Implementation of a Break Even Point (BEP)-Based Financial Information System at CV Bali Indigo

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Abstrak

Sistem informasi keuangan memiliki peran penting dalam mendukung pengambilan keputusan manajerial, khususnya pada usaha kecil dan menengah (UKM) yang beroperasi dengan struktur biaya yang dinamis dan tingkat persaingan yang tinggi; namun demikian, banyak UKM masih menggunakan praktik pencatatan keuangan konvensional yang berfokus pada pelaporan transaksi dan belum menyediakan dukungan analitis yang memadai untuk perencanaan dan pengendalian keuangan, sehingga menyulitkan manajemen dalam menentukan ambang batas keuntungan serta mengevaluasi hubungan biaya–volume–laba. Penelitian ini dilatarbelakangi oleh kebutuhan untuk meningkatkan dukungan keputusan keuangan melalui integrasi metode analitis ke dalam sistem informasi keuangan, sehingga diusulkan sebuah sistem informasi keuangan berbasis Break Even Point (BEP) untuk mendukung pengambilan keputusan manajerial pada lingkungan UKM. Kontribusi utama penelitian ini terletak pada integrasi analisis BEP sebagai komponen analitis inti dalam sistem, yang memungkinkan perhitungan titik impas secara otomatis serta penyajian informasi biaya dan pendapatan dalam bentuk tabel dan grafik yang mudah dipahami. Evaluasi sistem dilakukan melalui studi kasus menggunakan data keuangan riil dengan menitikberatkan pada akurasi perhitungan, efisiensi waktu pemrosesan, dan efektivitas dukungan keputusan. Hasil evaluasi menunjukkan bahwa sistem menghasilkan nilai BEP yang konsisten dengan perhitungan manual, sekaligus mampu mengurangi waktu pemrosesan secara signifikan dan meningkatkan kejelasan serta kegunaan informasi keuangan bagi manajemen. Penelitian selanjutnya dapat mengembangkan sistem dengan menambahkan metode analisis keuangan lainnya, model prediktif, serta validasi empiris yang lebih luas pada berbagai perusahaan untuk meningkatkan skalabilitas dan kemampuan dukungan keputusan.

Kata kunci— Sistem Informasi Keuangan; Break Even Point; Sistem Pendukung Keputusan; Usaha Kecil dan Menengah; Analisis Keuangan.

Abstract

Financial information systems play a crucial role in supporting managerial decision-making, particularly in small and medium-sized enterprises (SMEs) that operate under dynamic cost structures and competitive market conditions; however, many SMEs still rely on conventional financial recording practices that emphasize transaction reporting while providing limited analytical support for financial planning and control, making it difficult for management to accurately determine profit thresholds and evaluate cost–volume–profit relationships. This research is motivated by the need to enhance financial decision support through the integration of analytical methods into financial information systems, and therefore proposes a financial information system based on Break Even Point (BEP) analysis to support managerial decision-making in an SME environment. The main contribution of this study lies in

embedding BEP analysis as a core analytical component within the system, enabling automated calculation of break-even values as well as clear tabular and graphical visualization of cost and revenue relationships. The proposed system is evaluated through a case study implementation using real financial data, focusing on calculation accuracy, processing efficiency, and decision-support effectiveness. The evaluation results demonstrate that the system produces BEP values that are consistent with manual calculations while significantly reducing processing time and improving the clarity and usability of financial information for management. Future work may extend the system by incorporating additional financial analysis methods, predictive models, and broader empirical validation across multiple enterprises to enhance scalability and decision-support capabilities.

