E-ISSN : 3048-3646
Vol. 2 No. 1, April 2025

EFFORTS TO STRENGTHEN DIGITAL TALENT TO IMPROVE THE QUALITY OF HUMAN RESOURCES TOWARDS A GOLDEN INDONESIA 2045

[1]Marinco Oktoviano
Institut Bisnis and Multimedia asmi Jakarta

[2]K.P. Suharyono S. Hadiningrat
Vice Chancellor of Research, Community Services and Cooperation in Institut Bisnis and Multimedia asmi Jakarta Jakarta

Author's correspondence: mari023@komdigi.go.id[1], haryshadiningrat@gmail.com[2]

Abstract. *This article discusses efforts to strengthen digital talent in Indonesia as a strategic step towards the vision of a Golden Indonesia 2045. The background of the problem includes the challenges faced by Indonesia in utilizing the demographic bonus, where the competence of human resources (HR) must be relevant to the needs of the industry in the era of technological disruption. The purpose of this research is to analyze the policies and initiatives that have been carried out by the government as well as the role of the private sector in the development of digital talent. The discussion included various initiatives such as the Digital Talent Scholarship (DTS) program and the Merdeka Campus policy which aims to improve technical and non-technical skills. The results show that despite progress, there is still a competency gap between higher education graduates and industrial needs, as well as infrastructure challenges that hinder access to technology in disadvantaged areas. The conclusion of this article emphasizes the importance of collaboration between the government, the private sector, and academia in creating an ecosystem that supports the development of digital talent. An integrated policy is needed that harmonizes training and education programs to ensure that Indonesian human resources are ready to compete in the global arena. With this holistic approach, Indonesia can make the most of its digital potential and achieve sustainable development goals towards 2045*

Keywords: *Digital Talent, Human Resources, Indonesia Gold 2045*

BACKGROUND

The Golden Indonesia Vision 2045 is a great goal of the Indonesian nation in preparing a superior, independent, and globally competitive generation (Puspa et al.,

Received 20 April 2025; Revised 25 April 2025; Accepted 29 April 2025
* Marinco Oktoviano, mari023@komdigi.go.id

2023). In that year, Indonesia is projected to reach the peak of the demographic bonus, where the majority of the population is in productive age. However, this opportunity can only be used optimally if human resources (HR) have competencies that are relevant to the needs of the times, especially in the era of technological disruption. One of the keys to achieving this vision lies in the nation's ability to build digital talent—a collection of skills and expertise in the digital field that is the foundation of a knowledge-based economy.

Digital transformation has changed the global economic landscape, where technologies such as artificial intelligence (AI), big data, Internet of Things (IoT), and cloud computing are the main drivers of industries and other fields (Oktareza et al., 2024). For Indonesia, the use of digital technology is not only about modernization, but also a strategy to increase the nation's competitiveness in the international arena. Countries such as Singapore, South Korea, and Estonia have proven that investing in digital talent can drive inclusive and sustainable economic growth. Indonesia must also move quickly so as not to be left behind in increasingly fierce global competition.

However, efforts to build resilient digital human resources face various structural challenges. One of them is the digital competency gap between higher education graduates and industry needs. Many college or vocational school graduates are still underskilled in crucial areas such as programming, data analysis, or cybersecurity. On the other hand, the industry needs talents who not only master technical, but also have critical thinking, creativity, and adaptability skills in dealing with dynamic technological changes (Edwin, 2024).

In addition, the gap in access and infrastructure is also a major obstacle. Although Indonesia is one of the countries with the largest internet users in the world, internet connectivity and speed are still uneven, especially in the 3T (Frontier, Outermost, Disadvantaged) areas. This inequality has resulted in many people in remote areas not being able to optimize their digital potential. In fact, in the era of the digital economy, every individual should have the same opportunity to develop themselves through online learning platforms or remote work opportunities (Hadiningrat et al., 2024).

Another factor that is no less important is the low digital literacy among the general public. Many still use technology only for social media consumption or entertainment, without understanding the opportunities of the digital economy such as e-commerce, freelance working, or creative content creation. The lack of understanding of cybersecurity also makes many people vulnerable to online fraud, hoaxes, or malware attacks. This shows that strengthening digital talent is not only about technical training, but also increasing awareness and digital culture.

