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# Analysis and Design of Web-Based Management Information Systems for Culinary MSMEs in Cilegon

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**ABSTRACT**

This research aims to analyze and design a web-based management information system for culinary MSMEs in Cilegon to improve operational efficiency and the quality of business decision-making. Using the Design Science Research (DSR) approach, this research identifies the functional needs of businesses through interviews, observations, and questionnaires, which are then used as the basis for system design. The developed system includes key features such as stock management, transaction recording, and automatic financial report generation. The trial results showed an increase in work time efficiency of up to 68%, a reduction in recording errors, and an increase in user satisfaction with an average usability score of 85 out of 100. The system also proved easy to use, even by users with low levels of digital literacy. The evaluation shows that the system is able to answer the real needs of MSME actors and has the potential to be replicated in other business sectors. This research concludes that a web-based management information system is an effective strategic solution in encouraging the digital transformation of culinary MSMEs, and can be a model for sustainable technology implementation in other regions.

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## INTRODUCTION

Culinary MSMEs have a very important role in the Indonesian economy, especially in creating jobs and strengthening the competitiveness of the small industry sector. In Cilegon, as one of the growing cities in Banten Province, culinary MSMEs have grown rapidly along with the increase in population and the high demand for fast food. However, many MSME players in this sector still face major challenges in terms of efficient operational management. Increased demand and tighter competition mean that culinary MSMEs in Cilegon need to manage their businesses more effectively. Unfortunately, most MSME players still rely on manual methods in managing transaction data, inventory of goods, and financial reports. This condition affects operational efficiency and the quality of service provided to customers (Setiawan & Wijaya, 2023).

Limitations in the use of technology are one of the main obstacles in managing culinary MSMEs. Often, business actors only rely on manual recording, which requires a lot of time and effort, and is prone to human error (Wijayanti & Ramadhan, 2022). In addition, limitations in accessing real-time information make decision making less optimal. A web-based management information system can be an effective solution to overcome this problem. With this system, culinary MSME players can manage various aspects of their business more efficiently and structured. Web-based information systems allow easier data accessibility through any device, be it a computer or mobile device (Hidayat & Putri, 2023).

Several previous studies have shown that the implementation of technology-based information systems can provide great benefits for MSMEs. For example, management information systems can help speed up the transaction process, improve data accuracy, and reduce human error (Arief & Aditya, 2023). In addition, these systems can also increase transparency and ease in managing financial reports (Kurniasari & Yulianti, 2023). On the other hand, although there are various software solutions available in the market, many MSMEs find it difficult to choose and implement a system that suits their needs. The need for information systems that are easy to use and affordable is important in choosing the right technology solution for MSMEs (Simanjuntak & Widodo, 2022).

One of the main challenges in managing culinary MSMEs is inventory management. Without a good system, food inventory management becomes less efficient, which can result in waste or stock shortages (Puspitasari & Irawan, 2023). With a web-based management information system, businesses can monitor food inventory more accurately and avoid losses. In addition, irregular and poorly structured financial reports are often a big problem for culinary MSMEs. Unclear and inaccurate reports can make it difficult for business owners to make data-based decisions. Web-based information systems can automate the creation of financial reports and help business owners understand the financial condition of their business more deeply (Anggraeni & Rahmadani, 2023).

Cilegon, as an industrial city, has great potential to develop competitive culinary MSMEs. However, to achieve this, MSME players need to be encouraged to adapt to technology that can facilitate their business management. Therefore, this research aims to design a web-based management information system that can improve the operational efficiency and business management of culinary MSMEs in Cilegon. This project also aims to identify specific system needs for culinary MSMEs in Cilegon, taking into account the characteristics of the culinary business which has a high turnover rate and intense competition (Nurfalah & Ardhianto, 2023). In this case, the system designed must be able to accommodate needs such as ordering raw materials, managing stock, and setting product selling prices.

