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Research Article

WEB-BASED ACCOUNTING DISCREPANCY INFORMATION SYSTEM: INTERNAL CONTROL AND EMPLOYEE PERFORMANCE AT PT GRAHAPRIMA SUKSESMANDIRI

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ABSTRACT

Background: At PT Grahaprima Suksesmandiri, partly manual and fragmented cargo-discrepancy reporting led to delays and record revisions. During the baseline period, 40 of 325 reports (12.31%) required revision, and reporting took 2–3 working days.
Purpose: To develop a web-based accounting information system (AIS), map its features to the COSO internal control framework, and examine the association between perceived AIS implementation and employee performance.
Design/methodology/approach: An exploratory single-company study combined process observations and interviews, waterfall-based development using Python, Flask, and SQLite, and black-box testing. A post-implementation questionnaire from 30 users (26 drivers and four finance/accounting staff) was analyzed using simple linear regression.
Findings/Results: All reported functional test cases passed, and system features were mapped to all five COSO components. Perceived AIS implementation was positively associated with self-reported employee performance ($t = 5.954$; $p < 0.001$; $R^2 = 0.559$).
Conclusion: The system provides an integrated discrepancy-management workflow and COSO-oriented control design. Without comparable post-implementation measures, reporting efficiency gains and operating effectiveness of controls cannot yet be established.
Originality/value: The study integrates discrepancy reporting, interdepartmental verification, and COSO-based feature mapping in a single logistics-company AIS, alongside exploratory evidence on perceived employee performance.

ARTICLE INFO

Keywords:
accounting information system, cargo discrepancy, web-based reporting, internal control, employee performance

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INTRODUCTION

Transportation and logistics operations generate extensive records of receiving, storage, distribution, and delivery. Accurate and timely recording is essential for supply-chain coordination (Dwita & Puspita, 2025; Novianti & Ridha, 2026) and financial reporting (Monteiro et al. 2024). Accounting information systems (AISs) support transaction recording, information sharing, and operational controls (Putri et al. 2023). In logistics, discrepancies between physical cargo quantities and administrative records can affect customer claims, revenue recognition, and receivables (Siagian, 2024). At PT Grahaprima Suksesmandiri, drivers initially record discrepancies on corrected delivery notes (SJ Coret), which are delivered to the head office. Finance then manually prepares discrepancy and realization reports in Excel for Accounting. This fragmented procedure delays access to verified information and increases dependence on physical documents (Wau, 2022).

Observation and document review identified two baseline problems: the preparation of a discrepancy report took approximately 2–3 working days, and 40 of 325 reports issued between August and October 2025 required revision (12.31%). These figures indicate risks to reporting timeliness and data quality. Late or revised records may delay billing or affect the accuracy of claims and accounts receivable. Manual files also complicate verification and the tracing of changes or approvals. COSO (2013) emphasizes structured controls over information and authorization, while Deloitte (2024) discusses responses to weaknesses in financial-

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reporting controls. Web-based logistics systems offer potential improvements in data availability and workflow coordination (Setyadi, 2024; Wau, 2022). Prior studies also associate AIS quality and internal control with employee performance (Arumiasih & Dewi, 2021; Tambun & Pratiwi, 2022). The Technology Acceptance Model (Davis, 1989) and the information systems success model (DeLone & McLean, 2003) offer complementary perspectives on perceived system usefulness, quality, and organizational benefits.

Existing research on web-based inventory and logistics systems focuses on stock recording, warehousing, or retail inventory (Dwita & Puspita, 2025; Pratiwi et al. 2026; Setyadi, 2024; Wau, 2022). Related AIS studies address general system quality, internal control, and performance (Arumiasih & Dewi, 2021; Tambun & Pratiwi, 2022). The cited studies do not directly examine an integrated workflow for reporting, verifying, realizing, and accounting for cargo discrepancies. This study therefore develops a web-based discrepancy AIS at PT Grahaprima Suksesmandiri, maps its features to the COSO components, and examines the relationship between perceived AIS implementation and employee performance. The contribution is a discrepancy-specific workflow linking Drivers, Finance, and Accounting, supported by COSO-oriented control design and exploratory evidence on perceived user outcomes. The survey findings are interpreted as associations rather than causal effects.

TAM highlights perceived usefulness and ease of use as determinants of technology acceptance (Davis, 1989), while the DeLone and McLean (2003) model relates system and information quality to net benefits. Two hypotheses are examined: H_0, perceived implementation of the web-based discrepancy AIS is not significantly associated with perceived employee performance; and H_1, the association is positive and statistically significant. Because the study uses a single post-implementation survey without a control group or baseline performance measure, these hypotheses concern association, not causal impact.