The Indonesian government has actually carried out various strategic initiatives, such as the Digital Talent Scholarship (DTS) program by the Ministry of Communication and Digital of the Republic of Indonesia (Komdigi), which provides free training in the field of digital technology (Nuriyyah, 2025). In addition, the Independent Campus policy also encourages students to develop skills outside the conventional curriculum, including through internships at technology companies. However, these programs need to be expanded to include more people, including workers who want to reskill or upskill.

The role of the private sector and startups is also crucial in the development of digital talent. Companies such as GoTo, Bukalapak, or Traveloka not only create jobs, but also contribute to the training of digital talents through coding academy programs, data science bootcamps, or startup incubations. Collaboration between industry, academia, and the government (triple helix) is key to creating an ecosystem that supports the growth of digital human resources (Ghalib et al., 2024).

However, the biggest challenge is maintaining the relevance of the educational curriculum to the very rapid development of technology. Many educational institutions still teach outdated material, while the industry needs new skills such as blockchain, AI ethics, or cloud computing. Therefore, there is a need to reform the education system that is more flexible, project-based, and directly connected to market needs.

At the global level, Indonesia also has to compete with countries that have invested in the development of digital talent, such as India with its millions of IT graduates or Vietnam which is a technology manufacturing center. If Indonesia does not

improve immediately, then the potential for brain drain—where the best talents flock abroad—will be even higher.

LITERATURE REVIEW

Digital Talent Concept

Digital talent refers to the set of skills and expertise that individuals need to adapt and contribute effectively in the era of digital transformation. This concept includes not only technical skills such as programming or data analysis, but also includes non-technical competencies such as creativity, critical thinking skills, and adaptability in the face of dynamic technological changes (Novelia et al., 2022). In a broader context, digital talent is the main foundation for building human resources that are able to compete in the global market, where mastery of digital technology is an important prerequisite for various types of jobs in the future.

The types of digital competencies needed in the modern era are very diverse, covering fields such as artificial intelligence (AI), big data, software development, and cybersecurity (Tarumingkeng, 2025). Artificial intelligence, for example, is becoming one of the most sought-after skills as AI is rampant in various industry sectors, from healthcare to finance. Meanwhile, big data and data analytics are crucial to help companies make accurate data-driven decisions. Coding skills remain an important foundation, not only for developers but also for professionals in other fields who need to understand the logic and structure of digital technologies.

In addition to technical skills, digital marketing is also included in the category of digital competencies that are increasingly relevant along with the growth of the digital economy. The ability to market products or services through digital platforms, understand social media algorithms, and analyze online consumer behavior is a significant added value in the modern business world ((Erwin et al., 2023). On the other hand, cybersecurity is an equally important field considering the increasing threat of

digital attacks and data leaks. Professionals with these skills are needed to protect the company's digital assets and maintain user privacy (Waraprada et al., 2023).

Not only hard skills, digital talent also includes soft skills that support success in a digital work environment. The ability to collaborate virtually, effective communication in remote teams, and good time management are determining factors for productivity in the hybrid and remote working era. In addition, digital literacy—the ability to use technology responsibly and critically—is also included in the scope of digital talent. This is important so that individuals are not only able to operate the technology, but also understand the ethical and social impacts of its use.

The rapid development of technology requires digital talents to continue to learn and update their knowledge regularly. The concept of lifelong learning is the key to keeping digital HR relevant in the midst of constant change. Educational institutions, professional training, and companies need to work together to create an ecosystem that supports the sustainable development of digital talent (Hidayat & Saripulloh, 2025). Thus, both individuals and the nation as a whole can take advantage of opportunities in the digital era to be fully prepared to face future challenges.

Human Resources and National Development Towards 2045

The quality of human resources (HR) has a close and significant relationship with the economic growth of a nation, especially in the face of the era of knowledge-based economy and digital technology (Alwy, 2022). Indonesia, which targets to become a developed country by 2045, must ensure that its human resources are not only superior in number but also in competence, especially in strategic areas that drive innovation and productivity. The development of quality human resources will create a workforce that is able to adopt new technologies, increase production efficiency, and create added value in various economic sectors, so that it will ultimately encourage sustainable and inclusive economic growth. Without improving the quality of human resources, especially in mastering digital skills, Indonesia risks lagging behind in global competition and only becoming a market for other countries' innovative products.

