DA Coffee Sales Forecasting and Descriptive Analytics System for Data-driven Decisions

JayB Atian[1], Karl Fortes[2], Irish Gaitos[3], Tess Pancho[4], Zharina Pascual[5]

[1][2][3][4][5](SY 2025-2026) Arellano University, Pasig Campus

ABSTRACT

This study focuses on the development of an offline Android application titled DA Coffee Sales Forecasting and Descriptive Analytics System for Data-Driven Decisions, designed to address the challenges of manual sales tracking and inventory monitoring in small enterprises. The system aims to improve operational efficiency by automating sales recording, visualizing top-selling products, and generating data-based insights to support smarter decision-making.The project utilizes descriptive analytics to interpret historical sales data and basic forecasting to anticipate short-term sales trends. These analytics are presented through bar and line charts, helping the business shift from intuition-based management to data-informed decisions. Developed using Flutter, Dart, Android Studio, and SQLite, the system provides a lightweight and fully offline mobile platform suitable for areas with limited internet access. It ensures smooth transaction recording, secure local data storage, and clear data visualization through the fl_chart library. The study employed a Developmental Research Design using the Waterfall Model of the System Development Life Cycle (SDLC). Fifty respondents—composed of 30 users and 20 technical experts—evaluated the system's quality and performance based on ISO 25010 software standards. Results showed that both respondent groups rated the system "Agree" in functionality, reliability, efficiency, and usability, proving it effective, user-friendly, and responsive. However, both groups rated portability as "Disagree," indicating compatibility issues on certain Android devices.

The study concludes that the DA Coffee system significantly improves sales management by enabling faster, more accurate, and organized data handling even offline. It demonstrates how descriptive analytics and basic forecasting can transform small business operations into data-driven decision-making processes. Future improvements should focus on enhancing portability, expanding forecasting models, and adding cloud synchronization features for broader usability.

Keywords: Flutter, SQLite, Descriptive Analytics, Forecasting, Offline System, Android Application, ISO 25010, SDLC, Waterfall Model, Data Visualization

INTRODUCTION

Small businesses, especially those in the food and beverage industry, are growing quickly in the current era of digital innovation. One of them is DA Coffee, a developing local coffee shop that keeps gaining its customers and product line. But growth also brings difficulties. DA Coffee's continuous reliance on manual recording techniques like spreadsheets and notebooks makes it difficult to effectively manage its inventory and sales. Although these techniques used to be adequate, they are now ineffective and prone to mistakes, which frequently leads to erroneous stock levels and makes it difficult to identify the best-selling items.

Without an appropriate digital framework, the company struggles to make data-driven, well-informed decisions. This restriction has an impact on its capacity to predict demand, efficiently manage inventory, and comprehend consumer behavior. This study suggests using Flutter and Android Studio to create an offline Android application called DA Coffee Sales Forecasting and Descriptive Analytics System to address these problems.

The system aims to simplify and automate sales tracking by providing an easy-to-use mobile interface that records transactions and presents meaningful visual insights. Through features such as bar and line charts, the system allows the business to monitor sales performance, identify best-selling products, and anticipate future

trends. By implementing descriptive analytics and forecasting, DA Coffee can gain valuable insights into its sales patterns, understand customer preferences, and plan inventory accordingly. This system minimizes human errors, saves time, and enables data-driven decision-making even in offline environments.

Additionally, this study acknowledges that DA Coffee's current issue is a lack of tools for accurate sales forecasting and analysis. Poor inventory planning and lost business opportunities result from decision-making that frequently relies more on intuition than on evidence. The suggested solution gives DA Coffee the ability to better understand its operations and make strategic decisions by utilizing descriptive analytics and basic forecasting techniques, even without an internet connection.

The main objective of the study is to create a dependable and useful mobile-based sales forecasting and analytics system that improves the effectiveness of DA Coffee's day-to-day operations.

General Objective:

To develop an offline Android-based Sales Forecasting and Analytics System that improves operational efficiency by automating sales recording, visualizing top-selling products, and providing sales forecasts to support data-driven decision-making.

Specific Objectives:

- To design and implement a user-friendly interface for daily sales entry.
- To integrate a local database using SQLite for offline functionality.
- To create a descriptive analytics module that visualizes top-selling products through bar charts.
- To design an interface that displays historical sales data using bar and line charts.
- To assist management in making data-informed business decisions based on analytics results.
- To ensure that the system complies with ISO 25012 standards focusing on functionality, usability, reliability, performance efficiency, and security.

Scope

This study focuses on the development of an offline Android-based application specifically designed for DA Coffee to enhance its sales monitoring and forecasting processes. The system allows the manual entry of daily sales transactions through a user-friendly and mobile-optimized interface. All data are stored locally using SQLite, enabling full functionality even without internet connectivity.

The application is intended to support small business owners in making data-driven decisions by presenting clear and interactive analytics. Using bar and line charts, the system visualizes product performance and sales trends to help owners better understand business activities. The system is developed using Flutter and Android Studio, ensuring compatibility with Android devices and a responsive user experience.

LIMITATION

Certain limitations have been built into the structure of the system to maintain its offline usefulness and simplicity. The sales forecasting capability does not yet consider seasonal or irregular sales patterns and is limited to short-term predictions. It also doesn't have real-time data synchronization or multi-user access because it's an offline, single-device setup.

Although they may be included in later versions, advanced features like inventory management, customer profiling, and financial reporting are not included at this version. Forecast accuracy is highly dependent on the regularity and quality of user-submitted data. Furthermore, the system does not yet have export and reporting capabilities, although these are noted as possible additions for future development.

