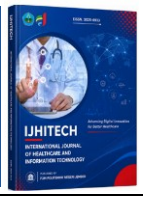
Content lists available at PublikasiPolije

International Journal of Healthcare and Information Technology

journal homepage : https://publikasi.polije.ac.id/index.php/ijhitech



Article

Web Portal Development for V-KES Teaching Factory at Politeknik Negeri Jember

Mudafiq Riyan Pratama[1], Gamasiano Alfiansyah[2], Demiawan Rachmatta Putro Mudiono[3*], Selvia Juwita Swari[4]

[1] Health Information Management, Politeknik Negeri Jember, Indonesia; mudafiq.riyan@polije.ac.id
[2] Health Information Management, Politeknik Negeri Jember, Indonesia; gamasiano.alfiansyah@polije.ac.id
[3] Health Information Management, Politeknik Negeri Jember, Indonesia; demiawanrpm@polije.ac.id
[4] Health Information Management, Politeknik Negeri Jember, Indonesia; selvia@polije.ac.id

* Correspondence: demiawanrpm@polije.ac.id

Abstract: V-Kes serves as a Teaching Factory (TeFa) for the Health Information Management Study Program within the Department of Health. Based on a preliminary study, it was found that V-Kes does not yet have a web portal specifically designed for early detection and integrated information services related to Diabetes Mellitus (DM). This study aims to develop a novel web-based portal that integrates early DM detection features with an educational and service information platform for the V-Kes TeFa, distinguishing it from existing general health web portals. The study focuses on the system outcomes and its impact on users rather than detailed development processes. The system was implemented as a web portal, with the frontend developed using React and Vite, and the backend utilizing Laravel. The study involved five V-Kes TeFa managers as informants for user identification and system evaluation. User satisfaction evaluation was conducted using qualitative methods supported by structured feedback indicators, including usability, information quality, and system responsiveness. Data were analyzed through data reduction, data presentation, and conclusion drawing. The study resulted in the development of a web-based portal at the V-Kes TeFa that enables early DM risk screening through user input data and provides real-time health information access. Evaluation results indicate that most users found the system easy to use, informative, and relevant to their needs, although specific issues were identified in system response time. However, improvements are still required in the timeliness dimension to provide faster response times according to user needs, as well as the addition of a user manual. Therefore, future development will focus on enhancing system access speed and incorporating a manual book.

Keywords: Teaching Factory, V-Kes, Web Portal

Citation: M. R. Pratama, G. Alfiansyah, D. R. P. Mudiono, and S. J. Swari, "Web Portal Development for V-KES Teaching Factory at Politeknik Negeri Jember", *ijhitech*, vol. 4, no. 1, pp. 35–45, Jul. 2026.

Received: 12-02-2026
Accepted: 05-04-2026
Published: 31-07-2026



Copyright: © 2026 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution-ShareAlike 4.0 International License (CC BY SA) license (http://creativecommons.org/licenses/by-sa/4.0/).

1. Introduction

Politeknik Negeri Jember (Polije), as a vocational higher education institution, has implemented various applied learning approaches to support industry-oriented competencies. One of the units supporting this effort is TeFa V-Kes (Health Innovation) under the Health Information Management Study Program, Department of Health, which functions as an innovation hub to support research and community service activities.

Despite its role, the main challenge faced by TeFa V-Kes is not the lack of innovation, but the absence of a digital system that can effectively manage, document, and disseminate its products and services. The innovative products developed by lecturers and students demonstrate strong potential for commercialization and educational use. However, based on interview results, this potential remains underutilized due to the absence of an integrated digital platform that enables systematic publication and wider accessibility of information [1], [2], [3], [4], [5], [6].

At present, TeFa V-Kes does not have a dedicated web portal functioning as an integrated medium for information sharing and promotion. As a result, research outputs and innovation activities have not been optimally documented or disseminated, and access for the public and industry partners remains limited. Previous studies on web

portal or system development in educational contexts have generally focused on institutional information services or e-learning platforms. However, limited studies specifically address the integration of early health detection features with promotional and commercialization functions within a single platform, particularly in the context of Teaching Factory-based innovation units. This indicates a clear research gap that distinguishes the present study from prior works [7], [8], [9], [10], [11].