The projected need for digital talent in various sectors shows an increasing trend along with the acceleration of digital transformation. In the industrial sector, the need for professionals who master artificial intelligence, data analysis, and process automation is expected to soar, especially in the manufacturing 4.0, digital banking, and e-commerce industries (Wibowo, 2023). The education sector also needs digitally literate educators and curriculum developers to ensure that the younger generation has skills that are relevant to future needs. Meanwhile, in the government sector, the need for digital talent is increasingly urgent in line with the implementation of smart government and digital-based public services that demand expertise in system development, cybersecurity, and data-driven policy analysis.

Welcoming 2045, Indonesia needs to prepare itself by mapping and meeting the needs of digital talent in all strategic sectors comprehensively. This requires synergy between the government, the world of education, and industry to create a skills development system that is responsive to technological changes and job market needs. Investment in vocational education, digital skills training, and the development of supporting infrastructure are key to ensuring that Indonesia has enough digital talents who are competent and ready to contribute to realizing the vision of a Golden Indonesia 2045. Without structured and sustained efforts in the development of digital human resources, the target of becoming a developed country with an innovation-based economy will be difficult to achieve.

Related Policies and Initiatives

The Government of Indonesia has taken various strategic steps to strengthen the development of digital talent as part of efforts to prepare superior human resources towards a Golden Indonesia 2045. One of the mainstay programs is the Digital Talent Scholarship (DTS) organized by the Ministry of Communication and Digital, which provides free training in various fields of technology such as coding, data science, and digital marketing for the general public, students, and professionals (Nuriyyah, 2025). This program not only aims to improve the technical skills of participants, but also opens up access to job opportunities in the technology industry. In addition, the Independent

Campus policy initiated by the Ministry of Education, Culture, Research, and Technology provides opportunities for students to study outside the campus through internships, independent projects, or professional certifications, including in the fields of digital technology (Kemendikbudristek, 2022). This policy is designed to bridge the gap between academia and industry needs, while preparing graduates to be more job-ready.

In addition to government initiatives, collaboration between the private sector and academia plays a crucial role in creating a sustainable ecosystem for digital talent development. Major technology companies such as Gojek, Tokopedia, and Traveloka have launched various training programs and bootcamps, such as Gojek Academy or Traveloka Academy, which are specifically designed to produce digital talents according to industry needs (MBKM Unugha, 2025). These programs often work with universities and training institutions to develop curricula that are relevant to the latest developments in the world of technology. In addition, multinational companies such as Google and Microsoft are also actively contributing through certification programs and workshops aimed at improving the digital literacy of the Indonesian people (Indonesia News Center, 2023 ; Kirana et al., 2024). This collaboration not only provides direct benefits to trainees, but also helps to create competency standards that are recognized nationally and internationally.

In addition to the training program, another noteworthy initiative is the establishment of a Digital Leadership Academy by the government with private partners, aimed at producing digital leaders in the public and private sectors. The program is designed to equip participants with in-depth knowledge of digital transformation, technology policy, and innovation strategies, so that they can lead change in their respective organizations (Komdigi, 2023). At the regional level, several provincial governments have also launched digital training programs for MSMEs and local workers, such as Smart Province in West Java (Humas Jabar, 2023) or Bali Digital Province (Sanjaya & Darma, 2023), which aim to increase regional economic competitiveness through digital skills improvement. These initiatives show the commitment of various stakeholders in building digital talent that is evenly distributed throughout Indonesia, not only concentrated in big cities.

In the future, strengthening triple helix collaboration between the government, industry, and academia will be the key to the success of digital talent development in Indonesia. The government needs to continue to expand the scope of training programs and ensure inclusive access for people in various regions. The private sector can contribute more by opening up more internship opportunities, providing training facilities, and participating in the development of educational curricula. Meanwhile, educational institutions must be more responsive to changing industry needs by regularly updating curricula and integrating project-based learning. With strong synergy between these three parties, Indonesia can build a digital talent pipeline that not only meets today's needs, but is also ready to face future technological challenges, while realizing Indonesia's vision as a digital innovation hub in the Southeast Asian region by 2045.