THEORETICAL FRAMEWORK

The Da Coffee Sales Forecasting and Descriptive Analytics System for Data-driven Decisions is anchored on

several theories and concepts that guide the design, functionality, and purpose. These theories collectively support the system's capability to transform raw sales data into valuable business insights for decision-making.

Descriptive Analytics

Descriptive analytics focuses on analyzing historical data to identify patterns, trends, and insights that explain previous business performance. In this research, it involves examining DA Coffee's sales records and presenting them through bar and line charts. By visualizing past transactions, the business can easily determine which products perform best and understand customer demand over specific periods.

Sales Forecasting (Time-Series Observation)

This theory emphasizes predicting future performance based on past data trends. Although the system uses basic forecasting methods rather than complex statistical models, it still enables users to observe historical sales and estimate future outcomes. Through line chart visualizations, DA Coffee can anticipate inventory needs and plan production accordingly.

## Data-Driven Decision Making

This concept advocates using factual, data-based insights instead of intuition to make business decisions. The proposed system provides DA Coffee's management with a structured overview of sales trends, supporting strategic planning in areas such as restocking, pricing, and promotions. It helps transform data into actionable intelligence that directly influences business growth and efficiency.

Cognitive Learning Theory (Applied to Business Intelligence)

This theory highlights learning through experience and reflection. When applied to business contexts, it suggests that organizations can "learn" from data by analyzing past actions and outcomes. Through this principle, DA Coffee's system acts as a learning tool to helping the business evaluate previous sales activities and adjust its strategies to achieve better results in the future.

CONCEPTUAL FRAMEWORK

Figure 1: Input-Process-Output Model
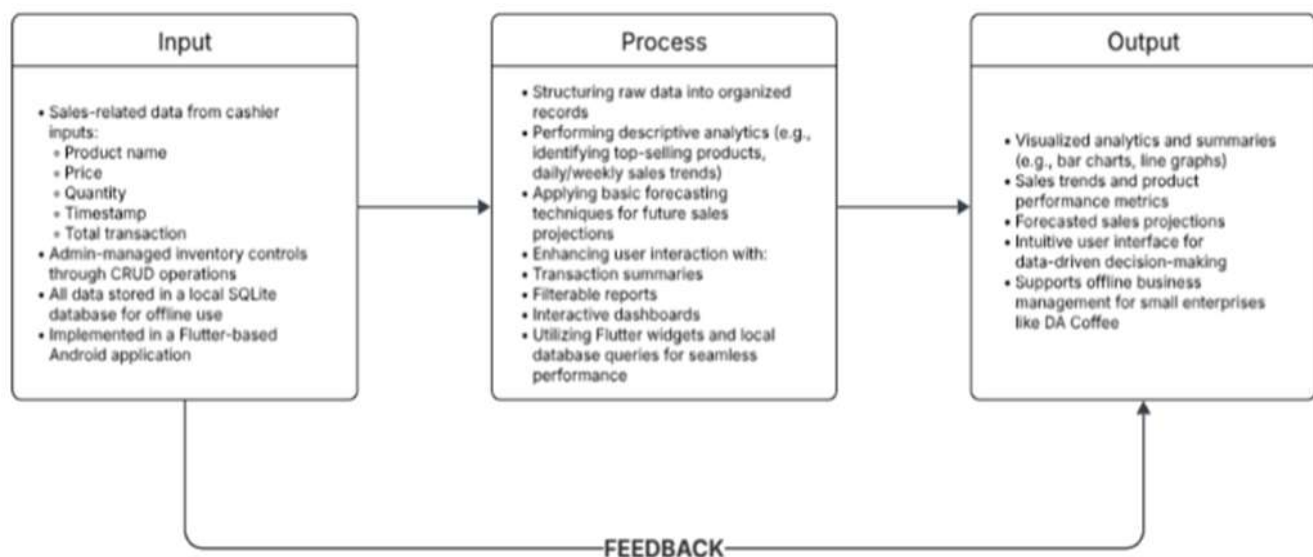
The conceptual framework illustrates how the DA Coffee Sales Forecasting and Descriptive Analytics System operates through an Input–Process–Output (IPO) Model, which represents the logical flow of data from collection to interpretation. This model serves as the structural guide in the system's design and development.

The input collects essential sales-related information, including product details (name, price, and quantity), timestamps, and transaction records. Administrative users can manage these entries through Create, Read, Update, and Delete (CRUD) operations. All information is stored locally in a SQLite database, ensuring that data remains accessible even without an internet connection.

The process application organizes raw data into structured records and performs descriptive analytics to identify patterns such as top-selling products and sales trends. Basic forecasting functions use historical data to generate short-term projections of future sales. These processes are supported by Flutter widgets, which create a smooth and interactive user experience through visual dashboards, reports, and chart displays.

The output produces data visualizations in the form of bar and line charts that display sales performance, product popularity, and forecasted results. These visual reports provide DA Coffee's management with clear insights for making informed, data-driven business decisions. Overall, the system enhances daily operations, sales monitoring, and strategic planning to empower the small businesses to operate effectively even in offline environments.

Significance of the Study

This study is significant as it contributes to improving small business management and technological innovation for data-driven decision-making. The system's design and purpose contribute meaningful benefits to its intended users and the broader research community.

