

Enhancing Operational Efficiency in Traditional Batik SMEs through Automated Sales Reporting in E-Commerce: A Case Study of Temanggung, Indonesia

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ABSTRACT- This study addresses the operational inefficiency faced by traditional batik Small and Medium Enterprises (SMEs) in Temanggung Regency, Central Java, whose sales are still dominated by conventional channels and manual transaction recording. This condition limits market reach and causes delays and inaccuracies in obtaining sales, stock, and performance information. This research designs and develops batiktemanggung.com, a web-based e-commerce application that integrates an online sales channel with an automated sales reporting module, allowing business owners to monitor transactions and business performance in real time. The system was developed using the Waterfall method, covering requirements definition, system design, implementation, integration testing, and maintenance. System feasibility was evaluated using the PIECES framework, while functional reliability was verified through Black-Box Testing with Boundary Value Analysis. The results show that the developed application improves transaction speed and availability, provides accurate and real-time sales and stock information, lowers promotional costs, strengthens transaction control, increases process efficiency, and delivers a more responsive service experience for customers. These findings indicate that integrating automated sales reporting into a web-based e-commerce platform can enhance the operational efficiency of traditional SMEs and support the digital transformation of local, culture-based businesses.

KEYWORDS- Automated Sales Reporting, Batik, E-Commerce, Small And Medium Enterprises (SMEs).

I. INTRODUCTION

The rapid growth of digital commerce has reshaped the way Small and Medium Enterprises (SMEs) reach their markets, and digital marketing approaches such as social media, websites, and online catalogs have been shown to significantly increase the sales performance of batik SMEs [1]. Despite this trend, many creative-economy SMEs, including the batik community in Temanggung Regency, Central Java, still rely on conventional sales channels such as physical stores and local exhibitions, which limit their market reach to the surrounding area. Sales transactions are also still recorded manually, a practice that is prone to input

errors, causes delays in obtaining accurate sales information, and makes the monitoring of stock and business performance difficult [2]. These conditions constrain the operational efficiency that traditional SMEs need in order to remain competitive in an increasingly digital marketplace.

Several studies have applied web-based e-commerce systems to digitalize batik sales, generally following the Waterfall development method together with PHP and MySQL. Monicasari et al. implemented an e-commerce platform for batik tulis Pati through requirement analysis, UML-based design, implementation, and system testing [3]. Similarly, Nuraeni and Astuti developed an online sales information system for a batik store in Pekalongan [4], while Hendradi and Rizki designed a comparable e-commerce system for Batik Rika Busana [5], and Sipahutar and Wirawan applied the same approach for an SME selling handicraft gifts [6]. These studies confirm that the Waterfall method is well suited for building transactional e-commerce platforms for small artisan businesses. However, their primary focus remains on enabling online transactions, with limited attention given to an integrated feature that automatically generates real-time sales, stock, and performance reports for the business owner.

This gap creates a secondary challenge that goes beyond simply expanding the market: ensuring that, as online transaction volume grows, information on sales, inventory, and business performance remains readily available so that owners can make timely and accurate decisions. Without an integrated reporting feature, digitalization merely shifts the manual recording burden from a physical ledger to an online medium, while the underlying problem of delayed and error-prone information, the very issue digitalization is meant to resolve, persists in a different form.

To address this shortcoming, this study designs and develops batiktemanggung.com, a web-based e-commerce application that combines an online sales channel for the Temanggung batik community with an automated sales reporting module, enabling business owners to monitor transactions, stock, and performance in real time through an integrated dashboard. The system is developed using the Waterfall method, covering the stages of requirements definition, system and software design, implementation and

unit testing, integration and system testing, and operational and maintenance. The feasibility of the resulting system is evaluated using the PIECES framework across six aspects, namely Performance, Information, Economy, Control, Efficiency, and Service, while its functional reliability is verified through Black-Box Testing using Boundary Value Analysis, an approach previously shown to be effective in evaluating the accuracy of financial and transactional information systems [7].

This study aims to provide a scalable and practical framework that enables traditional creative-economy SMEs, particularly the batik community in Temanggung Regency, to transition from conventional, manual sales practices toward a digitalized and self-monitoring business operation. By integrating an online sales channel with automated sales reporting, the proposed application is expected to reduce recording errors, shorten the time required to obtain operational information, and strengthen the operational efficiency and competitiveness of batik SMEs. This research contributes to the growing body of knowledge on e-commerce for creative-economy SMEs by demonstrating that combining a transactional platform with automated reporting is a viable and replicable solution for digitalizing the sales of traditional cultural products such as batik.

II. LITERATURE REVIEW

A. Information System

A system can be defined as a set of two or more interrelated components that work together to achieve a common goal, while from an organizational perspective it is also understood as an integrated set of procedures designed to carry out a company's core functions [8], [9]. Well-integrated system components allow a business to manage its processes more effectively toward its established objectives.

Building on this notion, an information system combines people, software, communication networks, and data resources into a coordinated framework used to store, retrieve, process, and disseminate information within an organization in support of decision-making and operational control [10]. In this study, the developed information system connects the Temanggung batik community's online sales channel with an automated, real-time sales reporting capability.

B. Sales Report

A sales report is a document that summarizes an organization's sales activity over a given period. It functions as a formal communication tool that records and presents transactional data, including trends, patterns, and overall sales performance, and is widely used to support business analysis and decision-making [11], [12]. Beyond simply recording transactions, a sales report is the primary instrument for understanding how a business is performing and how its sales strategy can be improved.

A sales report generally serves several purposes: it supports the evaluation of sales performance by comparing actual results against targets [13]; it helps organizations recognize sales trends and seasonal patterns that inform inventory planning, marketing strategy, and resource allocation [14]; it provides the data foundation for business decisions such as discontinuing underperforming products or adjusting pricing strategy [15]; it underlies sales planning and forecasting

based on historical data [16]; and it strengthens communication and accountability between the sales team and management [17]. This study develops an automated sales report for the batik e-commerce platform to fulfil these same functions in real time.