Applying the right management information system can increase productivity and work efficiency in business management. It will also reduce dependence on manual records that are prone to errors and data loss. In addition, with a web-based system, any changes in data will be recorded automatically and can be accessed by business owners and other related parties (Simanjuntak & Widodo, 2022). In the context of developing culinary MSMEs, it is important to have a system that is flexible and easily accessible. Web-based information systems can be accessed by various parties involved in the business process, ranging from business owners, employees, to raw material suppliers. This will facilitate coordination between parties and speed up the overall business process (Hidayat & Putri, 2023).

The success of developing a web-based management information system for culinary MSMEs in Cilegon will depend heavily on the understanding and readiness of business actors in adopting technology. Therefore, this research will also involve training and mentoring to ensure that the designed system can be optimally used by the entrepreneurs. The developed system must pay attention to data security and privacy factors. In an increasingly digitally connected world, data protection is very important. Therefore, the designed system must use technology that can protect transaction data and other business information to keep it safe from potential leakage or misuse (Kurniasari & Yulianti, 2023).

Overall, this research is expected to provide real solutions for culinary MSMEs in Cilegon to improve their business management through the application of efficient information technology. With the right web-based management information system, it is hoped that culinary MSMEs in Cilegon can better compete in this growing market.

## Literature review

### Digital Transformation

Digital transformation is a key element in improving the efficiency and effectiveness of MSME operations in Indonesia. Several studies have shown that the implementation of web-based management information systems (SIM) can significantly improve the managerial and operational performance of MSMEs (Susanto, 2022; Siregar & Sudarmanto, 2024). Research by Dewi, Azhar, and Maulana (2023) even states that the existence of SIM increases the speed of decision making and the accuracy of financial reports.

### The Implementation of Web-based Systems

The implementation of web-based systems with user-friendly interfaces is the dominant approach, where User-Centered Design (UCD) and Human-Centered Design (HCD) methods are adopted to increase user engagement (Yuniarti & Permana, 2023; Sampurno, Sianturi, & Kharisma, 2023; Rosaldy, Az-Zahra, & Wardani, 2024). Other research supports that intuitive design makes it easier for MSME actors - even with limited digital literacy - to operate the system independently (Wijaya et al., 2023; Wijayanti & Ramadhan, 2022). This indirectly increases users' confidence in the technology (Fitria, Jatiningsih, & Putri, 2024).

**System Modularity and Flexibility**

System modularity and flexibility are important aspects in developing applications that can be replicated across MSME sectors. Studies by Arief and Aditya (2023), and Nurfalah and Ardhianto (2023), show that modular design allows the system to be adapted to different business characteristics without sacrificing core performance. Angellin, Oetama, and Amri (2023) emphasized the importance of scalability in supporting system distribution to MSMEs across regions. In addition, the involvement of external parties such as business incubators and universities can accelerate technology adoption (Azra & Farihah, 2024; Saputra & Rahardjo, 2023).

**Perspective of Inventory and Transaction Management**

From the perspective of inventory and transaction management, integrated information systems are proven to reduce recording errors and improve internal supply chain efficiency (Setiawan & Wijaya, 2023; Puspitasari & Irawan, 2023; Anggraeni & Rahmadani, 2023). The integration of real-time sales and stock reports helps MSME players strategize based on data, not just intuition (Kurniasari & Yulianti, 2023; Wulandari, 2021). This is in line with Rachman and Rachmawati's study (2024) which emphasizes the importance of SIM in improving the efficiency and accuracy of MSME operations in the digital era.

In general, previous studies have shown that web-based management information systems contribute significantly to the digital transformation of MSMEs. By considering user needs, modular design, ease of access, and ongoing technical support, such systems not only address the internal challenges of MSMEs, but also open up opportunities for wider-scale digitalization (Arrofi, Ajie, & Sutabri, 2023; Hasanah, Saputra, & Hiiyatin, 2023; Simanjuntak & Widodo, 2022).

## METHODOLOGY

The research method used in this study is Design Science Research (DSR), which aims to develop a practical solution in the form of a web-based management information system for culinary MSMEs in Cilegon. The DSR approach was chosen because its main focus is to design and develop information technology artifacts to solve real problems, and evaluate the effectiveness of these solutions. With this approach, the research is directed at creating a system that can improve operational efficiency, stock management, sales transactions, and financial reporting in an automated and structured manner.

