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# DIGITALIZATION OF WOMEN'S ENTREPRENEURSHIP IN CIREBON CITY THROUGH POS APPLICATION INNOVATION IN SUPPORTING ASTA CITA

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*MSME Digitalization, Women Entrepreneurs, Point of Sale (POS), Goal Directed Design (GDD)*

**Abstrak**

*Digitalization is a strategic step in increasing the competitiveness and efficiency of Micro, Small, and Medium Enterprises (MSMEs), especially MSMEs managed by women in Cirebon City. There are still gaps in the use of digital technology, especially in the sales transaction recording and management system. This study aims to develop an Android-based Point of Sale (POS) application as a digitalization solution for women's MSMEs that also supports Asta Cita in realizing national economic independence. The study uses a software engineering approach with the Goal Directed Design (GDD) method, which emphasizes an in-depth understanding of user needs as the basis for system design. The research sample consisted of 30 women's MSMEs in Cirebon City who were selected purposively. Data collection techniques were carried out through observation, interviews, and direct application trials. The results of the study showed that the POS application developed was able to increase the efficiency of transaction recording, accelerate the sales process, and provide convenience in recapitulating daily financial reports. A significant finding from this study is that the GDD approach is effective in producing interface designs that are in accordance with the characteristics of female MSME users, thereby increasing practical technology adoption.*



## INTRODUCTION

Digital transformation is inevitable in global economic development, including in the Micro, Small, and Medium Enterprises (MSMEs) sector (Palos-Sanchez et al., 2025). In Indonesia, MSMEs contribute greatly to Gross Domestic Product (GDP) and

employment, reaching more than 97% of the total national workforce. Currently, the level of adoption of digital technology in MSMEs, especially in the regions, is still very minimal, especially in the aspects of financial recording and sales transactions (Matekaire & Siriram, 2025). In fact, the integration of information technology in MSME business processes is believed to be able to increase efficiency, accountability, and business competitiveness (Jyoti et al., 2025).

One group of MSME actors who face challenges in digitalization are women entrepreneurs . Based on BPS data (2024), more than 60% of MSMEs in Cirebon City are managed by women. The problem of limited digital literacy, access to technology, and application design that is not in accordance with their needs are obstacles in implementing technology (Nguyen et al., 2022). This condition creates a digital divide that has implications for low business growth and women's participation in the digital economy to the maximum (Ranta et al., 2021). Therefore, a special approach is needed that is not only technology-based, but also understands the characteristics of female users in MSMEs.

Previous studies have focused more on the development of information systems or POS (Point of Sale) applications in general, without considering specific user segmentation, such as female MSME actors (Azad-Honari et al., 2025). This shows that there is a research gap that needs to be bridged, namely how to design a POS application that suits the needs of female MSME actors so that digital solutions are truly effective (Peng & Tao, 2022). Therefore, choosing a user-centered design approach is very important in creating an inclusive and applicable system (Boopathy et al., 2025).

One relevant method to answer this problem is Goal Directed Design (GDD), a design approach that focuses on understanding user goals and behavior (Sadariawati & Nadeak, 2025). GDD not only prioritizes the technical functions of the application, but also pays attention to the psychological aspects and habits of users, so that the design results are more responsive and easy to use (Aliyah et al., 2024). This method is considered suitable in the context of women's MSMEs, because it considers the needs, limitations, and preferences of users in every stage of application design.

Based on this background, this study aims to design and build an Android-based Point of Sale (POS) application using the Goal Directed Design method to support the digitalization of women's MSMEs in Cirebon City (Joshi, 2025). This study is also oriented to support Asta Cita, especially on the point of developing national economic independence through empowering domestic strategic sectors. With a targeted approach, this application is expected to be a digital solution (Konopik et al., 2022) that can increase business efficiency, transparency of financial records, and digital literacy for women MSME actors (Chen et al., 2022).