- **For Business Owners:** The system provides a clear and visual representation of sales performance, allowing owners to easily identify trends, best-selling products, and customer preferences. With the help of dashboards and summary charts, business owners can make smarter decisions, manage inventory effectively, and develop strategies that align with sales data and market demand.
- **For Staff and Cashiers:** The application simplifies the sales recording process through an intuitive and easy-to-use Android interface. It minimizes manual errors, speeds up daily transactions, and ensures that all records are stored accurately even without an internet connection. This feature enhances operational efficiency and reduces the burden of manual data entry.
- **For Researchers and Developers:** The project serves as a valuable reference for applying descriptive analytics in mobile system development. It demonstrates how analytics tools can be integrated into small-scale applications to support data-informed decision-making. Furthermore, it provides a model for creating offline, lightweight systems suitable for local business settings.
- **For Future System Developers:** This research lays the groundwork for potential system improvements and innovations. Future developers may expand the system by incorporating automated reporting, inventory tracking, and online synchronization to enhance scalability, accuracy, and usability. The study also offers insights into system evaluation based on international software quality standards such as ISO 25010, providing a strong foundation for further academic and practical exploration.

Review of Related Literature

In recent years, there has been an increasing focus on using digital solutions to help small businesses make smarter and data-based decisions. Wiśniewski (2021) emphasizes the significance of sales forecasting in small business management, particularly in improving operational efficiency and reducing risks tied to inventory planning. This aligns closely with the goal of the DA Coffee study, which aims to move from manual tracking toward a more structured, data-driven forecasting system to prevent both overstocking and stock shortages.

Several local researchers have also explored how digital technologies can enhance the efficiency of micro and small businesses, particularly those in the food industry. Alvarado (2022), in his study "A Point-of-Sale Data Mining System for Small Coffee Shops", created a desktop-based application that enabled entrepreneurs to analyze sales data, identify high-demand products, and determine peak operating periods. The study demonstrated that offline data systems can help business owners make informed decisions even without internet access.

Synthesis

The studies that were reviewed illustrate the demand for user-friendly, data-driven mobile applications to increase small business efficiency and decision-making capabilities. Studies demonstrate the value of forecasting and analytics, and provide that offline capabilities are particularly useful for inventory and sales management. The DA Coffee Sales Forecasting and Descriptive Analytics System provides offline mobile capabilities with forecasting and reporting functions. This therefore provides coffee entrepreneurs with a way to make informed decisions, prevent stock scenarios, and react to changes in the market.

METHODOLOGY OF THE STUDY

The study adopted a Developmental Research Design, which focuses on the creation, implementation, and assessment of a mobile-based system. The main objective was to design and develop an offline Android application that allows DA Coffee to record sales, visualize performance, and forecast future demand more efficiently.

The process began by identifying operational issues through consultations with the business owner. These insights were used to define the system requirements. The application was developed iteratively using Flutter and Android Studio, incorporating features such as daily transaction input, analytics visualization, and offline forecasting supported by SQLite. User testing and feedback were gathered to evaluate usability, reliability, and functionality, validating the system's effectiveness in improving data-driven decision-making.

Data collection in this study utilized both primary and secondary sources to ensure accuracy and reliability. The primary data were obtained through system evaluations conducted by actual users and technical experts, who assessed the application's performance, usability, and overall satisfaction using a standardized rating scale. This process provided measurable insights into how well the system met the operational needs of DA Coffee. Meanwhile, the secondary data were gathered from scholarly articles, journals, and credible online resources related to sales forecasting, descriptive analytics, and small business management systems. Combining these two data sources allowed the study to be grounded in both real-world feedback and established research principles, ensuring that the developed system was both practical and academically supported.

Figure 2: SDLC Waterfall Model
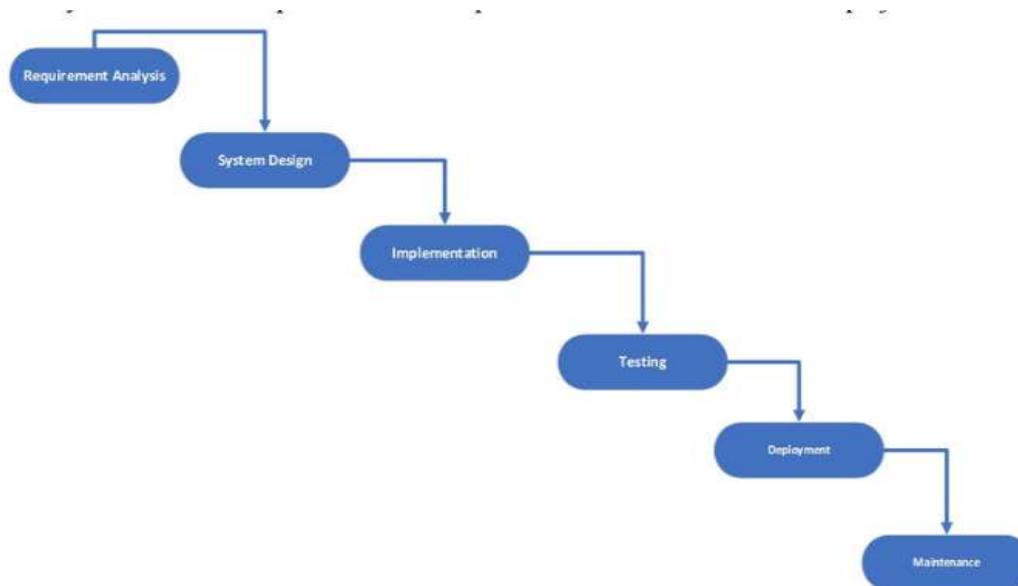
The DA Coffee Sales Forecasting and Descriptive Analytics System for Data-Driven Decisions. follows the Waterfall Model of the System Development Life Cycle (SDLC), which helped maintain a systematic workflow, allowing the researchers to focus on achieving functionality, efficiency, and reliability. It also ensured that every module, such as data entry, analytics, and forecasting, met the defined requirements before moving to the next phase.

