

Automated Financial Reporting and AI-Based Insights for MSMEs Using Gemini AI: A Case Study of Cubic Game House

Michael Christano Suryopranoto¹, Ridwan Sanjaya², Stephani Inggrit Swastini³

^{1,2,3}Department of Information System, Faculty of Computer Science Soegijapranata Catholic University, Semarang - Indonesia

¹mikechristano.19@gmail.com, ²ridwan@unika.ac.id, ³stephaniinggrit@unika.ac.id

Abstract— MSMEs are the backbone of Indonesia's economy, but many of them still rely on traditional manual accounting systems which are inefficient and prone to errors. General objective of the research is to develop and implement a web based financial management system using Artificial Intelligence to automatically generate financial report and provide business decision support. The methodology of the research in this paper uses a Waterfall model design and development process where Cubic Game House, a business that rents PlayStation console system, as the case study. The app is programmed in React and uses the Next.js framework and TypeScript is used in the user interface, and financial data is saved temporarily in the browser storage. It will connect to Gemini AI's API to assess transaction details, generate financial analysis, recognize irregular spending behaviours and share practical business tips. It is concluded that the proposed system improves the financial record-keeping, report generation process and data-driven decision making practices of MSMEs. Our research indicates that AI-based financial systems can be feasibly applied in MSMEs with limited technology.

Keywords—accounting information system, business insights, financial reporting, gemini ai, MSMEs

I. INTRODUCTION

MSMEs, or micro, small, and medium-sized enterprises, are frequently regarded as the backbone of the Indonesian economy. They are essential to preserving economic stability because they propel economic growth and create jobs [1]. Despite their significance, a

lot of MSMEs have trouble efficiently managing their financial data. At MSMEs, financial paper work is often done manually in spreadsheet applications or on a real pad. Preparing financial reports, inconsistent opinions and erroneous calculations are the drawbacks of such methods [2]. This means the owners frequently lack timely and accurate financial data, which they need in order to make informed decisions [3].

One MSME grappling with this challenge is Cubic Game House and its business of PlayStation console rentals. Transaction records were maintained in spreadsheets, a procedure that made it difficult to generate regular forms of financial reports such as cash flow statement and income statements and consolidate data [4].

Recent advances in artificial intelligence (AI) have enabled new capabilities to automate financial tasks. Managers can benefit from the use of AI by analyzing transactions trends, detecting anomalous ones and provide recommendations on managerial decisions [5]. Then there is accounting where the AI is increasingly employed to achieve greater financial transparency and improved accuracy of reporting [6].

But AI usage by MSMEs is still low. The widespread implementation is hindered by factors including lack of technical know-how, infrastructure inadequacy and concerns regarding system complexities [7]. Hence AI powered financial services that are pragmatic, user friendly and well-suited to an MSME's requirements.

The objective of this study is to design and implement a web-based financial

management system integrating Gemini AI. The objective of the system is to enable MSMEs get business intelligence and automate their financial reporting. After studying Cubic Game House, this paper demonstrates the feasibility of an automated financial system for MSMEs through AI by focusing on quality and accessibility.

II. METHOD

This research employs a design and development method with a qualitative descriptive approach. System development uses the Waterfall model; which comprises stages of Requirement analysis, System design, Implementation, Testing and Maintenance [8].

A. Research Design and Procedure

Cubic Game House was used as a case study for this investigation. The main methods used to collect information were direct observation of current financial record-keeping practices and conversations. The system specifications required to satisfy real operational requirements were developed using this data. The phases of development comprised:

1. Requirements Analysis: Using discussion and observation, identify problems in financial documentation and ascertain user requirements.
2. System Design: Developing entity relationship diagrams (ERDs), activity diagrams, use case diagrams, and a user interface prototype.
3. Implementation: Using Next.js, TypeScript, and React to build the system, Gemini AI is integrated via an API for financial assessment [9].
4. Testing: To guarantee the dependability and usability of the system, functional evaluations, AI accuracy validation, and user acceptability tests are carried out [10].