This research is useful both theoretically and practically. Theoretically, this research enriches the literature review in the field of software engineering based on a user-oriented design approach, especially for the female MSME segment. Practically, the results of this study can be implemented directly by MSME actors as a transaction and financial management tool (Barroso & Laborda, 2022). In addition, the results of this study can also be a reference for local governments and economic empowerment institutions in formulating a gender-inclusive MSME digitalization strategy in the Cirebon City area.(Saari et al., 2025)

## LITERATURE REVIEW

### Digitalization of MSMEs

Digitalization of MSMEs is the process of transforming traditional business activities into digital forms to improve efficiency, market access, and competitiveness (Ante & Fiedler, 2025). In Indonesia, the adoption of digital technology among MSMEs is a national priority in order to accelerate inclusive and sustainable economic growth (Hanafizadeh & Kim, 2020). However, several studies have revealed that digital adoption of MSMEs still faces obstacles such as limited digital literacy, access to technology, and lack of support systems (Abu et al., 2025). In this context, digitalization is not only about the use of technological tools, but also includes strengthening the ability of business actors to use digital applications that suit their business needs (Dobrovnik et al., 2025).

### Women and MSMEs

Women play a significant role in the Micro, Small, and Medium Enterprises (MSMEs) sector. In Indonesia, more than 60% of MSMEs are run by women; however, many of them still lack adequate technological support (Shaikh et al., 2020). Women entrepreneurs face specific challenges in digitalization, including limited time due to dual roles, a lack of gender-sensitive technology training, and non-intuitive application designs. Therefore, applications developed for women-led MSMEs must take into account user characteristics and adopt an empathy-based approach in system design (Seppänen et al., 2025).

### Point of Sale (POS) System

The Point of Sale (POS) system is a crucial tool for supporting transaction efficiency and financial record-keeping (Nababan et al., 2025). A POS functions not only as a digital cashier but also as an information system that can assist MSMEs in inventory management, financial reporting, and sales analysis (Miah et al., 2025). Android-based POS usage has become a trend due to its flexibility and accessibility for MSME actors who rely on mobile devices (Wijaya et al., 2025). However, the optimal use of POS still depends on a user-friendly interface design that aligns with the specific needs of its users (Yang & Wijaya, 2025).

### Goal Directed Design (GDD)

Goal Directed Design (GDD) is a design approach that emphasizes an in-depth understanding of user goals before designing a system (Tomberg, 2023). In user-based technology research, GDD is considered effective in producing digital products that are not only functional but also intuitive for their users (Bidari et al., 2023). The use of GDD in the context of women's MSMEs allows researchers to build applications that consider the real needs, obstacles, and behavior of users in running their daily businesses (Sebastian et al., 2024). Thus, this approach is very appropriate for use in the development of an Android-based POS system aimed at women MSME actors (Ramadhan, 2020).

### Asta Cita and Economic Empowerment

Asta Cita is Indonesia's eight national development agendas, one of which is realizing economic independence through strengthening the domestic sector, including MSMEs

(Li et al., 2023). Women's economic empowerment through digital technology is part of an inclusive and sustainable development strategy. This research is in line with the Asta Cita agenda because it aims to encourage the digital transformation of women's MSMEs as pillars of the local economy, as well as strengthening the role of technology as a tool for empowerment (Saari et al., 2025).

## RESEARCH METHODOLOGY

### (a) Research Design

This study employs a software engineering approach using the Goal Directed Design (GDD) method, which emphasizes a deep understanding of user needs at every stage of system design. This method was selected due to its ability to produce relevant, intuitive, and user-friendly application designs, particularly for women-owned MSMEs who are the primary target users.

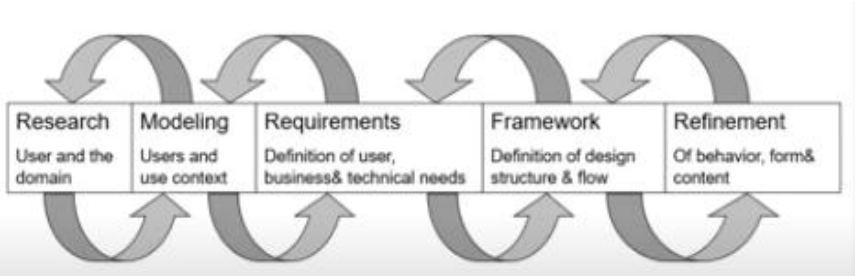


**Figure-1 Phases of the goal directed design method**

### (b) Research subjects and objects

The object of this research is the development of an Android-based Point of Sale (POS) application for women-owned MSMEs in Cirebon City. The research subjects are women entrepreneurs who were involved in the needs exploration process, functionality testing, and interface validation of the application. This study involved 30 women MSME actors as representative users for the design iteration and system testing process.