RESEARCH METHODS

This study uses a qualitative descriptive approach with a focus on secondary data analysis to explore in-depth information on efforts to strengthen digital talent in Indonesia (Safarudin et al., 2023). This approach was chosen because it is able to provide a comprehensive understanding through the exploration of government policies, institutional reports, and academic literature related to the development of digital human resources. The secondary data analyzed included strategic documents such as the National Medium-Term Development Plan (RPJMN) 2025–2045, official publications of the Ministry of Communication and Digital (Komdigi), as well as statistics from the Central Statistics Agency (BPS) relevant to the research theme.

To analyze the data, this study adopts a thematic content analysis technique, where data from various sources is categorized based on key themes such as digital talent development policies, implementation challenges, and best practices of collaboration between stakeholders. This method allows researchers to identify patterns, relationships, and gaps in efforts to strengthen digital human resources, as well as formulate evidence-based recommendations. The analysis is carried out

systematically by extracting important information from documents, comparing findings between sources, and presenting them in a coherent narrative to answer the research questions. This approach is expected to provide a complete picture of the strategic steps Indonesia needs in preparing digital talent towards 2045.

RESULTS AND DISCUSSION

Efforts to Strengthen Digital Talent

One of the strategic efforts in strengthening digital talent is through vocational education reform and digital-based curriculum alignment. The results of the study show that vocational education institutions are beginning to integrate subjects such as basic programming, data analysis, and digital literacy into the core curriculum. Several polytechnics and vocational schools have partnered with technology companies to develop teaching factories and digital laboratories that allow students to gain practical experience. However, the main challenge lies in the infrastructure gap between urban and rural institutions, as well as the lack of competent faculty in the field of cutting-edge technology. There is a need for national standardization for the digital curriculum and continuous training programs for teachers/lecturers so that the quality of vocational education is evenly distributed throughout Indonesia.

On the labor side, upskilling and reskilling programs have become an important solution to improve workers' digital competencies, especially in the era of technological disruption. Data shows that programs such as the Pre-Employment Card and the Digital Talent Scholarship have successfully trained hundreds of thousands of participants in areas such as digital marketing, basic coding, and data analysis. However, the effectiveness of the program is still constrained by several factors, including the duration of the training being too short, the lack of post-training mentoring, and the incompatibility of the materials with the specific needs of certain industries. The research reveals the need for a more personalized training system based on the industry sector, as well as a certification mechanism recognized by the business world to ensure the relevance of the competencies obtained by participants.

The startup ecosystem and industry 4.0 have played a crucial role as a natural laboratory for the development of digital talent. Startups such as Gojek, Bukalapak, and Traveloka not only create new digital jobs, but also actively organize training academies such as Gojek Academy and BukaKelas. In the manufacturing sector, the implementation of industry 4.0 has triggered a demand for digital talents who master IoT, robotics, and big data analytics. Interesting findings show that companies that have implemented 4.0 technology tend to be more active in employee reskilling programs than traditional companies. However, the adoption of digital technology in the industry is still concentrated in large companies, while MSMEs face obstacles in digital transformation due to limited resources and knowledge.

Further discussion revealed that the synergy between vocational education, job training, and industry is the key to the success of strengthening digital talent. Some of the collaboration models that have proven effective include certified internship programs, sharing laboratory resources between schools and industry, and joint curriculum development. The challenges ahead are to create sustainable funding schemes for digital training programs, expand reach to disadvantaged areas, and build a monitoring system capable of evaluating the impact of programs on work productivity. By solving these challenges, Indonesia can accelerate the formation of digital talents that not only meet the needs of the current job market, but are also ready to face future technological evolutions.

Implementation Challenges

One of the main challenges in strengthening digital talent is the wide gap between urban and underdeveloped areas. Data shows that many regions of Indonesia, especially in the eastern region and the border, are still experiencing limitations in digital infrastructure such as high-speed internet networks and stable electricity. This condition creates significant inequality of opportunity, where people in disadvantaged areas find it difficult to access online learning platforms, digital training programs, and remote work opportunities. In fact, the potential of human resources in these areas is actually quite large, but it is not optimally worked on due to infrastructure obstacles. In addition,

the lack of supporting facilities such as computers and digital laboratories in schools in remote areas has widened the gap in digital competence between generations. The government needs to accelerate the development of digital infrastructure evenly while encouraging training programs that are tailored to the specific conditions of disadvantaged areas (Hadiningrat et al., 2024).