The evaluation distinguishes the system deliverable from measurable outcomes. Functional correctness was assessed through black-box testing, and control design through feature mapping to the five COSO components. Perceived AIS implementation and employee performance were analyzed by regression. The pre-implementation revision rate (12.31%) and reporting time (2–3 working days) provide operational context, but comparable post-implementation measures were unavailable; efficiency improvements therefore could not be established.

METHODS

An exploratory single-company design combined qualitative process analysis, web-based system development, and a post-implementation survey. Observations and interviews identified workflow problems; the waterfall method guided requirements analysis, design, implementation, and testing. The system was developed using Python, Flask, and SQLite, and functional correctness was evaluated through black-box testing. Responses to a one-time questionnaire were analyzed using simple linear regression in SPSS, alongside reliability, validity, and regression-diagnostic tests. As the survey is cross-sectional and self-reported, the regression measures association rather than causal impact.

The study was conducted at the headquarters of PT Grahaprima Suksesmandiri in Central Jakarta. The population comprised employees involved in discrepancy recording, verification, realization, and accounting. All four Finance and Accounting employees were included through saturated sampling. Of 50 registered drivers, 26 met the purposive inclusion criteria and agreed to participate, resulting in 30 respondents (Table 1).

Drivers were eligible if they were active between January and March 2026, had encountered a discrepancy during loading or unloading, and could be contacted and consented to participate. The questionnaire comprised eight AIS implementation items (X) and eight perceived performance items (Y), rated from 1 (strongly disagree) to 4 (strongly agree), giving scores between 8 and 32 for each variable. Its conceptual basis drew on the information systems success model (DeLone & McLean, 2003) and employee-performance dimensions cited by Udayana and Juliarsa (2022). Pearson item–total correlations and Cronbach's alpha were used to evaluate measurement quality. Data collection took place between January and April 2026; the completed questionnaires were analyzed in SPSS.

Data were collected in three steps. First, one semi-structured interview was conducted with personnel involved in the discrepancy process, using a guide covering workflows, document handling, reporting time, and operational obstacles. The interview lasted approximately one hour, and notes were taken. Second, the process was observed on one occasion at the head office, following the flow from the corrected delivery note (SJ Coret) to the Excel-based realization report. The 325 reports issued from August to October 2025 were reviewed to establish the baseline revision rate; the baseline reporting time was also documented. Third, a questionnaire was administered once, in person, after respondents had tested the system.

Internal control design was assessed by mapping system features to the COSO framework. First, implemented features were identified from the system documentation and interface (Figures 1 and 2). Second, each feature was mapped to the corresponding component of the Internal Control–Integrated Framework (COSO, 2013). This procedure assessed the presence of control features, not their operating effectiveness; for example, whether erroneous or unauthorized entries were consistently detected was not tested.

Interview and observation notes were used to characterize the existing process and inform the system requirements. Survey responses were summarized descriptively and evaluated using Pearson item correlations, Cronbach's alpha, Kolmogorov–Smirnov residual normality, deviation-from-linearity, and Glejser heteroscedasticity tests. The reported p-values above 0.05 were interpreted as providing insufficient evidence of assumption violations.

Simple linear regression assessed the association between the AIS implementation score (X) and perceived employee performance (Y), using $Y = a + bX$. Coefficient significance was evaluated at the 5% level, and R^2 summarized the variance explained by the model. Because X and Y were rated by the same respondents at one time point, common-method bias and reverse association remain possible.

RESULTS

Initial Conditions and the Discrepancy Cycle

Observations indicate that discrepancy handling at PT Grahaprima Suksesmandiri before system implementation was semi-manual and not integrated. When a discrepancy in goods (selisih barang) occurs during loading and unloading (bongkar muat), the driver records it on a Surat Jalan (SJ) Coret document. This document is then physically taken to the head office for processing by the Finance Department. Next, Finance creates discrepancy reports and realization reports using Microsoft Excel, while Accounting performs verification and analysis based on the documents received. This situation leads to poor information flow among operations, finance, and accounting (Figure 3).

Based on document observations from August to October 2025, 325 discrepancy reports were reviewed, of which 285 were valid and 40 required revision. The error rate was 11.43% in August, 11.61% in September, and 13.89% in October, giving an overall revision rate of 12.31% (Table 2).