The initial step in the research process was to identify problems and user needs. This process is carried out through interviews with owners and managers of culinary MSMEs, direct observation of operational activities, and distributing questionnaires to collect quantitative data. The purpose of this step is to explore the main challenges faced by business actors, especially in data management, raw material stocks, and financial reports. Based on the results of this identification, the functional requirements of the system are determined, which include stock management modules, sales transactions, automatic financial reports, and business performance analysis features.

The next stage is the design and development of a web-based information system. The design was carried out by taking into account the characteristics of culinary MSMEs in Cilegon, which generally have varying levels of digital literacy. Therefore, the system is designed with a simple and intuitive user interface (UI/UX). The database structure is designed to record all transaction activities, purchases, and stock items automatically. System development is carried out using web-based technology so that it can be accessed through various devices and locations, making it easier for users to manage business in real-time.

After the system is developed, prototype implementation and testing is carried out on several culinary MSMEs as an initial trial. This test aims to evaluate the effectiveness and functionality of the system in real conditions. The testing process is carried out by comparing business management before and after system implementation. Feedback from users was collected through follow-up interviews and questionnaires to assess their satisfaction and experience in using the system. It is also useful to identify parts of the system that need to be improved.

Next, the system was evaluated and revised based on the trial results and feedback provided by the users. Evaluation is done to measure the extent to which the system has met user needs and whether there are aspects that need to be improved. Revisions are made to certain features and user interfaces to improve the performance and comfort of using the system. The purpose of this stage is to ensure that the system can be more widely adapted by other culinary MSMEs in the Cilegon area and its surroundings.

In terms of data collection, three main methods were used, namely interviews, observations, and questionnaires. The interview instrument contained open-ended questions designed to explore users' experiences in managing their businesses and their expectations of the information system. Observations were made directly to assess current operational management practices. Meanwhile, a questionnaire was used to obtain quantitative data, using a Likert scale to assess users' satisfaction with their current technology and their expectations of the new system.

To ensure validity and reliability, the data collection instruments were tested through content validity by involving experts in the field of MSMEs and information technology to ensure all important

aspects were covered. Next, the system was evaluated and revised based on the trial results and feedback provided by the users. Evaluation is done to measure the extent to which the system has met user needs and whether there are aspects that need to be improved. Revisions are made to certain features and user interfaces to improve the performance and comfort of using the system. The purpose of this stage is to ensure that the system can be more widely adapted by other culinary MSMEs in the Cilegon area and its surroundings.

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In the data analysis stage, qualitative data from interviews and observations were analyzed using a thematic approach to find important patterns related to user needs and challenges. Meanwhile, quantitative data from the questionnaires were analyzed descriptively and, where relevant, inferentially using statistical tests such as t-test or ANOVA to look at differences between user groups.

Finally, a thorough evaluation of the system was conducted based on the feedback received from users after implementation. This process includes not only an assessment of the system's functionality, but also its comfort, ease of use, and impact on the operational efficiency of MSMEs. From the evaluation results, continuous improvements were made to the system to ensure that the system developed actually provides real benefits and can be used as a model in developing similar systems for MSMEs in other regions.

**Table 1.** Participant Indicators

| Indicators | Criteria |
|---|---|
| **Type of Business** | MSMEs in the culinary sector (restaurants, stalls, food stalls, catering); Small to medium scale (annual turnover of Rp300 million to Rp50 billion); At least 1 year of operational experience. |
| **Business Owner or Manager** | Owner or manager with direct knowledge of operational management and involved in decision-making. |
| **Technology Readiness Level** | Use of technology in some aspects of operations (cashier system, stock management application, social media); Open to the use of web-based systems. |
| **Business Size (Operational Scale)** | Have at least 5 active employees; Have a high number of daily or monthly transactions; Have more than 1 branch (if applicable). |
| **Information System Management Experience** | Have not or rarely use technology-based systems; Still using manual methods in recording transactions and financial reports. |
| **Business Location** | Located in Cilegon (urban area or nearby); Actively operating and has the potential to grow with technology. |
| **Readiness to Conduct System Trials** | Willing to follow all stages of the research (data collection, system implementation, feedback); Open to training and mentoring. |
| **Nature of Participants** | Participants who are motivated to improve operational efficiency and willing to accept change and new technology. |

