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User Requirements Analysis for an Android-Based Consignment Sales Reporting System for MSMEs

Surtikanti Surtikanti[1*], Adi Rachmanto[1], Yayah Sutisnawati[2], Mellinda Baby Alyssa Dwiprana[1], Gendis Wardani[1], Mochamad Nurul imam[2]

[1]Accounting, Universitas Komputer Indonesia, Bandung, Indonesia

[2] Management, Universitas Komputer Indonesia, Bandung, Indonesia

[*]Corresponding E-mail: surtikanti@email.unikom.ac.id

Abstract. This research system aims to identify user needs for a consignment sales reporting system as the basis for developing an Android-based application. The method used was descriptive qualitative with an exploratory approach through questionnaires, participant observation, and semi-structured interviews with MSMEs in Bandung City. The analysis results indicate that manual reporting still dominates consignment practices, resulting in obstacles such as late reporting, miscalculations, difficulties in monitoring stock, and low transparency between the consignor and consignee. Thematic analysis yielded two groups of needs: consignees emphasized simple transaction recording, automated commission calculations, reminders, and transaction history; while consignors emphasized real-time reporting, detailed documentation, stock monitoring, and data security. From these results, three overarching themes emerged: the need for mobile-based accessibility, transparent and accountable reporting, and a clean user interface. Based on the findings, a conceptual system design was proposed with user-centered design principles as the basis for the development of the application. The results of this study will potentially enhance the effectiveness, accountability, and confidence in consignment-based MSME business relationship.

Keywords: Consignment Sales; Sales Reporting; Android Application; MSMEs; User-Centered Design

1. Introduction

The consignment sales system is a distribution system that is most commonly used by Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. The owner of the product (consignor) in this system leaves the goods with a shop or a cooperative (consignee) to be sold, and the payment is made only after the goods are sold. This is a good pattern because it reduces the capital risk for the consignee and at the same time increases the marketing coverage for the consignor. But consignment sales are often difficult to be transparent and accurately reported. Nugraha and Santosa (2023) argued that the manual consignment report will cause information delay, conflicts between the parties and difficulty in assessing sales performance.

Meanwhile, the advent of mobile-based digital technology, especially Android, brings new opportunities for MSMEs to overcome their weaknesses in keeping consignment records. Android applications can also enable real-time reporting, stock control and more accurate transaction recording. Ferida Kartika, and Ardi (2022) revealed that Android applications enable MSMEs to generate financial reports faster and more accurately, and thus enhance the effectiveness of decision-making. Likewise, Angellin, Oetama, and Amri (2023) showed that the integrated web-based information system can mitigate errors in manual recording and speed up the sales reporting in MSMEs. These results support the hypothesis that digital applications can improve transparency and efficiency in consignment systems.

However, most of the existing systems are still designed for general retail sales, not for consignment sales which have different characteristics such as return mechanism, commission sharing, and need for regular reporting between consignor and consignee. Hence, the analysis of user requirements is an important process prior to developing an Android-based application for consignment system. This ensures the system is really focused on MSMEs needs, is simple to use, and can raise the level of accountability in reporting consignment transactions. Thus, this research aims to develop user requirements for an Android-based consignment reporting system as a way to advance the literature and practice of MSME management in Indonesia.

2. Literature Review

2.1 Consignment Sales System

Consignment sales are a popular way of MSME collaboration in product distribution. In this system, the owner of the goods (consignor) delivers the goods to the seller (consignee) without any payment in advance, and the payment is made only after the goods are sold. This arrangement minimizes the capital needed for the seller and maximizes the marketing network for the owner. Nevertheless, the consignment system has inherent weaknesses: it depends on trust between parties and it demands accurate and transparent sales reports. Alam and Jamil (2020) that consignments are subject to disputes between consignor and consignee in the absence of adequate documentation. Gonzalez (2020) echoes this sentiment, stating that the lack of structure in recording consignment transactions can erode business trust and impede the longevity of partnerships.

2.2 Problems with Manual Sales Reporting

Reporting consignment sales at the MSME level is mostly manual, either in the form of a notebook or a simple spreadsheet. It is true that this approach is simple to apply, but it is also associated with high risks, including information delay, recording errors, and even data manipulation. Rahman and Ismail (2021) revealed that manual reporting system hinder the business performance evaluation process and transaction monitoring by the owners. In addition, Rini and Siti (2022) stated that manual reporting generally does not provide real-time access, so the owners are unable to plan the inventory and check the performance of sales partners. This circumstance shows that manual processes are the biggest barrier in developing a transparent and effective reporting system.

