OPEN ACCESS
VOL. 7, NO. 1, PP.118-126, NOVEMBER 2024

ISSN : 2622-8106 (ONLINE)
DOI: 10.20895/INISTA.V7I1.1635

Journal of Informatics, Information System, Software Engineering and Applications (INISTA)

MSME Digitalization Using Point of Sale Calculator to Improve Efficiency and Productivity

Muhammad Ainur Rony[1], Motika Dian Anggraeni[2]

[1,2]Universitas Budi Luhur
Jl. Ciledug Raya, Kec. Pesanggrahan, Kota Jakarta Selatan, Daerah Khusus Ibukota Jakarta

[1] ainur.rony@budiluhur.ac.id
[2] motika.diananggraeni@budiluhur.ac.id

Received on 03-11-2024, revised on 25-11-2024, accepted on 13-12-2024

Abstract

Digitalization of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia is crucial to increase competitiveness in the era of globalization. Due to cost considerations, many MSMEs continue to rely on conventional methods to manage their businesses, leading to inefficiencies in transaction handling and sales data analysis. This traditional approach often results in errors, reporting delays, and suboptimal decision-making, which can hinder growth and productivity. This study focuses on the implementation of a free cloud-based Point of Sale (POS) calculator application as a digital solution to address these challenges. The POS application streamlines the transaction process and generates real-time sales reports, ultimately improving operational efficiency and strategic decision-making. The development method used in this study is the System Development Life Cycle method. The POS application development process includes comprehensive Requirements Analysis, System and Software Design, Implementation, Testing, and Maintenance. User feedback was collected through structured interviews and surveys to evaluate the application's ease of use and its benefits in improving MSME operations. The findings showed significant improvements in operational efficiency, as the POS application speeds up transaction processing and provides timely, data-driven insights for decision-making.

Keywords: MSME, Point of Sale, Information Technology, Website.

Corresponding Author:
*Motika Dian Anggraeni
Universitas Budi Luhur
Jl. Ciledug Raya, Kec. Pesanggrahan, Kota Jakarta Selatan, Daerah Khusus Ibukota
Email: motika.diananggraeni@budiluhur.ac.id

I. INTRODUCTION

Micro, Small, and Medium Enterprises (MSME) is a business activity carried out by individuals, households, or small-scale business entities [1]. MSME have a vital role in the Indonesian economy, contributing significantly to gross domestic product and employment absorption [2]. The use of information systems to help organizational performance is increasingly needed [3]. However, many MSME still rely on conventional methods in business management, which often result in low operational efficiency, difficulty in monitoring inventory, and delays in decision making. With the rapid development of information technology, digitalization is a strategic step needed to increase the competitiveness of MSME.

In the early stages of the study, an approach was made to several MSMEs around the area where the researcher lives to get a big picture of the problems faced. The MSMEs targeted by the initial survey were MSMEs with different backgrounds in the sense of selling different products. in adopting new technology, the difficulties faced by MSMEs In addition to the lack of knowledge and skills in using digital systems, another equally difficult problem is the cashier application which usually uses special devices which require a separate allocation of funds to buy them. Considerations on the basis of reducing spending these funds cause MSMEs to decide to record transactions manually only, which causes other problems such as difficulty in managing transactions, making them prone to errors and inefficiencies. Therefore, a solution

is needed that can help MSMEs overcome problems in recording transactions that allow MSMEs not to have to spend special costs to procure a cash register. This study aims to develop a Point of Sale (POS) calculator application as a free cloud-based digital solution that can be implemented by MSMEs using devices they already have such as smartphones or laptops. Point of sale is an application used to carry out sales, purchase, return, inventory, and other transactions [4]. The development method used is the System Development Life Cycle (SDLC) model which includes the stages of needs analysis, design, implementation, testing, and system maintenance [5]. The system built is a website designed to make it easier for MSME to manage transactions, monitor sales data, and conduct real-time analysis. By implementing this POS application, it is hoped that MSME can optimize their resource management, reduce errors in transactions, and increase competitiveness in the market.

