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Effectiveness of an automated billing management system for invoice generation in a logistics company

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ABSTRACT

Efficient revenue management is crucial for PT Jalur Nugraha Ekakurir (JNE) amidst surging delivery volumes. To optimize billing and reduce manual errors from the legacy MyOrion system, JNE migrated to the RAISE Billing Management System. However, implementation faces operational constraints including synchronization gaps requiring manual reconciliation, lengthy maintenance downtimes, and rigid administrative validations that hinder cash flow. This study evaluates RAISE's operational effectiveness at JNE Gedebage's Revenue Assurance unit, mapping billing procedures, identifying systemic bottlenecks, and formulating strategic solutions. Utilizing a Qualitative Descriptive approach, data was gathered through interviews with four purposively selected informants and triangulated with observations, document analysis, and literature reviews. Findings reveal that RAISE significantly optimizes workflows via 24-hour automated synchronization, accelerating high-volume processing, reducing human error, and offering billing flexibility. Despite an 8.7 staff rating, technical barriers like early-month maintenance disrupting peak cycles, filter failures on cash transactions, and reliance on external communication for troubleshooting prevent maximum efficiency. Conclusively, while RAISE enhances speed and accuracy, technical instability limits its potential. Strategic recommendations include shifting maintenance to off-peak mid-month periods, mandating tax ID validation during onboarding, refining cash transaction filters, and developing real-time reconciliation dashboards. Future research should quantitatively measure workflow efficiency, evaluate user satisfaction, explore predictive error-detection analytics, and assess the macroeconomic impacts of technical billing inefficiencies.

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1. INTRODUCTION

Efficient revenue management is critical for PT Jalur Nugraha Ekakurir (JNE), a major Indonesian logistics distributor with 83,000 destinations and 50,000 employees. To optimize revenue amid surging shipment volumes, JNE's Revenue Assurance Unit manages billing for local and National Account (NA) customers. This study focuses on NA customers, who are headquartered in Bandung but generate transactions nationwide, ensuring billing accuracy and effectiveness.

To optimize invoicing efficiency, modern corporations rely on automated Accounting Information Systems (AIS), specifically Billing Management Systems (BMS). Accounting

Information Systems (AIS) are computer-based systems designed to collect, store, process, and communicate financial and accounting data. These systems serve as a means for organizations to manage their resources efficiently and provide critical insights to support informed strategic decision-making (Zohry & Al-Dhubaibi, 2024). The Billing Management System is a critical component that enables companies to enhance their information management capabilities to meet market demands (Chen et al., 2025). A BMS automates the billing cycle and mitigates errors to safeguard cash flow. In 2023, facing manual processing bottlenecks and scalability limits with its legacy MyOrion system, JNE migrated to Raise—a robust BMS designed for faster data extraction and invoicing.

Digital transformation in the logistics industry significantly enhances invoicing quality through automated platforms like the RAISE application. This shift accelerates operations via 24-hour automated data migration, drastically reducing human errors. Additionally, it streamlines cross-team collaboration, seamlessly accommodates diverse billing cycles and formats, and optimizes archive management by securing financial data in a centralized database.

Despite this upgrade, implementing *Raise* within Revenue Assurance encounters operational bottlenecks impeding invoice generation. Invoice data is considered a highly valuable asset because it is straightforward to implement, while concurrently offering robust analytical power that supports strategic business decisions (Mirkovic et al., 2022). Invoices are essential for tracking and accounting, yet processing faces delays from data discrepancies during automated 24-hour migrations (e.g., mismatched shipment origins) and strict validation rules, such as requiring a 16-digit NPWP.

These disruptions are compounded by variable customer billing cycles (weekly, monthly) causing occasional data omissions during automated extraction. Additionally, as a newly deployed platform, Raise undergoes monthly maintenance, causing operational downtime. These delays propagate down the financial pipeline, obstructing the Credit Team's ability to execute timely collections.

The research gap regarding the RAISE application at PT JNE Gedebage spans four key dimensions. Empirically, data synchronization issues still necessitate manual reconciliation, causing operational delays. Technically, full automation is hindered by prolonged system maintenance, flawed transaction filters, and rigid administrative rules like the mandatory 16-digit NPWP. Methodologically, the current qualitative focus creates a need for future quantitative studies to statistically measure workflow efficiency and user satisfaction. Finally, an integrational gap exists; the absence of automated validation and reconciliation dashboards forces ongoing manual intervention for customized billing requests.