2.3 Use of Mobile Applications in Sales Reporting

The advancement in mobile technology, especially Android, provides a more convenient way to capture and report sales. Mobile apps enable transactions to be recorded in real time and the data is saved automatically, minimizing the possibility of input errors.Fitriani and

Kurniawan (2022) revealed that MSMEs using Android applications can speed up transaction recording and also enhance the financial report accuracy. Meanwhile, Sutrisno and Hakim (2021) designed an application with a simple interface aimed at MSMEs with limited digital literacy. However, most developed applications are still oriented towards single-party point-of-sale (POS) systems, rather than the consignment model, which requires the involvement and transparency of both parties.

2.4 User-Centered Design-Based System Design

The success of an application is determined not only by the completeness of its technical features, but also by the extent to which the system aligns with the actual needs of users. The user-centered design (UCD) approach emphasizes user involvement throughout all stages of system development, from requirements analysis to prototype evaluation. According to Norman (2013), UCD focuses on the user experience to ensure the resulting system is truly intuitive and easy to adopt. A study by Sari and Budi (2023) confirmed that applications developed using UCD principles are more quickly accepted by MSMEs because their designs align with their work patterns and limitations. This suggests that involving users from the outset can result in reporting applications that are more relevant, efficient, and have a higher implementation success rate.

2.5 Opportunities for Developing a Consignment Reporting System

Despite the rapid development of mobile applications for MSMEs, research focused on consignment-based reporting remains limited. In fact, consignment has unique characteristics such as return mechanisms, commission sharing, and the requirement for consistent reporting between the goods owner and seller. Yusuf, Prabowo, and Devi (2023) stated that real-time reporting accessible to both parties simultaneously will increase trust and efficiency in business relationships. Therefore, developing an Android application that not only records transactions but also manages bipartisan reports, calculates commissions automatically, and integrates cloud-based inventory represents a significant opportunity that requires further research. Analyzing user needs is a fundamental first step in ensuring that application design can address the real-world challenges faced by MSMEs in consignment practices.

3. Methodology

3.1 Research Type and Approach

This research uses a descriptive qualitative approach with an exploratory nature. The primary objective is to gain a deep understanding of user needs for a consignment sales reporting system, which is still largely done manually. This exploratory approach was chosen because the topic of developing an Android-based consignment reporting system, particularly one involving two parties (consignor and consignee), is relatively rarely researched. This approach ensures that the data obtained is more contextual and in line with the realities faced by MSMEs (Creswell & Poth, 2018; Silverman, 2021).

3.2 Research Location and Subjects

The research was conducted in Bandung City, with the primary subjects being MSMEs engaged in consignment sales. Respondents consisted of two groups:

1) A questionnaire for recipients of consigned goods (consignees/cooperative partners, shops, or other small businesses) with 13 respondents.
2) A questionnaire for owners or consignors with 15 respondents.

The respondent selection technique used purposive sampling, which involves selecting informants based on specific criteria aligned with the research objectives. This approach is considered appropriate because only those directly involved in consignment activities are able to provide accurate information regarding the sales reporting process (Miles, Huberman, & Saldaña, 2020).

3.3 Data Collection Techniques

Data was collected through several methods, namely:

1) Participatory observation, by directly observing how the sales reporting process for consigned goods is carried out in the field. The focus of the observations included the recording media used, the transaction recording flow, and any obstacles encountered during the reporting process.
2) Semi-structured interviews, to explore the experiences and perceptions of both consignors and consignees regarding the manual reporting system. This interview format provided flexibility for researchers to adjust questions and opened the possibility of new, relevant information emerging (Braun & Clarke, 2021).
3) Documentation, in the form of photographs of manual reports, screenshots of spreadsheet files, and examples of transaction receipts, was used to strengthen the research evidence.
4) A questionnaire was distributed to two groups of respondents (13 consignees and 15 consignors) to obtain structured data regarding the needs of a consignment reporting system.

3.4 Data Analysis Techniques

The collected data was analyzed using a thematic analysis approach, a technique that focuses on the process of identifying, grouping, and interpreting important themes emerging from qualitative data. The analysis stages included data transcription, initial coding, grouping codes into themes, and interpreting findings based on the research focus (Braun & Clarke, 2021). The analysis was conducted inductively so that themes emerged directly from the field data, rather than being predetermined solely based on theory (Azungah, 2018). The results of this analysis then served as the basis for designing the initial design of the Android-based consignment reporting system.

3.5 Research Success Indicators

The success of the research was measured through several key achievements, namely:

1) Identification of manual reporting processes used by consignment operators in the field.
2) Development of system requirements specifications based on the results of the questionnaire, interviews, and observations.
3) The initial system flow design and interface mockup have been drawn.
4) The technical and non-technical needs of users, both from the consignor and consignee perspectives, have been mapped.