There are several previous studies that have been conducted related to the development of Point of Sales applications. Research to overcome the problem of Es Permen Karet Softdrink Agents in recording data that is not neat and has an impact on transactions. This study uses the prototype and black-box testing methods to design and test a more efficient system in managing orders and stock of goods [6]. The second study was conducted at PT. Teknologi Air Perkasa to overcome problems caused by conventional transaction recording and reporting methods. Web and mobile-based Point of Sales (POS), developed using the Waterfall method and tested with black box testing [7]. The third study was conducted at the Hoops Frozen Food Store, which still uses a manual system, requiring a Point of Sales (POS) system to speed up transactions and manage stock of goods. By implementing the Laravel and MySQL frameworks using the Agile Development method, this POS system has succeeded in increasing transaction efficiency and customer service [8].

II. RESEARCH METHOD

The development of this Point Of Sale application is done using the System Development Life Cycle (SDLC). The Software Development Life Cycle (SDLC) model is used as a systematic approach to system implementation and modification [9]. SDLC is a standard workflow that is commonly used by software vendor companies in developing their production application software [10]. The stages of the SDLC are as follows:

Fig 1. SDCL Stages

The following is an explanation of the stages of SDLC as follows [11]:

1. Planning stage : in the planning stage, comprehensive project planning is carried out, including determining the scope, feasibility analysis, resource and time planning, cost budgeting, developer team assignment, and system testing and maintenance planning
2. Analysis stage: analysis of planning information collection in solving problems. The information collected is studied, whether the creation of a website can solve the problems in the store or not.
3. Design stage : the design stage is a website design plan that is made based on previous analysis. In this stage, it describes in full with the aim of helping regarding what design should be made on the website.
4. Program coding stage (implementation): the program coding stage is the initial step in the website creation process by entering program codes and in this phase, testing will be carried out on the functionality of the program code whether it is appropriate or not.
5. Integration and system testing stage : this stage is the stage after the previous module or unit has been completed and tested, the next process will be testing and checking the system as a whole to find out if there are any possible errors or failures in the system.

6. Maintenance stage : this final stage is the evaluation process of the previous program testing stage, so that it can be known whether this pos website still needs to be repaired or not for the future as a whole and developed further in order to achieve optimal results.

III. RESULTS AND DISCUSSION

A. *Requirement Analysis*

In this stage, there are several stages carried out, namely:

1. Stakeholder Identification
   Stakeholder identification is carried out by meeting 7 MSME owners and employees. The result of this stage is a list of relevant stakeholders and their basic needs (Until this research was conducted, we already had 49 MSME clients).
2. Needs Collection:
   The process of gathering needs is carried out using the interview method to collect information about the desired features. At this stage, a collection of functional and non-functional needs is produced.
3. Analysis of the Current Business Process
   What is done at this stage is to study the existing workflow and sales process to identify pain points. The result of this stage is a detailed business process map with problem points that need to be addressed.
4. Define Main Features
   At this stage, the main feature needs of the system to be developed are formulated, such as Sales Management, Payment Processing, Sales Reporting, Integration with other devices (such as receipt printers).

B. *Design*

There are several stages carried out in the design stage, namely system flow design and user interface design.