In line with advances in information technology, web-based systems provide advantages such as accessibility, flexibility, and efficiency in information dissemination. However, unlike existing portals, this study emphasizes the development of a system that not only delivers information but also supports early detection services and promotes innovation products in an integrated manner [12], [13]. Therefore, the development of a web portal at TeFa V-Kes is expected to serve as an innovative strategy to strengthen academic visibility and support the utilization of research outputs.

The urgency of this research is supported by three main considerations: (1) TeFa V-Kes currently lacks a digital information system to promote and manage research products with commercialization potential; (2) there is a need for structured digital documentation to ensure sustainability and accessibility of innovation outputs; and (3) the development of an accessible information system aligns with national and institutional research priorities.

Based on this background, the present study aims to design and implement a web portal for TeFa V-Kes at Politeknik Negeri Jember. This study focuses on addressing the identified gap by developing an integrated platform that combines information dissemination, early detection services, and product promotion. The developed portal is intended to function as a strategic information medium that enhances the visibility and utilization of innovative products. The methodological explanation is streamlined to emphasize system outcomes and impact [14]. The system was developed using an iterative approach, and the findings of this research are expected to contribute to strengthening the independence of TeFa V-Kes, supporting product commercialization, and enhancing institutional visibility.

2. Materials and Methods

This study aimed to design and develop a web-based information system for Teaching Factory V-Kes The methodology focuses on system design and evaluation rather than detailed development procedures. The system was developed using an agile approach to accommodate iterative improvements based on user needs. The development process was simplified into four main stages:

A. Requirement Analysis and Design
   User needs were identified through interviews and literature review, followed by system and interface design.
B. System Development
   The web portal, including the dashboard and DM screening feature, was developed incrementally.
C. Testing
   System functionality was tested using the Blackbox Testing method to ensure all features operated properly.
D. User Evaluation and Refinement
   The system was evaluated by five users focusing on usability, information quality, and responsiveness. User satisfaction was measured using the System Usability Scale (SUS), a standardized instrument consisting of 10 items rated on a 5-point Likert scale. The SUS score was calculated to assess overall system usability, where higher scores indicate better user acceptance and usability performance. In addition, brief interviews were conducted to capture qualitative feedback and identify specific issues experienced by users, particularly related to system response time.

Improvements were made based on this feedback, resulting in the final system and supporting documentation. Detailed explanations of Scrum roles and sprint cycles were omitted to improve clarity and conciseness, with emphasis placed on evaluation outcomes.

3. Results

3.1. *Requirement Analysis and Design*

According to the TeFa V-Kes roadmap, the web portal includes several main features, namely Home, About, Services, Products, and DM Screening. This study focuses on the development of core features that support information dissemination, service management, and early DM detection.