Keywords— *Financial Information System; Break Even Point; Decision Support System; Small and Medium Enterprises; Financial Analysis.*

1. INTRODUCTION

Financial information systems have become a critical component in supporting managerial decision-making processes, particularly in small and medium-sized enterprises (SMEs) operating in highly competitive and uncertain business environments. The rapid development of information technology has transformed traditional financial management practices into more integrated, automated, and data-driven systems. Modern organizations are required to manage financial data accurately and in real time to ensure business sustainability, profitability, and strategic planning effectiveness. In this context, financial information systems play a vital role in processing financial transactions, generating reports, and providing analytical insights that can assist management in understanding the financial condition of the company [1]. However, many SMEs still rely on conventional bookkeeping methods or basic accounting applications that focus primarily on recording transactions rather than supporting analytical decision-making. As a result, management often faces difficulties in interpreting financial data to determine cost structures, profit margins, and operational efficiency. One of the most fundamental yet crucial analyses in financial management is the Break Even Point (BEP), which identifies the level of sales at which total revenues equal total costs. BEP analysis is widely recognized as a strategic tool for planning, cost control, and profit analysis [2]. Despite its importance, BEP is often calculated manually or using spreadsheets, which increases the risk of human error and limits its integration into broader financial decision-support systems. Therefore, the integration of BEP analysis into a comprehensive financial information system is increasingly necessary to enhance accuracy, efficiency, and managerial insight.

Although financial information systems have been widely implemented across various business sectors, several general problems persist, particularly in SMEs. One major issue is the lack of systems that not only record financial data but also provide analytical capabilities tailored to managerial needs [3]. Many existing systems focus on accounting compliance rather than supporting operational and strategic decision-making. Consequently, financial managers often struggle to evaluate cost behavior, determine optimal sales targets, and assess financial risks effectively. In SMEs, these challenges are further exacerbated by limited human resources, insufficient financial expertise, and budget constraints for advanced information systems [4]. Specifically, the absence of automated BEP analysis within financial information systems leads to inefficiencies in determining minimum sales volumes, pricing strategies, and profit planning. Managers may rely on intuition or fragmented financial reports, which can result in suboptimal decisions and increased financial risk. Furthermore, manual BEP calculations are time-consuming and prone to inconsistencies when financial data changes frequently. This problem is particularly relevant for companies operating in dynamic markets, where fluctuations in costs

and revenues require continuous evaluation. Therefore, the lack of an integrated, BEP-based financial information system represents a significant gap between theoretical financial analysis and practical implementation in SMEs. Addressing this gap is essential to improve financial transparency, decision accuracy, and organizational performance.

Based on these challenges, this research aims to design and implement a financial information system based on Break Even Point analysis for CV. Bali Indigo. The primary research goal is to develop a system that integrates financial data processing with automated BEP analysis to support managerial decision-making. The motivation behind this study arises from the practical need to assist SME managers in understanding their cost structures and profit thresholds more effectively. Previous studies have demonstrated that integrating financial analysis tools into information systems can significantly enhance decision quality and operational efficiency [5], [6]. However, many of these studies focus on large enterprises or generic financial systems without emphasizing BEP as a core analytical component. This research is motivated by the need to provide a practical, applicable solution tailored to the characteristics of SMEs, particularly those with limited financial management infrastructure. By embedding BEP analysis directly into the financial information system, managers can obtain real-time insights into cost-volume-profit relationships, enabling them to plan sales targets, evaluate pricing strategies, and anticipate financial risks more accurately. The proposed system is designed to address the specific operational conditions of CV. Bali Indigo, ensuring that the developed solution is both relevant and implementable in real-world business settings.

The proposed solution in this research involves the development of a BEP-based financial information system that systematically processes financial data, including fixed costs, variable costs, sales volume, and revenue. The system automatically calculates the break-even point and presents the results in the form of financial reports and visualizations that are easily understood by management. The main contribution of this study lies in the integration of BEP analysis into a financial information system as a decision-support tool for SMEs. Unlike conventional systems that merely record financial transactions, the proposed system emphasizes analytical functionality to support managerial planning and control. Additionally, this research contributes to the academic literature by providing empirical evidence of the effectiveness of BEP-based financial information systems in improving decision-making quality. The evaluation of the proposed system is conducted through system testing and case study analysis at CV. Bali Indigo, focusing on accuracy, usability, and decision-support effectiveness. The results demonstrate that the system can generate accurate BEP calculations, reduce processing time, and enhance managerial understanding of financial performance. In conclusion, this research highlights the importance of integrating analytical methods such as BEP into financial information systems and provides a practical framework for SMEs seeking to improve their financial management capabilities through information technology.