### (c) Operational definition and development variables

The POS application is defined as an Android-based transaction recording system with key features such as product management, sales recording, daily financial reporting, and inventory control. The development variables in this study include user needs, system functionality, and interface usability. All features were developed based on the findings from the user needs exploration and direct application testing.

### (d) Data collection techniques and instruments

Data collection was conducted through direct observation of MSME transaction activities and semi-structured interviews to explore system requirements and user preferences related to features and interface design. During the development process, prototyping sessions and usability testing were carried out with users to gather direct feedback. Field notes and visual documentation were used as supporting instruments in analyzing the design and implementation process.

**(e) Data analysis**

The data from observations and interviews were analyzed using qualitative descriptive analysis to identify users' primary needs and potential obstacles in application usage. Feedback from the prototyping process was used as the basis for interface design iteration and feature refinement. Final validation was conducted through direct application testing to assess whether the application aligned with the needs and workflows of women MSME entrepreneurs.

## RESULTS AND DISCUSSION

### (a) Results of using the Goal Directed Design Method

### a.1. Research

In this study, the first stage carried out is research, namely collecting data through direct interviews with business owners to determine the needs in making this application by asking 10 questions related to the application to be made. The questions asked include the function of the application, and the design to be made. Overall, from the results of the interview, it can be concluded that business owners need a Point of Sales application to increase the effectiveness and efficiency of their sales process. The application will be made with several features as desired by the business owner, namely transaction features, printing sales notes, tax and discount management needs, and sales report recaps based on a certain period.

### a.2. Modelling

**User Persona**

The first step in the modeling stage is to build a persona, which is a fictional but realistic representation of the user based on real data. This persona reflects the characteristics of female MSME actors in Cirebon City, including their business background, digital skills, the purpose of using the application, and the obstacles they face in the transaction process and financial recording. Personas help the development team stay focused on user needs throughout the application design process.


**Figure-2 User Persona**

**Identify User Goals**

After the persona is formed, the next step is to identify the main goals of the user, such as ease in recording transactions, speed of access to financial reports, and ease in monitoring stock. These goals serve as a guide in determining the features and interaction flow in the POS application to be developed.

**Workflow Analysis**

Modeling also includes workflow modeling based on the real activities of MSME actors. This stage aims to understand how users complete their main tasks, such as recording sales or checking stock. From here, logical and efficient interaction stages are determined, as well as critical points that require interface design solutions.

**Grouping Needs and Features**

The modeling results are used to group user needs into functional components of the application. For example, the need to record daily sales is associated with the "Transaction Input" feature, while the need to evaluate sales performance is associated with the "Automatic Daily Report" feature.

**Design Insight Documentation**

The final step in the modeling phase is to compile documentation in the form of design insight that becomes the basis for creating wireframes and prototypes. This insight contains design decisions that answer user needs, including selecting appropriate visual displays, menu sequences, and simple data input mechanisms.

**a.3. Requirements**

At this stage, application usage scenarios are created in the form of user flows and user needs are obtained based on the user personas that were created at the modeling stage.

**Table-1 User Needs**

| No. | User Needs |
|---|---|
| 1. | Can make menu purchase transactions in the application. |
| 2. | Can view sales report recaps in the application based on a specific time period. |
| 3. | Can manage tax costs and discounts. |
| 4. | Using an attractive and easy to understand design display. |

**a.4. Framework**

The framework stage in GDD aims to develop the conceptual structure and interaction architecture of the application, based on the results of the modeling that has been done previously (Subiyakto et al., 2020). This stage is very important because it determines how the features needed by users will be arranged and accessed in the system logically and efficiently.

The first step is to create an information architecture, which is how the content, features, and functions in the POS application are grouped and organized. In this study, the information architecture was designed so that users (female MSME actors) can

easily access the main functions, such as: product management, sales recording, daily reports.