1. System flow design
   The system flow is formulated using the Unified Modeling Language (UML).

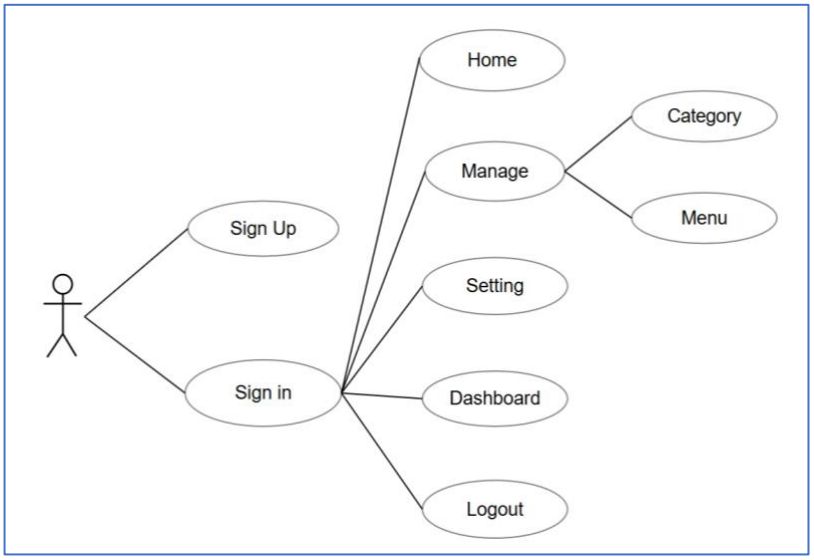

Fig 2. Use Case Diagram

C. User interface design

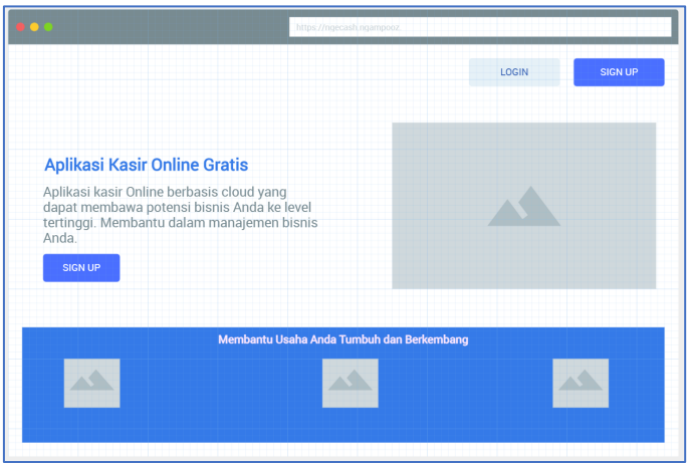

Fig 3. Homepage

The dashboard page is designed as the initial display presented to MSME partners who use the application. On the dashboard page, two menus are provided, namely the register menu and the login menu.

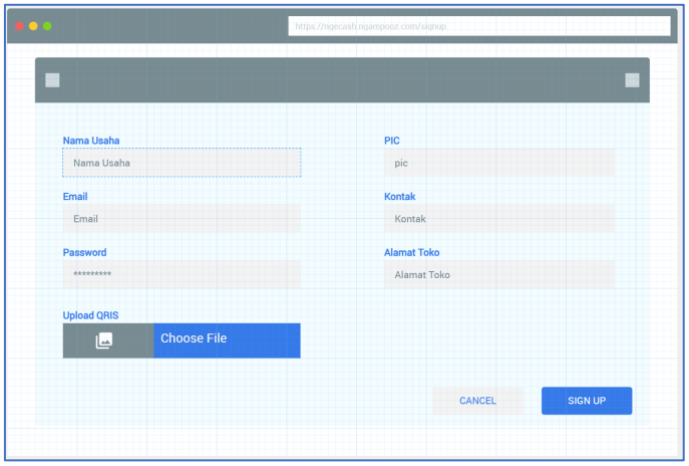

Fig 4. Registration page

As a new user, MSME owners are required to register first. In this section, MSME partners are asked to follow some information related to the MSME they own, including the barcode used in buyer payment transactions.

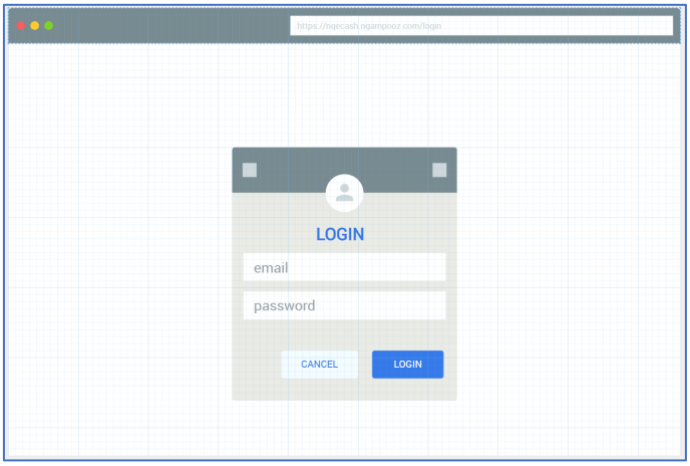

Fig 5. Login page

The login page is designed as an entrance that can be accessed by members who have previously completed the registration process. Login cannot be done if you have not completed the registration process first.