C. Waterfall System Development Method

This study adopts the Waterfall method, a classic software development approach characterized by a structured, sequential workflow in which each stage must be completed before the next begins [18]. This method was selected for its simplicity and its capacity to organize the development process in a clear and directed manner, which suits the scope of this system. The Waterfall method consists of five sequential stages, namely requirements definition, system and software design, implementation and unit testing, integration and system testing, and operational and maintenance, with a complete requirements definition forming the foundation for the quality of the resulting system [19].

During the system and software design stage, the system's structure is represented using Unified Modeling Language (UML), a standardized modeling notation for object-oriented software development that includes class, use case, sequence, and activity diagrams [20].

D. Related Studies

Several studies have applied the Waterfall method to develop web-based e-commerce systems for the batik industry and related creative-economy SMEs. Monicasari et al. implemented an e-commerce platform for batik tulis Pati through data collection via observation and interviews, requirement analysis, UML-based design, implementation with PHP and MySQL, and system testing [3]. Nuraeni and Astuti applied a similar approach to build an online sales information system for a batik store in Pekalongan [4], while Hendradi and Rizki designed a comparable e-commerce system for Batik Rika Busana [5], and Sipahutar and Wirawan used the Waterfall method with the CodeIgniter framework and a MySQL database to build a website-based e-commerce system for an SME selling handicraft gifts [6]. In addition, Mansur et al. applied Black-Box Testing with a Boundary Value Analysis approach to evaluate the financial reporting system of a microfinance institution in Temanggung, demonstrating this testing approach's effectiveness in ensuring that a system reliably handles diverse transactional input scenarios [7]. Taken together, these studies confirm that the Waterfall method is well established for developing e-commerce systems in the batik and creative-economy sector; however, as noted in the Introduction, most focus primarily on enabling online transactions rather than on integrated, automated sales reporting, the gap this study seeks to address.

III. METHODOLOGY

A. Research Design

This study applies the Waterfall method operationally to the design and development of batiktemanggung.com, covering five sequential stages: requirements definition, system and software design, implementation and unit testing, integration and system testing, and operational and maintenance [18]. The system was developed by the research team for the batik artisan community of Temanggung Regency, Central Java,

and each stage below describes the concrete procedures, respondents, and instruments used to carry it out.

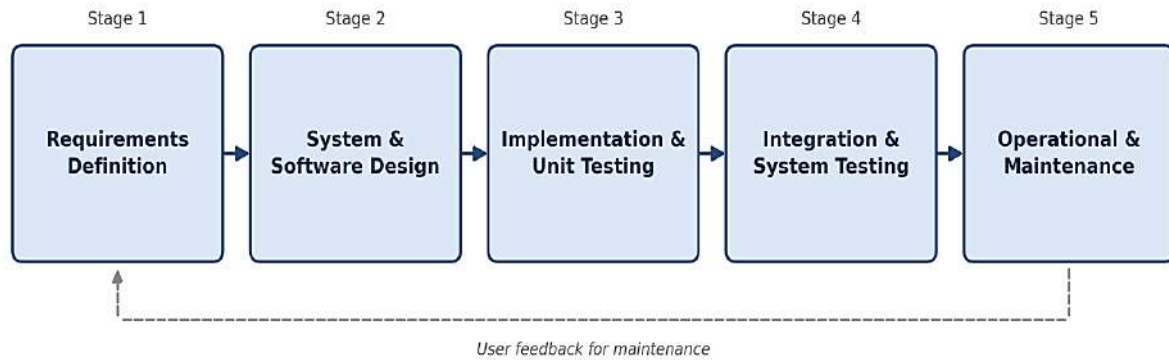


Figure 1: Waterfall-based research flow adopted in this study

B. Requirements Definition

1) Data Collection

Data were collected through direct observation of the existing manual sales process and semi-structured interviews with 30 batik artisans and SME actors together with 3 sales administrators in Temanggung Regency, totaling 33 informants. The interviews explored how sales transactions, stock, and performance information were currently recorded, the constraints these informants faced in reaching wider markets, and the type of reporting information they considered most important for monitoring their business.

2) Requirement Analysis

The information gathered from observation and interviews was analyzed to derive the functional requirements of the system, namely an online product catalog, shopping cart and checkout, stock management, a batik-community directory, an administrator dashboard, and an automated module for generating real-time sales, stock, and performance reports, as well as non-functional requirements such as usability and data accuracy. The weaknesses of the existing manual process were further mapped onto the six PIECES categories, namely Performance, Information, Economy, Control, Efficiency, and Service [21], so that each proposed feature could be traced directly to the operational problem it was intended to resolve.

C. System and Software Design

The system architecture was designed using the Laravel framework following the Model-View-Controller (MVC) pattern, with MySQL as the database management system. The system structure was modeled using Unified Modeling Language (UML), comprising a use case diagram to describe the interactions between the batik community, customers, and the system; a class diagram to represent the system's data entities, including products, transactions, stock, and sales reports, and their relationships; an activity diagram to describe the online sales workflow from product browsing to checkout; and a sequence diagram to describe the interaction sequence between the user interface, the controller, and the database when a transaction is recorded and a sales report is generated [20]. The database schema was designed in the form of an entity-relationship diagram covering entities such as users, products, orders, transactions, and sales reports, while the user interface for the storefront and the administrator dashboard was designed to present sales, stock,

and performance information in a summarized, real-time view.

D. Implementation and Unit Testing

The system was implemented using the PHP programming language with the Laravel framework and a MySQL database, and deployed as the web-based e-commerce platform batiktemanggung.com. Development was carried out module by module, comprising the storefront and product catalog, the shopping cart and checkout module that constitutes the online sales channel, a batik-community directory, the administrator authentication and product or stock management module, and the automated sales-reporting module that aggregates transaction data into a real-time dashboard. Each module was unit-tested during development to verify that it functioned according to its design specification before being combined with the other modules.