### a.5. Refinement

The Refinement stage is the final phase in the Goal Directed Design (GDD) method that focuses on refining interface design and technical implementation, based on testing results and feedback from users in the previous stages (Prototyping and Framework). This phase aims to ensure that the design developed is truly relevant, usable, and in accordance with the needs and characteristics of the end user.

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## PROGRAM VIEW

### Android Application View (Cashier)

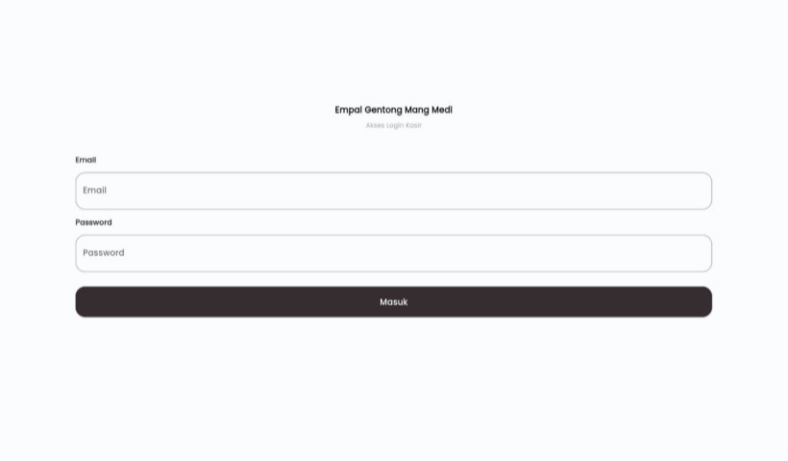


**Figure-3 Cashier Login**

On the Cashier login page, there is an email and password form that must be filled in, then if everything has been filled in, the Cashier can click the login button, if the data is correct, the Cashier will be directed to the home page.

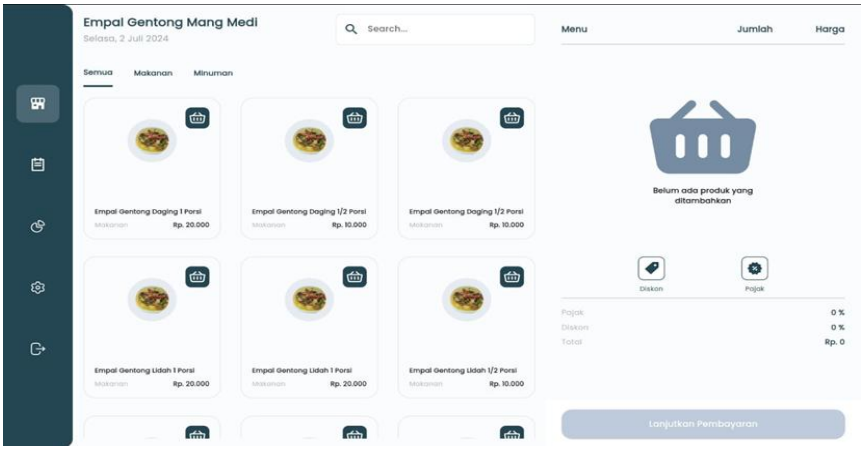


**Figure-4 Home Page 1**

On the first home page, the menus from the database stored in the local storage of the device used will be displayed, which displays the name, category, and price. Before the cashier selects a menu, the “Continue Payment” button will not be active.