Table 1. Research Population and Sample

Respondent Group	Population	Sampling Technique	Sample
Finance	2	Saturated Sampling	2
Accounting	2	Saturated Sampling	2
Driver	50	Purposive Sampling	26
Total	54	—	30

Table 2. Summary of Manual Discrepancy Reports, August–October 2025

Month	Total Reports	Valid Reports	Revised Reports	Error Rate
August 2025	105	93	12	11.43%
September 2025	112	99	13	11.61%
October 2025	108	93	15	13.89%
Total/Average	325	285	40	12.31%



Figure 1. Use Case Diagram of the Discrepancy Accounting Information System

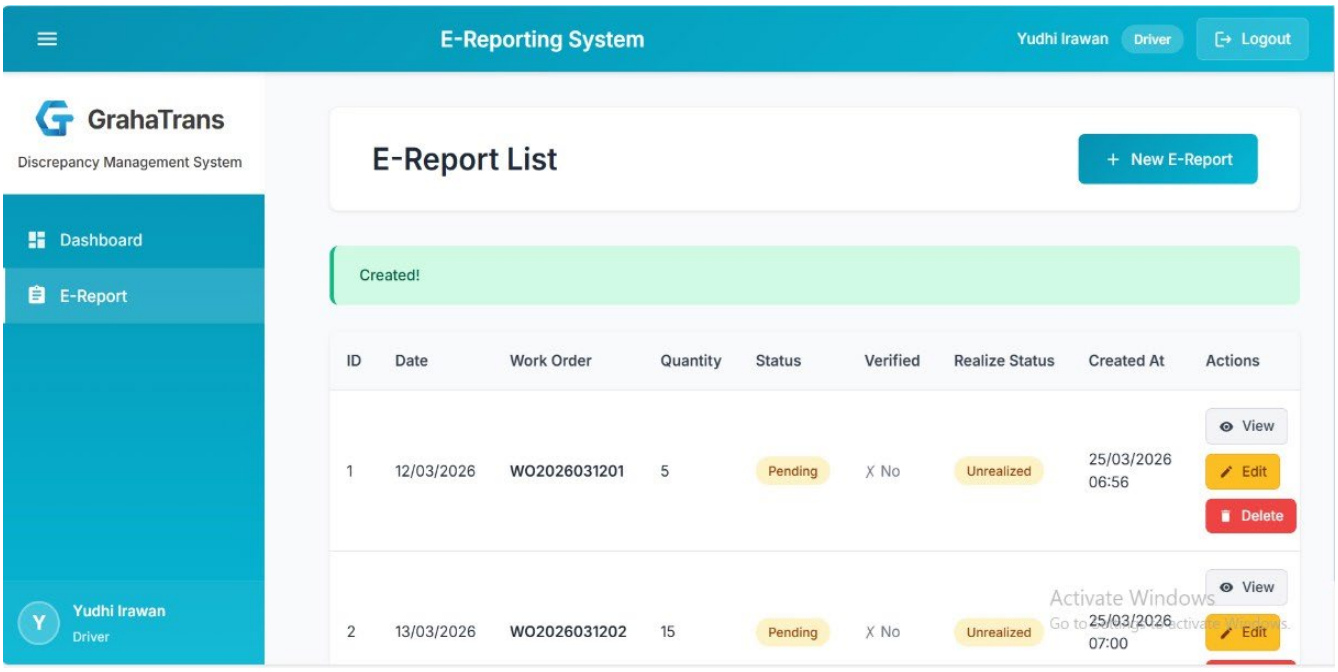


Figure 2. E-Report List and Create E-Report Views

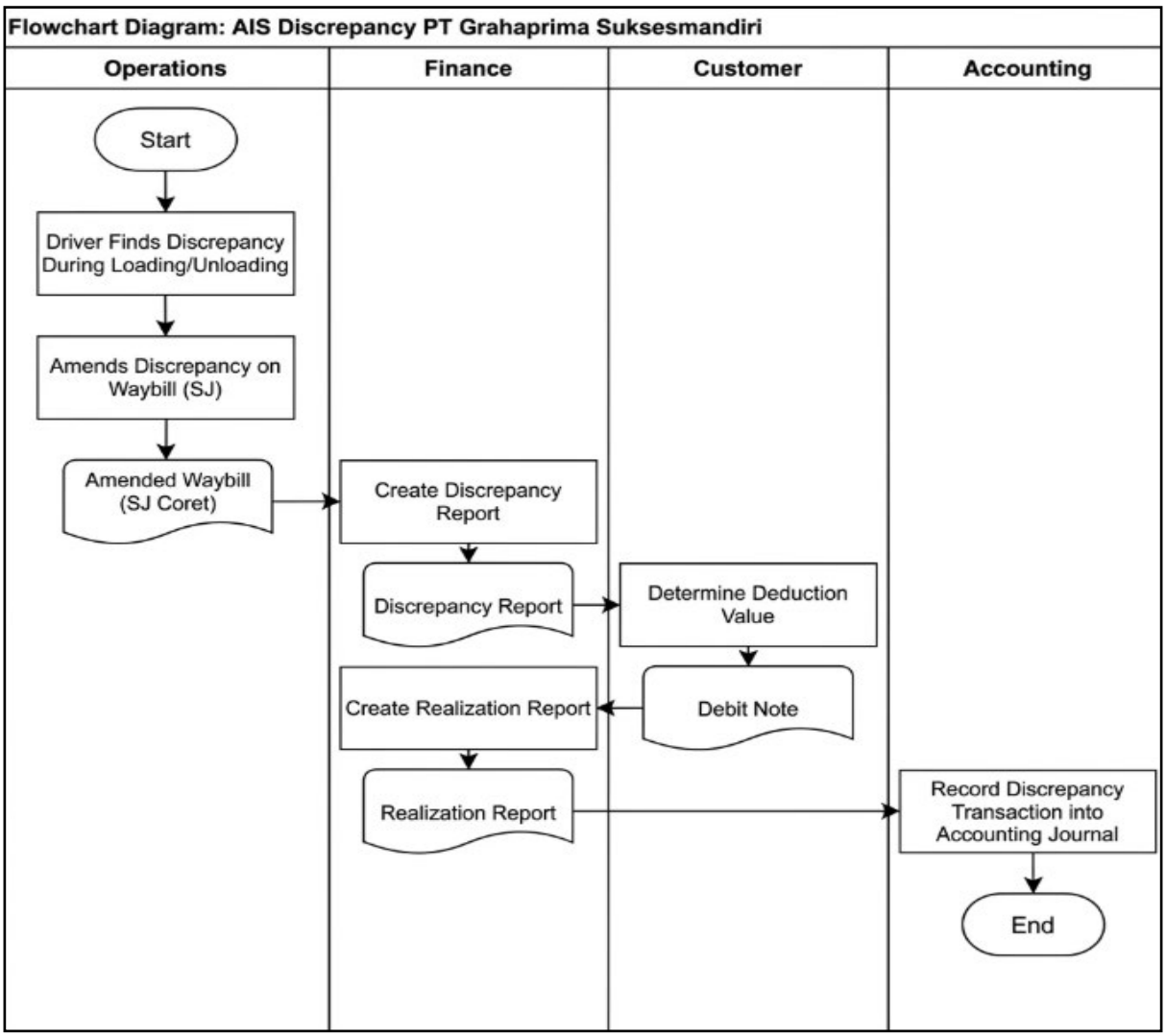


Figure 3. Discrepancy Cycle Before System Implementation

Preparing a discrepancy report took approximately 2–3 working days after the incident was identified in the field. Reliance on physical document delivery and manual recording also delayed coordination between departments, according to the interview findings. These are pre-implementation baseline measures, not post-implementation outcomes; a before-and-after comparison was not conducted.

System Design and Implementation

Based on the identified needs, the discrepancy AIS was developed using the waterfall method. The system was designed to integrate reporting by Operations, verification and realization by Finance, and information access for Accounting. The design included Data Flow Diagrams (DFD), Use Case Diagrams (Figure 1), Entity Relationship Diagrams (ERD), Logical Record Structures (LRS), and interface designs. The system provides three access levels based on user roles: Driver, Finance, and Accounting.

The implemented system provides features such as e-reporting, verification, realization, a dashboard, progress tracking, and PDF report export (Figure 2). Drivers enter discrepancies directly into the system. Finance then carries out verification and processing. Accounting accesses the processed reports to support accounting records. Technically, the system was built using Python with the Flask framework, HTML, and CSS, with SQLite as the database.

Black-box tests assessed system functions used by drivers, Finance, and Accounting. The tests covered authentication, reporting, verification, realization, editing, deletion, PDF export, and user access. For the Accounting role, the reported tests verified access to e-reports, verification and realization records, and

PDF exports. Functional success does not by itself demonstrate improvements in reporting speed, data accuracy, or internal control effectiveness.