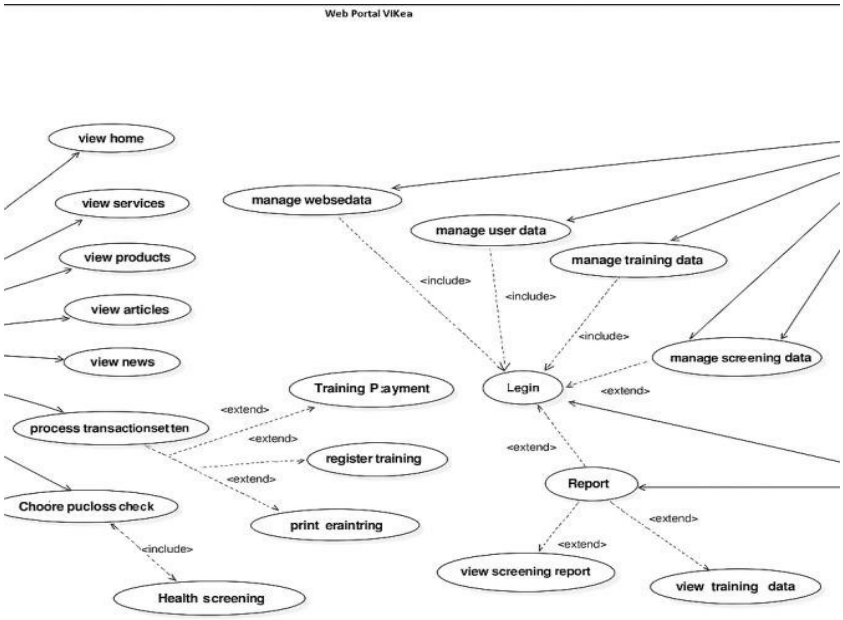


Figure 1. Use Case Diagram

To represent system functionality, a Use Case Diagram was developed to illustrate interactions between users and administrators. Users can access information, perform health screening, and utilize service features, while administrators manage system data and content. This modeling ensures that the system design aligns with user needs and supports integrated digital services.

3.2. *System Development and Tersting*

The Product Backlog represents a prioritized compilation of system feature requirements. In this study, each backlog item is defined with its corresponding description and priority level (High, Medium, or Low). The Product Backlog is shown in the table below.

Table 1. Product Backlog Items of the V-Kes Web Portal Development

No	Item Backlog	Description	Priorities
1	Home	Displays the header slideshow, health check button, articles, news, service slideshow, and product slideshow.	High
2	About	Displays the profile and team of TeFa V-Kes.	Low

No	Item Backlog	Description	Priorities
3	Services	Creates, reads, updates, and deletes data related to TeFa V-Kes service offering	High
4	Products	Creates, reads, updates, and deletes product data (SIPKes, Health Space, DetekStunting, GROWHT, SITI).	High
5	Articles	Creates, reads, updates, and deletes health articles.	Medium
6	News	Creates, reads, updates, and deletes news related to TeFa activities.	Medium
7	Contact	Creates, reads, updates, and deletes contact information.	Low
8	Health Check: Diabetes Mellitus	Provides an early screening feature for Diabetes Mellitus, including form submission, result calculation, and recommendation output.	High
9	Admin Login	Provides a login page with authentication (username and password), password hashing, and security validation.	High
10	Admin Dashboard	Provides an admin dashboard to access all modules (Services, Products, Articles, News, Contacts, and Screening).	Medium

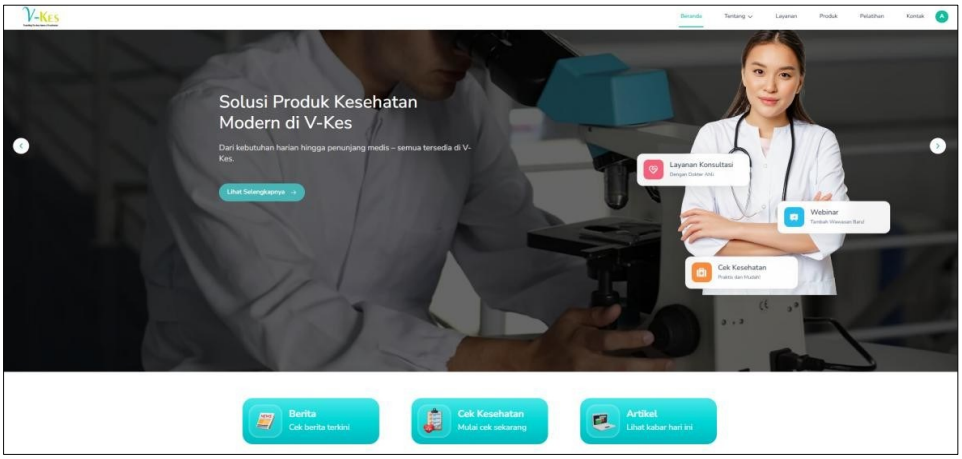


Figure 2. Homepage Interface

The home page serves as the main entry point of the system, providing access to core features through a structured navigation menu The interface shows effective usability, enabling users to access key services quickly and efficiently. System performance on this page is stable, with clear information display and consistent navigation across features. Key elements such as quick-access menus support seamless interaction without functional issues. Overall, the home page effectively supports user access and system navigation, indicating good performance as the primary interface.