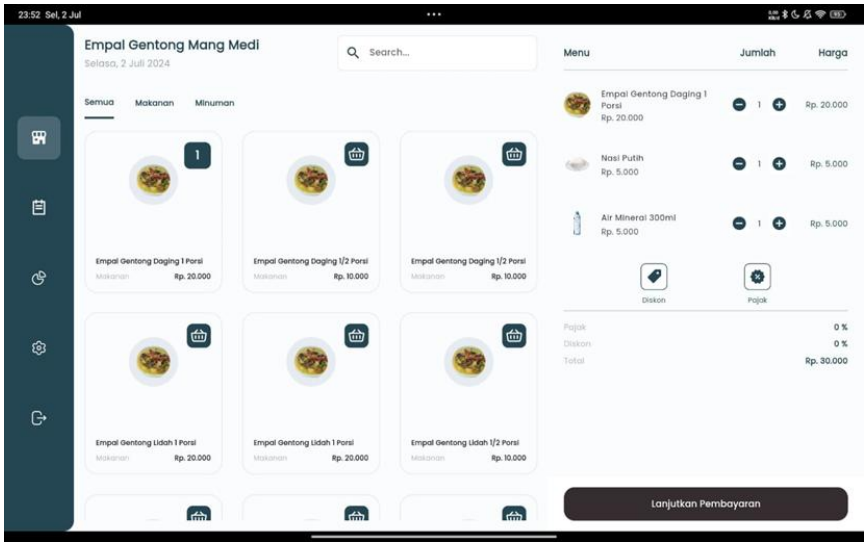


**Figure-4 Home Page 2**

On the second home page, if the menu is selected, the menu will be displayed on the right side of the application, displaying information on the selected amount, as well as the price based on the selected amount, and the “Continue Payment” button will also be active.

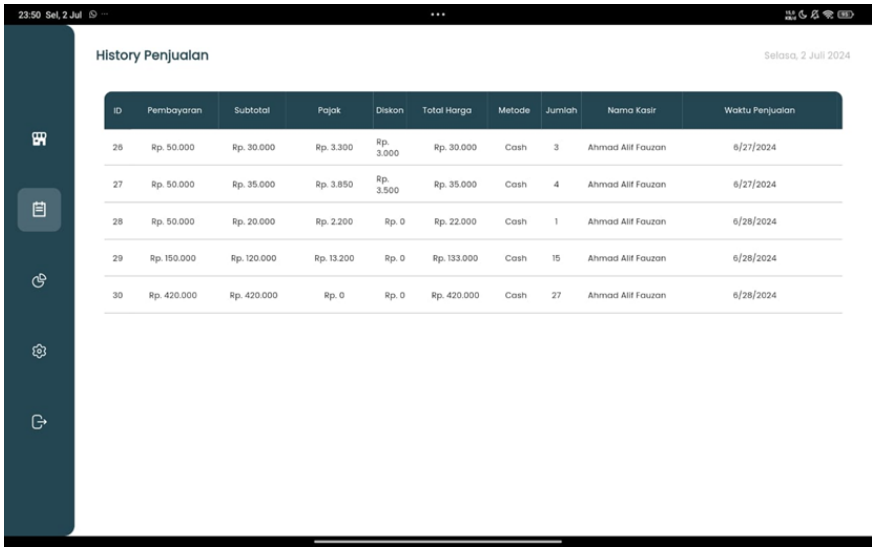


**Figure-5 Transaction History Page**

On the transaction history page, a list of sales or transactions that have occurred but have not been synchronized to the database is displayed. Sales history displays information such as id, payment, subtotal, tax, discount, total price, payment method, amount, cashier name, and sales time. The data displayed will later be deleted and moved to the database if the order sync process has been carried out.

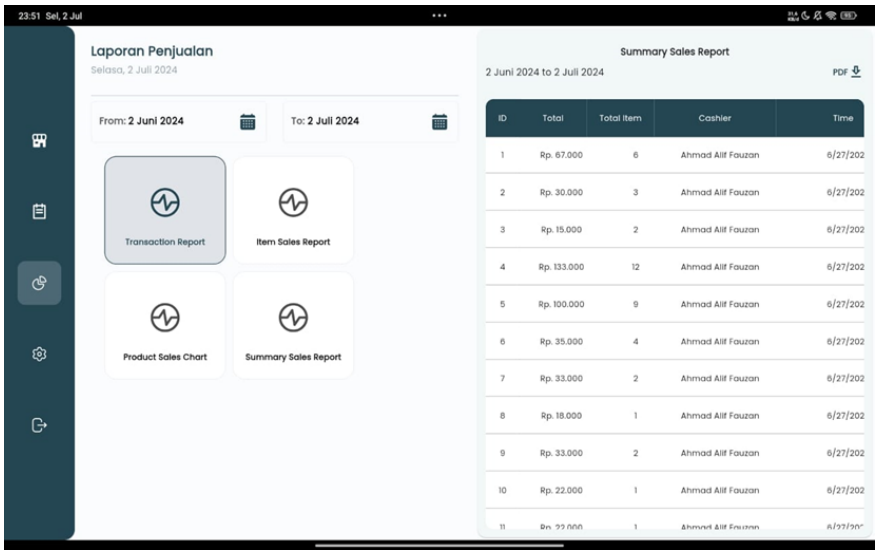


**Figure-6 Sales Report Page**

On the sales report page, there are 4 menus, namely transaction reports, sold menu reports, sold menu reports in diagram form, and sales summary. On this report page to view the report must select the period first, so that later the report will be displayed according to the selected period.

