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THE IMPLEMENTATION OF AN INTEGRATED INFORMATION SYSTEM FOR VOCATIONAL EDUCATION AND TRAINING: A CASE STUDY OF INDONESIA

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ABSTRACT

The integration of an information system in vocational education and training (VET) is essential for improving workforce readiness and aligning education with labor market needs. This study explores the implementation of a nationwide vocational information system in Indonesia, based on Presidential Regulation No. 68 of 2022. Using a case study approach, the research examines policies, system development, and stakeholder involvement. The findings show that the system improves access to labor market data but faces challenges in integration, user adoption, and data compatibility. Key success factors include strong government support, industry collaboration, and the use of digital platforms for real-time job market insights. The study highlights the need for ongoing investment in digital infrastructure and collaboration between the government, education institutions, and industries. This research provides practical insights into the benefits and challenges of implementing an integrated vocational information system, with recommendations for improving its effectiveness.

***Keyword*:** Vocational Education, Information System, Workforce Development, Digital Transformation, Policy Implementation

INTRODUCTION

Vocational education and training (VET) play a crucial role in preparing a skilled workforce that meets the demands of an evolving labor market [1]. In many countries, including Indonesia, there is a growing emphasis on aligning vocational training with industry needs to improve employment outcomes [2]. This alignment is essential because it ensures that vocational graduates possess the skills required by industries, reducing the gap between education and employment. One key strategy to achieve this alignment is the implementation of an integrated Vocational Information System (VIS), which facilitates data-driven decision-making for education providers, policymakers, and industries [3]. By leveraging such systems, stakeholders can better anticipate labor market trends and adjust training programs, accordingly, ultimately enhancing workforce competitiveness.

Despite its importance, Indonesia has long struggled with mismatches between vocational education outcomes and labor market needs. Reports indicate that a significant percentage of vocational graduates remain unemployed or work in fields unrelated to their expertise due to limited access to real-time labor market data [4]. Inconsistent data collection practices and a lack of coordination between government agencies, industries, and vocational institutions have further exacerbated the problem. As a result, employers often report difficulties in finding adequately skilled workers, while vocational graduates struggle to find jobs that match their qualifications [5].

This situation highlights the urgent need for a centralized information system to address these gaps.

Recognizing the need for a more structured approach, the Indonesian government issued Presidential Regulation No. 68 of 2022 on the revitalization of VET [6]. This regulation highlights the importance of a centralized labor market information system to bridge the gap between vocational graduates and industry demands [7]. Beyond serving as a policy framework, this regulation reflects the government's commitment to addressing persistent employment challenges by improving the relevance of vocational training. Such a system is expected to provide real-time insights into workforce needs, track graduates' employment outcomes, and enhance collaboration between educational institutions and industries [8]. However, implementing an integrated information system for VET presents several challenges. These include not only technological infrastructure and stakeholder engagement but also the consistency of data collection practices and interoperability across multiple institutions [9,10]. Overcoming these obstacles requires a coordinated effort among policymakers, educators, and industry partners.

This study examines the development and implementation of Indonesia's Vocational Information System (VIS), assessing its effectiveness and identifying challenges in its adoption [11]. Understanding how such systems operate in real-world settings is essential to evaluate whether they effectively bridge the gap between vocational training and labor market needs. By analyzing policy frameworks, technological infrastructure, and stakeholder participation, this research provides insights into best practices for implementing digital solutions in vocational education [12,13]. In addition to identifying key success factors, this study also highlights areas where improvements are needed, such as data standardization and user engagement. The findings offer recommendations to improve the integration and long-term sustainability of the system, ensuring its effectiveness in addressing workforce demands [14–16].

METHODS

This study utilizes a qualitative case study approach to examine the implementation of an integrated information system for vocational education and training (VET) in Indonesia, as mandated by Presidential Regulation No. 68 of 2022 [17]. The research focuses on analyzing how the system has been developed, implemented, and sustained within the context of workforce development. To achieve this, the study employs document analysis, policy review, and system performance evaluation.