2. METHODOLOGY

Recent studies indicate that financial information systems should evolve from transaction-oriented accounting tools into analytically driven systems that actively support managerial decision-making. Stair and Reynolds [1] and Susanto [3] emphasize that modern financial systems must integrate data processing, analysis, and reporting to support planning and control; however, empirical evidence shows that many small and medium-sized enterprises (SMEs) still rely on basic financial applications that primarily record transactions and provide limited analytical support due to resource constraints and inadequate system customization [4]. Several studies have examined decision support systems for SME financial management, reporting that the integration of analytical models can improve decision quality and managerial confidence [4], [6]. Nevertheless, most of these systems employ generic techniques such as ratio

analysis, trend analysis, or forecasting, which offer limited insight into cost–volume–profit relationships that are essential for determining profit thresholds, minimum sales volumes, and cost sensitivity. Break Even Point (BEP) analysis remains a fundamental managerial accounting tool for evaluating cost behavior and profitability [2], [8], yet it is often treated as a standalone or manual calculation using spreadsheets, limiting its consistency and real-time applicability. Although recent research has attempted to integrate BEP analysis into financial information systems for SMEs and reported improvements in accuracy and usability [7], comprehensive evaluations that combine technical accuracy, processing efficiency, and decision-support effectiveness are still limited. Consequently, there is a clear research gap in positioning BEP as a core analytical component within financial information systems tailored specifically to SME managerial decision-making needs.

2.1 Research Object and Data Sources

This research is conducted as an applied study focusing on the development and implementation of a financial information system based on Break Even Point (BEP) analysis. The object of this research is CV. Bali Indigo, a small-to-medium enterprise (SME) operating in the garment and creative industry sector. The selection of this company is based on its operational characteristics, which involve fluctuating production volumes, variable cost structures, and the need for accurate financial planning to support managerial decision-making. Such characteristics make the company a suitable case study for implementing a BEP-based financial information system.