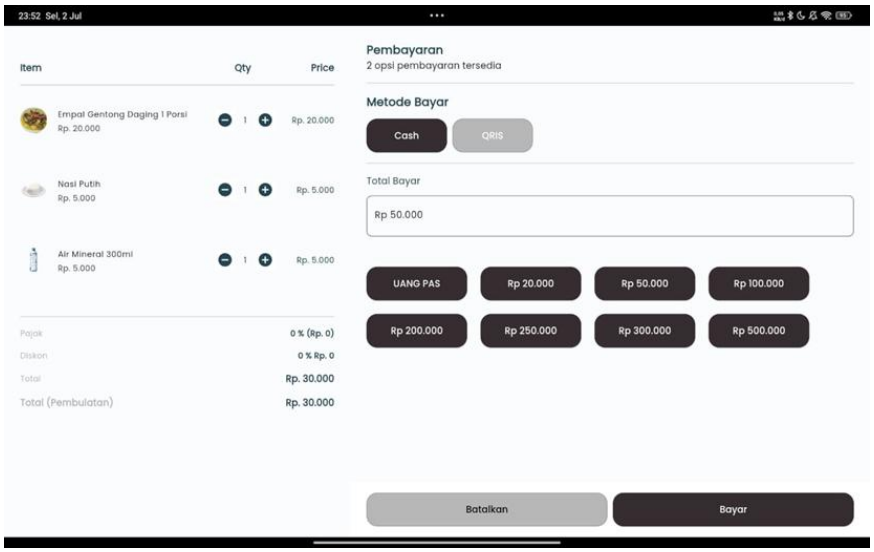


**Figure-7 Sales Report Page**

## CONCLUSION

This research successfully designed and developed an Android-based Point of Sale (POS) application tailored to the needs of women-owned MSMEs in Cirebon City. Using the Goal Directed Design (GDD) approach, the application was built based on a deep understanding of the users' goals, constraints, and characteristics. The testing results show that an intuitive, simple, and responsive application design can support daily transaction recording, inventory management, and sales reporting efficiently and in a user-friendly manner, even for non-technical users.

Practically, the application provides a digital solution that empowers women entrepreneurs by improving the efficiency of their daily financial management. Another implication is the importance of designing applications that not only focus on features but also emphasize user experience that is contextual and empathetic to the users' social realities, such as limited time and digital literacy. The use of the GDD approach has proven effective in producing a human-centered and inclusive technology product.

This study has several limitations. First, the number of participants involved in the design and testing phases was limited to five women MSME owners, so the generalizability of the results is still limited and needs to be tested on a broader scale. Second, the application's features are limited to basic transaction recording, inventory management, and sales reporting, without integration into digital payment systems or advanced accounting functions. Third, this research has not yet explored data security and privacy in depth.

Future studies are recommended to test the application's effectiveness on a larger and more diverse user base, considering various types of businesses, geographic locations, and levels of digital literacy. Furthermore, integrating the application with digital payment systems (such as QRIS or e-wallets) and adding simple bookkeeping features would support more complex business needs. Future researchers are also encouraged to explore other inclusive design approaches and examine data security aspects in compliance with user information protection standards.

## BIBLIOGRAPHY


Abu, N., da Silva, F. P., & Vieira, P. R. (2025). Government support for SMEs in the Fintech Era: Enhancing access to finance, survival, and performance. *Digital Business*, *5*(1), 100099. https://doi.org/10.1016/j.digbus.2024.100099

Aliyah, R. A. A., Indah, D. R., & Firdaus, M. A. (2024). Goal Directed Design Method on UI/UX Design Mobile-Based Application for Preventing Waste Dumping. *Ultima InfoSys: Jurnal Ilmu Sistem Informasi*, *15*(2), 113–121.