The case study begins with an examination of policy documents and government reports to understand the objectives and regulatory framework behind the system [18]. The study then explores technological infrastructure, including the digital platforms and databases used to support the information

system [19,20]. Key stakeholders, such as government agencies, vocational education institutions, and industries, are also analyzed to assess their roles in system implementation [21].

The primary method involves an in-depth analysis of official government documents, including Presidential Regulation No. 68 of 2022, ministerial guidelines, and national reports on vocational education. This approach provides insights into policy objectives, regulatory frameworks, and institutional responsibilities that underpin the implementation of the system. Additionally, technical documentation and system architecture reports are examined to understand how the system operates.

A structured policy review is conducted to evaluate the alignment between policy goals and actual implementation. This involves comparing the intended outcomes of the regulation with the progress reports and performance indicators provided by government agencies. The review identifies gaps and inconsistencies in policy execution that may hinder system effectiveness.

A literature review is conducted to compare Indonesia's approach with successful implementations of similar systems in other countries [22]. Recent studies on digital transformation in vocational education, workforce data management, and labor market information systems provide insights into best practices and common challenges [23–28]. This review helps to contextualize Indonesia's experience within a broader global framework.

The research aims to:

1. Identify barriers in system implementation, including technical and institutional challenges.
2. Provide recommendations for improving system adoption and long-term sustainability.

By integrating policy analysis, technological assessment, and stakeholder evaluation, this study provides a comprehensive framework for addressing challenges in implementing digital solutions for vocational education. The findings offer practical insights for policymakers, educators, and industry leaders in optimizing workforce development strategies [29,30]. This study provides a holistic view of the development, challenges, and potential improvements of the integrated information system for vocational education and training in Indonesia. The findings offer valuable insights for policymakers and stakeholders seeking to optimize similar systems in other contexts.

RESULT AND DISCUSSION

The findings of this study reveal several significant barriers in the implementation of Indonesia's Vocational Information System (VIS), encompassing both technical and institutional challenges. Technically, the system faces persistent issues with data interoperability, where inconsistent data formats and fragmented data collection practices across vocational institutions hinder the seamless integration of labor

market information. Despite efforts to centralize data, discrepancies remain in how institutions report graduate outcomes and labor market demands, leading to data inaccuracy and delayed reporting. Furthermore, infrastructure limitations, particularly in rural areas with inadequate internet connectivity, exacerbate accessibility issues, preventing many vocational institutions from fully utilizing the system.

Institutional challenges are equally prominent, with stakeholder coordination emerging as a critical barrier. The study found that limited collaboration between government agencies, educational institutions, and industry stakeholders slows down the decision-making process and reduces the system's overall effectiveness. Many stakeholders reported a lack of clarity regarding their roles and responsibilities, resulting in overlapping tasks and underutilized resources. Additionally, user resistance due to inadequate digital literacy among vocational educators and administrators further complicates system adoption. Without sufficient training and continuous support, many users struggle to engage with the platform, limiting its impact on workforce development.

To address these challenges, the study offers several recommendations aimed at improving system adoption and ensuring long-term sustainability. Strengthening data standardization is crucial to ensure consistent and reliable information across all vocational institutions. Implementing cloud-based solutions and leveraging automated data collection tools can enhance data accuracy and reduce manual reporting burdens. Additionally, fostering stronger partnerships with industry stakeholders can help align vocational training with market demands while encouraging greater participation from the private sector in providing real-time labor market data.

Capacity-building efforts are also essential to improve user engagement. The study emphasizes the need for comprehensive digital literacy programs targeting vocational educators and administrators, enabling them to navigate and utilize the system effectively. By integrating continuous training, feedback mechanisms, and technical support, user confidence in the system can be enhanced.

Overall, the results highlight that while the VIS has the potential to bridge the gap between vocational training and labor market needs, its success depends on resolving technical bottlenecks, improving stakeholder collaboration, and fostering user engagement. These findings offer valuable insights for policymakers and system developers seeking to optimize the use of integrated information systems in vocational education.