The data used in this research consist of both primary and secondary data. Primary data are obtained directly from the company through interviews with management and finance staff, as well as direct observation of existing financial management practices. These data include information on fixed costs, variable costs, production capacity, selling prices, and current financial reporting procedures. Secondary data are collected from company financial documents such as income statements, cost reports, and historical sales records. In addition, supporting theoretical data are obtained from scientific literature related to financial information systems, decision support systems, and BEP analysis published between 2020 and 2025 [1], [2], [7]. The combination of primary and secondary data ensures that the proposed system is grounded in real operational conditions while remaining aligned with established theoretical frameworks.
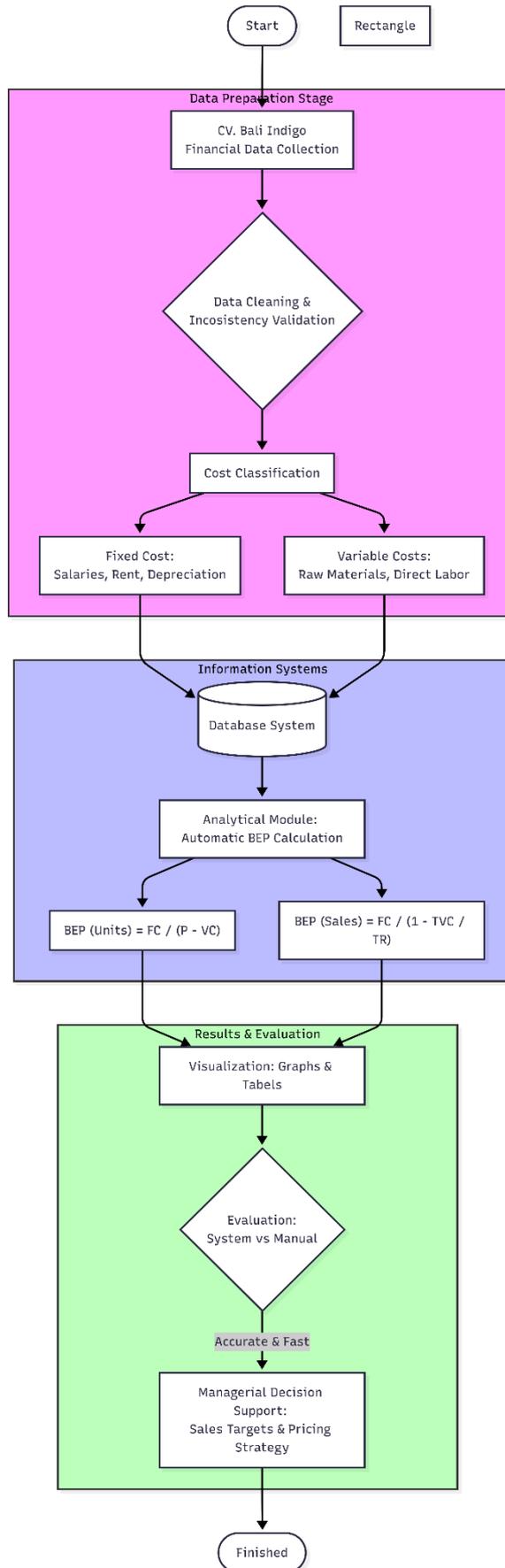
Figure 1. *Visualization of Break Even Point (BEP) analysis showing the intersection between total cost and total revenue curves.*

The main analytical output of the system is illustrated in **Figure 1**, which visualizes the relationship between total costs and total revenues. As shown in the figure, the system plots both cost and revenue curves based on user-input financial data. The intersection point of these curves represents the break-even point, where total revenue equals total cost. This visualization enables management to clearly identify the minimum sales level required to avoid losses.

Through system testing, the BEP values generated by the system were found to be consistent with manual cost–volume–profit calculations using the same data. Moreover, the system recalculates BEP values automatically whenever financial inputs change, demonstrating its capability to provide real-time analytical results. This feature is particularly valuable for SMEs operating in dynamic environments, where cost structures and sales conditions frequently fluctuate.

2. 2 Data Preparation and Preprocessing

Before implementing the proposed system, the collected data undergo a preparation and preprocessing stage to ensure accuracy, consistency, and suitability for analysis. Financial data obtained from the company are first examined to identify inconsistencies, missing values, and potential recording errors. This step is essential because inaccurate financial data can lead to incorrect BEP calculations and misleading decision-support outputs. Data cleaning is performed by validating cost classifications, verifying sales figures, and ensuring that all cost components are recorded within the same accounting period.

After data cleaning, the financial data are categorized into fixed costs and variable costs, which form the core inputs for BEP analysis. Fixed costs include expenses that do not vary with production volume, such as rent, salaries, and depreciation, while variable costs include expenses directly related to production volume, such as raw materials and direct labor [2]. This classification follows standard managerial accounting principles and is critical for accurately modeling cost–volume–profit relationships. The prepared data are then structured into a database format that can be processed by the financial information system. This structured representation enables efficient data retrieval, updating, and analysis, supporting real-time BEP computation and financial reporting within the system [9].