E. Integration and System Testing

1) System Feasibility Evaluation Using the PIECES Framework

After the modules were integrated, the feasibility of the resulting system was evaluated using the PIECES framework [21] across its six aspects, Performance, Information, Economy, Control, Efficiency, and Service, by comparing the condition of the previous manual process with the condition after batiktemanggung.com was implemented. The evaluation was conducted through structured interviews and a questionnaire distributed to the same 30 batik artisans and SME actors and 3 system administrators involved in the requirements stage ($n = 33$), who assessed the system based on their direct experience using it.

2) Functional Testing Using Black-Box Testing with Boundary Value Analysis

The system's functional reliability was verified through Black-Box Testing with a Boundary Value Analysis (BVA) approach, following the testing procedure previously applied to evaluate a financial reporting system in Temanggung [7]. Test scenarios were designed for the system's critical functional modules, including user and administrator login, product and stock input, order quantity at checkout, and payment amount, by testing the minimum, just-above-minimum, normal, just-below-maximum, and maximum values of each input boundary. The actual output of the

system for every scenario was then compared with the expected result to determine whether the system correctly accepted valid input and appropriately rejected or flagged invalid input at each boundary.

F. Operational and Maintenance

Following successful integration and system testing, batiktemanggung.com was deployed for use by the 30 participating batik artisans and 3 system administrators. Training sessions were conducted to familiarize users with the online sales channel and the sales-reporting dashboard, supported by a manual book describing step-by-step operating procedures. Feedback obtained during this stage was used as the basis for subsequent system refinement and maintenance.

IV. RESULTS AND ANALYSIS

A. System Implementation Overview

Following the stages described in the Methodology, batiktemanggung.com was implemented as a web-based e-commerce application built with the Laravel framework following the Model-View-Controller (MVC) pattern and a MySQL database, in accordance with the System and Software Design stage. The implemented system realizes the functional requirements identified during the Requirements Definition stage, namely an online product catalog, a shopping cart and checkout module that constitutes the online sales channel, a batik-community directory, an administrator authentication and product or stock management module, and an automated sales-reporting module that aggregates transaction data into a real-time dashboard. Figure 2 presents the class diagram of the implemented system, showing the main data entities, including users, products, transactions, and sales reports, and their relationships, consistent with the entity-relationship design produced during the System and Software Design stage.

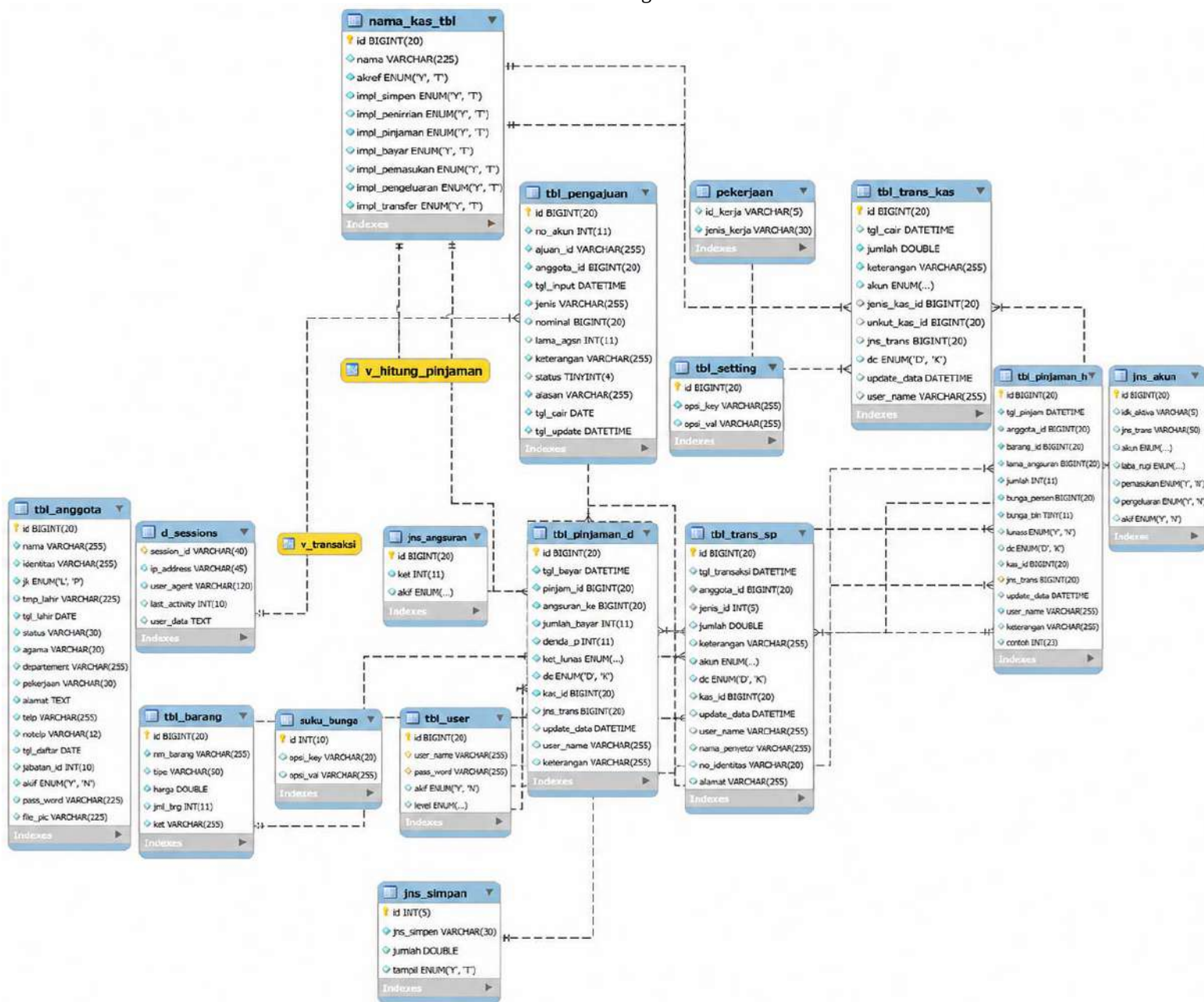


Figure 2: Class diagram of the implemented batiktemanggung.com system

B. User Interface and Feature Implementation

Figure 3 to 7 present the main interfaces of

batiktemanggung.com produced during the Implementation and Unit Testing stage.