**RESULTS**

**Table 2.** Observation Data

| Name of MSME | Data Collection Methods | Questions/Topics | Operational Findings/Challenges | Functional Requirements for the System |
|---|---|---|---|---|
| Cilegon Satay Stall | Interview | Stock Management | Raw material stocks often run out without warning, causing delays in production. | Automated stock management features with low stock alerts and material purchase reports. |
| Kedai Kopi Rakyat | Interview | Transaction Management | The process of recording transactions is manual, time-consuming and error-prone. | Automated sales transaction feature and integration with financial reports. |
| Nasi Goreng Restaurant | Observation | Financial Management | Financial reports are generated manually, are often inconsistent and take time to complete. | Automated financial reports integrated with sales transactions. |
| Katering Ria | Questionnaire | Data Processing Time | Processing transaction data and financial reports is time-consuming and often late. | Features for automation of data processing and real-time report generation. |
| Warung Makan Suka | Interview | Business Performance Monitoring | There is no system in place to monitor business performance, whether in terms of sales, profit margins or expenditure. | Business performance analysis features (e.g. sales graph, profit margin). |
| Deli Restaurant | Questionnaire | System Integration | Data is scattered in various places (notebooks, other applications), making it difficult to manage and analyze data as a whole. | An integrated system that combines transaction, stock, and financial data in one platform. |

The following table includes the results of the design, development, and outputs that have been provided based on findings from interviews, observations, and questionnaires:

**Table 3.** Follow-up and Observation Results

| Aspects | Description | Output Provided |
|---|---|---|
| **Database Structure** | Sales Transaction Table: Transaction ID, date, product, quantity, price per unit, total price, customer. Purchase Table: Purchase ID, date, raw material, quantity, price, supplier. Stock Table: Raw material ID, material name, quantity available, minimum stock. | Output: The integrated system automatically updates transaction, purchase, and raw material stock data with high accuracy, and provides low stock notifications automatically. |

| | | |
|---|---|---|
| **User Interface Design (UI/UX)** | Dashboard: Summary of sales transactions, raw material stocks, and financial reports. Sales Transaction Page: Transaction input with automatic product, quantity, and price. Stock Management: Raw material stock monitoring with low stock alerts. Financial Reports: Automatic profit and loss and cash flow reports. | Output: Responsive, easy-to-use user interface that displays real-time graphs and reports to assist business owners in managing their business. |
| **Technology Used** | Frontend: HTML, CSS, JavaScript with React. Backend: Node.js and Express.js. Database: MySQL for data management. Web Hosting: Heroku for web-based system hosting. | Output: Web-based system that can be accessed easily through various devices (desktop or mobile), with good integration between frontend and backend. |
| **System Prototype** | The system prototype was tested with 5 culinary MSMEs in Cilegon. The system is used for sales transactions and raw material stock management automatically and in real-time. | Output: A prototype system that is tested by users to ensure functionality, ease of use, and accuracy in managing transactions and raw material stocks. |
| **Prototype Testing Results and User Feedback** | Speed and Efficiency: Speed up transactions and stock management, reduce manual recording time. Financial Report Accuracy: Accurate and reliable automated financial reports. User Feedback: Users were satisfied with the ease of use, but some suggested integration with online payment systems and export of reports to Excel. | Output: A more efficient system in managing transactions and financial reports, as well as an intuitive user interface. Users also provided suggestions for further development, such as online payment integration. |

The results of the system implementation show a significant improvement in the operational efficiency of culinary MSMEs. One of the most prominent positive impacts is the increase in transaction speed, where the system successfully reduces the time needed to record daily transactions. The process of recording sales and purchases is automated, thus reducing manual workload and the risk of data input errors. In addition, the system allows users to generate financial reports automatically, which not only saves time, but also improves accuracy in the preparation of profit and loss and cash flow statements.