2.3 Proposed Method and System Design

The main method employed in this research is Break Even Point (BEP) analysis, which is integrated into a financial information system to support managerial decision-making. BEP analysis is a quantitative method used to determine the sales volume at which total revenue equals total cost, resulting in neither profit nor loss [2], [8]. Conceptually, the BEP is calculated using the following formula:

$$\text{BEP (units)} = FC \frac{FC}{P - VC} \qquad (1)$$

Where $FCFCFC$ represents total fixed costs, PPP denotes the selling price per unit, and $VCVCVC$ indicates the variable cost per unit. In addition to BEP in units, the system also computes BEP in monetary value using:

$$\text{BEP(sales)} = \frac{FC}{1 - \frac{VC}{P}} \qquad (2)$$

These formulas are embedded into the system's analytical module, allowing automatic and consistent BEP calculation whenever financial data are updated. The system design follows a modular approach, consisting of data input, data processing, analysis, and reporting modules. Financial data entered into the system are processed to calculate total costs, revenues, and BEP values, which are then presented to users in the form of reports and graphical visualizations.

The integration of BEP analysis into the financial information system transforms traditional financial reporting into a decision support tool. Instead of merely displaying historical financial data, the system provides analytical insights that help management evaluate sales targets, pricing strategies, and cost efficiency. This approach aligns with previous studies emphasizing the importance of embedding analytical models within financial information systems to enhance decision-making quality [6], [9]. By positioning BEP as the core analytical method, the proposed system addresses the limitations identified in prior research, where BEP was often treated as a supplementary or manual analysis [7].

2.4 Supporting Techniques and Performance Enhancement

To improve the usability and effectiveness of the proposed system, several supporting techniques are incorporated alongside the core BEP analysis. One such technique is financial data visualization, which presents BEP results in graphical form, such as cost–revenue charts. Visualization helps users intuitively understand the relationship between costs, revenues, and profit thresholds, thereby enhancing managerial comprehension and reducing cognitive load [5]. This feature is particularly important for SME managers who may not have extensive financial analysis backgrounds.

Another supporting technique involves scenario analysis, where management can simulate changes in key variables such as selling price, variable cost, or fixed cost to observe their impact on the BEP. Although the underlying calculation remains based on standard BEP formulas, scenario analysis extends the analytical capability of the system by enabling "what-if" evaluations. This technique supports proactive decision-making and financial planning, allowing managers to assess potential risks and opportunities before implementing strategic changes. The inclusion of such techniques aligns with recommendations from decision support system literature, which emphasizes the importance of interactive and flexible analytical tools for effective managerial support [6], [10].

2.5 System Evaluation and Testing

The evaluation of the proposed BEP-based financial information system is conducted using a case study approach at CV. Bali Indigo. System evaluation focuses on both technical performance and decision-support effectiveness. From a technical perspective, the system is tested to verify the accuracy of BEP calculations by comparing system-generated results with manual calculations performed using the same financial data. This validation ensures that the implemented formulas are correct and consistently applied across different data scenarios.

From a usability and decision-support perspective, the evaluation examines how effectively the system supports managerial decision-making. Feedback from users, particularly management and finance staff, is collected through structured interviews and questionnaires. The evaluation criteria include ease of use, clarity of information presentation, and perceived usefulness of BEP outputs in financial planning and decision-making. This dual evaluation approach is consistent with prior studies that emphasize the need to assess both system performance and user satisfaction when evaluating financial information systems [4], [7]. The evaluation results serve as the basis for analyzing the effectiveness of the proposed system and identifying potential improvements for future development.

2.6 System Implementation Results

The implementation of the BEP-based financial information system resulted in an integrated web-based application that supports financial data processing and automated break-even analysis. The system successfully combines data input, computation, visualization, and reporting modules into a unified platform that can be used by management for financial evaluation and planning.

3. RESULTS AND DISCUSSION

This section presents and discusses the results obtained from the implementation of the Break Even Point (BEP)-based financial information system at CV. Bali Indigo. The discussion is structured to explain system outputs, user interface implementation, analytical performance, system effectiveness, and comparison with previous studies. Each subsection explicitly refers to the figures presented, while maintaining consistency with the previously defined captions.

