

Qualitative Evaluation Of Purchase Invoice Management And Inventory Control Using The Pieces Framework: A Case Study Of Toko Ayu Kumis, East Bekasi, West Java

Roebana¹, Felix Wuryo Handono², Hari Sugiarto³

¹Information Systems Study Program, Faculty of Engineering and Informatics, Universitas Bina Sarana Informatika, Jakarta, Indonesia

^{2,3}Lecturer, Universitas Bina Sarana Informatika, Jakarta, Indonesia

e-mail: ¹roebana07@gmail.com, ²felix.fwh@bsi.ac.id, ³hari.hig@bsi.ac.id

Abstract

Toko Ayu Kumis is a small-scale trading business located in Rawalumbu, East Bekasi, West Java, whose purchase invoice recording and inventory control are still carried out manually. This condition has led to recording errors, stock discrepancies, slow document retrieval, and a risk of missing goods, all of which reduce operational reliability. This study aims to qualitatively evaluate the purchase invoice management and inventory control process at Toko Ayu Kumis using the PIECES framework, which covers six dimensions: Performance, Information and Data, Economy, Control and Security, Efficiency, and Service, and to formulate practical improvement recommendations. A qualitative case study design was used, with data collected through direct observation, semi-structured interviews with the store owner, documentation review of invoices and stock records, and a supporting Likert-scale questionnaire whose results were converted into a System Performance Value (Nilai Kinerja Sistem/NKS). The findings show that recording is generally completed on the same day but tends to slow down as transaction volume increases; invoice information is adequate but its accuracy still depends on manual diligence; the manual system is inexpensive to operate but carries a risk of loss from stock errors; invoice-to-goods matching is practiced but lacks a structured audit trail; duplicated work steps persist in the recording process; and limited real-time stock data affects service speed. The overall NKS score was 62.50 percent, with Control and Security (53.33 percent) and Efficiency (50.00 percent) identified as the weakest dimensions and therefore the top priorities for improvement. Recommended actions include digitizing transaction and inventory records, building an integrated stock database, applying a scheduled stock-opname standard operating procedure, digitally archiving purchase invoices, and integrating purchasing, sales, and inventory data into a single system to support more reliable small-business operations.

Keywords: *Qualitative Evaluation; Purchase Invoice; Inventory Control; PIECES Framework; Small and Medium Enterprises (SME)*

I. INTRODUCTION

The advancement of information technology has encouraged Micro, Small, and Medium Enterprises (MSMEs) to gradually shift from manual recording toward more computerized systems in order to improve operational accuracy and efficiency. Inventory represents a direct source of revenue for a trading business, and sound inventory management helps

such a business absorb demand fluctuations while controlling purchasing cost.

Toko Ayu Kumis, located in Rawalumbu, East Bekasi, West Java, is a small trading enterprise whose daily operations still rely on conventional recording of purchase invoices and stock monitoring. This condition is common among similar small and medium trading businesses, which typically still record inventory manually,

resulting in inaccurate data, frequent counting discrepancies, and even loss of goods due to unclear accountability among staff.

The goods-receiving process at Toko Ayu Kumis begins when a supplier delivers goods along with a purchase invoice specifying the type and quantity of items to be received. When the volume of incoming goods is large, part of the stock has to be moved to a separate storage area, so that items listed on a single invoice end up split across two locations. Verification then requires the owner or staff to re-count and re-match the goods in both locations against the invoice before the transaction can be considered complete, which slows the process and increases the possibility of human error, especially when transaction volume is high.

Manual handling of purchase invoices also delays the verification of invoices, delivery notes, and goods-receipt evidence. A complete and properly verified invoice is essential before a purchase is posted into the purchase journal; when this process is not integrated with stock recording, the risk of recording error, delayed information, and operational inefficiency increases substantially.

To determine whether the current purchase-invoice and inventory-control process at Toko Ayu Kumis is functioning as intended, a systematic evaluation is required. One widely used approach for evaluating an information system or a business process is the PIECES framework, which decomposes the evaluation into six focus areas: Performance, Information, Economy, Control, Efficiency, and Service. This framework was selected because it is well suited to analyzing every operational variable under study and produces a concrete picture of the effectiveness of the system or process used by a business.

Prior studies have demonstrated the effectiveness of the PIECES framework in evaluating diverse information systems,

ranging from government web portals and academic information systems to e-commerce and inventory administration platforms, confirming that the framework is flexible enough to be applied not only to digital systems but also to manual business processes such as those found in small trading enterprises. Unlike most PIECES-based studies, which primarily measure user satisfaction toward an already-running application, the present study positions PIECES as a comprehensive qualitative evaluation tool for a manual business process, namely the management of purchase invoices and inventory control at Toko Ayu Kumis.