Figure 3. About Page

The About page provides essential information regarding the system's background, objectives, and development context. The page effectively delivers clear and concise information, supporting user understanding of the system's purpose and value without usability issues. The Services and Products modules represent key functional components of the system and demonstrate stable and effective performance. These modules enable users to manage service and product data dynamically through integrated features. From a performance perspective, the system supports reliable data processing, including adding, updating, and deleting data, without functional errors. The interface design ensures consistent navigation and facilitates efficient user interaction. System testing confirms that all functionalities within these modules operate as expected, with stable performance and no critical issues identified.

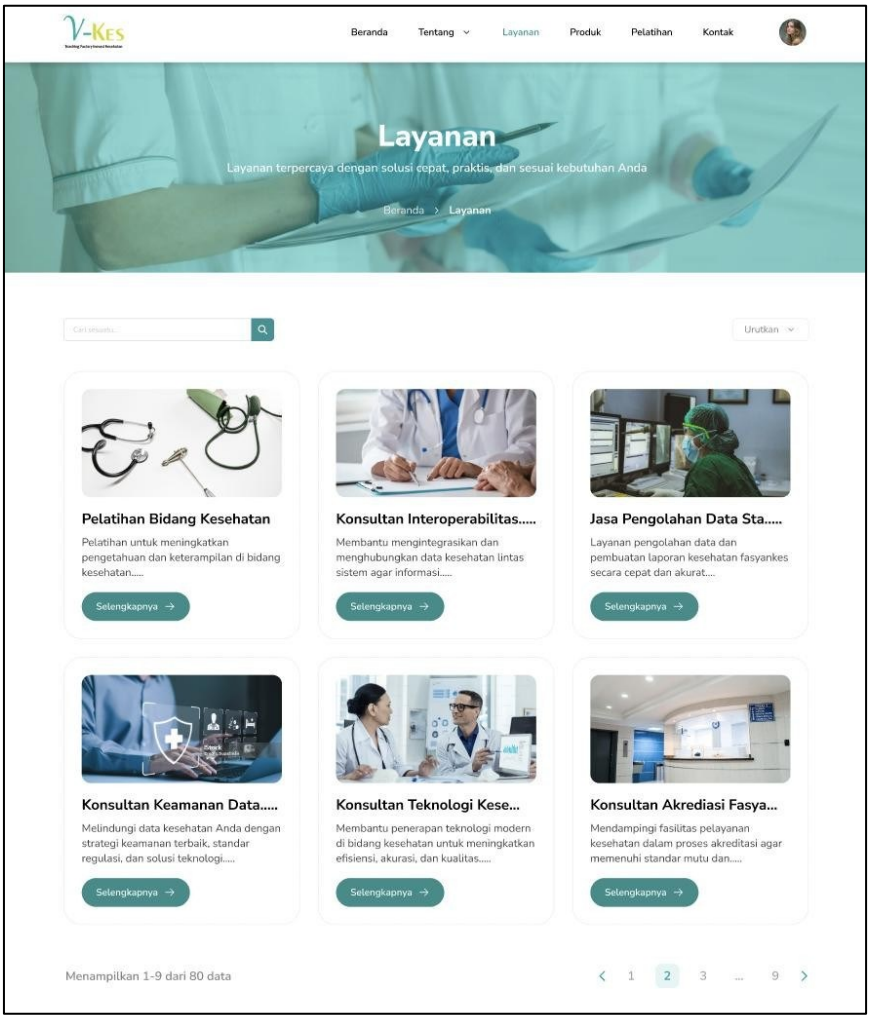


Figure 4. Services Page

The Services page provides access to all available services within the system. The module demonstrates effective performance by enabling users to manage service data (view, add, update, and delete) efficiently and without functional errors. Users reported that the service management feature is easy to use and supports their needs in accessing and organizing service information. The system also ensures consistent data handling and reliable operation across interactions. However, in line with overall evaluation findings, improvements in system response time are still required to enhance user experience.



Figure 5. Products Page

The Products page provides access to all product data within the system. The module demonstrates reliable performance by enabling efficient product data management without functional errors. Evaluation results indicate that users can access and manage product information effectively, reflecting good usability and system reliability. The system also maintains consistent interaction across modules, supporting a smooth user experience.Overall, the feature operates stably; however, improvements in system response time remain necessary, in line with overall system evaluation findings [15].