Effectiveness is understood as the achievement of goals (Lagin et al., 2022). Effectiveness is conceptually defined as the extent to which a system or process successfully achieves its predetermined operational objectives (Prakash, 2021). When operational outputs diverge from strategic goals, an empirical evaluation is imperative. To contextualize this, the study's conceptual framework models the RAISE application as the independent variable—an automated BMS driving daily data migration, customer management, and financial reporting. The dependent variable is invoicing effectiveness, evaluated through processing speed, reduced human error, and billing schedule flexibility. This relationship is mediated by core administrative functions but constrained by bottlenecks like system synchronization, routine maintenance, and strict validations. Ultimately, the framework links system implementation (Input) and administrative execution (Process) to operational effectiveness (Output), generating feedback to address technical constraints. Therefore, this study analyzes the effectiveness of the *Raise* application as a Billing Management System (BMS) for customer invoicing within JNE's Revenue Assurance unit. The findings aim to provide actionable insights to optimize system performance and enhance financial workflows.

This study aims to evaluate the operational effectiveness of the *Raise* application as a Billing Management System (BMS) within JNE's Revenue Assurance unit at Gedebage Station Center. By analyzing the customer invoicing workflow, the research maps its procedural mechanics and identifies systemic and operational bottlenecks. Ultimately, the objective is to formulate strategic solutions and mitigations to optimize the invoice generation process. To achieve this, the research formulates three explicit questions: (1) What is the procedure for generating customer

invoices using the RAISE application as a BMS at JNE Gedebage Station Center's Revenue Assurance unit? (2) Is the use of this system effective for processing these invoices? and (3) What proposed solutions can address the operational impacts and technical constraints of utilizing this application?"

To contextualize the operational evaluation of the Raise application, this study cross-references three relevant empirical precedents. The first study, conducted at Green Bus Company in Thailand, a transport firm that also offers courier services, demonstrates how data analytics enhances operational efficiency and drives innovative business models in the courier industry. It identifies 'freight bill payment' as a core logistics activity requiring rigorous optimization, highlights 'data structure gaps,' and emphasizes investigating corporate database architecture. Specifically, this JNE research closely parallels the Green Bus study as both: address Logistics Service Provider (LSP) challenges in managing high e-commerce transaction volumes; highlight the shift from manual to automated systems (like JNE's transition to RAISE) to remain competitive; emphasize the utility of transaction data—whether for automated daily invoicing or advanced analytics to create new revenue streams; and aim to improve operational efficiency while reducing human error through integrated systems. These empirical insights directly align with this study's focus on delayed invoice generation caused by required centralized data reconciliation (Jintana et al., 2021).

The second study, conducted in Malaysia, examines the efficiency of Robotic Process Automation (RPA) in human resource management, showing how automation captures critical data—including invoice aggregates—to optimize processing speed and precision. This closely aligns with the JNE research in optimizing business processes through technology by: automating repetitive administrative tasks to boost productivity; significantly reducing human errors to maintain consistent data quality; relying heavily on seamless system integration for automated data migration; and demonstrating how advanced automation tools can overcome technical barriers, such as system maintenance downtime**.** It underscores that manual interventions are slower and error-prone compared to automated alternatives, reinforcing the operational necessity for an automated Billing Management System (BMS) within the Revenue Assurance unit (Mohamed et al., 2022).

Lastly, an investigation into Internet of Things (IoT) applications within courier services in Malaysia explores electronic document management, positioning the customer invoice as a primary variable. This research validates that integrating digital documents within a unified system exerts a statistically positive influence on streamlining corporate workflows and enhancing operational visibility. These studies are highly complementary in logistics digital transformation: while Prapinit et al. empirically validate that electronic document management boosts productivity and customer experience, the JNE study provides practical implementation through the RAISE system's automated daily data migration and reduction of manual pricing errors. Furthermore, the theoretical risks of real-time information disruptions noted by Prapinit et al. are directly evidenced by JNE's practical constraints with data synchronization and system maintenance downtime**.** This empirical consensus substantiates the requirement for an effective BMS function to eliminate data fragmentation and latency in modern logistics operations (Prapinit et al., 2024).