The dynamics of rapid technological change are another complex challenge in the development of digital talent. The exponential speed of technological innovation causes educational curriculum and training materials to often become obsolete before they can be fully implemented. A clear example is the emergence of generative AI technologies such as ChatGPT which in a short period of time has changed the landscape of skills needs in various industries. This phenomenon demands a more dynamic and flexible knowledge renewal mechanism, both in educational institutions and job training programs (Shaid, 2025). The challenges are exacerbated by the fact that there are still many teaching staff and trainers who are not able to keep up with the latest developments in digital technology, thus creating a knowledge gap between what is taught and what is actually needed in the world of work.

These two challenges interact with each other and complicate efforts to strengthen digital talent nationally. The infrastructure gap in disadvantaged areas makes the community even more backward in keeping up with rapidly changing technological developments. Meanwhile, accelerating technological change requires qualified digital infrastructure as a foundation for learning. To overcome this, an integrated strategy is needed that combines equitable distribution of digital infrastructure, strengthening the capacity of educators, and developing adaptive learning systems that can adapt to technological changes in real-time. Multi-stakeholder collaboration between the government, the private sector, and local communities is key to creating sustainable solutions that are able to answer these complex challenges while ensuring that no region or community group is left behind in the digital transformation towards a Golden Indonesia 2045

Chance

The triple helix collaboration model between the government, the private sector, and academia offers a great opportunity to accelerate the systematic development of digital talent. Governments can act as regulators and facilitators through supportive policies, such as tax incentives for companies investing in digital training or dedicated funding for applied research in universities. The private sector, particularly technology and industry 4.0 companies, can contribute practical knowledge about current skills needs as well as provide a platform for professional internships and certifications. Meanwhile, academics have a crucial role in creating adaptive curricula and conducting research to map future digital skills trends. Successful examples such as the "Bangkit" program by Google, Gojek, and the Ministry of Education and Culture show the great potential of this model when the three actors work together in a coordinated manner to create a comprehensive training program based on industry needs.

Improving Digital Infrastructure and Community Literacy is an important foundation that must be built in parallel with skills development programs. In terms of infrastructure, accelerating the development of broadband internet networks to 3T (Frontier, Outermost, Disadvantaged) areas needs to be a priority, accompanied by the provision of digital access facilities such as computers and supporting devices in public spaces such as regional libraries and training centers. For digital literacy, a massive national campaign with a tiered approach is needed - from basic training on digital device operations for the general public, to advanced programs such as cybersecurity and the use of productive technology for MSMEs. The involvement of local communities and digital volunteers is the key to success in reaching all levels of society, including vulnerable groups and people with disabilities. Programs such as Siberkreasi by the Ministry of Communication and Information can be expanded by involving more regional partners and local content creators.

To optimize these opportunities, implementable strategic recommendations are needed. First, the establishment of a Digital Talent Development Board consisting of triple helix representatives to compile an integrated roadmap for digital human resource

development. Second, the development of a national digital learning platform that is integrated with talent data and industry needs. Third, innovative funding schemes such as public-private partnerships for digital infrastructure and training programs. Fourth, a real-time data-based monitoring and evaluation system to measure the impact of various initiatives carried out. With this holistic approach, Indonesia can create an ecosystem for digital talent development that is inclusive, sustainable, and able to respond dynamically to technological changes, while ensuring that the benefits of digital transformation can be felt equally by all people in achieving the vision of a Golden Indonesia 2045.

CONCLUSION AND RECOMMENDATION

Conclusion

Strengthening digital talent has become an urgent and crucial need in preparing Indonesian Human Resources (HR) that are competitive and ready to face the challenges of the digital era towards a Golden Indonesia 2045. The digital transformation that is happening globally has transformed the economic and employment landscape, where technical skills such as artificial intelligence, data analysis, and programming, as well as non-technical abilities such as adaptability and complex problem-solving, are the main prerequisites for competing in the job market. Without systematic efforts to build digital talent, Indonesia risks lagging behind in global competition, while at the same time losing the opportunity to make optimal use of the demographic bonus. Investment in the development of digital talent will not only increase productivity and innovation in various sectors, but also be key in reducing the skills gap between education graduates and industrial needs, as well as accelerating the transformation of the knowledge and technology-based economy.