Solutions and Forward-Looking Insights

The implementation of Indonesia’s Vocational Information System (VIS) has shown progress in improving access to labor market data and facilitating better alignment between vocational education and industry needs. However, several key

challenges persist, including data integration issues, stakeholder coordination, and technological infrastructure limitations. Based on the case study, three major solutions have been identified to enhance system effectiveness:

1. Strengthening Data Interoperability and Standardization

To ensure accurate and seamless labor market insights, the VIS must adopt a standardized data framework that allows real-time integration across government agencies, vocational institutions, and industries. Implementing cloud-based platforms and AI-driven analytics can improve data consistency and predictive modeling for workforce demand.

2. Enhancing Stakeholder Engagement and Industry Collaboration

A successful VIS requires active participation from the private sector. Establishing a digital collaboration platform where industries can update job market trends, provide internships, and validate skills requirements will create a more dynamic and responsive vocational education system.

3. Developing a Digital Literacy and Training Program

Many vocational institutions and policymakers still face technical limitations in utilizing labor market information systems effectively. A nationwide digital upskilling initiative for educators, administrators, and students can enhance system adoption and maximize its potential in workforce planning.

Scientific Analysis of Implementation Challenges

The success of a Vocational Information System (VIS) is largely determined by its technological integration, policy consistency, and stakeholder collaboration. Several studies on digital transformation in vocational education highlight that a fragmented data ecosystem and weak inter-institutional coordination often hinder the full potential of such systems [31,32].

Indonesia's case study reflects similar issues, where multiple vocational training providers operate independently, leading to inconsistent data collection and reporting. Countries like Germany and Singapore have successfully implemented centralized labor market data systems by enforcing unified digital standards and encouraging private-sector co-ownership [33]. Applying similar models to Indonesia could improve data transparency and usability.

Moreover, technology adoption remains a challenge, especially in regions with limited internet infrastructure and low digital literacy. Previous research suggests that government incentives and digital skills training programs significantly improve the adoption rate of labor market information systems [34,35]. In Indonesia, investing in AI-driven career guidance and mobile-accessible platforms can enhance usability for students, teachers, and job seekers in both urban and rural areas.

The findings emphasize the need for sustained policy support, industry engagement, and technological advancement to maximize the impact of

the VIS. Future studies should explore the long-term effectiveness of the system and its direct influence on employment rates, skills matching, and economic growth.

CONCLUSION

The implementation of Indonesia's Vocational Information System (VIS), as mandated by Presidential Regulation No. 68 of 2022, represents a significant step toward enhancing the alignment between vocational education and labor market demands. This study has identified three key solutions to address major challenges in system integration: (1) strengthening data interoperability, (2) enhancing stakeholder engagement, and (3) developing digital literacy programs for vocational institutions and policymakers. These strategies are essential for improving the effectiveness and adoption of the VIS in supporting workforce development.

Despite its potential, challenges such as fragmented data management, limited industry participation, and uneven digital infrastructure remain barriers to full system implementation. Lessons from countries with successful labor market information systems, such as Germany and Singapore, suggest that a centralized, standardized, and industry-integrated approach is crucial for long-term success. Additionally, leveraging AI-driven analytics and mobile-accessible platforms can significantly improve user engagement, particularly in regions with limited technological resources.

The findings of this study have important policy and practical implications. Strengthening cross-sector collaboration between government agencies, industries, and vocational institutions will be critical for ensuring the system's sustainability and effectiveness. Future research should explore the long-term impact of VIS on employment outcomes, skills matching, and economic growth, while also considering the integration of emerging technologies to further optimize vocational education and training in Indonesia.

REFERENCES

[1] Yoana, Auwalin I, Rumayya. The role of vocational education on unemployment in Indonesia. Cogent Education 2024;11. https://doi.org/10.1080/2331186X.2024.2340858.

[2] Abdel Hamid M.S. Esmail, Zahid M. Khan. Alignment of vocational education curricula with job requirements in industrial sector: Analysis study. World Journal of Advanced Research and Reviews 2024;21:2303–13. https://doi.org/10.30574/wjarr.2024.21.3.1002.

[3] Mahmudah FN, Santosa B. Vocational School Alignment Based-on Industry Needs. Journal of Vocational Education Studies 2021;4:36. https://doi.org/10.12928/joves.v4i1.3611.