2. RESEARCH METHOD

The method used in this research is a Qualitative Description (QD) approach. Qualitative methodology is an umbrella research paradigm that explores human experiences and actions through natural language and textual data rather than numbers. This approach allows participants to share their beliefs on their own terms, enabling researchers to interpret underlying meanings and behavioral patterns through a diverse collection of empirical techniques (Burney et al., 2024). Qualitative Description (QD) is a pragmatic, low-inference method that provides a straightforward, comprehensive summary of human experiences using everyday language and staying close to the actual data. Free from rigid theoretical constraints, this adaptable approach focuses on participants' perspectives in their natural state, making it highly useful for mixed-method research, questionnaire development, and understanding firsthand experiences (Hall & Liebenberg, 2024).

This qualitative descriptive study aims to evaluate the effectiveness of the RAISE Billing Management System (BMS) in customer invoicing at PT JNE Gedebage's Revenue Assurance unit, determining whether it successfully achieves its operational objectives. Implemented to efficiently handle high transaction volumes, accelerate billing and payment receipts, and minimize human error across national and local accounts, the system's practical utilization was assessed through four purposively selected informants. This cohort—comprising one Unit Head and three specialized staff members—was chosen for their strategic oversight, distinct portfolio management in retail and corporate sectors, operational mastery of the platform, and advanced capability to resolve complex technical or administrative constraints.

To ensure robust empirical reliability, primary data collected from direct on-site interviews was cross-validated using methodological triangulation, seamlessly integrating these practitioner discussions with field observations, relevant literature reviews, and comprehensive document analysis.

The analytical process utilized a taxonomic approach to systematically describe operational phenomena without establishing quantitative causality. The collected data was synthesized using an administrative framework to evaluate how effectively the system gathers, records, manages, duplicates, sends, and stores billing information. Ultimately, the application's overall success was rigorously measured against critical indicators: accelerated processing via 24-hour automated data migration, enhanced accuracy through the mitigation of manual calculation errors, and operational flexibility to accommodate diverse billing schedules and specialized commercial invoice formats. Furthermore, the evaluation assessed the platform's improved user-friendliness compared to the legacy system and its strict compliance with fundamental Accounting Information System (AIS) standards, ensuring timely and relevant decision support.

3. RESULTS AND DISCUSSIONS

The results obtained from the field observations, literature review, interviews, and document analysis are summarized in the following tables and details. The responsibilities of the Revenue Assurance unit, the invoicing process, and the operating procedures for the Billing Management System (BMS) are detailed in Tables 1, 2, and 3, respectively. The remaining findings are elaborated below.

Table 1. The responsibilities of the revenue assurance unit

No	Responsibilities
1	Unbilled Monitoring: Monitoring unbilled transactions and accelerating the invoice issuance process.
2	Root Cause Analysis: Identifying and analyzing the root causes of delays and constraints in the invoicing process.
3	Invoicing: Generating invoices for both National Account (NA) and local customers.
4	Reconciliation: Performing data reconciliation to align records between internal systems and customer data.
5	Invoice Modification: Handling invoice revisions and cancellations.
6	Tax Administration: Managing the issuance and cancellation of tax invoices.
7	Revenue Leakage Mitigation: Minimizing revenue leakage and maximizing billable corporate revenue.
8	Cross-Functional Coordination: Coordinating regularly with related units, including Sales, Operations, IT, and Finance & Accounting.

Table 2. Invoicing process using the billing management system (BMS)

No	Processes
1	Data Pulling: • Finance Dashboard • Orion Operational • Raise Data
2	Data Processing: • Transaction Population Comparison • Invoiced Population Comparison • Take-Out Transaction Check • Discount Estimation / Calculation
3	Unbilled Data Reporting:

- Unbilled Data Sharing with External Units & Owned Main Branches
- NA Allocation Execution and Agent/Partner Branch Unbilled Reconciliation

Table 3. Procedure for using a billing management system (BMS)

No	Procedure
1	System Authentication: Access the Billing Management System (BMS) platform via the web address (https://raise-pro.jne.co.id/home) and log in using individual corporate employee credentials.
2	Module Selection and Customer Categorization: Navigate to the 'Invoicing' menu and determine whether the transaction falls under a National Account (NA) or Local customer profile. If classified as an NA customer, proceed to the multi-branch interface.
3	Invoice Type Specification: Define and select the appropriate classification of the invoice based on the designated Customer ID.
4	Parameter Configuration: Input 'BDO' into the branch field allocation and select all available options within the service type parameters.
5	Temporal Framework Allocation: Enter the corresponding Customer ID and establish the specific chronological period designated for the generation of the invoice.