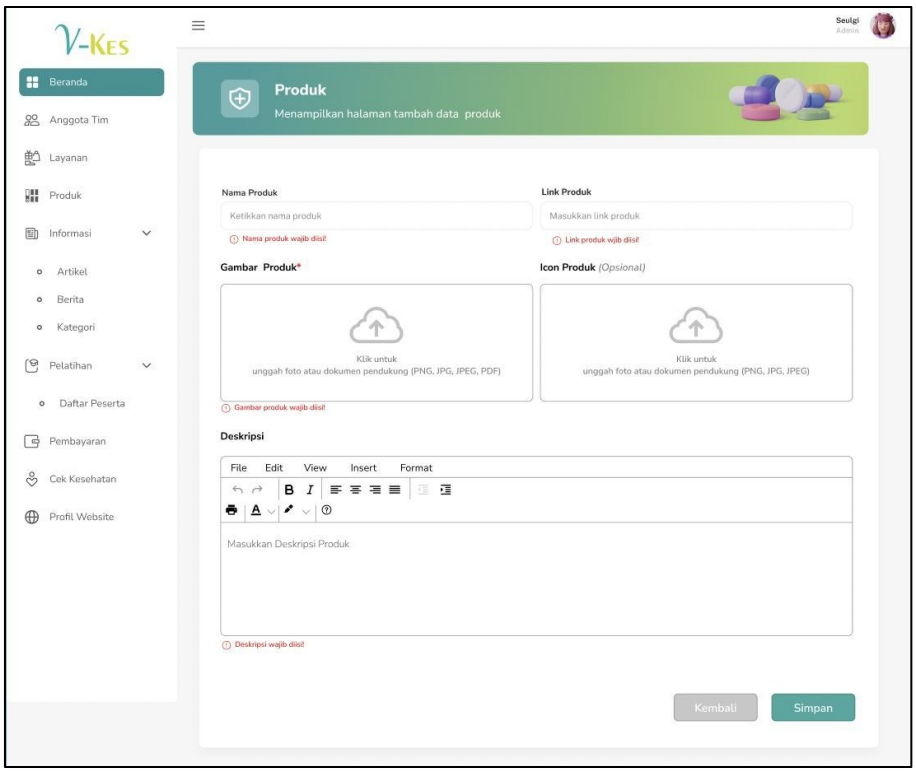


Figure 6. Add Product Page

The Add Product feature supports the addition of new product data within the system. The functionality operates reliably, allowing users to input and store product data efficiently without errors. Overall, the Services and Products modules demonstrate stable performance, enabling effective data management, including adding, updating, and deleting data. System testing confirms that these features operate consistently and meet functional requirements. The implementation of the system significantly improves accessibility of research products, which can now be accessed by the public, industry partners, and other stakeholders through a digital platform. This enhances the visibility and utilization of research outputs beyond internal documentation. The system also contributes to improved efficiency in information dissemination, reducing reliance on manual processes and supporting broader participation [16].

3.3. User Evaluation and Refinement

The system evaluation results are summarized in Table 3, highlighting usability performance, system reliability, and user satisfaction.

Table 2. System Evaluation Result

Evaluation Aspect	Indicator	Measurement Method	Result	Interpretation
Usability	Ease of use, navigation, interaction	System Usability Scale (SUS)	78 (average score)	Good usability (above average)
User Satisfaction	User perception	Questionnaire (5 users)	4/5 users satisfied	High user acceptance
Information Quality	Clarity, relevance of information	Questionnaire	4/5 users satisfied	Information is clear and relevant

System Responsiveness	Speed, response time	User feedback (interview)	3/5 users noted delay	Needs improvement
Functional Performance	Feature operation (CRUD, screening)	Blackbox testing	No critical errors	System functions reliably
Data Processing	Input, update, retrieval	System testing	Stable	Consistent performance

The implementation results demonstrate that the system supports information dissemination, data management efficiency, and digital health services through DM screening.Based on Table 3, the system achieved a SUS score of 78, indicating good usability, with 4 out of 5 users reporting positive experiences. System testing also shows reliable performance without critical errors, although responsiveness remains an area for improvement as noted by 3 out of 5 users. These findings indicate that the system improves accessibility, efficiency, and usability, and functions effectively as a platform for research dissemination and digital health services.