In terms of stock management, the system is able to automatically update the amount of raw material stock every time a sales or purchase transaction occurs. This feature is also equipped with a warning notification when the amount of stock reaches the minimum limit, so that business owners can immediately re-procure and avoid stock vacancies that can disrupt production continuity.

Based on user feedback, most MSME owners find the system very helpful in streamlining their operational processes. They appreciated the ease of use and tangible benefits provided by the system in managing their daily business. However, there are some inputs from users who want further development, such as integration features with online payment systems and the ability to export reports into Excel format, for more flexibility in processing and sharing data with other parties.

The following is a table analyzing the results of validity, reliability, pilot testing, and descriptive statistics of interview and observation results:

**Table 4.** Validity, Reliability, Test-Test Analysis of Interview and Observation Results

| Type of Analysis | Purpose of Analysis | Findings | Conclusion |
|---|---|---|---|
| Validity Test | Measuring the extent to which the question items in the questionnaire are able to | All items have a correlation value > 0.3, declared valid | The instrument is valid for use in research |

| | | | |
|---|---|---|---|
| | measure the intended variables | | |
| Reliability Test | Assessing the internal consistency of items in the questionnaire (e.g. using Cronbach's Alpha) | Cronbach's Alpha = 0.871, high reliability | The questionnaire has good reliability |
| Pilot Test | Observing the extent to which the system is accepted and understood by respondents during the initial pilot test | Most respondents were able to use the system easily and provided positive feedback | The system is easy to use and in accordance with the initial expectations of users |
| Descriptive Statistics (Attitude) | Obtain an overview of user attitudes towards information technology in business operations | Average score of attitude towards technology use: 4.3 out of 5 (high) | Users have a positive attitude towards technology utilization |
| Descriptive Statistics (Expectations) | Identifying user expectations of the features and benefits of the designed information system | Average expectation score for system features: 4.6 out of 5 (very high) | Users have high expectations of the usefulness of information systems |

**Table 5.** Descriptive Statistics of Interview and Observation

| Additional Data Types | Description | Output |
|---|---|---|
| Usability Analysis / Ease of Use of the System | A survey or questionnaire of MSME users regarding the ease of use of the system (navigation, display, speed, and menu clarity). Use Likert scale or System Usability Scale (SUS). | Average ease of use score: 85/100 based on SUS, categorized as good. |
| Time and Efficiency Comparison Data | Comparison of the time required for recording transactions, reports, and stock management before and after using the system. | Transaction recording time reduced from 25 minutes to 8 minutes per day (efficiency increased by 68%). |
| Business Process Mapping | Workflow diagram of MSME operations before and after using the system to show increased efficiency or reduced work stages. | The diagram shows the reduction of 3 stages of manual processes, such as stock recording and daily report recap. |
| User Satisfaction Evaluation | Survey/questionnaire on the level of user satisfaction with the system (features, speed, reports, display convenience, accessibility). | A total of 85% of respondents expressed satisfaction or very satisfied with the information system implemented. |
| Brief Case Study of Each MSME (Mini Case) | Short narrative from each MSME using the system, covering initial challenges, system implementation process, and impact on operations. | “My financial report can now be completed in 1 click.” - Owner of Cilegon Satay Shop. |