B. Technology Stack and System Architecture

The system utilizes a state of the art web based architecture using client side storage and cloud AI processing.

No	Component	Technology
1	Frontend	React (Next.js) with TypeScript
2	Database	LocalStorage / IndexedDB
3	AI Engine	Gemini AI (Google Generative AI API)
4	Deployment	Web-based (Browser)

Table 1: Technology Stack Used

The transaction data is maintained in the browser, but it is pushed to Gemini AI when someone clicks on the AI Insights feature.

C. Testing Method

Black-box testing on the system was performed in order to verify that all system features conform to its specification, without accounting for the internal structure of code [10]. The accuracy of the AI was measured by comparing the results of AI-derived insights with manual financial assessments that had been made by researchers. Owner and staff from Cubic Game House performed the User Acceptance Testing (UAT) to test the user friendliness and usefulness of the system [11].

D. Sample Selection

For the study, complete sampling was performed on all Cubic Game House system users, which included one owner and two operators. This approach made it possible to ensure the wide basing of the study in the research field, which corresponds to a common procedure in case study research [12].

III. RESULTS AND DISCUSSION

A. Result

This system has several important parts:

- Manual transactions information input: The users fill-in the data of debit and credit accounts manually.
- Financial Statement Generator: Automatically produces income statements, balance sheets, and cash flow statements in just one click.
- Anomaly Detection: AI finds transactions that seem odd.

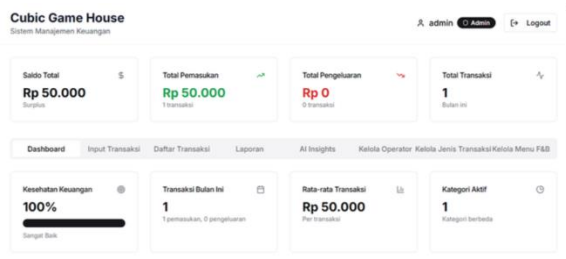


Figure 1: Dashboard Page

Figure 1 shows the front page of Cubic Game House's financial application interface. This dashboard presents the current standing of the business related to money, presenting total income, total expense, balance in hand, transactions summary and financial health indicators. Users are able to monitor on the fly financial performance and enable data-informed decisions with no manual formulas required.

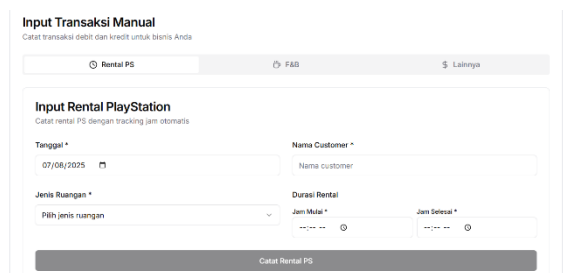


Figure 2: Input Transaction Page

Referring to Figure 2, form is provided for recording PlayStation rental transactions, f&b transactions and all other transactions with automatic time adjustments (start and end times) made as well as room type desired or selected and customer name. This is very useful for correct book keeping and to safe rental time.

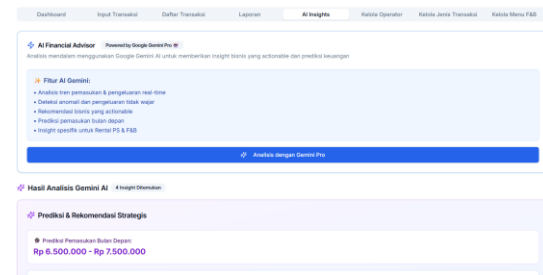


Figure 3: AI Insights Page

As shown in Figure 3, After performing the push on the analysis button, the system presents Strategic Predictions and Recommendations. For example, the AI shows a forecast salary for next month, such as between IDR 6,500,000 and IDR 7,500,000 that applies based on previous data trends. What's more, the AI has a list of strategic suggestions e.g. to drive efficiency in electricity costs and sell Regular PS Rental – or F&B products. These are some of the business tips that entrepreneurs can use to better run their business and earn more profit.