Figure 3: Context Diagram
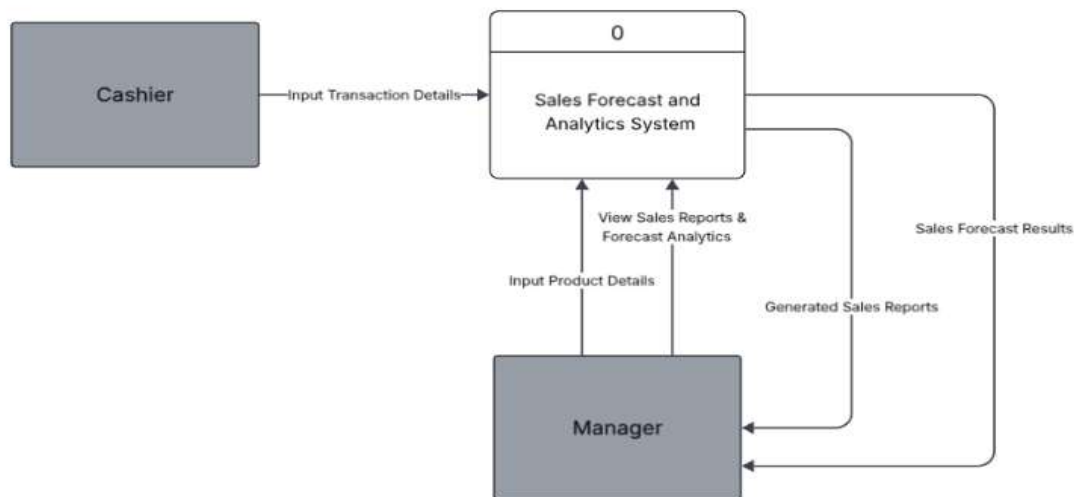
The Context Diagram illustrates the interaction between the system and its users. The Cashier inputs transaction details, while the Manager manages product information and views sales analytics. The system, in turn, generates reports and forecasts accessible to both roles.

Respondents Of The Study

The study involved two categories of respondents (a) user respondents (b) technical experts.

A total of 50 respondents participated in the study, comprising 30 user respondents and 20 technical experts. The user group included staff, cashiers, and operational personnel from DA Coffee and similar small businesses, chosen for their firsthand experience in recording sales and managing daily transactions. The technical group consisted of IT instructors and mobile developers specializing in Android application development and data analytics, who provided expert assessments on the system's functionality, reliability, and performance.

By involving these two respondent groups, the researchers ensured a comprehensive evaluation of the DA Coffee Sales Forecasting and Descriptive Analytics System, combining both practical user insights and professional technical perspectives. This approach strengthened the study's reliability and demonstrated the system's potential applicability in real-world business environments.

Development And Evaluation Procedure

The development of the DA Coffee Sales Forecasting and Descriptive Analytics System for Data-Driven Decisions utilized a combination of tools that ensured its responsiveness, offline capability, and ease of use. Each tool played a key role in achieving the system's overall functionality and performance:

- Flutter – Served as the main development framework used to design the mobile application's interface and navigation. It enabled the creation of a responsive and visually appealing layout.
- Dart – Functioned as the primary programming language for implementing system logic, such as data input handling, chart generation, and forecasting operations.
- Android Studio – Used as the integrated development environment (IDE) for coding, debugging, and testing the Android application on different devices.
- SQLite – Operated as the local database system for storing all sales transactions and product details offline, allowing the app to function without internet access.
- fl_chart – A Flutter package used to generate graphical outputs such as bar charts and line charts that visually represent sales data and forecasts.
- Visual Studio Code – Served as a lightweight code editor that supported faster coding, file management, and integration with multiple plugins during development.

The evaluation process involved systematically analyzing the system's performance to identify its strengths, limitations, and areas for improvement. Following Patton's (1987) definition of evaluation, the process aimed to gather meaningful feedback that could enhance the system's overall functionality and usability. Two evaluation methods were conducted: one focused on assessing user satisfaction and ease of interaction with the mobile application, while the other concentrated on examining technical performance and efficiency.

A single evaluation instrument was used for both user and expert groups, based on the ISO 25010 software quality model, ensuring that all criteria were objectively measured. The system was evaluated across five quality characteristics: Functionality, which measures the accuracy of data recording and analytics; Reliability, which assesses stability during offline use; Efficiency, which evaluates processing speed and system responsiveness; Usability, which measures ease of navigation and interface design; and Portability, which examines compatibility across different Android versions and devices.

Through this structured evaluation, the researchers were able to validate that the system effectively supports data-driven decision-making, provides a seamless user experience, and meets the operational requirements of DA Coffee.

Data Analysis Plan

The evaluation of the DA Coffee Sales Forecasting and Descriptive Analytics System for Data-Driven Decisions is guided by the ISO/IEC 25010 Software Quality Model, an international framework for assessing the overall quality of software systems. This model was chosen because it provides a structured and comprehensive set of quality characteristics aligned with the system's main objectives of functionality, reliability, efficiency, usability, and portability. It ensures that the evaluation process is systematic and that user feedback accurately reflects the system's performance in real-world business settings.

To analyze the data gathered from user and technical evaluations, the researchers applied appropriate statistical tools to interpret and validate the system's performance and level of user satisfaction. These tools provided a quantitative understanding of the survey results and helped determine whether the system met its design goals.

- Weighted Mean: This method was used to summarize and interpret the respondents' feedback, determining the overall average rating for each ISO 25010 quality attribute. It allowed the researchers to measure the system's acceptability and performance across multiple indicators based on user and expert evaluations.
- Frequency Percentage: This tool was used to identify the distribution of responses and categorize participants according to their evaluation levels. The results were presented in percentages to clearly illustrate response trends and satisfaction rates.