**Fig 1.** Comparison of Transaction Recording Time

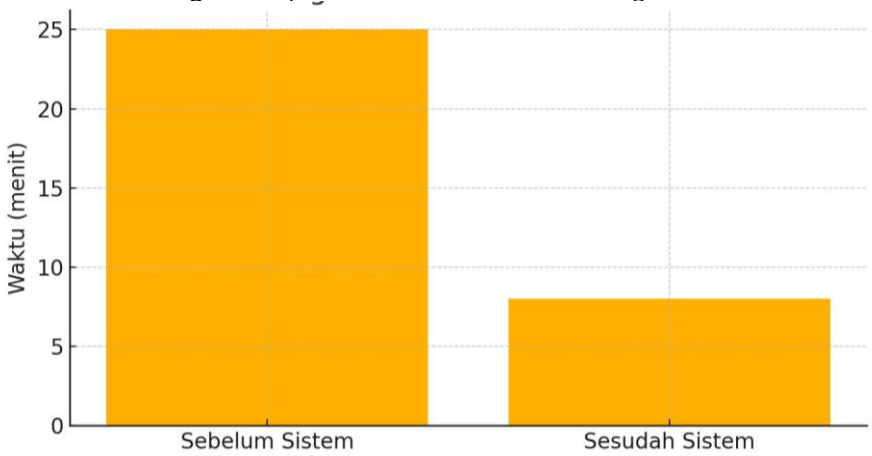
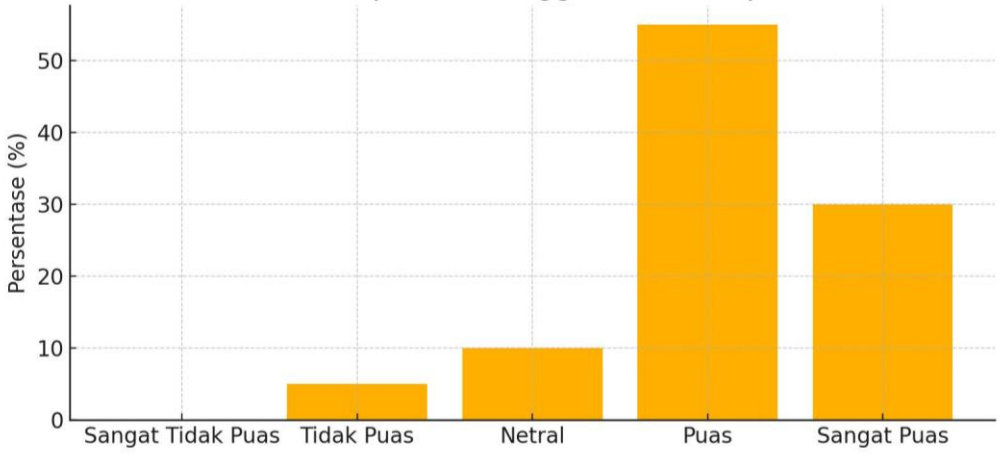



**Fig 2.** Distribution of User Satisfaction with the System




The results showed a significant increase in operational efficiency after the implementation of a web-based management information system. Based on the comparison chart of transaction recording time, the time required by MSME players to record transactions manually previously averaged 25 minutes per day. After using the system, the time decreased dramatically to only 8 minutes per day. This shows a time efficiency of 68%, which means that the system has successfully reduced the daily administrative burden and provided more time for business owners to focus on other productive activities.

In addition to time efficiency, this study also analyzed the level of user satisfaction with the developed system. The distribution graph shows that the majority of respondents, 55%, stated that they were satisfied and 30% stated that they were very satisfied with the system used. Only a small number of respondents were neutral (10%) and very few were dissatisfied. This indicates that the system developed has successfully answered the needs of MSME players in terms of speed, ease of use, and accuracy of results, especially in stock management, transaction recording, and financial reporting.

This finding reinforces that the user needs-based design approach taken in this study was appropriate. The high level of satisfaction and increased time efficiency are proof that the system is not only well received, but also has a direct impact on improving MSME business processes. In the future, this system can be further developed by adding additional features such as digital payment integration and cloud-based reports to expand its benefits to MSMEs outside the Cilegon area.

## DISCUSSION

### Operational Efficiency through Management Information System

The implementation of a web-based management information system has a real impact on the operational efficiency of culinary MSMEs in Cilegon. Business processes that were previously done manually and time-consuming can now be automated through the designed system. One example is recording transactions that previously took up to 25 minutes per day, now only takes about 8 minutes. This reflects a time saving of more than 60%. This finding is in line with the research results of Hasanah, Saputra, and Hiiyatin (2023) which show that ERP or web-based management information systems can automate business

processes, provide real-time data, and significantly improve efficiency in an MSME environment.