3.1 User Interface Implementation

The user interface (UI) of the proposed system was designed using a simple and functional approach to ensure ease of use for small and medium enterprise (SME) users with varying levels of financial and technical expertise. The UI implementation consists of several interconnected pages, including the login page, main dashboard, financial data input page, BEP analysis page, and financial report page.

The dashboard serves as the central information hub, presenting a summary of financial data and BEP analysis results. Key indicators such as total costs, total revenues, and the company's position relative to the break-even point are displayed to provide a quick overview of financial performance. This enables management to monitor the company's financial condition efficiently without reviewing detailed reports.
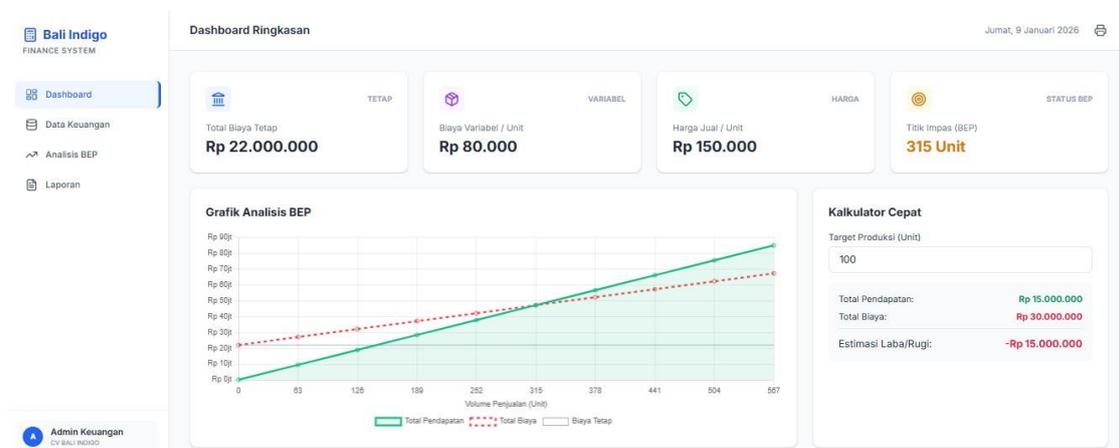
Figure 2. *Dashboard interface of the BEP-based financial information system displaying summarized financial and BEP information.*

The financial data input page facilitates systematic entry of fixed costs, variable costs, and sales data. Input validation features are implemented to reduce data entry errors that could affect the accuracy of BEP calculations. This structured data input process ensures consistency and reliability of the financial data stored in the system.

Figure 3. Financial data input interface for recording fixed costs, variable costs, and sales information.

Once the data are submitted, the system automatically performs BEP analysis and presents the results on the analysis page. This page displays BEP values numerically and visually through cost–revenue graphs, allowing users to easily interpret the break-even condition and assess the impact of financial variables.
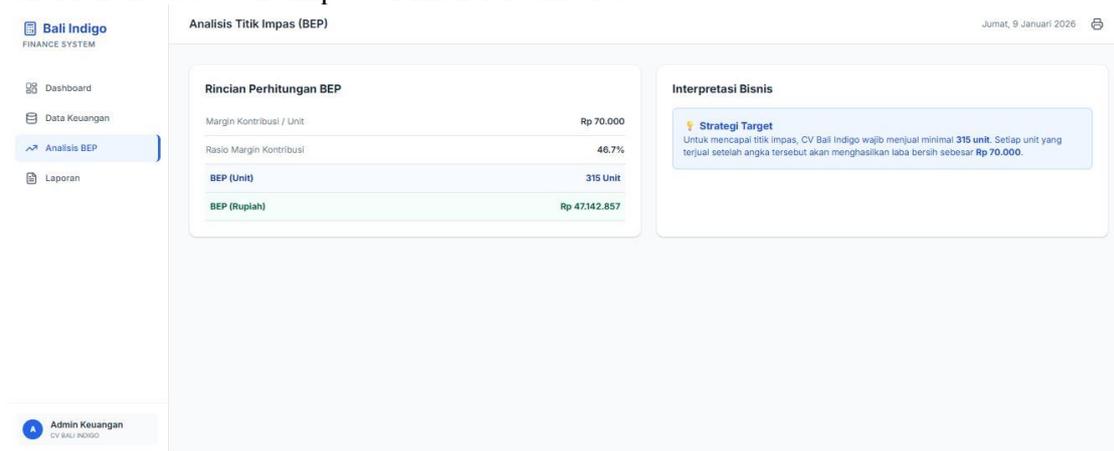
Figure 4. Break Even Point (BEP) analysis page presenting calculated BEP values and cost–revenue visualization.