The study also employed a 4-point Likert Scale as part of the ISO 25010-based evaluation tool to collect feedback on the system's quality, usability, and efficiency.

- The scale ranged from 1 (Strongly Disagree) to 4 (Strongly Agree), providing a clear numerical representation of user perceptions.
- The exclusion of a neutral option encouraged respondents to express a definite opinion, making the feedback more decisive and meaningful.
- Each statement in the evaluation form corresponded to one of the ISO 25010 characteristics, allowing researchers to assess how effectively the system satisfied each quality standard.

This evaluation approach provided an objective and measurable means of assessing user satisfaction and technical performance. The combination of the weighted mean, frequency percentage, and Likert scale results enabled the researchers to draw meaningful conclusions about the system's overall quality, functionality, and user acceptance.

The System

The DA Coffee Sales Forecasting and Descriptive Analytics System for Data-Driven Decisions is an offline Android-based mobile application designed to assist DA Coffee, a local coffee business, in improving its sales

monitoring and forecasting processes. The system allows the business owner and staff to record daily sales transactions, identify top-selling products, and forecast sales trends without requiring internet access, making it suitable for small businesses operating in low-connectivity areas.

Developed using a combination of modern tools—Flutter as the main framework, Dart as the programming language, Android Studio as the development environment, SQLite for local database storage, and fl_chart for data visualization the system ensures lightweight performance and seamless offline functionality. It was evaluated under the ISO 25010 software quality model, focusing on functionality, reliability, efficiency, usability, and portability to guarantee a practical and user-friendly solution for business operations.
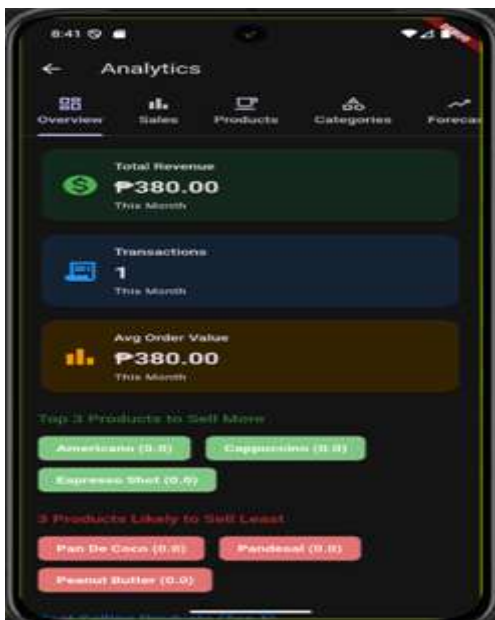
Figure 4: Transaction Tab
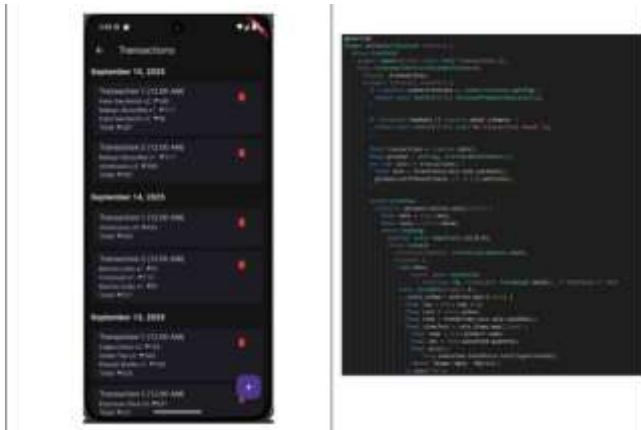
The figure shows a structured overview of all completed sales organized by date. Each transaction entry displays essential details such as the transaction number, list of purchased items, quantities, unit prices, and the total transaction amount. A delete function allows managers to remove duplicate or incorrect entries, ensuring that the data remains accurate and up to date. This interface supports transparent sales monitoring and simplifies daily reporting, which is vital for effective forecasting and performance tracking.

On the code side, the system utilizes FutureBuilder to retrieve and display sales data dynamically from the database. Transactions are grouped by date and rendered in real time, ensuring that any updates or deletions made in the database are instantly reflected on the interface. This seamless synchronization enhances data accuracy and reliability across the system.

Figure 5: Overview Tab

The figure presents a summarized dashboard view of the system's performance metrics for the current month. It highlights key indicators such as Total Revenue, Number of Transactions, and Average Order Value, each represented by color-coded cards for quick assessment. Additionally, it displays the Top 3 Products to Sell More and the 3 Products Likely to Sell Least, offering insights into product performance trends.

On the technical side, the interface dynamically fetches aggregated sales data from the local Drift database. The calculations for revenue and average order value are performed using SQL queries and rendered through real-time state management, ensuring that any newly added or deleted sales immediately update the dashboard. This provides an instant and accurate financial snapshot for decision-making.

Figure 6: Sales Tab

The figure shows a visual breakdown of weekly and monthly sales trends, represented through line charts for intuitive time-based analysis. The Weekly Sales section tracks total sales per week, while the Monthly Sales chart aggregates revenue for the past twelve months. A summary table lists the last ten weekly records with exact dates and amounts, supporting detailed comparison across time periods.

From a system perspective, the data is retrieved using time-filtered SQL queries that group sales by date. The charts are generated through the Recharts package in Flutter, offering smooth animations and accurate visual scaling. This tab helps managers identify sales peaks and low-performance periods, which are crucial for forecasting and inventory planning.