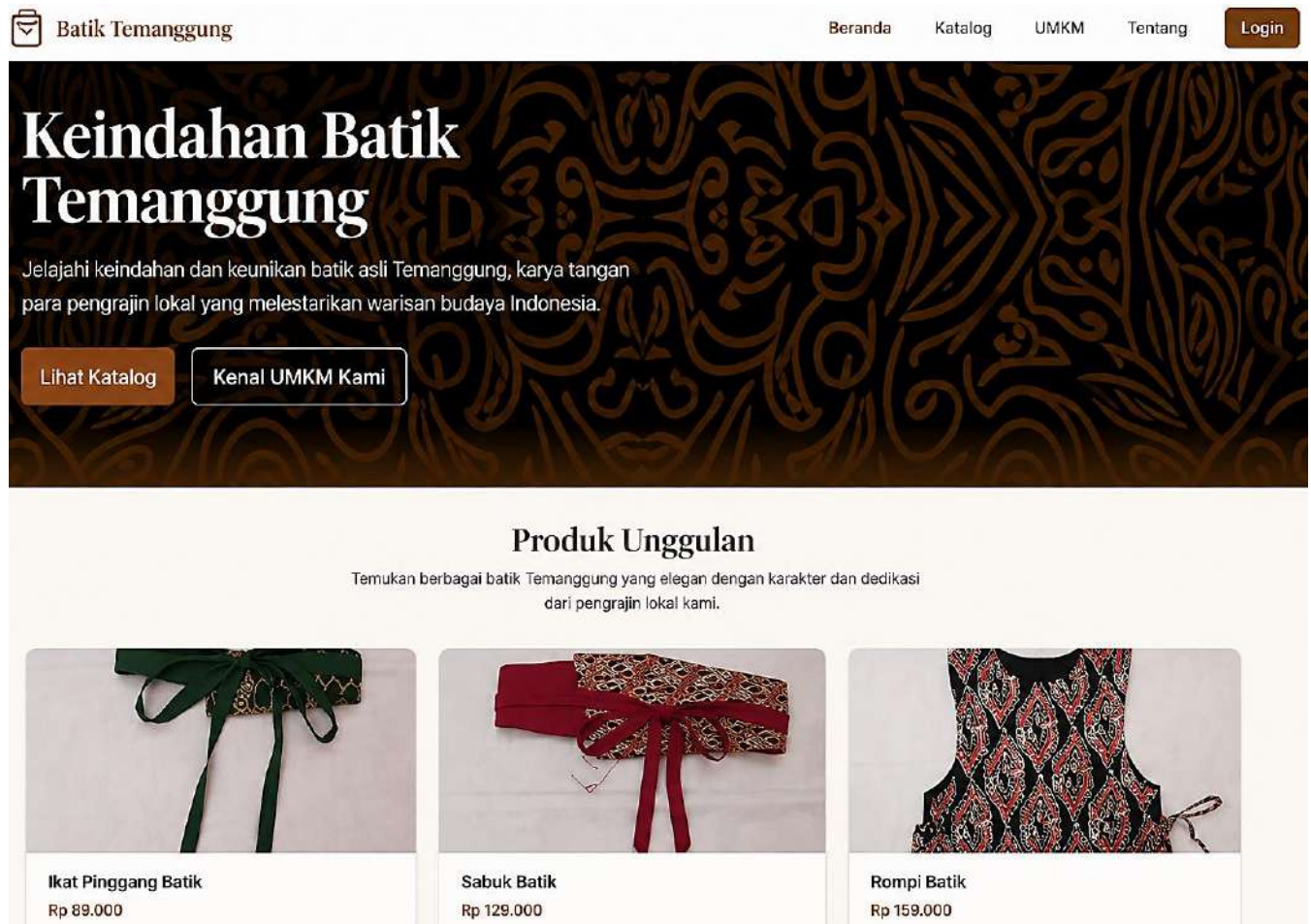


Figure 3: Homepage of batiktemanggung.com

Figure 3 shows the storefront homepage, which introduces the Temanggung batik community and provides direct navigation to the product catalog, realizing the online sales

channel that replaces the community's previous reliance on physical stores and local exhibitions.