The benefits of this efficiency not only impact on uptime, but also on reducing administrative workload for both owners and employees. With a system that automatically processes transactions and reports, MSMEs can focus their human resources on more strategic activities, such as product development or customer service. Efficiency is also reflected in the integration of stock management. Previously, many MSME players experienced raw material shortages or overstock due to inaccurate manual records. With a web-based system, raw material stocks are monitored in real-time and the system will provide alerts when stocks are approaching the minimum limit. This minimizes the risk of losses due to inventory management errors, as evidenced by research by Angellin, Oetama, and Amri (2023) which shows that web-based inventory information systems can reduce recording errors and improve overall data accuracy.

The presence of this system also supports efficiency in financial reporting. MSME players who usually have difficulty preparing reports manually can easily generate profit and loss or cash flow reports with just a few clicks. The resulting reports are not only faster, but also more accurate and can be used as a basis for making business decisions. Fitria, Jatiningsih, and Putri (2024) in their study found that accounting information systems are very instrumental in supporting the sustainability of culinary MSME businesses because they can improve internal control, financial transparency, and time and cost efficiency.

Operational efficiency also has an indirect impact on business costs. For example, reduced transaction errors, paper savings, and less need to reprint reports. In the long run, this can increase business profitability, especially for MSMEs with limited profit margins. Aside from the technical aspects, this efficiency also impacts customer perception. With faster service, accurate order recording, and good stock management, customer satisfaction increases. This is important for MSMEs in maintaining customer loyalty and building business reputation.

Overall, the web-based management information system has proven to be an important tool in driving efficiency in the operational processes of culinary MSMEs. This system answers the fundamental needs of business actors who have been relying on traditional methods, and encourages real digital transformation on a micro scale.

**Technology Acceptance and User Satisfaction**

The implementation of a web-based management information system has a real impact on the operational efficiency of culinary MSMEs in Cilegon. Business processes that were previously done manually and time-consuming can now be automated through the designed system. One example is recording transactions that previously took up to 25 minutes per day, now only takes about 8 minutes. This reflects a time saving of more than 60% (Susanto, 2022).

The benefits of this efficiency not only impact on working time, but also on reducing the administrative workload for both owners and employees. With a system that automatically processes transactions and reports, MSMEs can focus their human resources on more strategic activities, such as product development or customer service (Yuniarti & Permana, 2023).

Efficiency is also reflected in the integration of stock management. Previously, many MSME players experienced raw material shortages or overstock due to inaccurate manual records. With a web-based system, raw material stocks are monitored in real-time and the system will provide a warning when the stock is approaching the minimum limit. This minimizes the risk of losses due to inventory mismanagement.

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**Impact of Digital Transformation on MSME Performance**

Digital transformation has become an urgent need for MSMEs, especially after the COVID-19 pandemic that accelerated technology adoption in various business sectors. This study shows that the implementation of a web-based management information system directly contributes to improving the performance of culinary MSMEs in Cilegon. This is reflected in increased operational efficiency, ease of

business management, and more accurate data-based decision-making.

Before the system, MSME players tended to make decisions based on intuition or habit. With a system that generates real-time financial reports and sales data, they can now analyze product performance, sales trends, and determine promotional strategies more purposefully. This shows that management information systems not only function as administrative tools, but also as strategic tools in business decision making (Dewi et al., 2023).

In addition to the managerial aspect, the system also affects the internal organizational structure. Many MSMEs that were previously only managed by the owner are now starting to delegate tasks to staff, as the system facilitates the division of labor based on certain access. This contributes to professionalizing business management and increasing internal digital capabilities (Azra & Farihah, 2024).

Digital transformation also expands market reach. Although these systems focus on internal management, users who are familiar with digital systems will be better equipped to integrate their systems with online sales platforms in the future. This is an important foundation towards a more thorough digitalization of MSMEs (Arrofi et al., 2023).