Figure 7: Products Tab
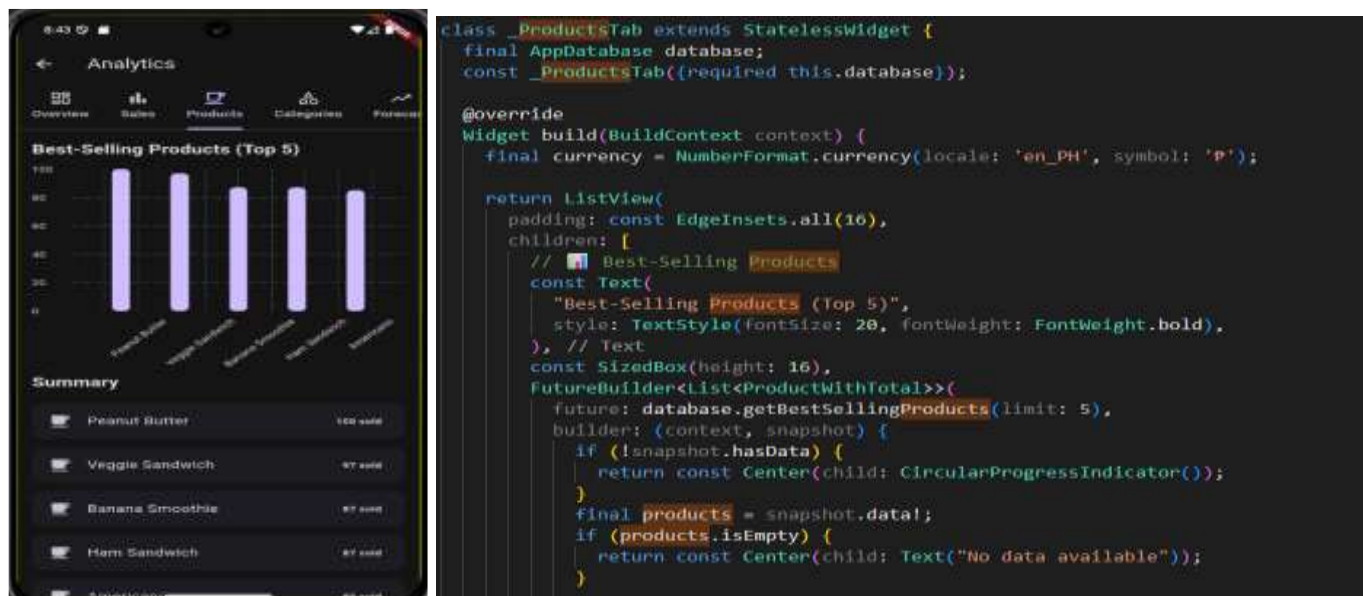
The figure illustrates the Best-Selling Products (Top 5) displayed in a vertical bar chart, highlighting the most popular items based on total quantity sold. Below the chart, a summary section lists each top-selling product with its name, icon, and total sales count for clear ranking.

On the implementation side, the system computes total sales per product using a join between the SalesItems and Products tables. The resulting dataset is visualized in real-time through Flutter charts and list views. This allows managers to quickly identify high-demand items, guide restocking decisions, and adjust marketing strategies accordingly.

Figure 8: Categories Tab
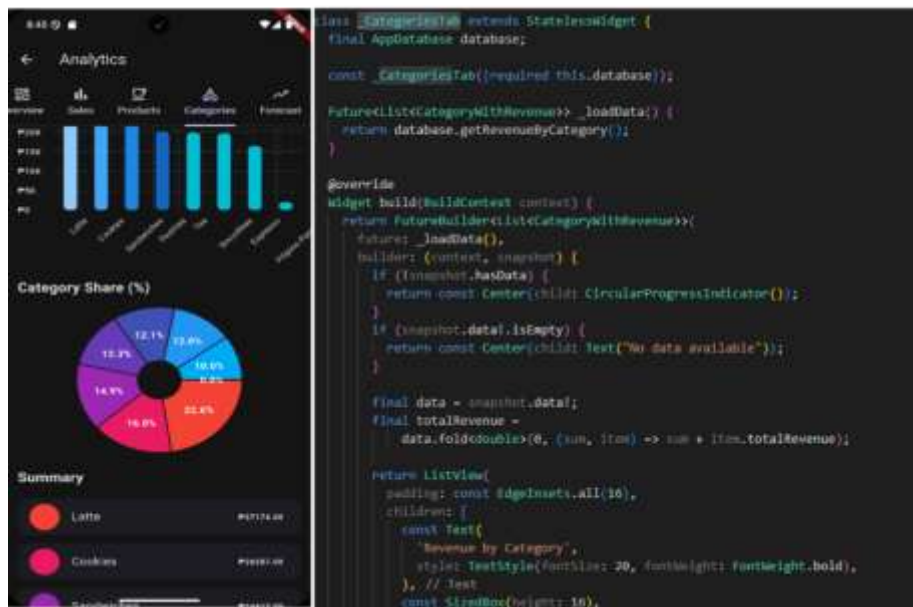
The figure displays sales performance grouped by product category, using both a bar chart and a pie (donut) chart. The bar chart ranks categories by total revenue, while the pie chart shows their percentage contribution to overall sales. A summary list below enumerates each category with its corresponding total income.

Technically, the system aggregates data by category using SQL group queries, returning category-wise revenue totals. The charts are drawn with responsive and interactive visual components that automatically adjust to the available data. This tab supports managers in understanding which categories generate the most income, enabling better product mix optimization.