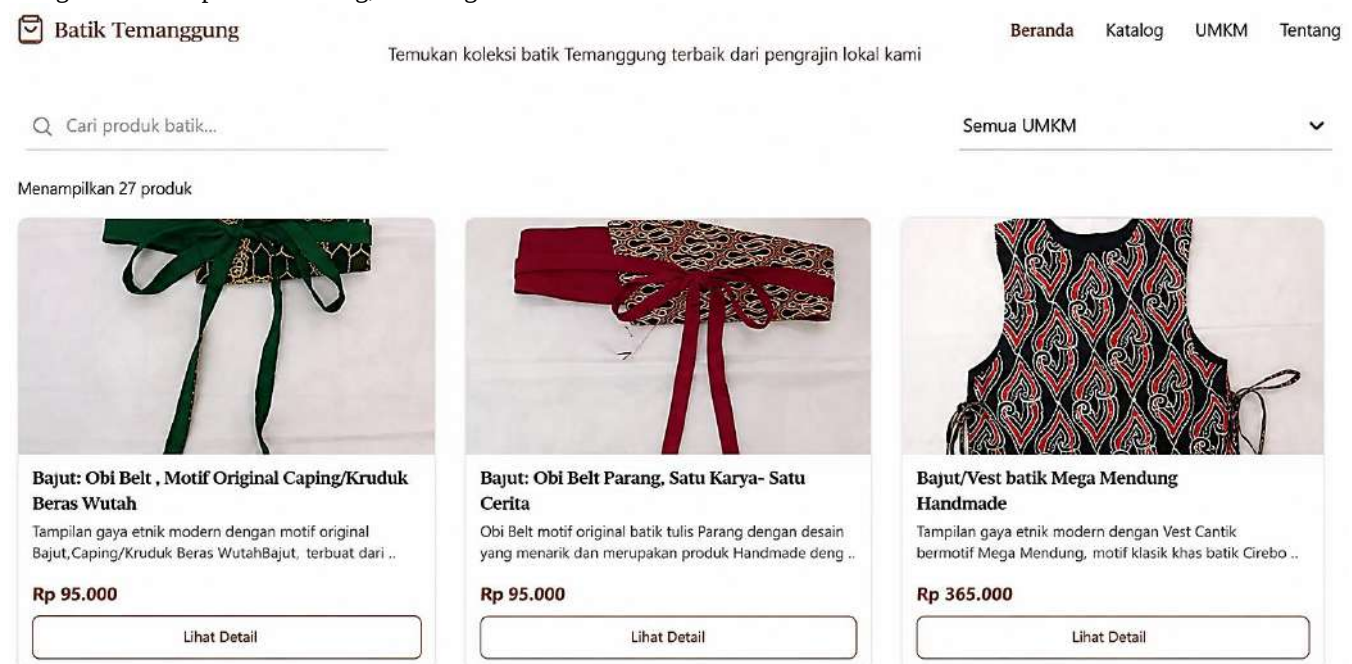


Figure 4: Product catalog page of batiktemanggung.com

Figure 4 presents the product catalog page, where customers can search and browse the batik products offered by the

participating artisans, directly addressing the limited market reach identified in the Introduction.

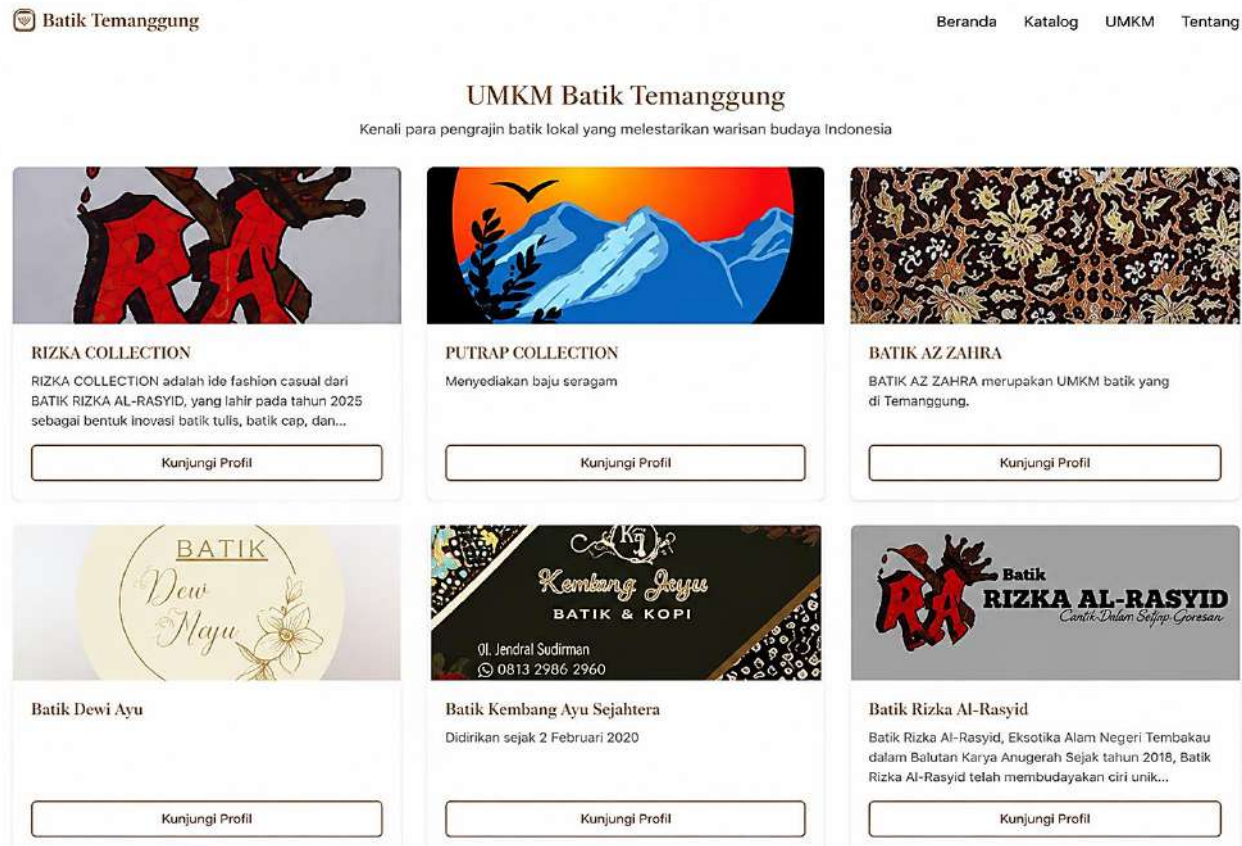


Figure 5: Batik-community (UMKM) directory page of batiktemanggung.com

Figure 5 shows the batik-community directory page, which profiles the participating artisan groups and their products,

giving individual SME actors visibility that previously depended on physical exhibitions.