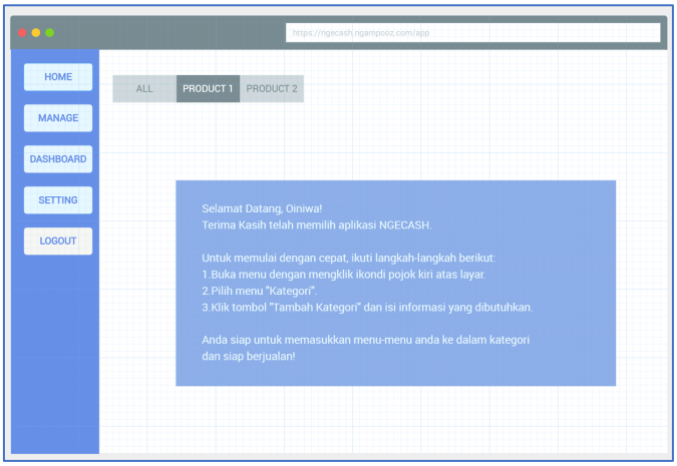

Fig 6.User homepage

The user homepage design is the initial display when the user successfully logs in. There are several main menus that can be accessed by the user when successfully logged in besides the homepage, namely the dashboard menu, manage menu, setting menu, and logout menu.

D. Implementation

The application development process is carried out using HTML, JSCript and SQL. The application named NGECASH. NGECASH can be accessed freely and for free via https://ngecash.ngampooz.com/. NGECASH is an open platform that can be used by anyone without requiring a special device with high specifications, simply by utilizing a smartphone or laptop that you already have. NGECASH is developed as a website-based system to facilitate access that can be done anytime and anywhere by MSME partners. The following is a screenshot of the system after going through the coding process.

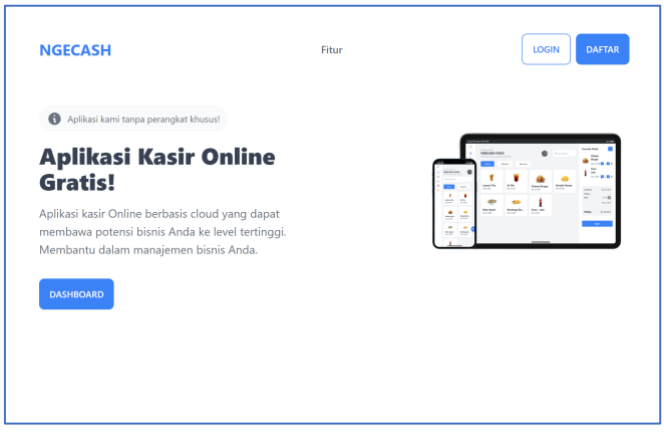

Fig 7. Home

The website's homepage is modern and user-friendly. This design makes it easy for visitors to explore the content easily.

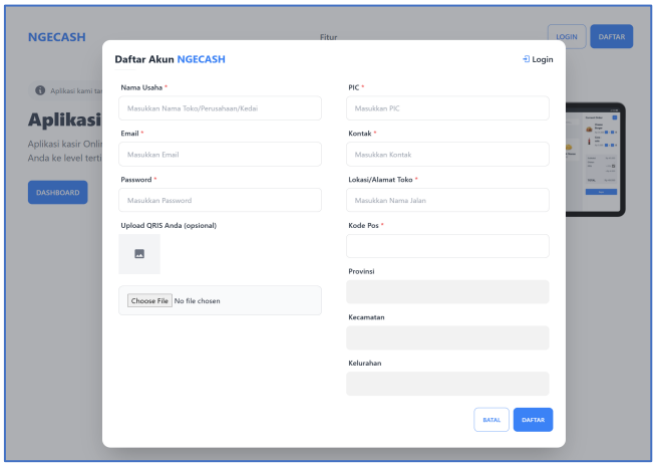

Fig 8. Registration page

Simple and easy to use registration page layout. The registration process is designed to ensure a fast and efficient user experience by requiring users to enter relevant information.