[4] Khoiruddin MA, Setyanti AM, Suman A, Prasetyia F, Susilo S. Exploring Determinants of Education-Job Mismatch Among Educated Workers in Indonesia. Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan 2024:263–81. https://doi.org/10.23917/jep.v25i2.23994.

[5] Wicaksono P, Theresia I, Al Aufa B. Education–occupation mismatch and its wage penalties: Evidence from Indonesia. Cogent Business & Management 2023;10. https://doi.org/10.1080/23311975.2023.2251206.
[6] Susilowati WMH. APPLICATION OF FAST-TRACK LEGISLATION METHOD IN PRESIDENTIAL SYSTEM OF GOVERNMENT IN INDONESIA. Cepalo 2024;8:49–68. https://doi.org/10.25041/cepalo.v8no1.3346.
[7] Darmawan L, Jamil R, Rees CJ. Human resource management and corporate social responsibility: a case study of a vocational and education training (VET) programme in Indonesia. Industrial and Commercial Training 2023;55:457–69. https://doi.org/10.1108/ICT-11-2022-0080.
[8] Employment and Skills Strategies in Indonesia. OECD; 2020. https://doi.org/10.1787/dc9f0c7c-en.
[9] Ghosh L, Ravichandran R. Emerging Technologies in Vocational Education and Training. Journal of Digital Learning and Education 2024;4:41–9. https://doi.org/10.52562/jdle.v4i1.975.
[10] Jiang R, Chen Y, Peng Y, Xie S, Qu D. Opportunities and Challenges of AI in Vocational Education. International Journal of Learning and Teaching 2024:590–6. https://doi.org/10.18178/ijlt.10.5.590-596.
[11] Bagaskara RS, Nurochim HFGI, Susilowati HPD, Agustin NN. Exploring Vocational Interest Measurement Instruments in Indonesia: Insights from a Scoping Review. Jurnal Psikologi 2024;51:272. https://doi.org/10.22146/jpsi.101309.
[12] Xu J, Jiang T, Wei M, Qing Z. The digital transformation of vocational education: Experience and reflections of Shenzhen Polytechnic University. Vocation, Technology & Education 2024;1. https://doi.org/10.54844/vte.2024.0522.
[13] Lu Y, Dong G, Ba Z, Lin X. Practice of Digital Transformation in Vocational College, 2024, p. 149–56. https://doi.org/10.2991/978-94-6463-574-4_17.
[14] Weijzen SMG, Onck C, Wals AE, Tassone VC, Kuijer-Siebelink W. Vocational education for a sustainable future: Unveiling the collaborative learning narratives to make space for learning. Journal of Vocational Education & Training 2024;76:331–53. https://doi.org/10.1080/13636820.2023.2270468.
[15] Claver-Cortés E, Marco-Lajara B, Seva-Larrosa P, Ruiz-Fernández L, Sánchez-García E. Explanatory Factors of Entrepreneurship in Food and Beverage Clusters in Spain. Sustainability 2020;12:5625. https://doi.org/10.3390/su12145625.
[16] Ramadhan NG, Purnomo, Widiyanti, Suhartadi S, Purnawirawan O. Model of Education System in Indonesia Vocational High Schools Based on the Aspects School Cooperation with Industry Through Work-Based Learning to Improve Sustainable Development Goals (SDGs). Journal of Lifestyle and SDGs Review 2025;5:e05013. https://doi.org/10.47172/2965-730X.SDGsReview.v5.n03.pe05013.