Based on the foregoing, this study aims to (1) describe the current condition of purchase-invoice management and inventory control at Toko Ayu Kumis, (2) evaluate that process against the six PIECES dimensions, (3) identify the root causes of ineffective transactions, calculation errors, and the risk of missing goods, and (4) formulate concrete improvement recommendations that can be implemented by the store to strengthen its future operational governance.

II. RESEARCH METHOD

A. Research Design

This study employed a qualitative case study design to obtain an in-depth understanding of the purchase-invoice management and inventory-control process at Toko Ayu Kumis. The qualitative approach was chosen because the study focuses on understanding real operational problems, constraints, and needs rather than statistical generalization.

B. Location and Object of the Study

The research was conducted at Toko Ayu Kumis, located in Rawalumbu, East Bekasi, West Java. The object of the study was the process of managing purchase invoices and controlling inventory during the observation period.

C. Data Collection Techniques

Three data collection techniques were combined. First, direct observation was carried out to understand the manual workflow used in the store, from goods receipt to stock recording. Second, a semi-structured interview was conducted with the store owner, Mr. Paino, to obtain deeper information about constraints, needs, and expectations that could not be captured through observation alone. Third, documentation study was carried out on relevant records such as purchase invoices, stock notes, and transaction reports. Data credibility was strengthened through source triangulation by comparing and cross-checking the results of observation, interview, and documentation.

As supporting quantitative evidence, a closed Likert-scale questionnaire consisting of 16 statement items representing the six PIECES dimensions (Performance: 3 items, Information and Data: 3 items, Economy: 3 items, Control and Security: 3 items, Efficiency: 2 items, and Service: 2 items) was administered to the owner and staff, using a five-point scale where 5 = strongly agree/very good and 1 = strongly disagree/poor.

D. Data Analysis - The PIECES Framework

The PIECES framework decomposes system or process evaluation into six dimensions. Performance assesses the speed and responsiveness of recording and data updates. Information and Data assesses the accuracy, timeliness, and reliability of information produced. Economy assesses the cost-benefit balance of the current process. Control and Security assesses how well the process safeguards data and assets against error, fraud, or loss, including the existence of an audit trail. Efficiency assesses whether resources (time, labor, equipment) are used optimally without unnecessary duplication. Service assesses the quality of service delivered to internal and external stakeholders.

The analysis proceeded through five steps: (1) identifying the object and indicators for each PIECES dimension, (2) collecting qualitative and quantitative data, (3) analyzing each dimension separately to obtain its strengths and weaknesses, (4) determining an evaluation status (good, fair, or weak) for each dimension based on the qualitative findings reinforced by the questionnaire percentage, and (5) formulating improvement recommendations, prioritizing dimensions with a weak status.

E. System Performance Value (NKS) Calculation

The percentage achievement of each dimension was computed using the System Performance Value (Nilai Kinerja Sistem/NKS) formula. The maximum possible score was calculated as $Y = Nq \times Nr \times X_{max}$, where Nq is the number of question items, Nr is the number of respondents, and X_{max} is the highest Likert scale value (5). The System Performance Value was then obtained as $NKS = (\text{Sigma}X / Y) \times 100\%$, where $\text{Sigma}X$ is the total actual score obtained. The resulting percentage was interpreted using the following intervals: 81-100% = very good/strong, 61-80% = fair (needs improvement), 41-60% = weak (needs correction), 21-40% = poor, and 0-20% = very poor.

III. RESULTS AND DISCUSSION

A. Overview of Toko Ayu Kumis

Toko Ayu Kumis is a small trading business owned and managed by Mr. Paino, selling daily household necessities to customers around the Rawalumbu area of East Bekasi. The store organization is simple, consisting of the owner and a small number of employees/shopkeepers who together carry out purchasing, storage, and sales activities.

B. Findings from Observation, Interview, and Documentation

Direct observation revealed that most operational activities are still performed manually, which creates a potential for delayed information, recording errors, and the risk of losing documents or goods. Specific findings include: (1) purchase-invoice recording still uses a notebook and physical documents; (2) stock updates are performed manually after goods are received; (3) invoice documents are stored physically without a systematic numbering scheme; and (4) there is no scheduled stock-opname procedure.

Interview results with the store owner confirmed several recurring issues, namely recording errors, discrepancies between physical stock and recorded stock, difficulty in retrieving purchase documents, and the risk of losing goods due to weak inventory supervision. These findings were then used as the basis for the PIECES-based analysis below.

C. NKS Results per PIECES Dimension

Table I presents the recapitulation of the System Performance Value (NKS) for each PIECES dimension, calculated from 16 questionnaire items.