Furthermore, strengthening digital talent should be seen as an integrated national strategy, involving close collaboration between the government, the private sector, and educational institutions. The government needs to ensure supportive policies, such as the equitable provision of digital infrastructure, inclusive training programs, and

incentives for companies investing in human resource development. The private sector can contribute through training, internships, and certification programs that suit the needs of the industry, while academics must constantly update curricula and learning methods to be relevant to technological developments. With this holistic approach, Indonesia will not only have human resources who are ready to work, but also be able to innovate and lead in the global arena. Therefore, strengthening digital talent is not only about meeting current needs, but also about building a solid foundation for sustainable economic growth and equitable development in the future, realizing Indonesia's vision as a developed and highly competitive country by 2045.

Recommendation

Strengthening digital talent requires an integrated policy that aligns all training, education, and industry incentive programs in a single national roadmap, supported by a data-driven real-time monitoring system to evaluate program effectiveness through indicators such as graduate uptake and economic impact. The establishment of an inter-ministerial task force, national competency certification, and an integrated monitoring platform are key steps to ensure digital human resource investment delivers optimal results towards a Golden Indonesia 2045.

REFERENCES

Alwy, M. A. (2022). Manajemen Sumber Daya Manusia di Era Digital Melalui Lensa Manajer Sumber Daya Manusia Generasi Berikutnya. *Sibatik Journal : Jurnal Ilmiah Bidang Sosial, Ekonomi, Budaya, Teknologi, Dan Pendidikan*, *1*(10), 2265–2276. https://doi.org/10.54443/sibatik.v1i10.334

Edwin, M. P. M. P. (2024). *Keterampilan Abad Ke-21 dan Pembelajaran* (E. Santoso (ed.)). Tasikmalaya : Perkumpulan Rumah Cemerlang Indonesia.

Erwin, Ardyan, L., Ilyas, A., Ariasih, M. P., Nawir, F., Sovianti, R., Amaral, M. A. L., Setiawan, Z., Setiono, D., & Munizu, M. (2023). *DIGITAL MARKETING (Penerapan Digital Marketing pada Era Society 5.0)* (Efitra (ed.)). Jambi : PT. Sonpedia

Publishing Indonesia.

Ghalib, N., Efendi, M. M., Hamdani, A., Ramadhani, G. D., & Ningrum, N. S. (2024). Kolaborasi : Sinergi Universitas , Industri , Dan Pemerintah Dalam Meningkatkan SDM Melalui Program Pengembangan Yang Efektif. *Gudang Jurnal Multidisiplin Ilmu*, *2*(10), 145–148. https://doi.org/10.59435/gjmi.v2i10.9

Hadiningrat, K. P. S. S., Silalahi, V. A. J. M., & Wardani, F. P. (2024). Opportunities and Challenges in Implementing Information Technology Innovations in the Indonesian Education Sector. *East Asian Journal of Multidisciplinary Research (EAJMR)*, *3*(8), 3763–3776. https://doi.org/10.55927/eajmr.v3i8.10686

Hidayat, S., & Saripulloh, A. (2025). PENDIDIKAN LIFELONG LEARNING DALAM MENINGKATKAN KESIAPAN TENAGA KERJA DI INDONESIA MELALUI IMPLEMENTASI YANG EFEKTIF. *Addabani: Interdisciplinary Journal of Islamic Education*, *2*(2), 109–125. https://doi.org/10.52593/adb.02.2.04

Humas Jabar. (2023). *Masterplan Jabar Smart Province Rampung, Pemdaprov Terima Kasih Asistensi Tim Ahli Kemen Kominfo*. https://jabarprov.go.id/berita/masterplan-jabar-smart-province-rampung-pemdaprov-terima-kasih-asistensi-tim-ahli-kemen-11112

Indonesia News Center. (2023). *Microsoft Gandeng Kemenko Perekonomian, Berikan Pelatihan Pengembangan Literasi Digital Gratis bagi Masyarakat Indonesia*. https://news.microsoft.com/id-id/2023/01/10/microsoft-gandeng-kemenko-perekonomian-berikan-pelatihan-pengembangan-literasi-digital-gratis-bagi-masyarakat-indonesia/#:~:text=Microsoft Gandeng Kemenko Perekonomian%2C Berikan Pelatihan Pengembangan,baru saja meluncurkan Skills for Jobs Indonesia.