In addition to analysis, the system provides a reporting page that presents financial data and BEP results in tabular format. These reports can be used as supporting documents for financial evaluation, planning, and managerial decision-making.
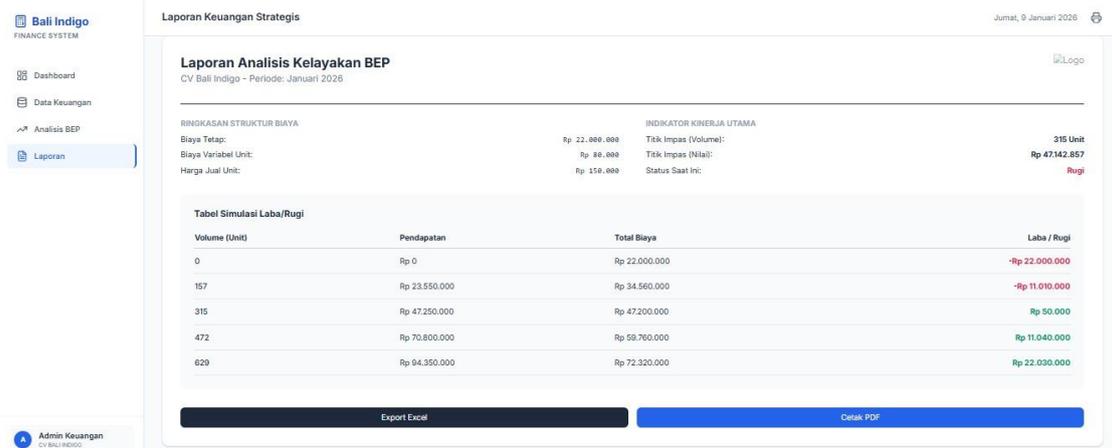
Figure 5. *Financial report page presenting BEP analysis results in tabular form.*

Presents the financial report interface of the BEP-based financial information system, which displays the results of Break Even Point analysis in a structured tabular format. This page provides a concise summary of key financial variables, including cost components, revenue, and BEP values, enabling management to review and document financial analysis outcomes efficiently for evaluation and decision-making purposes.

3.2 Discussion of System Effectives

Based on the implementation and testing results, the BEP-based financial information system demonstrates a high level of effectiveness in supporting managerial decision-making at CV. Bali Indigo. From an accuracy perspective, the BEP values generated by the system are consistent with manual calculations, indicating that the analytical formulas have been correctly implemented within the system.

In terms of efficiency, the system significantly reduces the time required to perform BEP analysis compared to manual methods or spreadsheet-based calculations. Automated processing eliminates repetitive calculation steps and minimizes the risk of human error, particularly when financial data are frequently updated. This efficiency is especially beneficial for SMEs operating in dynamic business environments.

Furthermore, the graphical and dashboard-based presentation of financial information enhances the clarity and usability of BEP analysis results. Management can easily identify whether the company is operating below, at, or above the break-even point and can evaluate alternative pricing, sales, and cost control strategies accordingly. Therefore, the system not only functions as a financial recording tool but also serves as an effective decision support system that adds analytical value to financial management practices.