PIECES Dimension	No. of Items	Actual Score	Max. Score	NKS (%)	Status
Performance	3	10	15	66.67 %	Fair - needs improvement
Information & Data	3	10	15	66.67 %	Fair - needs improvement
Economy	3	10	15	66.67 %	Fair - needs improvement
Control & Security	3	8	15	53.33 %	Weak - priority (high)
Efficiency	2	5	10	50.00 %	Weak - priority (high)
Service	2	7	10	70.00 %	Fair - needs improvement

Overall System	16	50	80	62.50 %	Fair - needs improvement
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D. Discussion by Dimension

1) Performance: Purchase-invoice recording is generally performed on the same day the goods arrive, allowing stock data to be updated in a timely manner under normal conditions. However, because the entire process is carried out manually using a notebook and physical documents, performance is likely to decline when transaction volume increases, since manual recording cannot scale in the same way an automated system can. This is reflected in the NKS score of 66.67 percent, placing this dimension in the fair category.

2) Information and Data: The information recorded on purchase invoices - item name, quantity, price, and date - is generally complete and sufficient for basic inventory management. Nevertheless, the accuracy of this information still depends heavily on the diligence of the person recording it, and retrieval of past transaction history is time-consuming because documents are not stored in a structured manner. The NKS score for this dimension is 66.67 percent (fair - needs improvement).

3) Economy: The manual system requires little investment in technology and is therefore inexpensive to run in terms of direct operating cost. However, this apparent cost efficiency is offset by the indirect financial risk arising from stock discrepancies, which can lead to inventory loss or overstock. The NKS score of 66.67 percent indicates that, although the process is economical on paper, it remains exposed to hidden costs from recording inaccuracies.

4) Control and Security: This dimension recorded the second-lowest NKS score at 53.33 percent, categorized as weak. Although incoming goods are checked and matched against the purchase invoice before stock data is updated, physically

stored invoice documents are vulnerable to loss, damage, or misplacement, and there is no structured audit trail to track changes to stock data. This weak control mechanism is one of the main contributors to the risk of missing goods identified in this study.

5) Efficiency: Efficiency obtained the lowest NKS score of all dimensions at 50.00 percent (weak, top priority for improvement). The manual workflow still involves repeated steps, such as re-counting goods across two storage locations and re-verifying quantities against the invoice, which increases the time and labor required and raises the likelihood of input error. This finding directly explains the ineffectiveness of transactions described by the store owner.

6) Service: Service recorded the highest NKS score among the six dimensions at 70.00 percent (fair - needs improvement). Available stock information is generally sufficient to help staff respond to customer inquiries about product availability; however, because this information is not updated in real time, service speed and accuracy could be further improved if stock data were synchronized immediately after each transaction.

E. Root Causes of Transaction Ineffectiveness, Calculation Errors, and the Risk of Missing Goods

Based on the combined qualitative and quantitative evaluation, four root causes were identified: (1) the purchase-invoice and inventory recording system is still manual and not integrated between the purchasing and stock-recording functions; (2) there is no information system capable of performing automatic data validation and updates; (3) stock control has not been standardized and lacks a scheduled stock-opname procedure; and (4) transaction documentation has not been digitized, making it vulnerable to loss or damage.

F. Improvement Recommendations

Following the priority levels derived from the NKS results - high priority for Control and Security and Efficiency, medium priority for Performance, Information and Data, and Economy, and low priority for Service - the following improvements are recommended for Toko Ayu Kumis: (1) adopt a digital transaction and inventory recording system, such as a simple point-of-sale application or a structured spreadsheet, to improve the speed and accuracy of data management; (2) build an integrated stock and transaction database so that information can be accessed more easily and reports can be compiled more accurately; (3) implement a routine (at minimum monthly) stock-opname procedure supported by a written Standard Operating Procedure (SOP) for inventory management to strengthen recording accountability; (4) digitally archive purchase invoices (through scanning or photographing) to reduce the risk of losing physical documents; and (5) integrate purchasing, sales, and stock data within a single system to facilitate inventory monitoring and support day-to-day business decision-making.

Implementing these recommendations is expected to help Toko Ayu Kumis reduce recording errors, strengthen internal control over inventory, and improve service quality to customers, while keeping the investment required proportionate to the scale of a small trading business.

IV. CONCLUSION

This study evaluated the purchase-invoice management and inventory-control process at Toko Ayu Kumis using the PIECES framework and found that the current process is still fully manual, resulting in recording errors, discrepancies between physical and recorded stock, slow document retrieval, and exposure to the risk of missing goods. The PIECES-based evaluation, reinforced by a System

Performance Value (NKS) of 62.50 percent overall, showed that Performance, Information and Data, Economy, and Service fall into the fair category (61-80%), while Control and Security (53.33%) and Efficiency (50.00%) fall into the weak category and therefore require priority improvement. The root causes identified were the absence of an integrated recording system, the lack of automatic data validation, the absence of a scheduled stock-opname procedure, and the lack of digital documentation. Recommended improvements include digitizing transaction records, building an integrated stock database, applying a routine stock-opname SOP, digitally archiving purchase invoices, and integrating purchasing, sales, and inventory data in one system. Future research is encouraged to design and develop an actual information-system prototype based on these recommendations and to extend the evaluation model by combining the PIECES framework with quantitative methods on a broader sample of small and medium trading enterprises.

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