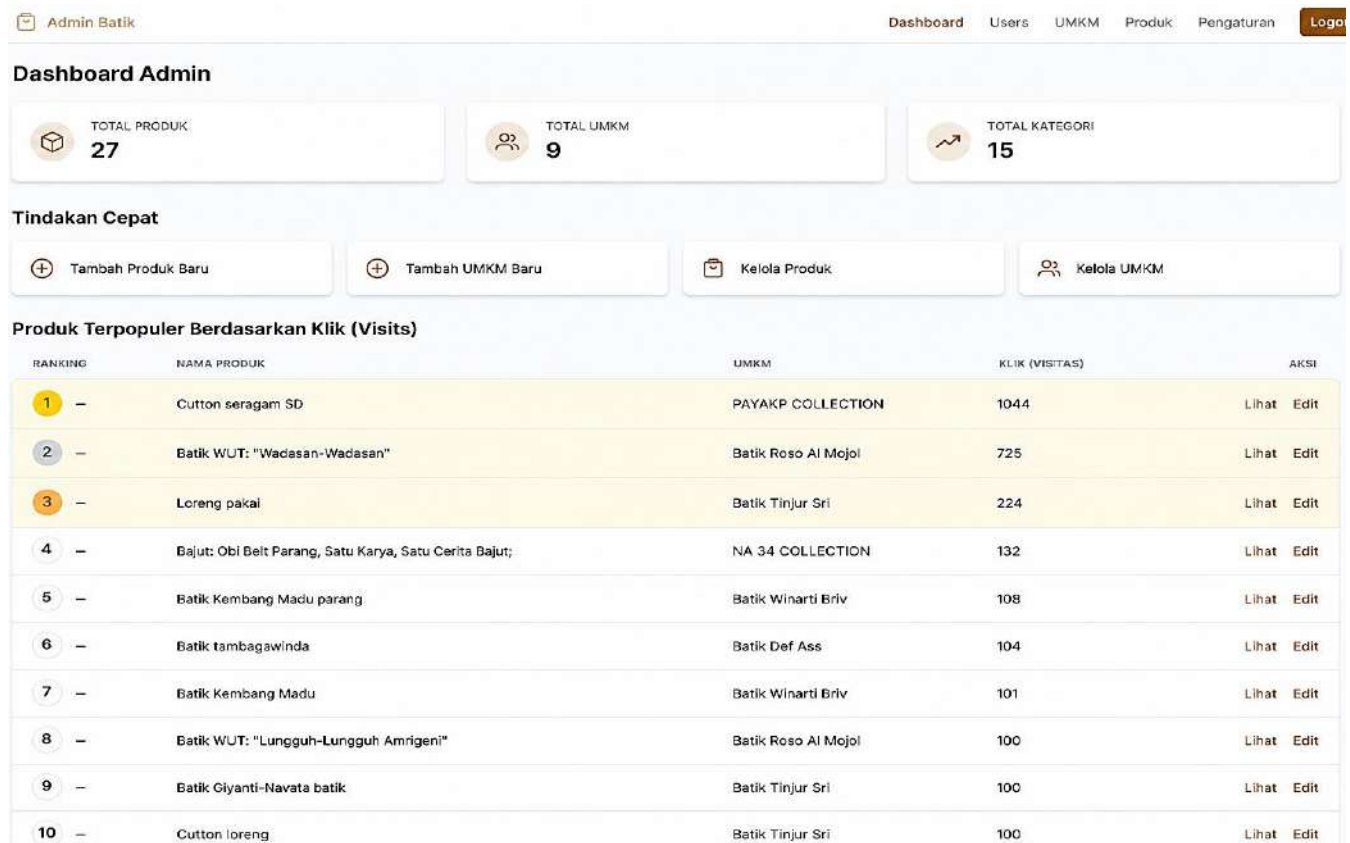


Figure 6: Administrator dashboard of batiktemanggung.com

Figure 6 presents the administrator dashboard, which realizes the automated sales-reporting module by aggregating product, community, and transaction-interest data into a real-

time summary view, directly addressing the delayed and error-prone manual reporting described in the Introduction.

PRODUK	HARGA	UMKM	AKSI
Bajut: Obi Belt Motif Original Capoct/Untuk Bross Wida Bajut; Tampilan pola etnik modern dengan nuan...	Rp 89.000	NA 34 COLLECTION	
Bajut: Obi Belt Parang, Satu Karya, Satu Cerita Bajut; Obi belt motif original batik tulis Parang yang...	Rp 89.000	NA 34 COLLECTION	
Bajut/Vest Etnik Mega Mendung Non/AnakBajut; Tampilan gaya etnik modern dengan kesan...	Rp 345.000	NA 34 COLLECTION	
Asrina Setia Setelan motif yang terinspirasi dari pet yang...	Rp 450.000	Batik Tinjur Sri	
Loreng pakai Pakai tebinges slash salv jebolan premium dari...	Rp 300.000	Batik Tinjur Sri	
Sq jar ngajt ntraaa Motif talenan kuat nggak ngeri is manisloh....	Rp 300.000	Batik Tinjur Sri	
Bajut: Parang Jagad Bross Wuan Bajut; Warisanmu perpaduan harmoni alam seme...	Rp 385.000	Batik Roso Al Mojol	
Mboku War Asya Setia dari Liyar Bojen Kain berkailbrasi ukuran 2in x 115cm Nama...	Rp 450.000	Batik Tinjur Sri	
Batik Kembang Madu Batik Kembang Madu: menggambarkan...	Rp 300.000	Batik Winarti Briv	
Cutton seragam SD Ukuran L, XL, XXL, 3XL	Rp 109.000	PAYAKP COLLECTION	
Rara Kain boltim/katun halus.	Rp 125.000	Batik Tinjur Sri	

Figure 7: Product and stock management page of batiktemanggung.com

Figure 7 shows the product and stock management page used by administrators to add, update, and monitor product records; every change recorded here is reflected automatically in the reporting dashboard in Figure 6, eliminating the duplicate manual recording that the previous manual process required.

C. System Feasibility Evaluation Using the PIECES Framework

Following system integration, the feasibility of batiktemanggung.com was evaluated using the PIECES framework across its six aspects through structured interviews and a questionnaire distributed to the 30 batik artisans and SME actors together with the 3 system administrators involved in the requirements stage ($n = 33$), as described in the Methodology. Table 1 summarizes the condition of the previous manual process and the corresponding condition reported after batiktemanggung.com was implemented, for each PIECES aspect.

Table 1: System Feasibility Evaluation Using The Pieces Framework

Aspect	Condition of the Previous Manual Process	Condition batiktemanggung.com After Was Implemented
Performance	Sales transactions were slow and depended on face-to-face interaction, limited to the business's physical operating hours.	Transactions can be carried out at any time online; respondents reported faster response and an increase in transactions reached through the online channel.
Information	Sales data were poorly documented, prone to input errors, and no real-time	Transaction, stock, and sales-report information is presented accurately, completely, and in real time through the administrator dashboard.