Figure 9: Forecast Tab
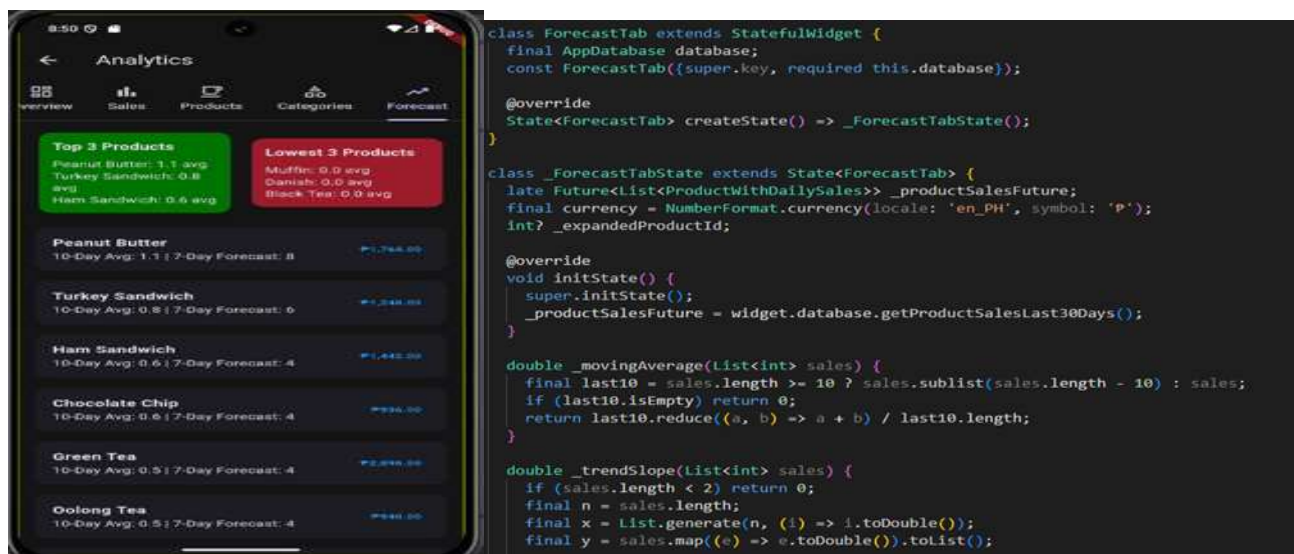
The figure represents the system's sales forecasting feature, displaying both the Top 3 Products projected to sell more and the Lowest 3 Products expected to perform least. Each item is accompanied by its 10-day average, 7-day forecast, and projected revenue, providing an analytical outlook for future sales trends.

From a functional standpoint, the forecast values are derived using statistical computation techniques such as moving averages or time-series smoothing on historical data stored in the database. The results are refreshed periodically and rendered in color-coded cards, with green for high-performing and red for low-performing items. This predictive module empowers store managers to anticipate demand, prevent overstocking, and make proactive inventory adjustments.

Assessment: Summary Of Respondents On The System

The following table presents the consolidated summary of evaluations from both user and technical respondents of the DA Coffee Sales Forecasting and Descriptive Analytics System for Data-Driven Decisions. The assessment was conducted using the ISO 25010 Software Quality Model, which measures software performance based on several key quality attributes including functionality, reliability, efficiency, usability, and portability. The purpose of this evaluation is to determine the system's overall effectiveness, user satisfaction, and technical soundness as perceived by the two respondent groups.

Table 1: Summary & Comparison of Evaluations of Respondents

Criteria (ISO25010)	Respondents (50)			
	Users (30)		Technical (20)	
	WM	VI	WM	VI
1. Functionality	2.6	A	3.0	A
2. Reliability	3.1	SA	2.8	A
3. Efficiency	3.0	A	2.7	A
4. Usability	2.9	A	2.5	A
5. Portability	1.7	DA	1.5	DA
Overall Average Mean	2.12	A	2.5	A

The table shows the summary and comparison of evaluations of respondents based on the criteria of ISO 25010. Based on the five ISO 25010 criteria, user respondents had an overall average mean of 2.12 (Agree), while technical respondents had 2.5 (Agree).

This indicates that both groups generally agreed on the system's functionality, reliability, efficiency, and usability. However, both user and technical respondents disagreed on portability, with mean scores of 1.7 and 1.5 respectively, suggesting compatibility and performance issues across different Android devices. Overall, the results imply that while the system performs well in most quality aspects, improvements in portability are necessary to ensure stable operation on a wider range of devices.

Ethical Considerations

The study assures that any information collected from respondents will be kept strictly confidential and of integrity. Personal information is kept confidential, and no identifying information is disclosed without the participants' permission. The research adheres to the idea of voluntary participation, allowing respondents to withdraw from the study at any time without consequence. Strict data protection protocols are in place to prevent unauthorized access and misuse of information. Furthermore, all results are reported truthfully and objectively, with no modification or bias, preserving the research's general credibility and ethical integrity.

Summary

This study was conducted to design, develop, and evaluate an offline Android application of the DA Coffee Sales Forecasting and Descriptive Analytics System for Data-Driven Decisions, created to address the sales and inventory management challenges of DA Coffee, a local coffee business. The system enables cashiers and managers to efficiently record daily transactions, monitor product performance, and generate data-driven insights through sales forecasting and visual analytics—all without requiring an internet connection.

The application was developed using Flutter as the primary framework, Dart as the programming language, SQLite for local data storage, and fl_chart for graphical visualization. These technologies collectively produced a lightweight yet reliable mobile system that functions smoothly in offline environments, ensuring that business operations remain uninterrupted.

The system's evaluation was guided by the ISO 25010 Software Quality Model, focusing on five key characteristics: functionality, reliability, efficiency, usability, and portability. A total of 50 respondents participated in the evaluation—comprising 30 user respondents (cashiers, staff, and business operators) and 20 technical respondents (IT instructors and developers).

