawan, A., Sabrina, M., & Ramadhan, M. H. (2025). Implementasi Metode Prototyping Dalam Perancangan Aplikasi Manajemen Inventaris Gudang Berbasis Mobile. *Informatic Technique (IT) Journal*, *13*(1), 111–122. https://doi.org/10.22303/it

Sommerville, I. (2016). *Software Engineering* (10th ed.). Pearson.

Sugiyono. (2023). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D* (2nd ed.; Sutopo, Ed.). Alfabeta.

Umrani, C. S., & Konnur, B. A. (2021). A Review on Materials Management System in Construction Industry. *International Research Journal of Engineering and Technology (IRJET)*, *8*(7), 4154–4156. Retrieved from www.irjet.net

Wahyudin, A., Anisyah, A., & Ahmaddifa, D. (2025). Pengembangan Sistem Notifikasi Real Time untuk Aplikasi Manajemen Persuratan Multiplatform menggunakan Firebase Cloud Messaging dan Application Programming Interface. *Jurnal Teknik Informatika Unika ST. Thomas (JTIUST)*, *10*(01), 75–87. Retrieved from https://ejournal.ust.ac.id/index.php/JTIUST/article/view/4437

Yasir, A., Eka, M., & Simon, J. (2023). Sosialisasi Penerapan Waterfall Model Pada Sistem Informasi Desa di Kampung Nelayan Indah. *Jurnal Hasil Pengabdian Masyarakat (JURIBMAS)*, *2*(1), 44–48. https://doi.org/10.62712/juribmas.v2i1.110