Kemendikbudristek. (2022). *KAMPUS MERDEKA : Program persiapan karier yang komprehensif untuk mempersiapkan generasi terbaik Indonesia*. https://kampusmerdeka.kemdikbud.go.id/

Kirana, A. N., Lestari, E. P., & Rachman, I. F. (2024). PENINGKATAN LITERASI DIGITAL MELALUI KOLABORASI PEMERINTAH , SEKTOR SWASTA , DAN MASYARAKAT : KONTRIBUSI TERHADAP PENCAPAIAN SDGS 2030 DALAM PENDIDIKAN. *Jurnal Ilmiah Multidisplin*, *1*(5), 1–8. https://doi.org/10.62017/merdeka

Komdigi. (2023). *Digital Leadership Academy*. Learning Management System Komdigi. https://lms.sdmdigital.id/course/index.php?categoryid=165

MBKM Unugha. (2025). *Bangkit by Google, GoTo, Traveloka*. https://mbkm.unugha.ac.id/bangkit-by-google-goto-traveloka/

Novelia, V., Hartati, P. P., & Giovanni, A. (2022). Perspektif Pengembangan Digital Talent Era Industri 4.0. *Jurnal Akmenika: Jurnal Akuntansi Dan Manajemen*, *19*(1), 614–621. https://doi.org/10.31316/akmenika.v19i1.2637

Nuriyyah, Z. A. (2025). *Peluncuran Program Digital Talent Scholarship (DTS) 2025 dan Survei Indeks Masyarakat Digital Indonesia (IMDI)*. https://bpsdm.kominfo.go.id/berita-peluncuran-program-digital-talent-scholarship-dts-2025-dan-survei-indeks-ma-46-2182#:~:text=Peluncuran Program Digital Talent Scholarship (DTS) 2025,dan. * sertifikasi dari standard perusahaan global/internasional.

Oktareza, D., Noor, A., Saputra, E., & Yulianingrum, A. V. (2024). Transformasi Digital 4.0: Inovasi yang Menggerakkan Perubahan Global. *CENDEKIA: Jurnal Hukum, Sosial & Humaniora*, *2*(3), 661–672. https://doi.org/10.5281/zenodo.12742216

Puspa, C. I. S., Rahayu, D. N. O., & Parhan, M. (2023). Transformasi Pendidikan Abad 21 dalam Merealisasikan Sumber Daya Manusia Unggul Menuju Indonesia Emas 2045. *Jurnal Basicedu*, *7*(5), 3309–3321. https://doi.org/10.31004/basicedu.v7i5.5030

Safarudin, R., Kustati, M., & Sepriyanti, N. (2023). Penelitian Kualitatif. *INNOVATIVE: Journal Of Social Science Research*, *3*(2), 9680–9694. https://j-innovative.org/index.php/Innovative/article/view/1536

Sanjaya, I. G. W., & Darma, G. S. (2023). Bali Smart Island : Smart City Implementation in Bali Province. *Journal of Governance and Public Policy*, *10*(2), 203–215.

Shaid, N. J. (2025). Era AI dan Masa Depan Pekerjaan: Keterampilan Apa yang Masih Dibutuhkan? *Kompas.Com*. https://money.kompas.com/read/2025/02/26/231615826/era-ai-dan-masa-depan-pekerjaan-keterampilan-apa-yang-masih-dibutuhkan

Tarumingkeng, R. C. (2025). *Pengembangan SDM Dalam Era Digital : Tantangan dan*

Peluang. Bogor : RUDYCT e-PRESS.

Waraprada, K. D., Fathurokhman, K. F., & Sasongko, M. A. (2023). Keamanan Siber di Era Digital. *Jurusan Informatika UII*. https://informatics.uii.ac.id/2023/10/15/keamanan-siber-di-era-digital/

Wibowo, A. (2023). *Revolusi Industri 4.0 dan Society 5.0* (J. T. Santoso (ed.)). Semarang : Yayasan Prima Agus Teknik.