Customer Invoicing Procedures via the Billing Management System (BMS)

Through the Billing Management System (BMS) at PT JNE Gedebage Station Center's Revenue Assurance unit, digital transformation automates flexible billing cycles for National Account (NA) clients. This workflow manages three distinct classifications: STDNA and CCNC process verified transactions using static rates requiring no modification, whereas GIMFEE necessitates manual price adjustments based on predetermined proposals. Research conducted in Malaysia highlights how automation is transforming the industrial landscape to achieve significant time and cost savings. By mimicking human interactions with digital platforms, the technology absorbs repetitive tasks. Entire data workflows—encompassing collection, recording, updating, processing, and validation—are streamlined to maximize productivity. The study reveals these systems handle records ten times faster than manual methods, delivering flawless precision, whereas human performance typically degrades under heavy workloads. Consequently, deploying such solutions proves highly advantageous for managing critical, high-volume monthly transactions by eliminating time-consuming routines (Mohamed et al., 2022). Parallel to how the BMS automates billing cycles, research on Defense Business Administration Optimization in Indonesia highlights the critical role of data-driven solutions in driving operational efficiency. Integrating such innovations into resource administration yields substantial positive impacts on organizational performance. Furthermore, PT JNE's transaction categorizations (STDNA, CCNC, and GIMFEE) echo the study's insights regarding the necessity of highly structured management frameworks to sustain workflow optimization. Systematizing business processes translates directly into practical productivity gains. JNE's digital transformation perfectly aligns with empirical evidence showing that embedding appropriate technology into managerial practices progressively elevates performance to optimal levels. Ultimately, the research affirms that transparent, unified administrative networks mitigate inefficiency and bolster accountability—closely mirroring the error-reduction capabilities of automated platforms like the BMS (Prayitno, 2026).

Operationally, the core data workflow relies on cross-departmental collaboration among the Revenue Assurance, Support, Admin, Accounting, and National Account (NA) teams. The process begins by logging into the BMS, selecting the account type (National or Local), and configuring parameters such as Branch, Service Type, Customer ID, and billing period prior to finalization. This underlying mechanism involves three main phases: extracting operational data migrated to the BMS from the Finance Dashboard, Orion, and Raise systems; processing the data by comparing transaction populations, managing exclusions, and calculating discounts; and finally, presenting unbilled logs to internal units, branches, and partner main branches for reconciliation. A joint study by Birzeit University and the University of Limerick on humanitarian data management emphasizes that successful inter-agency coordination optimizes limited resources and prevents service duplication. Furthermore, sharing data between units enhances rapid response capabilities through targeted interventions. Ultimately, standardizing data collection and fostering inter-departmental collaboration are crucial to eliminating inaccuracies and ensuring data quality—specifically its relevance, accuracy, and timeliness (Shalash et al., 2022).

Operating on separate operational and Billing Management Systems (BMS) severely impedes billing efficiency. Disconnected data forces the Revenue Assurance team into time-consuming manual reconciliations, while a 24-hour migration cycle frequently delays invoice generation. Additionally, poor system integration demands heavy cross-unit coordination via external channels, significantly increasing administrative overhead. This platform separation also threatens data integrity, triggering mass errors like double invoicing or unfiltered cash transactions during migration. Ultimately, these synchronization bottlenecks delay invoicing and stall the credit team's collection process, leading to late customer payments and negatively impacting overall cash flow and accounts receivable management.