These achievements are expected to serve as a conceptual foundation for further development of an Android-based consignment reporting application that meets the real needs of MSMEs.

4. Results and Discussion

4.1 Respondent Profile

This study involved two main groups: 13 consignees and 15 consignors. Most consignees were cooperatives and small shops with more than five years of business experience, serving 6–20 consignees. Meanwhile, the majority of consignors were from the food and beverage sector, with partners ranging from one to more than ten. This variation reflects the diversity of MSMEs in consignment practices.

4.2 Current Consignment Sales Reporting Practices

The questionnaire results indicate that the reporting system is still predominantly manual, using either notebooks or simple spreadsheets. Reports are typically submitted to the goods owner via photos or WhatsApp messages. From the consignor's perspective, reports received are often late and inconsistent. This situation confirms that manual record-keeping carries a high risk of delays, errors, and low accountability (Rahman & Ismail, 2021).

4.3 Main Obstacles in Reporting

A. Obstacles from the Consignee

Consignee respondents identified four main obstacles:

1) Delays in recording,
2) Forgetting to submit reports,
3) Manual calculation errors,
4) Communication barriers with the owner of the goods.

A visualization of the questionnaire results is presented in Figure 1.

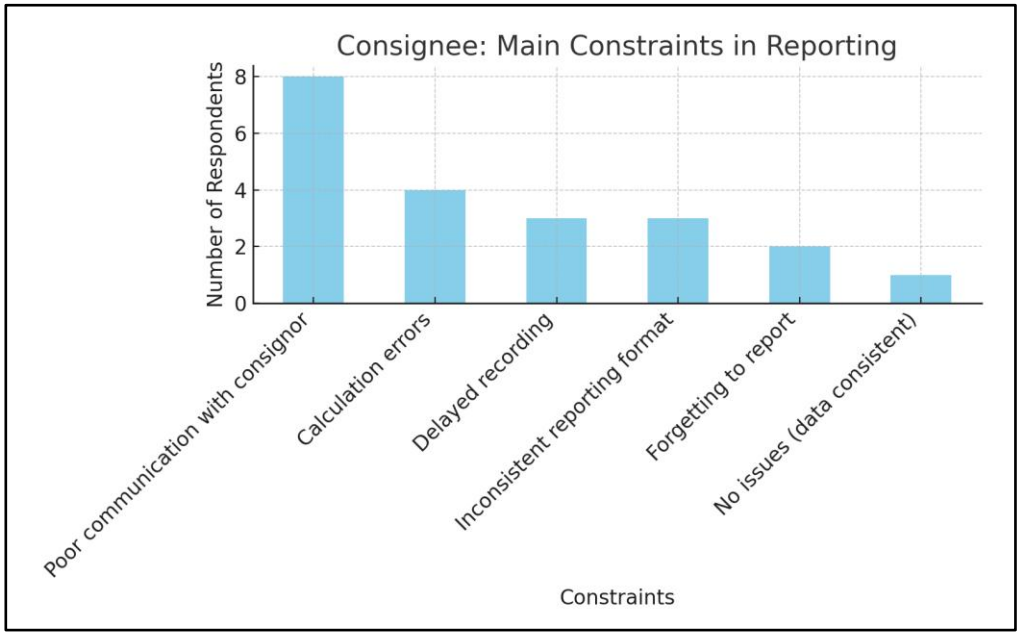

Figure 1. Main obstacles in reporting sales of consigned goods from the consignee's perspective

B. Obstacles from the Consignor

From the consignor's perspective, the main obstacles include:

1) Delays in reporting,

2) Difficulty monitoring remaining stock,
3) 3. Lack of detailed transaction reports.

A visualization of the questionnaire results is shown in Figure 2 below:

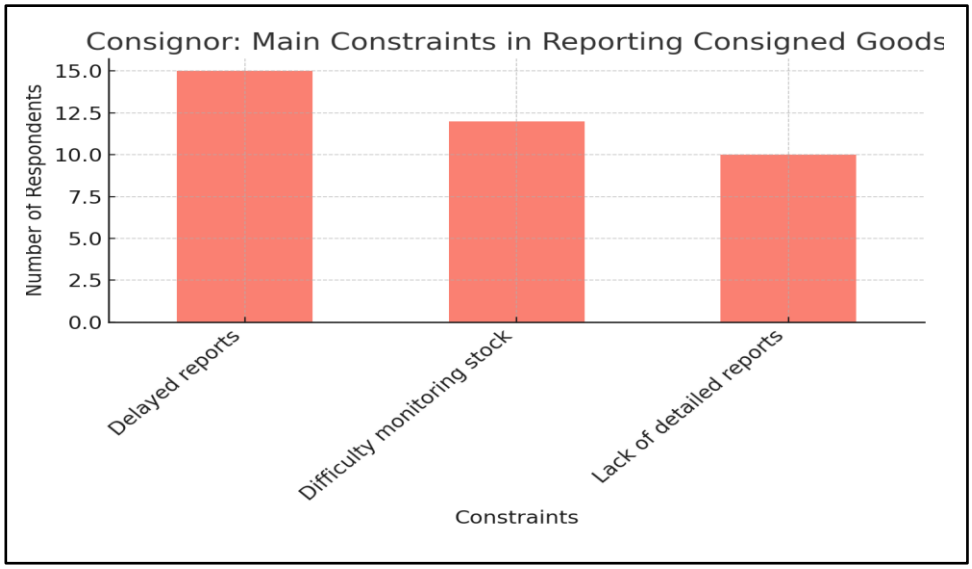

Figure 2. Key challenges in reporting consigned goods from the consignor's perspective

4.4 Thematic Analysis of System Requirements

The thematic analysis process was conducted using the Braun and Clarke (2021) framework, which emphasizes identifying meaningful patterns (themes) from qualitative data. Questionnaire and interview data were then grouped into key themes that represent user needs for a consigned goods reporting system. This analysis was divided into two perspectives: the consignee's and the consignor's perspective.

The results of the system requirements analysis from the consignee's perspective are shown in Table 1 below:

Table 1. Thematic Analysis of System Requirements from the Perspective of Consignees

Theme	Interpretation	Proposed Features
Ease of recording	Requires fast and practical transaction recording	Simple transaction input form
Commission accuracy	Difficulty in manual calculation	Automated commission calculation
Report transparency	Reports should be easily shared with consignors	Automated reports in PDF/Excel format

Reporting reminders	Frequently forget to perform daily recording	Reminder notifications
Transaction history	Requires an archive for periodic evaluation	Digital transaction history

Meanwhile, the results of the system requirements analysis from the consignor's perspective can be seen in Table 2 below:

Table 2. Thematic Analysis of System Requirements from the Perspective of Consignors

Theme	Interpretation	Proposed Features
Transparency & accountability	Requires real-time and accurate reporting	Dual-role access; data synchronization
Stock & return assurance	Difficulty in monitoring remaining goods or returned items	Stock and return monitoring
Digital report access	Needs well-organized documentation for evaluation	Automated digital reports
Simple interface	Not accustomed to complex systems	Intuitive and minimalist menu
Data security	Data must be protected from manipulation by other parties	Authentication and cloud backup

4.5 Initial System Design

Based on the findings, the initial design of the Android-based reporting system includes the following features:

1) Simple transaction input,
2) Automatic commission calculation,
3) Digital reports in PDF/Excel format,
4) Recording reminder notifications,
5) Complete transaction history,
6) Dual-role login mode with real-time synchronization,
7) Return and stock monitoring features,
8) Authentication and cloud-based data security.

This design principle refers to user-centered design (Norman, 2013), which emphasizes understanding user needs as the basis for system development.

4.6 Discussion

The findings suggest that there are differences in the focal points of needs:

1. Consignees focus on recording efficiency and ease of operation.
2. Consignors require reporting transparency, stock certainty, and data security.

These two views are complementary and should be incorporated into the application design. By incorporating requirements into system features, the design becomes more meaningful to

the real users' context. This method concurs with the result of Sari and Budi (2023) that systems developed using user-centered design approach are more accepted by MSMEs.

5. Conclusion

This research is to study the user needs of consignment sales reporting system as the first step to develop an Android application. The findings indicate that manual reporting systems used by MSMEs are still hampered by various constraints, including late submission of reports, difficulty in monitoring stock and returns, calculation errors, and poor transparency between consignor and consignee. Employing a descriptive qualitative methodology supported by questionnaire data and thematic analysis, the study was able to identify system requirements from two different angles. The consignee stressed the importance of having a simple data input system, with automatic commission calculations, reporting reminders, and transaction history. On the other hand, the consignor requested access to reports in real-time, full sales documentation, stock tracking, and assurance of data security. Based on these results, three main themes can be identified as conclusions: the need for a mobile-based system that fits the day-to-day activities of MSMEs, the requirement for transparent and accountable reporting, and a desire for a simple and user-friendly interface. In response, the study designed the conceptual system with a user-centered design approach to ensure that the developed application framework is suitable for the workflow and needs of both parties. This conceptual model not only contributes academically to the MSME digitalization literature but also can be used as a practical basis for the development of the application in the future. By translating user needs into system features, the proposed approach can contribute to increasing the efficiency, accountability, and trust within consignment-based business relations.

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