4. Discussion

The implementation of the V-Kes Teaching Factory web portal reflects a shift from conventional information systems toward integrated digital platforms that combine service delivery and knowledge dissemination. This transformation can be interpreted within the framework of digital innovation theory, where system integration enhances value creation by connecting multiple functionalities into a unified platform.

a) Agile Approach in System Adaptability

Rather than focusing on procedural aspects, the use of an agile approach in this study can be interpreted as enabling adaptive alignment between system features and evolving user needs. This aligns with prior studies that position agile methodologies as mechanisms for enhancing responsiveness and stakeholder-driven development. The implication is that system adaptability, rather than the methodology itself, becomes the primary contributor to successful implementation in dynamic service environments.

b) Usability and User-Centered Design Perspective

The observed usability of the system can be explained through user-centered design (UCD) theory, which emphasizes that simplicity, consistency, and clarity directly influence user satisfaction and system acceptance. Previous research consistently shows that interface consistency reduces cognitive load and improves task efficiency. In this context, the findings suggest that maintaining design uniformity across modules is critical in multi-functional systems to ensure usability and long-term adoption. This reinforces the principle that usability is not only a design outcome but also a determinant of system sustainability.

c) System Reliability and Trust Formation

The system's stable performance can be interpreted using information system success models, particularly the system quality dimension, which highlights reliability as a key factor influencing user trust and continued use. Prior studies indicate that functional reliability directly affects perceived system usefulness. Therefore, the implication of these findings is that ensuring consistent system performance is essential not only for technical success but also for building user confidence in digital health platforms. The integration of DM screening functionality further extends the system's role. This reflects a transition from passive information systems to interactive health technologies, consistent with the growing emphasis on preventive and patient-centered digital health services.

d) Digital Transformation and Knowledge Utilization

The improved accessibility of research outputs can be interpreted within the context of digital transformation theory, were digital platforms act as enablers of knowledge exchange and stakeholder engagement. Previous studies highlight that web-based systems enhance visibility and utilization of institutional outputs. The key implication is that integrating research dissemination with service platforms increases the practical relevance of academic outputs, effectively bridging the gap between academia and real-world application. Additionally, the reduction in manual processes reflects improved operational efficiency. This supports the notion that digitalization contributes to sustainability by minimizing resource use while maximizing information reach.

e) Implications for Scalable Digital Health Systems

The system architecture indicates potential for scalability and interoperability, which are critical components in modern health information systems. This aligns with existing literature emphasizing integration with electronic medical records and advanced analytics as future directions. The implication is that future development should prioritize interoperability and intelligent features (e.g., predictive analytics) to enhance system value and long-term impact. Expanding screening capabilities to other diseases would further position the system within a broader preventive healthcare ecosystem.

5. Conclusions

This study presents a web-based platform that integrates digital health services and research dissemination within the V-Kes Teaching Factory, demonstrating improved usability, system reliability, and accessibility. The integration of DM screening as an embedded feature highlights the system's novelty in transforming a conventional information portal into an interactive digital health platform that supports preventive care. Practically, the system offers a scalable solution for educational institutions to enhance research visibility, streamline service management, and support community-oriented digital health services. This indicates its potential to bridge the gap between academic outputs and real-world utilization. Future work should prioritize improving system responsiveness, enabling interoperability with electronic medical records, and incorporating advanced analytics to enhance decision support. Expanding the screening module to other non-communicable diseases may further strengthen its role within a broader digital health ecosystem

References

1. M. R. Demetres, D. Delgado, and D. N. Wright, "The Impact of Institutional Repositories: A Systematic Review," *J. Med. Libr. Assoc.*, vol. 108, no. 2, pp. 177–184, 2020, doi: 10.5195/jmla.2020.856.

2. E. Gori, A. Romolini, S. Fissi, and M. Contri, "Toward the Dissemination of Sustainability Issues through Social Media in the Higher Education Sector: Evidence from an Italian Case," *Sustain.*, vol. 12, no. 11, 2020, doi: 10.3390/su12114658.