From an Accounting Information Systems perspective, this integrated framework replaces manual routines with an automated, systematic data flow that supports strategic financial decision-making. Contemporary Accounting Information Systems (AIS) integrate functionalities such as automation and interoperability with other business systems to enhance the effectiveness of financial reporting (Magboul et al., 2024). However, the system continues to face synchronization challenges across its operational platforms. These technical discrepancies cause occasional data lags, forcing teams to perform manual reconciliations and adjustments. Consequently, while the digital procedure operates systematically, further optimization is crucial to eliminate manual dependencies and fully realize the expected operational efficiency. This operational bottleneck is widely recognized in contemporary literature, which emphasizes that technological adoption without deep structural integration is insufficient. For instance, Yoshikuni's research on Accounting Information Systems (AIS) in Brazil and the US highlights that full infrastructure integration is essential to eradicate manual processes and elevate strategic decision-making (Yoshikuni et al., 2023). Similarly, Jintana's analysis of Thailand's Green Bus Company reveals that disparate IT usage between units creates a gap between operational data and strategic insights. Jintana stresses that digital record-keeping must be coupled with an "information technology view to support collaborative decision-making." (Jintana et al., 2021). Furthermore, Rajendran's study of the US courier market reinforces this by demonstrating that even with new technologies, technical gaps and fragmented data lead to delayed status updates and poor customer ratings. Collectively, these studies substantiate that the mere presence of digital procedures does not guarantee efficiency; continuous innovation and robust system integration are imperative to eliminate manual redundancies and meet operational quality standards (Rajendran, 2021).

Achieving full billing automation via the RAISE application is hindered by several critical limitations. Frequent data synchronization mismatches between operational and billing systems necessitate time-consuming manual reconciliation. Additionally, routine system downtime—sometimes lasting up to two weeks—disrupts access and forces a temporary return to manual processing. The automated workflow is further stalled by rigid administrative prerequisites, such as incomplete customer tax IDs, and highly varied customer billing schedules that the system frequently fails to capture. Moreover, the lack of robust filtering capabilities for cash transactions causes mass processing errors, while overall system instability leads to technical glitches like double invoicing and data retrieval failures. Consequently, staff must still heavily rely on manual interventions and external communication channels to coordinate revisions and resolve errors, severely undermining the efficiency of the automated system.

Analysis of Interview Findings: The Effectiveness of the Billing Management System (BMS)

The transition to the RAISE application at PT JNE Gedebage's Revenue Assurance Unit has significantly optimized workflows by replacing redundant manual quality control with automated 24-hour data synchronization. This accelerates high-volume processing, automates data migration, and simplifies administrative tasks. As the Head of the Revenue Assurance Unit stated, "Invoicing is faster, processing time is also faster." Furthermore, tighter system integration drastically minimizes human error by systematically standardizing complex pricing and discount calculations. Unlike the error-prone legacy MyOrion system, RAISE's stable architecture guarantees data integrity. Affirming this, the first staff member noted, "(RAISE) is more accurate and better in terms of processing steps." The system also demonstrates high service flexibility in fulfilling heterogeneous customer requirements, accommodating centralized processing for diverse branch origins, various invoice types, and adaptable billing cycles to maintain Service Level Agreements.

The second staff member corroborated, "Invoices can be created based on customer needs such as weekly, dates 1-15, etc."

Despite these operational efficiencies, critical technical barriers disrupt stability. Routine early-month maintenance coinciding with peak billing cycles, data integration inconsistencies, rigid 16-digit tax ID (NPWP) administrative constraints, and logic errors failing to filter cash transactions severely hinder workflows. Highlighting these issues, staff members reported, "There is often maintenance at the beginning of the month, up to two weeks," "Constraints like double invoices, invoices cannot be pulled," and "100 AWBs failed because the status was cash, not automatically filtered." Overall, the RAISE application is highly effective, earning an 8.7 rating from the third staff member, though the first staff member's remark that it is "not yet 100%" effective underscores the ongoing need for manual interventions. To mitigate threats to corporate cash flow, strategic recommendations include shifting maintenance to off-peak mid-month periods, implementing mandatory NPWP validation during customer onboarding, refining unbilled module logic filters to automatically exclude cash transactions, and developing a real-time reconciliation dashboard to preemptively flag data anomalies before invoice generation.