Internal Control System

The internal control mapping indicates that system features correspond to the five COSO components (COSO, 2013; Table 3). Role-based permissions distinguish access by Drivers, Finance, and Accounting. A "Need Verification" dashboard supports risk identification; mandatory-field validation and approval rules are designed as control activities. A dashboard and progress tracker support information and communication, while transaction history is intended to support monitoring and an audit trail. These features provide evidence of control design, not of operating effectiveness, which would require testing actual transactions, access logs, and exceptions.

Results of the Quantitative Analysis

Quantitative analysis was conducted on 30 system users: drivers, finance staff, and accounting staff. The instrument consisted of eight items measured on a 1–4 Likert scale for AIS implementation (X) and eight items for employee performance (Y). Descriptive statistics show that AIS implementation had a mean summed score of 25.33 (out of a possible 32), while employee performance had a mean summed score of 26.67. The statistical summary is shown in Table 4.

At the item level, the highest mean score for AIS implementation was found in X5 (3.50), while the lowest was found in X6 (2.93). All employee performance items had mean scores above 3.00, ranging from 3.20 to 3.47 (Table 5).

The validity test shows that all AIS implementation items have calculated r values between 0.512 and 0.773, while the employee performance items have calculated r values between 0.530 and 0.781. All these values exceed the r table value of 0.361 and are significant at the 0.05 level. Therefore, all instrument items meet the validity criterion. Both variables are also reliable, with Cronbach's alpha values of 0.803 and 0.801 (Table 6).

The regression diagnostic tests reported no evidence of non-normal residuals, with an Asymp. Sig. value of 0.200. The linearity test produced a deviation-from-linearity significance value of 0.478, while the Glejser test produced a significance value of 0.714. All three values are above 0.05 (Table 7).

Table 3. Mapping of System Features to the COSO Components (Control Design)

COSO Component	System Feature (Control Design)
Control Environment	Role-based access control according to user authority
Risk Assessment	Need Verification dashboard for unverified reports
Control Activities	Mandatory field validation and approval mechanisms
Information and Communication	Real-time dashboard and progress tracker
Monitoring	Transaction history and audit trail

Table 4. Descriptive Statistics for Research Variables

Variable	N	Min.	Max.	Mean	Std. Deviation
Accounting Information System Implementation (X)	30	16.00	32.00	25.33	4.071
Employee Performance (Y)	30	20.00	30.00	26.67	2.746

Table 5. Summary of Statistics by Item

Variable	Highest Mean	Item	Lowest Mean	Item
Accounting Information System Implementation (X)	3.50	X5	2.93	X6
Employee Performance (Y)	3.47	Y1	3.20	Y3

The simple linear regression produced the equation Y = 13.895 + 0.504X. The regression coefficient for AIS implementation was 0.504, with a t-value of 5.954 and $p < 0.001$ (Table 8).

The results support H_1: perceived implementation of the web-based discrepancy AIS is positively and significantly associated with perceived employee performance. The regression model explains 55.9% of the variation in the performance scores. However, because both variables were measured in a single self-reported survey, the findings do not establish that system implementation caused improvements in employee performance.

Before implementation, physical delivery notes and disconnected Excel files delayed the reporting cycle. The baseline review recorded a 12.31% revision rate and a reporting time of 2–3 working days; neither indicator was remeasured after implementation. The web-based system was designed to make reporting, verification, and realization accessible to relevant roles in a shared workflow. This is consistent with the expected function of AISs in organizing information for accounting operations, but the present data do not demonstrate operational efficiency gains.

The system includes role-based permissions, mandatory validation, approval steps, dashboards, and transaction history. These features map to the five COSO components and may facilitate data traceability; however, their effectiveness was not tested against actual exceptions, unauthorized changes, or post-implementation error rates. The design extends inventory-oriented logistics systems (Pratiwi et al. 2026; Setyadi, 2024) by connecting cargo discrepancy reports to finance and accounting workflows. Survey responses were generally favorable: the AIS implementation score averaged 25.33 of 32, with item means ranging from 2.93 (X6) to 3.50 (X5).

Important residual control risks remain. Drivers can enter and modify source reports, and the system cannot independently verify physical quantities. Finance may edit or delete verification and realization records, potentially weakening the audit trail unless changes are retained. Finance also performs both verification and realization, warranting independent review. Database capacity, access logging, and backup arrangements should be evaluated as transaction volume increases. These considerations call for compensating controls rather than an assumption that control design ensures effectiveness.