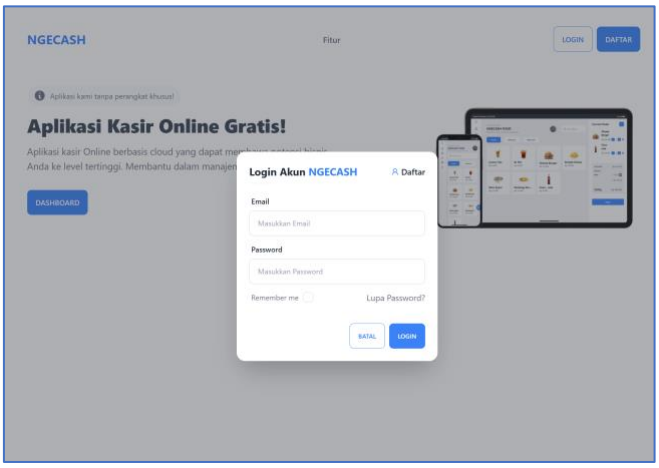

Fig 9. Login page

The login page allows users to access their accounts by entering the correct credentials. The main function of this page is to ensure that only registered users can log in to the system.

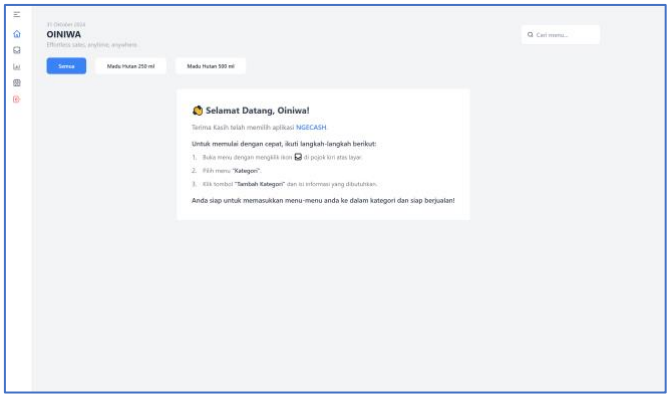

Fig 10. User home

The user's home page displays relevant key information and features. This page provides quick access to various services or content available such as the dashboard menu, manage menu, setting menu, and logout menu.

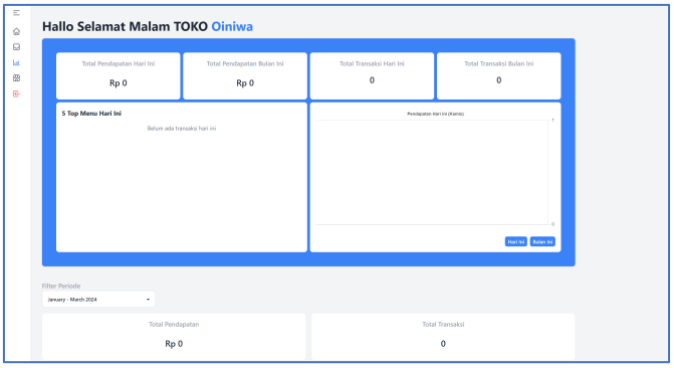

Fig 11. User Dashboard

User dashboard view that displays detailed sales summary. This page provides a complete overview of sales performance and related statistics.