Ante, L., & Fiedler, I. (2025). The new digital economy: How decentralized finance (DeFi) and non-fungible tokens (NFTs) are transforming value creation, ownership models, and economic systems. *Digital Business*, *5*(1). https://doi.org/10.1016/j.digbus.2024.100094

Azad-Honari, N., Yadollahi-Farsi, J., & Arabiun, A. (2025). Women's Roles in Middle Eastern Family Businesses: Identity Construction Amid Structural Inequality. *European Journal of Family Business*, *15*(1), 121–134. https://doi.org/10.24310/ejfb.15.1.2025.21902

Barroso, M., & Laborda, J. (2022). Digital transformation and the emergence of the Fintech sector: Systematic literature review. *Digital Business*, *2*(2), 100028. https://doi.org/10.1016/j.digbus.2022.100028

Bidari, I. G. A. A. M., Buana, B., & Oetama, R. (2023). Refining Web-Based Job Search through Goal-Directed Design Improvement. *The Indonesian Journal of Computer Science*, *12*(4).

Boopathy, P., Deepa, N., Maddikunta, P. K. R., Victor, N., Gadekallu, T. R., Yenduri, G., Wang, W., Pham, Q. V., Huynh-The, T., & Liyanage, M. (2025). The Metaverse for Industry 5.0 in NextG Communications: Potential Applications and Future Challenges. *IEEE Open Journal of the Computer Society*, *6*(August 2024), 4–24. https://doi.org/10.1109/OJCS.2024.3497335

Chen, C., Zhang, L., Li, Y., Liao, T., Zhao, S., Zheng, Z., Huang, H., & Wu, J. (2022). When Digital Economy Meets Web3.0: Applications and Challenges. *IEEE Open Journal of the Computer Society*, *3*(November), 233–245. https://doi.org/10.1109/OJCS.2022.3217565

Dobrovnik, M., Herold, D. M., & Kummer, S. (2025). Exploring supply chain managers' complex perceptions of dynamic capabilities for digital transformation. *Digital Business*, *5*(1), 100098. https://doi.org/10.1016/j.digbus.2024.100098

Hanafizadeh, P., & Kim, S. (2020). Digital Business: A new forum for discussion and debate on digital business model and digital transformation. *Digital Business*, *1*(1), 1–2. https://doi.org/10.1016/j.digbus.2021.100006

Joshi, H. (2025). Emerging Technologies Driving Zero Trust Maturity Across Industries. *IEEE Open Journal of the Computer Society*, *6*(January), 25–36. https://doi.org/10.1109/OJCS.2024.3505056

Jyoti, J., Dash, G., Rani, A., Kour, S., & Nasser, L. K. (2025). Self-efficacy and women sustainable entrepreneurship in an emerging economy: Role of bricolage and attitude in the era of open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *11*(3), 100572. https://doi.org/10.1016/j.joitmc.2025.100572

Konopik, J., Jahn, C., Schuster, T., Hoßbach, N., & Pflaum, A. (2022). Mastering the digital transformation through organizational capabilities: A conceptual framework. *Digital Business*, *2*(2). https://doi.org/10.1016/j.digbus.2021.100019

Li, S., Gao, L., Han, C., Gupta, B., Alhalabi, W., & Almakdi, S. (2023). Exploring the effect of digital transformation on Firms' innovation performance. *Journal of Innovation and Knowledge*, *8*(1), 100317. https://doi.org/10.1016/j.jik.2023.100317

Matekaire, K., & Siriram, R. (2025). An overview of factors influencing the adoption of IoT payment systems in South Africa's small and medium-sized retail enterprises. *Journal of Open Innovation: Technology, Market, and Complexity*, *11*(3), 100566. https://doi.org/10.1016/j.joitmc.2025.100566

Miah, M. T., Aiupova, N., Erdei-Gally, S., & Fekete-Farkas, M. (2025). Digital entrepreneurship ecosystems: Then vs. now-a future perspectives. *Digital Business*, *5*(1). https://doi.org/10.1016/j.digbus.2025.100110

Nababan, A. A., Hasugian, P. M., Jannah, M., & Harefa, A. M. L. (2025). DIGITALISASI PROSES PENJUALAN MELALUI WEB BASED POINT OF SALE PADA WARUNG DEK GAM KUPHI. *Multidisiplin Pengabdian Kepada Masyarakat*, *4*(01), 6–10.