3.3 Comparison with Previous Studies

To further evaluate the contribution of the proposed system, the results of this study are compared with findings from previous research on financial information systems and BEP-based decision support. Prior studies generally emphasize the use of financial information systems for transaction recording and basic reporting, with limited integration of analytical methods tailored to managerial planning.

Several previous works implemented BEP analysis as a standalone or supplementary tool, often using spreadsheet-based calculations or external modules. In contrast, the proposed system embeds BEP analysis as a core analytical component within the financial information system, enabling automated and real-time calculation. This integration reduces manual intervention and minimizes calculation inconsistencies, as also highlighted in earlier studies focusing on analytical system integration.

Compared to previous SME-oriented systems, which primarily focus on usability and user satisfaction, this study provides a more comprehensive evaluation by assessing calculation accuracy, processing efficiency, and decision-support effectiveness. The case study results demonstrate that the proposed system not only improves operational efficiency but also enhances managerial understanding of cost–volume–profit relationships, thereby addressing limitations identified in earlier research.

3.4 Practical Implications for SMEs

The implementation results indicate that the proposed BEP-based financial information system has significant practical implications for small and medium-sized enterprises. By providing automated BEP analysis and intuitive visualization, the system enables managers to identify minimum sales targets and evaluate pricing strategies more effectively.

For SMEs with limited financial expertise, the system reduces dependency on manual calculations and subjective judgment. The dashboard and graphical representations support faster interpretation of financial conditions, allowing management to respond promptly to cost changes and market fluctuations. As a result, the system contributes to improved financial planning, cost control, and risk mitigation in daily business operations.

3.5 Limitations of the Results

Despite the positive results, several limitations should be acknowledged. First, the system evaluation is based on a single case study at CV. Bali Indigo, which may limit the generalizability of the findings to other industries with different cost structures. Second, the analysis focuses primarily on static BEP calculations and does not incorporate dynamic factors such as demand uncertainty or seasonal variations.

Additionally, the evaluation relies mainly on qualitative feedback from users regarding system usefulness and decision support. While this approach provides valuable insights, future studies could incorporate quantitative performance indicators and longitudinal data to assess long-term impacts on financial performance.

3.6 Summary of Discussion

Overall, the discussion demonstrates that the proposed BEP-based financial information system offers clear improvements over conventional financial recording practices and previously developed systems. By integrating BEP analysis directly into the financial information system, the proposed approach bridges the gap between financial data processing and analytical decision support. The system enhances accuracy, efficiency, and managerial insight, reinforcing its potential as a practical and scalable solution for SMEs.

4. CONCLUSIONS

This research has presented the design and implementation of a Break Even Point (BEP)-based financial information system to support managerial decision-making in a small-to-medium enterprise. The study focused on integrating BEP analysis into a financial information system to transform conventional financial data processing into an analytical decision support tool. The system was developed based on real financial data and operational characteristics of CV. Bali Indigo, ensuring practical relevance and applicability in an actual business environment.

The results demonstrate that the proposed system is capable of accurately calculating BEP values in both units and monetary terms, with outputs that are consistent with manual calculations. In addition, the automated computation significantly reduces processing time and minimizes the risk of human error associated with manual financial analysis. The graphical and tabular outputs generated by the system improve the clarity and interpretability of financial

information, enabling management to better understand cost structures, profit thresholds, and the impact of changes in key financial variables. These findings indicate that integrating BEP analysis into a financial information system can enhance efficiency, accuracy, and the quality of managerial decision-making in SMEs.

Despite these positive results, this research has several limitations that open opportunities for future work. The system implementation is based on a single case study, which may limit its generalizability to other types of enterprises or industries with different cost structures. Future research may extend the system by incorporating additional financial analysis methods, such as forecasting, budgeting, or optimization techniques, to provide more comprehensive decision support. Furthermore, broader empirical evaluations involving multiple companies could be conducted to assess system scalability and adaptability. These improvements are expected to further enhance the effectiveness and robustness of BEP-based financial information systems in supporting strategic financial management..

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