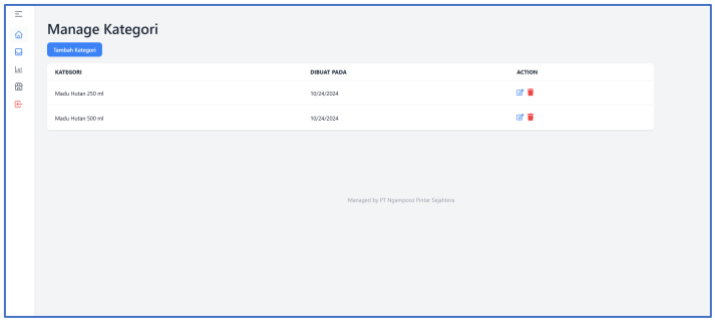

Fig 12. Manage page

Product management page view that allows users to manage the list of products sold. This page makes it easy to organize, update, and delete products efficiently.

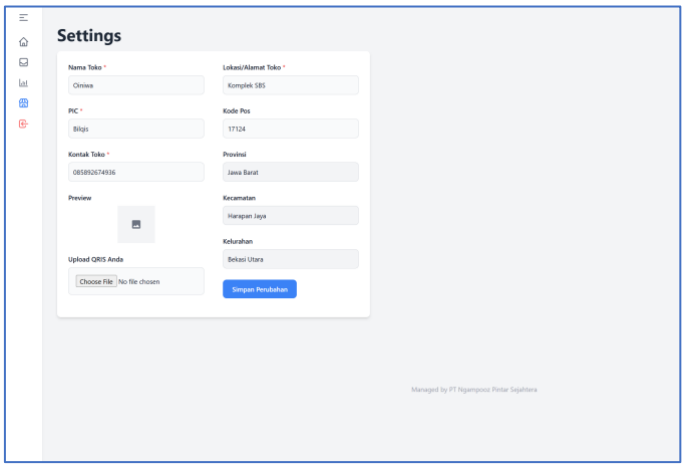

Fig 13. Setting

View the settings page to manage basic information for MSMEs. This page allows users to update important data such as business name, contact, and address.

E. Testing

NGECASH is intended for free use by MSMEs. Because NGECASH will be used by quite a few users, it is important to test website performance to anticipate if anything inappropriate is found. The following are the results of website performance testing. Overall, NGECASH performance is 99%, Accessibility 72%, best practice 100% and SEO 83%. From the results of this test, it can be seen that NGECASH has very good performance.

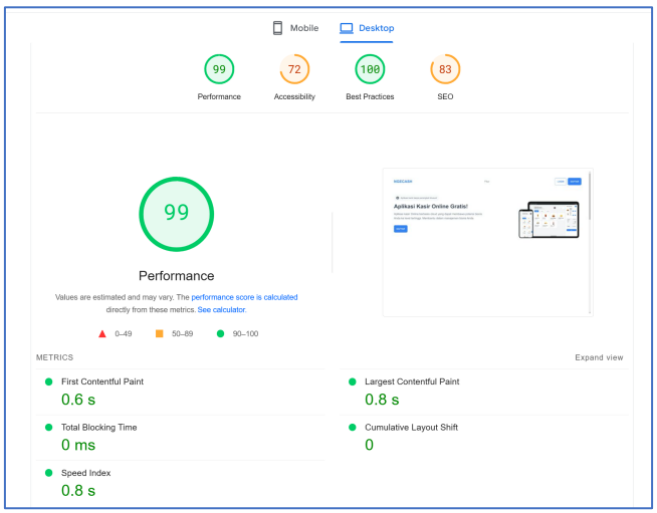

Fig 14. Testing result

IV. CONCLUSION

A. Conclusion

Digitalization of MSMEs in Indonesia through the implementation of Point of Sale (POS) applications has proven to be an effective solution to overcome problems in manual reporting carried out by MSMEs, as well as being a new solution for MSMEs that are just starting out and still limit the use of funds to buy special cashier devices. NGECASH which was created can be freely accessed and can also be used freely by MSMEs with or without the need for special devices, simply using a smartphone or computer that is already owned. NGECASH not only speeds up the transaction process, but also provides real-time reports that support better decision making.