The present research at PT JNE fundamentally diverges from ten comparative studies across its operational focus, methodology, technological subject, and geographic scope. Operationally, this study distinctly examines internal accounting administration, specifically targeting billing system effectiveness for revenue assurance. In contrast, existing literature explores diverse logistical areas such as ecological crowdshipping (Akbar et al., 2024), sentiment analysis and reputation (Rajendran, 2021), IoT-driven supply chain sustainability (Prapinit et al., 2024), route optimization and physical infrastructure (Liu, 2024; Sawik, 2024), and HRMS automation (Mohamed et al., 2022).

Methodologically, the JNE research utilizes a descriptive qualitative approach via field observations, document studies, and in-depth interviews with four specific informants. This contrasts sharply with comparative studies employing quantitative regression surveys (Prapinit et al., 2024), big data web scraping (Rajendran, 2021), mathematical optimization algorithms (Liu, 2024; Sawik, 2024), and systematic literature reviews (Engesser et al., 2023; Silva et al., 2023).

Technologically, the JNE study exclusively evaluates the RAISE application as an Accounting Information and Billing Management System, whereas other research broadly investigates sharing economy platforms, robotic process automation, autonomous delivery drones and vehicles, and predictive data analytics (Jintana et al., 2021; Sorooshian et al., 2022).

Finally, regarding geographic and contextual scope, this research is micro-targeted at a single Revenue Assurance unit in Gedebage, Indonesia. This highly localized approach provides a distinct contrast to the global multinational frameworks, national industry analyses in Malaysia, and macro-urban logistics optimizations in Poland and Norway that dominate the comparative literature.

Transitioning from the legacy Orion system to the Raise Billing Management System (BMS) significantly enhances operational performance. By automating data extraction and invoice generation within a 24-hour cycle, Raise eliminates manual entry and drastically reduces human errors in quantities and discounts. Furthermore, its flexible, multi-branch capabilities seamlessly streamline large-scale corporate billing. These empirical findings strongly align with recent logistics literature, which confirms that continuous, automated workflows maximize productivity while significantly cutting processing times and labor costs (Engesser et al., 2023; Mohamed et al., 2022). A central consensus across these studies is the critical reduction of human error. Since manual intervention accounts for the vast majority of operational mistakes—such as negligence or disorientation—transitioning to AI-powered and autonomous systems ensures near-perfect accuracy and reliability (Engesser et al., 2023; Mohamed et al., 2022; Sorooshian et al., 2022). Moreover, integrating innovations like the Internet of Things (IoT) and electronic document management streamlines vast distribution networks. This integration facilitates real-time data exchange and enhances operational visibility, thereby guaranteeing that organizations meet the high-scale demands for speed, precision, and transparency in modern logistics (Prapinit et al., 2024; Sorooshian et al., 2022).

Despite its advancements, the system's overall effectiveness is hindered by recurring technical and administrative barriers. Routine early-month maintenance can trigger delays of up to

two weeks, compounded by daily glitches such as duplicate invoices, unretrievable data, and invalid tax ID (NPWP) blocks. These empirical challenges align with Liu's recent research, which confirms that technical complexity, continuous maintenance demands, and poor data quality remain major hurdles that disrupt and delay digital logistics operations (Liu, 2024). Furthermore, Sawik emphasizes that automated systems are highly vulnerable to integration complexities and infrastructure disruptions. Sawik warns that delaying essential system maintenance escalates costs and exacerbates operational failures. To overcome these inherent technical gaps and prevent data discrepancies, both studies suggest that continuous system refinement, real-time analytics, and proactive maintenance are imperative (Sawik, 2024).

These limitations hinder full automation, forcing a heavy reliance on manual coordination via email or WhatsApp for troubleshooting and reconciliation. This operational bottleneck is further worsened by rigid filters that fail to automatically isolate cash transactions, triggering mass processing errors that severely disrupt the invoicing workflow. These empirical challenges are strongly corroborated by recent literature, which confirms that modern digital systems rarely achieve complete autonomy and persistently suffer from data gaps and profound manual dependencies. (Akbar et al., 2024; Khan & MacEachen, 2022). Because technology alone cannot resolve complex operational dynamics or technical glitches, human intervention remains a crucial standard. Establishing functional digital workflows requires "intentional actions" and joint human efforts to navigate conflicting stakeholder interests and maintain coordination (Khan & MacEachen, 2022; Silva et al., 2023). Consequently, relying on external communication apps like WhatsApp serves as a common, practical workaround to bridge these systemic shortcomings. Ultimately, digital transformation introduces significant complexities; without flexible procedures and integrated collaboration, rigid traditional systems risk becoming outdated and highly vulnerable to the exact large-scale disruptions observed in practice (Silva et al., 2023).