3. S. Gul, N. T. Nisa, F. Gulzar, S. Bashir, A. Khan, and A. Bashir, "A Systematic Review of Open Access Institutional Repositories (OAIRs)," University of Nebraska-Lincoln, 2021.

4. N. I. Lazarenko *et al.*, "Institutional Repositories as a Global Dissemination Tool of Educational and Scientific Information,"
   a. *Encount. Theory Hist. Educ.*, vol. 23, pp. 241–258, 2022, doi: 10.24908/encounters.v23i0.15230.

5. M. A. Simard, G. Ghiasi, P. Mongeon, and V. Lariviere, "National Differences in Dissemination and Use of Open Access
   a. Literature," *PLoS One*, vol. 17, no. 8 August, pp. 1–14, 2022, doi: 10.1371/journal.pone.0272730.

6. R. Smart, "What Is an Institutional Repository to Do? Implementing Open Access Harvesting Workflows," *Publications*,

vol. 7, no. 2, 2019, doi: 10.3390/publications7020037.

7. K. Antonopoulou, C. Begkos, and Z. Zhu, "Staying Afloat Amidst Extreme Uncertainty: A Case Study of Digital Transformation in Higher Education," *Technol. Forecast. Soc. Change*, vol. 192, no. April 2022, p. 122603, 2023, doi: 10.1016/j.techfore.2023.122603.

8. S. Bohara, V. Bisht, P. Suri, D. Panwar, and J. Sharma, "Online Marketing and Brand Awareness for HEI: A Review and Bibliometric Analysis," *F1000Research*, vol. 12, pp. 1–21, 2024, doi: 10.12688/f1000research.127026.2.

9. Y. K. Dwivedi *et al.*, "Setting the Future of Digital and Social Media Marketing Research: Perspectives and Research Propositions," *Int. J. Inf. Manage.*, vol. 59, no. June 2020, p. 102168, 2021, doi: 10.1016/j.ijinfomgt.2020.102168.

10. S. M. C. Loureiro, R. G. Bilro, and F. J. de A. Angelino, "Virtual Reality and Gamification in Marketing Higher Education: A Review and Research Agenda," *Spanish J. Mark. - ESIC*, vol. 25, no. 2, pp. 179–216, 2021, doi: 10.1108/SJME-01-2020-0013.

11. S. K. Pawar, "Social Media in Higher Education Marketing: A Systematic Literature Review and Research Agenda," *Cogenta Bus. Manag.*, vol. 11, no. 1, pp. 1–25, 2024, doi: 10.1080/23311975.2024.2423059.

12. I. F. Aguillo, "Altmetrics of the Open Access Institutional Repositories: A Webometrics Approach," *Scientometrics*, vol. 123, no. 3, pp. 1181–1192, 2020, doi: 10.1007/s11192-020-03424-6.

13. M. S. Ramirez-Montoya, J. C. Weber, G. Cox, and G. C. Tenorio-Sepulveda, "Inclusive Digital Education on Open Platforms: A Case Study of the Complexity of the Future of Education," *Comput. Sch.*, pp. 1–18, 2024, doi: 10.1080/07380569.2024.2322164.

14. G. Torrente, T. Q. de Souza, L. Tonaki, A. P. Cardoso, L. Manickchand Junior, and G. O. da Silva, "Scrum Framework and Health Solutions: Management and Results," *Stud. Health Technol. Inform.*, vol. 284, no. December, pp. 290–294, Dec. 2021, doi: 10.3233/SHTI210725.

15. L. D. Putri, "Evaluasi User Interface Web Commerce Menggunakan Aturan Eight Golden Rules," *Indones. J. Appl. Informatics*, vol. 5, no. 2, pp. 94–100, Jan. 2021, doi: 10.20961/ijai.v5i2.41935.

16. S. Putri, A. Azizah, I. Hermawan, and D. Vivi, "Pengembangan Platform Digital Melalui E-Katalog dalam Rangka Diseminasi Informasi pada PT. Uola Pandawa Sejahtera di Yogyakarta," *J. Kridatama Sains dan Teknol.*, vol. 6, no. 1, pp. 335–349, 2024.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of Polije and/or the editor(s). Polije and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.