B. Suggestions

For the development of the results of this study in the future, there are several suggestions given by the author, namely:

1. It is recommended that MSMEs receive training on the use of digital technology, including POS applications, to maximize the benefits obtained.
2. POS application developers should continue to innovate to ensure that applications can be adjusted to the specific needs of various types of MSMEs.
3. Conduct periodic evaluations of the use of POS applications to ensure that applications continue to meet user needs and identify areas that need improvement.
4. Encourage MSMEs to collaborate with technology service providers to obtain more integrated and comprehensive solutions.

REFERENCES

[1] T. Sudrartono *et al.*, *Kewirausahaan Umkm Di Era Digital*. 2022.
[2] C. Yolanda, "Peran Usaha Mikro, Kecil Dan Menengah (UMKM) Dalam Pengembangan Ekonomi Indonesia," *J. Manaj. Dan Bisnis*, vol. 2, no. 3, pp. 170–186, 2024, doi: 10.36490/jmdb.v2i3.1147.
[3] D. Hermawan, Y. Sutrayana, and Abudiman, "Point of Sales Application Development at Worm Store Workshop," *J. Mantik*, vol. 6, no. 3, pp. 2685–4236, 2022.
[4] B. S. Prayogi, I. Fitri, and R. Nuraini, "Aplikasi Point of sale Berbasis Website pada Toko Sembako

Tegar," *J. JTIK (Jurnal Teknol. Inf. dan Komunikasi)*, vol. 6, no. 2, pp. 260–266, 2022, doi: 10.35870/jtik.v6i2.411.

[5] R. Inggi, Y. Prayudi, and B. Sugiantoro, "Penerapan System Development Life Cycle (Sdlc) Dalam Mengembangkan Framework Audio Forensik," *SemanTIK*, vol. 4, no. 2, pp. 2502–8928, 2019, doi: 10.5281/zenodo.2528444.

[6] A. Kusmawati and W. S. Utami, "KLIK: Kajian Ilmiah Informatika dan Komputer Pengembangan Aplikasi Point of Sale untuk Meningkatkan Kinerja Agen Softdrink Menggunakan Metode Prototype," *Media Online)*, vol. 4, no. 2, pp. 1121–1133, 2023, doi: 10.30865/klik.v4i2.1300.

[7] K. Telaumbanua, F. S. Damanik, M. Alhami, and E. Suparnap, "Pengembangan Sistem Point of Sales Menerapkan Pendekatan PIECES," *RESOLUSI Rekayasa Tek. Inform. dan Inf.*, vol. 3, no. 6, pp. 291–298, 2023.

[8] A. Lutfi Irawan, A. Triayudi, and A. Iskandar, "Implementasi Sistem Point of Sales Menggunakan Metode Agile Development," *Media Online)*, vol. 3, no. 6, pp. 1326–1333, 2023, doi: 10.30865/klik.v3i6.940.

[9] Fitria Anisa, Fauzi Syahputra Harahap, Harits Al Khosyi, Intan Permata Sari, and Yahfizham, "Pengembangan Software Menggunakan Model SDLC Guna Mencapai Keselarasan dengan Kebutuhan Pengguna," *J. Informatics Busisnes*, vol. 01, no. 04, pp. 229–232, 2024, [Online]. Available: https://jurnal.ittc.web.id/index.php/jibs/index

[10] N. Hasanah and M. N. Indriawan, "Rancangan Aplikasi Batam Travel Menggunakan Metode Software Development Life Cycle (SDLC)," *Comb. - Conf. Manag. Business, Innov. Educ. Soc. Sci.*, vol. 1, no. 1, pp. 925–938, 2021, [Online]. Available: https://journal.uib.ac.id/index.php/combines/article/view/4524

[11] Ichsan Raksa Gumilang, "Penerapan Metode Sdlc (System Devlopment Life Cycle) Pada Website Penjualan Produk Vapor," *Jural Ris. Rumpun Ilmu Tek.*, vol. 1, no. 1, pp. 47–56, 2022, doi: 10.55606/jurritek.v1i1.144.