Aspect	Condition of the Previous Manual Process	Condition batiktemanggung.com Implemented	After Was
	report was available.		
Economy	Promotional costs were high because they depended on a physical store and additional staff, while market reach remained limited.	Operational costs decreased, digital promotion is less costly, and market reach extends to the national and international level.	
Control	Stock was not controlled, and manual records were vulnerable to manipulation or loss.	Records are generated automatically, administrator access is managed, activity logs are kept, and a transaction-validation mechanism strengthens data security.	
Efficiency	The manual process was time-consuming, records were kept separately, and administrators had to enter the same data twice.	Records are generated automatically, business processes are more concise, administrators no longer re-enter data manually, and daily work is more efficient.	
Service	Customers had to visit the store in person, service was not responsive, and product choices were not always available.	Customers can view the complete catalog and place orders at any time, and respondents reported a more responsive and satisfying experience.	

Across the six aspects, respondents consistently reported that batiktemanggung.com improved on the condition of the previous manual process, with the most notable gains perceived in the Information and Efficiency aspects, where the automated sales-reporting module removed the duplicate recording work previously required of administrators. This finding is consistent with earlier evidence that adopting a digital sales platform improves the sales performance and data management of batik SMEs [1], [2], and confirms that the reporting module addresses the operational-efficiency gap identified in the Introduction.

D. Functional Testing Results Using Black-Box Testing with Boundary Value Analysis

The functional reliability of batiktemanggung.com was verified through Black-Box Testing with a Boundary Value Analysis (BVA) approach, following the same testing procedure previously applied to evaluate a financial reporting system in Temanggung [7]. Test scenarios covered the system's critical functional modules, namely user and administrator login, product and stock input, order quantity at checkout, and payment amount, with the minimum, just-above-minimum, normal, just-below-maximum, and maximum values of each input boundary tested for every module, as described in the Methodology. Table 2 summarizes the results of this testing.

Table 2: Black-Box Testing Results Using Boundary Value Analysis

No	Tested Module	Boundary Categories Tested	Testing Result
1	User and administrator login (username and password length)	Minimum, just-above-minimum, normal, just-below-maximum, and maximum character length	The system accepted credentials within the valid length range and rejected inputs outside the boundary, matching the expected result for every category.
2	Product and stock input (stock-quantity field)	Minimum, just-above-minimum, normal, just-below-maximum, and maximum stock quantity	The system accepted stock quantities within the valid range and rejected or flagged values outside the boundary, matching the expected result for every category.
3	Order quantity at checkout	Minimum, just-above-minimum, normal, just-below-maximum, and maximum order quantity relative to available stock	The system accepted order quantities within available stock limits and rejected quantities exceeding available stock, matching the expected result for every category.
4	Payment amount	Minimum, just-above-minimum, normal, just-below-maximum, and maximum payment amount	The system accepted payment amounts within the required range and rejected or flagged incomplete or excessive amounts,

No	Tested Module	Boundary Categories Tested	Testing Result
			matching the expected result for every category.

For all four modules and every boundary category tested, the actual output produced by the system matched the expected result, indicating that batiktemanggung.com correctly accepts valid input at each input boundary and appropriately rejects or flags invalid input. This outcome is consistent with the reliability that Black-Box Testing with a Boundary Value Analysis approach is intended to verify in transactional and financial information systems [7], [22].

E. Discussion

Taken together, the implementation results, the PIECES-based feasibility evaluation, and the Black-Box Testing results indicate that batiktemanggung.com achieves the objective stated in the Introduction, namely combining an online sales channel with an automated sales-reporting module so that business owners can monitor transactions, stock, and performance in real time. Compared with earlier Waterfall-based batik and creative-economy e-commerce systems, which focused primarily on enabling online transactions [3]–[6], the addition of an automated, real-time reporting module in this study directly addresses the gap identified in the Introduction, extending digitalization beyond the sales channel itself into the operational information the batik community needs to manage its business. The PIECES results further suggest that the largest perceived gains occurred in the Information and Efficiency aspects, consistent with the automated reporting module being the feature that most directly replaces the previous manual, duplicate recording process.

The present feasibility evaluation nonetheless relied on structured interviews and a questionnaire administered to a comparatively small group of 33 respondents drawn from the artisans and administrators directly involved in the requirements stage, and it did not include a statistically validated Likert-scale instrument or feedback from the storefront's end customers. Future work could therefore apply a validated quantitative instrument to a larger and more varied respondent base, including customers, to statistically confirm the feasibility gains reported here, and could extend batiktemanggung.com with a mobile interface and integration with third-party payment and logistics services to further support the digital transformation of the Temanggung batik community.

V. CONCLUSION

This study designed and developed batiktemanggung.com, a web-based e-commerce application that integrates an online sales channel for the Temanggung batik community with an automated, real-time sales-reporting module. Using the Waterfall method across its five stages, the system was successfully implemented with a storefront and product catalog, a batik-community directory, a shopping cart and checkout module, and an administrator dashboard that automatically aggregates sales, stock, and performance data. The PIECES-based feasibility evaluation involving 30 batik

artisans and SME actors together with 3 system administrators indicated improvement across all six aspects, Performance, Information, Economy, Control, Efficiency, and Service, compared with the previous manual process, while Black-Box Testing with a Boundary Value Analysis approach confirmed that the system's critical modules behave reliably at their input boundaries. These findings indicate that integrating automated sales reporting into a web-based e-commerce platform can enhance the operational efficiency of traditional batik SMEs and support the digital transformation of local, culture-based creative-economy businesses. Future research is encouraged to validate these findings with a larger, statistically analyzed respondent base and to extend the platform with mobile access and third-party payment and logistics integration.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