Table 6. Summary of Validity and Reliability Tests

Variable	Calculated r Range	r Table	Cronbach's Alpha	Decision
Accounting Information System Implementation (X)	0.512–0.773	0.361	0.803	Valid and Reliable
Employee Performance (Y)	0.530–0.781	0.361	0.801	Valid and Reliable

Table 7. Results of the Regression Assumption Tests

Test	Statistic	Sig.	Criterion	Result
Normality (Kolmogorov–Smirnov)	0.092	0.200	> 0.05	Fulfilled
Linearity	–	0.478	> 0.05	Fulfilled
Heteroscedasticity (Glejser)	-0.370	0.714	> 0.05	Fulfilled

Table 8. Hypothesis Test Results

Analysis	Value	Sig.
Regression coefficient (B)	0.504	<0.001
t-value	5.954	<0.001
F-value	35.453	<0.001
R	0.747	–
R^2	0.559	–

Regression results showed a positive association between perceived AIS implementation and performance ($B = 0.504$; $t = 5.954$; $p < 0.001$; $R^2 = 0.559$). The model explains 55.9% of the variance in perceived performance; the remaining 44.1% is unexplained by this specification. The finding accords with studies connecting AIS quality or adoption to employee outcomes (Arumiasih & Dewi, 2021; Daulah & Suwarno, 2025; Nuriadini & Hadiprajitno, 2022; Tambun & Pratiwi, 2022). Nonetheless, the cross-sectional self-report design cannot determine whether favorable system ratings lead to better work performance or whether better-performing respondents rate the system more positively.

TAM and the information systems success model provide interpretations of these perceptions, not independent causal validation (Davis, 1989; DeLone & McLean, 2003). The system offers a unified path for recording discrepancies, processing verification, and supplying information to Accounting. Its practical contribution is therefore a documented workflow and design for more traceable accounting information; gains in operational speed, error reduction, and control effectiveness remain to be assessed.

The study is limited to one company and 30 respondents, of whom 26 are drivers. Both measures were self-reported in a single survey, creating potential common-method bias; no pre-implementation performance measure, comparison group, or post-implementation error-rate and reporting-time series was available. The results primarily reflect drivers' perceptions and should not be generalized to other roles or companies without further evidence.

Future research should include larger samples across multiple logistics companies and additional explanatory variables, such as user satisfaction, information quality, ease of use, competence, and motivation. A before-and-after or quasi-experimental design should also measure objective outcomes, including report revision rates, processing time, receivables ageing, and the operating effectiveness of internal controls.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study examined discrepancy handling at PT Grahaprima Suksesmandiri, developed a web-based AIS, mapped its features to COSO internal control components, and assessed the relationship between perceived AIS implementation and employee performance. Before implementation, the process was partly manual and fragmented: 40 of 325 reports (12.31%) from August to October 2025 required revision, while preparation of a report took 2–3 working days. The system was developed using the waterfall method with Python, Flask, and SQLite and provided separate access for Drivers, Finance, and Accounting. All reported black-box test cases passed, supporting functional correctness but not demonstrating reduced errors or faster reporting.

The system features correspond to all five COSO components through role-based access, verification dashboards, mandatory validation and approval, progress tracking, and transaction history. This establishes a control-design mapping, not control effectiveness; risks remain in the accuracy of driver-entered data and permissions to edit or delete Finance records. In a post-implementation survey of 30 users, perceived AIS implementation was positively associated with perceived performance ($B = 0.504$; $t = 5.954$; $p < 0.001$; $F = 35.453$; $R^2 = 0.559$). Thus, H_1 is supported as an association, while causal improvement has not been demonstrated.

The positive association is consistent with earlier studies linking AIS quality and use to employee performance (Arumiasih & Dewi, 2021; Nuriadini & Hadiprajitno, 2022; Tambun & Pratiwi, 2022). The system design also complements web-based information-system studies by Setyadi (2024) and Wau (2022). Unlike studies reporting measured gains in accuracy or speed, this research collected no comparable post-implementation operational measures. The case contributes a discrepancy-specific linkage among accounting information quality, COSO-oriented control design, and perceived user outcomes, while the evidence remains limited to one organization.

Recommendations

The study is limited by its single-company setting, small and driver-dominated sample (n = 30; 26 drivers), cross-sectional self-reported measures, and absence of post-implementation outcome data. The company should monitor revision rates, reporting time, and receivables ageing; test control operation; and introduce appropriate safeguards for data edits, deletions, and authorization. Future studies should assess objective outcomes across multiple organizations.

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