The impact of this transformation is also psychological. MSME owners feel more confident and proud of being able to run technology-based systems that they previously considered complicated. This sense of confidence is a motivation to continue developing their business, both in terms of technology and services.

However, the success of digital transformation is not free from challenges. Some users still require advanced training, especially in reading financial reports and understanding dashboards. Therefore, continuous mentoring and needs-based training are still needed to maintain the sustainability of the system.

Overall, this research proves that digitalization through management information systems can have a real impact on MSMEs, not only from an operational perspective, but also strategically and psychologically. The designed system has paved the way for culinary MSMEs to be better prepared for the digital era as a whole.

**Accuracy of System Design Based on User Needs**

The accuracy of the management information system design in this study lies in the application of the user-centered design (UCD) approach, which ensures that system development is based on the real needs of culinary MSME players in Cilegon. Through interviews, observations, and questionnaires, key user needs such as transaction recording, real-time stock management, and automated financial report generation were identified. These results became the basis for building a system that is simple, intuitive, and relevant to the local context (Sampurno et al., 2023).

In the development process, the system was designed modularly so that features such as transaction input, stock monitoring, and daily reports could be accessed flexibly without confusing users. The usage evaluation shows that the stock management feature and daily sales report are the most frequently used, indicating that the design has prioritized the core needs of MSMEs. This is also supported by an interface that is easily accessible from mobile devices, so that users can manage their business anytime and anywhere (Rosaldy et al., 2024; Wijaya et al., 2023).

User responses indicate that the system is very helpful in minimizing recording errors and improving operational efficiency. In addition, users feel more confident because they are able to operate the technology independently. This finding confirms that the success of the system comes not only from the technical side, but also from a deep understanding of the needs and characteristics of MSME users.

**Potential for System Replication and Scalability in Other MSMEs**

The successful implementation of a web-based management information system for culinary MSMEs in Cilegon opens up great opportunities for replication in other MSME sectors that have similar operational characteristics. Many MSMEs in Indonesia still face challenges in manual record-keeping, inaccurate reports, and sub-optimal stock management. The modular and flexible design of the system allows customization to the specific needs of various sectors, such as retail, fashion, or fast-food services. This customization can be done by changing product categories, transaction types, and report formats according to the characteristics of each business (Saputra & Rahardjo, 2023).

The scalability of the system is further strengthened by the use of web-based technology, which allows simultaneous access by multiple users from different geographical locations. This supports the adoption of the system by more MSME actors, thus accelerating the digitization process in Indonesia's informal sector. Research by Siregar and Sudarmanto (2024) shows that the adoption of digital technology by MSMEs can improve management efficiency, inventory control, decision-making, and customer relations, ultimately improving productivity and competitiveness.

To support replication and scalability, collaboration with MSME assistance agencies such as cooperative offices, business incubators, and universities is essential. They can play a role in introducing the system to MSMEs, providing training and technical support. In addition, continuous development with a user community-based approach can ensure the system remains relevant and secure. With the integration of

additional features such as digital payment systems, e-commerce, and business analytics, the system has the potential to develop into an ERP platform that is affordable and easy to use by MSMEs across Indonesia (Rachman & Rachmawati, 2024).

## CONCLUSION

This research shows that the design and development of a web-based management information system can significantly improve the efficiency and effectiveness of the operations of culinary MSMEs in Cilegon. The system built focuses on the main needs of business actors, such as stock management, transaction recording, and automatic financial reports. The trial results showed a reduction in administrative work time, increased data accuracy, and easy access to the system by users from various devices.

From the user perspective, the system received positive feedback, with a high level of satisfaction with its functionality and ease of use. MSME players stated that the system helps them understand their business financial condition in real-time and make more informed business decisions. The user needs-based design approach is a key factor in the successful adoption of this system in the field.

In addition to providing solutions to local problems, the system also has the potential for replication and scalability to other MSME sectors. With its modular and web-based design, the system can be easily customized for different types of micro enterprises in different regions. This research emphasizes the importance of a contextual, simple, and functional technology approach in driving the digital transformation of MSMEs in Indonesia.

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