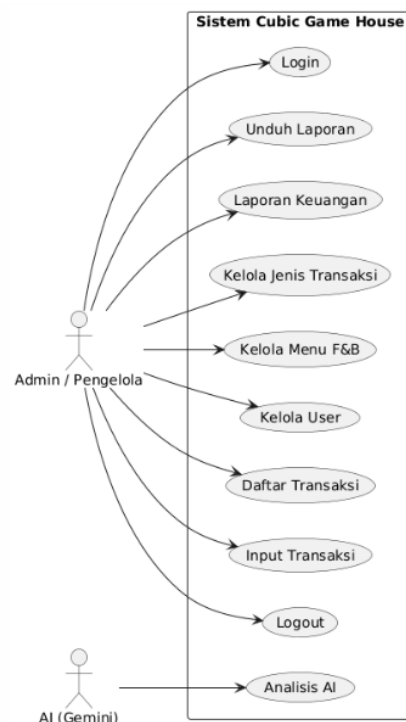


Figure 4: Use Case Diagram

Figure 4 showcases the use case diagram for the financial management system of Cubic Game House. The diagram demonstrates how system users engage with the key features offered by the application.

B. Discussion

Results show that the developed system is capable of solving the financial control problem commonly experienced by MSMEs owners. The system unburdens accounting personnel by automating financial reporting functions and thereby reducing data entry time as well as chances for miscalculation, findings that are consistent with prior studies on AIS.

Business owners can make sense of financial patterns and recognize unusual spending without being an accounting whizz thanks to AI Insights [13]. Which also results into better decisions and thus better financial management. Contrary to other research that have concentrated on complex AI technologies, this research focuses on user-friendliness and simplicity, enabling the use of AI financial analysis among MSMEs [14].

Gemini AI integration allows context-aware analysis with an easy-to-use user interface [15]. These results indicate that AI-driven financial platforms are practicable for deployment in technological poor MSMEs.

IV. CONCLUSION

A web-based financial management system with Gemini AI for MSMEs was effectively developed and deployed in this study. This is a financial reporting system that connects with out-of-system data input to automatically update based on manual transactions which also has AI insights to inform business decisions. The results also show that the existence of AI financial system is influential in improving efficiency, accuracy and awareness financially at MSMEs as Cubic Game House. Further studies could be conducted about database integration, development of mobile app, sophisticated financial prediction matrix and wider testing in different MSME categories.

REFERENCES

- [1] Ministry of Cooperatives and SMEs of Indonesia, MSME Statistics Report, 2021.
- [2] A. Susanto, Accounting Information Systems, Bandung: Lingga Jaya, 2017.
- [3] M. B. Romney and P. J. Steinbart, Accounting Information Systems, 14th ed., Pearson, 2020.
- [4] Ikatan Akuntan Indonesia, Financial Accounting Standards (PSAK), 2022.
- [5] S. Russell and P. Norvig, Artificial Intelligence: A Modern Approach, 4th ed., Pearson, 2021.
- [6] M. A. Vasarhelyi et al., "Big data in accounting," Accounting Horizons, 2015.
- [7] A. Moll and C. Yigitbasioglu, "The role of internet-related technologies in shaping the work of accountants," British Accounting Review, 2019.
- [8] R. S. Pressman, Software Engineering: A Practitioner's Approach, McGraw-Hill, 2014.
- [9] T. Davenport and D. D. D'Ignazio, "Artificial intelligence for the real world," Harvard Business Review, 2018.
- [10] ISO/IEC 25010, Systems and Software Quality Requirements and Evaluation, 2011.
- [11] J. Nielsen, Usability Engineering, Morgan Kaufmann, 2012.
- [12] R. K. Yin, Case Study Research and Applications, Sage, 2018.
- [13] J. Heaton, Introduction to Artificial Intelligence for Business, Heaton Research, 2020.
- [14] N. A. O. Ahmad and N. M. Zabri, "The application of AI in SME financial management," Asian Journal of Accounting Research, 2020.
- [15] Google, Gemini API Documentation, 2024.