Nguyen, T. H., Le, X. C., & Vu, T. H. L. (2022). An Extended Technology-Organization-Environment (TOE) Framework for Online Retailing Utilization in Digital Transformation: Empirical Evidence from Vietnam. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(4), 200. https://doi.org/10.3390/joitmc8040200

Palos-Sanchez, P. R., Chang-Tam, R. J., & Folgado-Fernández, J. A. (2025). The role of Neobanks and FinTech in sustainable finance and technology. The customer/user perspective for entrepreneurs. *Sustainable Technology and Entrepreneurship*, *4*(3). https://doi.org/10.1016/j.stae.2025.100109

Peng, Y., & Tao, C. (2022). Can digital transformation promote enterprise performance? —From the perspective of public policy and innovation. *Journal of*

*Innovation and Knowledge*, *7*(3), 100198. https://doi.org/10.1016/j.jik.2022.100198

Ramadhan, M. G. (2020). Perancangan Sistem Informasi Pos (Point of Sales) Berbasis Web Dengan Menggunakan Framework Codeigniter Pada Pasar Swalayan. *Electrician: Jurnal Rekayasa Dan Teknologi Elektro*, *14*(3), 76–83.

Ranta, V., Aarikka-Stenroos, L., & Väisänen, J. M. (2021). Digital technologies catalyzing business model innovation for circular economy—Multiple case study. *Resources, Conservation and Recycling*, *164*(August 2020), 105155. https://doi.org/10.1016/j.resconrec.2020.105155

Saari, A., Sinclair, S., Leshinsky, R., & Junnila, S. (2025). Best practices for blockchain-driven digital transformation in cross-industry settings. *Digital Business*, *5*(2), 100127. https://doi.org/10.1016/j.digbus.2025.100127

Sadariawati, R., & Nadeak, E. (2025). Implementation of Goal Directed Design in Website Based Customer Savings Data Processing System. *8th FIRST 2024 International Conference on Global Innovations (FIRST-ESCSI 2024)*, 510–517.

Sebastian, D., Senapartha, I. K. D., & Riandito, G. (2024). Implementation of Goal-Directed Design in the Development of the Jogja Tourist Travel Planning Website Application. *Jurnal Edutran Computer Science & IT Education (ECSITE)*, *1*(2), 2986–7703.

Seppänen, S., Ukko, J., & Saunila, M. (2025). Understanding determinants of digital transformation and digitizing management functions in incumbent SMEs. *Digital Business*, *5*(1). https://doi.org/10.1016/j.digbus.2025.100106

Shaikh, A. A., Sharma, R., & Karjaluoto, H. (2020). Digital innovation & enterprise in the sharing economy: An action research agenda. *Digital Business*, *1*(1), 100002. https://doi.org/10.1016/j.digbus.2021.100002

Subiyakto, A., Adhiazni, V., Nurmiati, E., Hasanati, N., Sumarsono, S., & Irfan, M. (2020). Redesigning user interface based on user experience using goal-directed design method. *2020 8th International Conference on Cyber and IT Service Management (CITSM)*, 1–6.

Tomberg, V. (2023). Mapping Design Frameworks for Digital Behaviour Change Interventions to Goal-Directed Design. *2023 10th International Conference on Behavioural and Social Computing (BESC)*, 1–7.

Wijaya, K. M. C., Utama, I. W. N. A., Rukmiyati, N. M. S., Tuwi, I. W., & Susanti, C. (2025). ANALYSIS OF THE DESIGN OF A WEBSITE-BASED POINT OF SALES SYSTEM FOR HOTEL MANAGEMENT. *Jurnal Ekonomi Kreatif Dan Manajemen Bisnis Digital*, *3*(4), 684–696.

Yang, L. M., & Wijaya, I. S. (2025). Perancangan Aplikasi Point Of Sales (POS) Pada PT. Mutiara Primarasa Abadi Jambi. *Jurnal Informatika Dan Rekayasa Komputer (JAKAKOM)*, *5*(1), 1416–1425.