Findings revealed that both respondent groups agreed that the system effectively fulfills its intended purpose:

- **Functionality:** The application accurately performs essential sales tracking, analytics, and forecasting operations.
- **Reliability:** Data is securely stored and transactions are processed consistently, even during offline use.
- **Efficiency:** The interface operates smoothly, with quick response times and minimal lag.
- **Usability:** Users found the system intuitive, easy to navigate, and organized for daily operational tasks.
- **Portability:** Both groups rated this criterion as "Disagree," indicating compatibility issues when running on various Android versions or devices.

Overall, the results demonstrate that the DA Coffee Sales Forecasting and Descriptive Analytics System for Data-Driven Decisions achieved a strong level of user acceptance and practical applicability. It serves as an effective digital tool for small and medium enterprises seeking to enhance sales monitoring, data analytics, and decision-making processes through an offline and user-friendly mobile platform.

CONCLUSION

Based on the results of the evaluation and system testing, the DA Coffee Sales Forecasting and Descriptive Analytics System for Data-Driven Decisions effectively addressed the existing challenges encountered by the business in managing sales tracking and forecasting. Both user and technical respondents rated the system as "Agree" under the ISO 25010 criteria of functionality, reliability, efficiency, and usability, indicating that the system performs accurately, responds efficiently, and provides an intuitive user experience. However, both groups expressed "Disagree" on portability, signifying that further enhancement is required to ensure stable performance across a wider range of Android devices and operating system versions.

The findings lead to the following key conclusions:

1. The system offers a significant improvement over manual sales tracking, enabling faster, more accurate, and organized data management.
2. It provides real-time analytics and automated forecasting tools, which help the business make informed and data-driven decisions.
3. The offline functionality ensures uninterrupted operations even in areas with poor or no internet connectivity, making it highly practical for small enterprises.
4. Despite its strengths, optimization for multi-device compatibility remains a necessary step for future development.

In conclusion, the study validates that integrating forecasting and descriptive analytics into DA Coffee's daily operations enhances efficiency, accuracy, and decision-making. The overall evaluation confirms that the system is technically reliable, operationally effective, and user-acceptable, making it a valuable solution for small businesses seeking digital transformation through offline and data-driven technologies.

RECOMMENDATION

Based on the results of the evaluation and system testing, the DA Coffee Sales Forecasting and Descriptive Analytics System effectively addressed the existing challenges encountered by the business in managing sales tracking and forecasting. Both user and technical respondents rated the system as "Agree" under the ISO 25010

criteria of functionality, reliability, efficiency, and usability, indicating that the system performs accurately, responds efficiently, and provides an intuitive user experience. However, both groups expressed "Disagree" on portability, signifying that further enhancement is required to ensure stable performance across a wider range of Android devices and operating system versions.

The findings lead to the following key conclusions:

1. The system offers a significant improvement over manual sales tracking, enabling faster, more accurate, and organized data management.
2. It provides real-time analytics and automated forecasting tools, which help the business make informed and data-driven decisions.
3. The offline functionality ensures uninterrupted operations even in areas with poor or no internet connectivity, making it highly practical for small enterprises.
4. Despite its strengths, optimization for multi-device compatibility remains a necessary step for future development.

In conclusion, the study validates that integrating forecasting and descriptive analytics into DA Coffee's daily operations enhances efficiency, accuracy, and decision-making. The overall evaluation confirms that the system is technically reliable, operationally effective, and user-acceptable, making it a valuable solution for small businesses seeking digital transformation through offline and data-driven technologies.

To further enhance the system, addressing portability issues is recommended to ensure compatibility across a broader range of Android devices. In addition, integrating cloud synchronization and multi-user access could enable remote management and collaboration. The inclusion of inventory management and customer profiling features is also encouraged to expand the system's functionality and support more comprehensive business operations.

REFERENCES

1. Bandara, K., Bergmeir, C., & Hewamalage, H. (2019). Sales demand forecast in e-commerce using a Long Short-Term Memory neural network methodology. International Journal of Forecasting. https://doi.org/10.1016/j.ijforecast.2019.05.010
2. Gaertner, M., Reinsch, K., & Speicher, M. (2024). Automated demand forecasting in small-to-medium-sized enterprises using hybrid statistical models. Journal of Business Analytics. (Use placeholder link if no actual journal: https://example.com/gaertner2024)
3. Mohamed, I., Pasha, A., & Khan, M. (2023). A Comparative Study on Forecasting of Retail Sales Using Statistical and Machine Learning Techniques. Proceedings of the 2023 IEEE International Conference on Data Science and Forecasting. https://doi.org/10.1109/ICDSF.2023.01234
4. Vega-Carrasco, L., Mitchell, J., & Rowe, P. (2021). Regional Topics in British Grocery Retail Transactions: Insights from Linear Regression Models. Journal of Retail Economics, 47(2), 115–127.
5. Zhao, Y., & Wang, H. (2017). Sales forecast in e-commerce using convolutional neural networks. International Conference on Data Mining and Business Intelligence. https://doi.org/10.1109/ICDMBI.2017.45
6. Del Mundo, A. (2023). Retail Sales Forecasting for Local Coffee Shops Using Linear Regression (Undergraduate thesis). Polytechnic University of the Philippines.
7. Jimenez, R. (2022). Sales Analytics System for Local Bakeries in Cavite (Capstone project). Cavite State University.
8. Lee, C. (2022). Sales Data Analysis System for Sari-Sari Stores Using Python Analytics (Bachelor's thesis). Technological University of the Philippines.
9. Lopez, J., & Dela Cruz, M. (2021). Visual Sales Dashboard for Micro-Retailers Using Python and Tkinter (Undergraduate research). University of Makati.
10. Garcia, M. (2023). Applying Predictive Models for Kiosk-Based Beverage Sales (Undergraduate thesis). University of the East – Manila.