REFERENCES

- [1] S. Suranto, R. Pratiwi, N. Nurgiyatna, A. Pratiwi, and R. A. Rahman, "Model pemasaran batik berbasis digital industri kreatif di Indonesia," *AKSES: Jurnal Ekonomi dan Bisnis*, vol. 18, no. 1, pp. 13-18, 2023. Available from: <https://publikasiilmiah.unwahas.ac.id/AKSES/article/view/8592/0>
- [2] N. A. Amrulloh and H. Marcos, "Perancangan aplikasi data penjualan batik berbasis Android menggunakan database Firebase," *SiI - Jurnal Sistem Informasi*, vol. 11, no. 2, pp. 42-49, 2024. Available from: <https://doi.org/10.30656/jsii.v11i2.6043>
- [3] L. Monicasari, T. Listiyorini, and E. Supriyati, "Implementasi e-commerce penjualan batik tulis khas Pati berbasis website (studi kasus Batik Tulis Jengdur)," *JUMINTAL: Jurnal Manajemen Informatika dan Bisnis Digital*, vol. 2, no. 1, pp. 57-68, 2023. Available from: <https://doi.org/10.55123/jumintal.v2i1.2348>
- [4] N. Nuraeni and P. Astuti, "Rancangan bangun sistem informasi penjualan online (e-commerce) pada Toko Batik Pekalongan dengan metode Waterfall," *Jurnal Teknologi Komputer*, vol. 5, no. 2, 2019. Available from: <https://ejournal.bsi.ac.id/ejournal/index.php/jtk/article/view/5344>
- [5] P. Hendradi and M. I. Rizki, "Perancangan sistem informasi e-commerce Toko Batik (Studi Kasus: Batik Rika Busana)," *Jurnal Ilmiah Fakultas Teknik LIMIT'S*, vol. 18, no. 1, p. 38, 2022. Available from: <https://ojs-teknik.usni.ac.id/index.php/jlmt/article/view/207>
- [6] N. B. T. Sipahutar and R. Wirawan, "Perancangan e-commerce berbasis website pada UMKM Bunch of Gifts," *Jurnal Sistem Informasi dan Aplikasi*, vol. 2, no. 1, 2024. Available from: <https://doi.org/10.52958/jsia.v1i1.5911>
- [7] A. W. Mansur, Mardinawati, U. Hidayati, and S. Supaya, "Evaluation of the financial reporting system of LKM Gapoktan Tani Manunggal Temanggung using Black Box Testing," *Journal of Economics, Finance and Management Studies*, vol. 7, no. 8, pp. 4794-4799, 2024. Available from: <https://doi.org/10.47191/jefms/v7-i8-01>
- [8] M. B. Romney and P. J. Steinbart, *Accounting Information Systems*, 14th ed. Pearson, 2016. Available from: <https://www.pearson.com/en-us/subject-catalog/p/accounting-information-systems/P200000007724/9780134475639>
- [9] Mulyadi, *Sistem Akuntansi*. Jakarta: Salemba Empat, 2016. Available from: <https://leksikabookstore.com/product-detail/eBook-Sistem-Akuntansi-Edisi-4-Mulyadi>
- [10] J. O'Brien and M. Marakas, *Pengantar Sistem Informasi*. Jakarta: Salemba Empat, 2017. Available from:

<https://penerbitsalemba.com/buku/02-0317-pengantar-sistem-informasi-e16-2>

- [11] W. G. Zikmund, B. J. Babin, J. C. Carr, and M. Griffin, Business Research Methods. Cengage Learning, 2013. Available from: <https://www.cengage.com/c/business-research-methods-9e-zikmund-babin-carr-griffin/9781111826949/>
- [12] R. M. Stair and G. W. Reynolds, Principles of Information Systems. Cengage Learning, 2018. Available from: <https://www.cengage.com/c/principles-of-information-systems-14e-stair-reynolds/9780357112410/>
- [13] H. Kerzner, Project Management: A Systems Approach to Planning, Scheduling, and Controlling. John Wiley & Sons, 2017. Available from: <https://www.wiley.com/en-us/Project+Management:+A+Systems+Approach+to+Plannin+g,+Scheduling,+and+Controlling,+13th+Edition-p-9781119805373>
- [14] N. Slack, A. Brandon-Jones, and R. Johnston, Operations Management. Pearson Education, 2010. Available from: https://books.google.com/books/about/Operations_Managem ent.html?id=_iC-ngEACAAJ
- [15] K. C. Laudon and J. P. Laudon, Management Information Systems: Managing the Digital Firm. Pearson, 2018. Available from: <https://www.pearson.com/en-us/subject-catalog/p/management-information-systems-managing-the-digital-firm/P200000001392/9780136971542>
- [16] R. B. Chase and F. R. Jacobs, Operations Management for Competitive Advantage. McGraw-Hill Education, 2014. Available from: https://books.google.com/books/about/Operations_Managem ent_for_Competitive_Ad.html?id=8Nq7f3l2PG8C
- [17] E. Turban, D. Leidner, E. McLean, and J. Wetherbe, Information Technology for Management: Transforming Organizations in the Digital Economy. John Wiley & Sons, 2018. Available from: <https://bcs.wiley.com/he-bcs/Books?action=index&bcsId=2230&itemId=0471705225&itemTypeId=BKS>
- [18] R. Pressman, Rekayasa Perangkat Lunak: Pendekatan Praktisi Buku I. Andi, 2015. Available from: <https://opac.polinema.ac.id/item/8920>
- [19] Muhammad F., "Rancang Bangun Sistem Informasi Housekeeping Inventory dengan Metode Waterfall," Jurnal Infotech, vol. 1, no. 1, 2019. Available from: <https://doi.org/10.31294/infotech.v1i1.6999>
- [20] R. A. Sukamto and M. Shalahuddin, Rekayasa Perangkat Lunak (Terstruktur dan Berorientasi Objek). Bandung: Modula, 2014. Available from: <https://www.goodreads.com/book/show/58993015-rekayasa-perangkat-lunak-terstruktur-dan-berorientasi-objek>
- [21] J. L. Whitten and L. D. Bentley, Systems Analysis and Design Methods, 7th ed. New York: McGraw-Hill, 2007. Available from: <https://search.worldcat.org/title/systems-analysis-and-design-methods/oclc/680473695>
- [22] G. J. Myers, C. Sandler, and T. Badgett, The Art of Software Testing, 3rd ed. Hoboken, NJ: John Wiley & Sons, 2011. Available from: <https://doi.org/10.1002/9781119202486>