[17] Nugroho FW, Rr Chusnu Syarifa Diah kusuma, Wahyu Rusdiyanto. SINERGI: Human Resource Management Learning Innovation Using Website-Based Instructional Media. Scientific Journal of Informatics 2025;11:1073–84. https://doi.org/10.15294/sji.v11i4.15426.
[18] Yasdin Y, Muksins M. Political paradigms and vocational education policy in Indonesia: a document analysis. Quality Education for All 2024;1:204–21. https://doi.org/10.1108/QEA-10-2023-0007.
[19] Gayatri G, Jaya IGNM, Rumata VM. The Indonesian Digital Workforce Gaps in 2021–2025. Sustainability 2022;15:754. https://doi.org/10.3390/su15010754.
[20] Claver-Cortés E, Marco-Lajara B, Seva-Larrosa P, Ruiz-Fernández L, Sánchez-García E. Explanatory Factors of Entrepreneurship in Food and Beverage Clusters in Spain. Sustainability 2020;12:5625. https://doi.org/10.3390/su12145625.
[21] Misbah Z, Gulikers J, Dharma S, Mulder M. Evaluating competence-based vocational education in Indonesia. Journal of Vocational Education & Training 2020;72:488–515. https://doi.org/10.1080/13636820.2019.1635634.
[22] Wahjono HGB, Kristianto VA. The Comparison of the Partnership Model Between Vocational Education Institutions and Industrial Sectors in North American and Indonesian Universities. Proceedings of the 4th Vocational Education International Conference (VEIC 2022), Paris: Atlantis Press SARL; 2023, p. 198–210. https://doi.org/10.2991/978-2-494069-47-3_25.
[23] Xu J, Jiang T, Wei M, Qing Z. The digital transformation of vocational education: Experience and reflections of Shenzhen Polytechnic University. Vocation, Technology & Education 2024;1. https://doi.org/10.54844/vte.2024.0522.
[24] Anwar C, Sofyan H, Ratnaningsih N. Digital technology practices for vocational teachers in the industrial revolution 4.0: Mediating technology self-efficacy. Journal of Pedagogical Research 2024. https://doi.org/10.33902/JPR.202424585.
[25] Gunawan BT, Nuraeni Y. Development of labor market information system in Indonesia towards world class. Informasi 2023;53:1–14. https://doi.org/10.21831/informasi.v53i1.47615.
[26] Kulynych O. Digital transformation of vocational educational organizations of Ukraine: European vector. ScienceRise: Pedagogical Education 2021:12–7. https://doi.org/10.15587/2519-4984.2021.238001.
[27] Zhu Y, Zuo H, Chen Y. Digital Transformation in Vocational Education: Challenges, Strategies, and an Experimental Proposal, 2024, p. 643–50. https://doi.org/10.2991/978-94-6463-242-2_79.
[28] Heliana, Wahyuni H. BIG DATA ANALYSIS IN HUMAN RESOURCES DECISION MAKING: OPTIMIZING WORKFORCE MANAGEMENT. JRMSI - Jurnal Riset Manajemen Sains Indonesia 2024;15:58–69.

https://doi.org/10.21009/JRMSI.015.1.06.

[29] Karakhan AA, Nnaji CA, Gambatese JA, Simmons DR. Best Practice Strategies for Workforce Development and Sustainability in Construction. Practice Periodical on Structural Design and Construction 2023;28. https://doi.org/10.1061/(ASCE)SC.1943-5576.0000746.

[30] Leake R, De Guzman A, Golieb K, Rienks S. Workforce development strategies: a model for preparing the workforce to support transformational systems in child welfare. J Public Child Welf 2020;14:19–37. https://doi.org/10.1080/15548732.2019.1674233.

[31] Habibi A, Sofyan S, Mukminin A. Factors affecting digital technology access in vocational education. Sci Rep 2023;13:5682. https://doi.org/10.1038/s41598-023-32755-6.

[32] Ali W, Rahman A, Karsidi R. Sustainable Skill Development in Pakistan: Bridging Gaps in Vocational and Technical Education Policy – A Systematic Literature Review. Society 2024;12:656–73. https://doi.org/10.33019/society.v12i2.734.

[33] Wibowo RA, Myau-Lyau N, Christy NNA, - A. The Challenges for Indonesia to Integrate Dual Vocational Education and Training System. Journal of Technical Education and Training 2022;14. https://doi.org/10.30880/jtet.2022.14.02.008.

[34] Neto ASM. Essays on technology adoption and the labor market. maastricht university, 2024. https://doi.org/10.26481/dis.20240318an.

[35] Khoerulloh AbdK, Aziz HA. Labor Market Transformation: Implications of Technological Change in Society 5.0. Jurnal Ilmu Ekonomi Terapan 2024;9:26–36. https://doi.org/10.20473/jiet.v9i1.53513.