Overall, while the BMS effectively accelerates processing, reduces errors, and manages high-volume billing, it has not yet reached its full potential. Its long-term success relies on improving technical stability and deep-level automation to eliminate inefficient manual workarounds. This aligns with research validating that automation is significantly faster than manual labor, consistently maintaining high accuracy under heavy workloads where human performance would typically decline. (Mohamed et al., 2022). Despite being technically effective, operational success is often hindered by immature infrastructure. Technical constraints such as server downtime or malfunctioning applications are identified as the primary causes of transaction delays and late status updates (Rajendran, 2021). Gaps in the database architecture between operational systems and decision support systems prevent collected data from being fully utilized for corporate strategy (Jintana et al., 2021). The presence of manual workarounds in this study is supported by evidence that staff frequently must intervene manually to fix system inconsistencies. For instance, a lack of automated integration forces teams to perform manual reconciliation and cross-departmental data format corrections, leading to wasted time (Mohamed et al., 2022), and systems that are not yet fully integrated still rely on manual data extraction processes from transactional systems, which adds wait time and institutional inefficiency (Yoshikuni et al., 2023).

This JNE research contributes significantly to operational management and Accounting Information Systems (AIS) within the logistics industry by uniquely prioritizing back-end system stability over front-end innovations like IoT or AI. Theoretically, it validates classical administration frameworks within modern Billing Management Systems (BMS), proving their ongoing relevance for evaluating digital transformations. Furthermore, it strengthens AIS theory by offering empirical evidence on complex data synchronization challenges and the execution of core AIS principles in high-volume environments. Notably, the study pioneers a micro-level analysis of specific, often-overlooked operational bottlenecks—such as rigid administrative prerequisites like 16-digit tax IDs and disruptive early-month maintenance cycles—that impede full automation. By focusing exclusively on revenue assurance rather than conventional last-mile delivery, the research fills a crucial literary gap regarding how logistics firms secure cash flow through commercial document accuracy. Additionally, it conceptualizes a "hybrid workflow" during digital transitions, framing manual interventions not merely as system failures, but as essential, manageable components within developing digital ecosystems. Ultimately, the study provides strategic, data-driven

recommendations for BMS optimization, proposing rapid reconciliation dashboards and automated pre-invoice validations that lay the groundwork for future error-detection algorithms in logistics billing.

4. CONCLUSION

In conclusion, while implementing the RAISE Billing Management System (BMS) at JNE Gedebage enhances operational efficiency through 24-hour automated data migration and reduced human error in transaction pricing, systemic bottlenecks like lengthy maintenance downtimes, synchronization gaps, and manual third-party coordination directly delay the billing and collection processes. This study significantly contributes to Accounting Information Systems (AIS) in the logistics sector by validating classical administrative theories—gathering, recording, managing, duplicating, sending, and storing—as effective frameworks for auditing modern digital transformations. It provides empirical evidence of integration challenges requiring manual reconciliation and proposes targeted solutions, including rapid reconciliation dashboards, customizable invoice periods, and automated administrative reminders, to support structured cash flow and receivables management. However, this micro-level evaluation is strictly limited; relying on four informants within the Gedebage Revenue Assurance unit handling National Account clients, the findings cannot be broadly generalized across the logistics industry. The identified operational constraints, particularly early-month maintenance cycles and rigid 16-digit tax ID (NPWP) validation blocks, are highly specific to the proprietary RAISE application implemented in 2023 rather than universal industry hurdles. Ultimately, these localized insights establish a foundation for future research, which should leverage predictive analytics and assess the macroeconomic impacts of technical inefficiencies. To comprehensively measure future BMS effectiveness, subsequent studies must evaluate quantitative work efficiency by comparing pre- and post-implementation processing durations, alongside user satisfaction, system stability, inter-departmental coordination quality, data validation automation levels, and the completeness of customer administrative data.

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