

Sustainable Career Development Strategies in the Digital Age: The Role of Upskilling and Reskilling in Facing Automation and Artificial Intelligence

Feby Arma Putra¹⁾, Andriyansah setiawan²⁾, Sapari³⁾, Pebrianti Pawesti⁴⁾, Sudiharto⁵⁾

^{1,2,3,4,5} Universitas Pamulang, Indonesia

Email: dosen03429@unpam.ac.id¹, dosen03396@unpam.ac.id², dosen03428@unpam.ac.id³,
dosen03439@unpam.ac.id⁴, dosen03402@unpam.ac.id⁵

Abstract: *The digital era and technological advancements like Artificial Intelligence (AI) have transformed the scope of work and posed significant challenges: automation, which threatens human roles. This research aims to analyze adaptive career management strategies thru the important role of upskilling and reskilling, as well as the importance of agility and networking. The research method applied is a literature review with thematic analysis techniques applied to various recent academic literature and industry reports. The discussion revealed that upskilling and retraining are not only efforts to enhance competency, but also strategic instruments for maintaining individual productivity and career sustainability amidst disruption. Additionally, the synergy between agility, resilience, and responsiveness, supported by a strong network, has been shown to improve accessibility to training opportunities and facilitate faster career transitions. The conclusion of this research confirms that career management oriented toward a lifelong learning mindset is key to transforming the threat of automation into an opportunity for sustainable professional growth.*

Abstrak : *Era digital dan kemajuan teknologi seperti Artificial Intelligence (AI) telah mengubah lingkup pekerjaan serta menimbulkan tantangan besar yaitu otomatisasi yang mengancam peran manusia. Penelitian ini bertujuan untuk menganalisis strategi manajemen karir yang adaptif melalui peran krusial upskilling dan reskilling, serta pentingnya kelincahan (agility) dan jaringan (networking). Metode penelitian yang diterapkan adalah studi pustaka (library research) dengan teknik analisis tematik terhadap berbagai literatur akademik dan laporan industri terkini. Hasil pembahasan mengungkapkan bahwa upskilling dan reskilling bukan sekadar upaya peningkatan kompetensi, melainkan instrumen strategis untuk menjaga produktivitas dan keberlangsungan karir individu di tengah disrupsi. Selain itu, sinergi antara agility, resilience, dan responsiveness yang didukung oleh networking yang kuat terbukti meningkatkan aksesibilitas terhadap peluang pelatihan dan memfasilitasi transisi karir yang lebih cepat. Simpulan penelitian menegaskan bahwa pengelolaan karir yang berorientasi pada pola pikir pembelajaran seumur hidup merupakan kunci utama dalam mengubah ancaman otomatisasi menjadi peluang pertumbuhan profesional yang berkelanjutan.*

Keywords : *Career Management, Upskilling, Reskilling, Agility, Networking*

INTRODUCTION

The digital era, or Industry 4.0, has made people familiar with the internet as a means of facilitating and accelerating the exchange of information (Fantini & Tamba, 2020). Industrial revolutions such as Artificial Intelligence (AI), the Internet of Things (IoT), and Big Data have transformed various digital services, such as e-commerce, e-learning, and ride-sharing, that are

transforming the way we interact, shop, and even learn. The Industrial Revolution 4.0 focuses on automation and the connection between the physical and digital worlds to create more efficient and intelligent production, while the digital era refers to the broad impact of internet technology on various aspects of life (Deni, 2023).

At the same time, these technologies will transform the nature of work and the workplace itself. Machines will be able to perform more tasks than humans do, complement existing tasks, and even perform tasks that surpass human capabilities. As a result, some jobs will decline, others will thrive, and many more will change. While there will be enough jobs for everyone (barring extreme scenarios), society will need to grapple with significant workforce transition and dislocation (Kurniawan & Aruan, 2021).

A questionnaire conducted by Databoks found that 31% of respondents believed that AI has the potential to replace workers in content production. Others believed that AI could replace workers in customer service, marketing and sales, human resources, information technology, data analysis, and even administration (Databoks, 2024). This phenomenon has left many, especially Gen Z, anxious about their career prospects. With more jobs being automated, they face the challenge of adapting to the changes. However, rather than viewing AI as a threat, this generation needs to understand how technology can be a tool that helps them thrive and creates new opportunities in the workplace (Adha, 2020).

The workplace is now increasingly focusing on Human Resource (HR) development strategies that enable employees to adapt to changing work environments and market demands. Innovations in HR include approaches such as personalized training, mentoring, and digital learning platforms (Sulartopo et al., 2023). This helps employees develop new skills and increase their career resilience in the face of changing jobs and technology. Furthermore, new approaches to career management are emerging, with organizations providing more space for career exploration and cross-functional development. This allows employees to learn from diverse experiences, expand their networks, and gain a deeper understanding of their careers (Hasanah & Qushwa, 2024).

Research by Akbar (2024) revealed that costs and resistance remain challenges in developing digital literacy. According to Asmoro (2025), these cost challenges can be addressed through company-university partnerships and effective employee redeployment to mitigate layoffs. Furthermore, a study by Bolon et al. (2025) delved deeper into the implementation, internal dynamics, and employee and manager perspectives of reskilling programs in state-owned banking companies to support digital transformation.

Career management has evolved significantly, driven by the fast-paced world of work, longer tenures, and changing personal priorities (Febrianty & Ichdan, 2024). Consequently, individuals today

need to adopt a "lifelong learning" mindset and proactively manage their own career paths, rather than relying solely on the company's HR department to map them. To address these challenges, HR professionals must employ several strategies, such as continuous development (re-skilling), building strong, flexible networks, and being ready for change. In short, career management must address agility, resilience, and the ability to respond quickly and effectively to market changes.

Based on the issues and previous research mentioned, there is still ample scope for further research on this topic. This research focuses on how Sustainable Career Development Strategies in the Digital Era: The Role of Upskilling and Reskilling in Facing Automation and Artificial Intelligence, as well as Building Agility and Networking as a Quick Response to Market Changes which are expected to build optimal career management strategies in the industrial world 4.0.

METHOD

This study uses library research to analyze Career Management Strategies in the Digital Era: The Role of Upskilling and Reskilling in Facing Automation and AI. Data collected comes from literature, policy documents, scientific journals, and reports relevant to the topic. Researchers will conduct a thematic analysis of various literature to identify patterns, key issues, and proposed solutions related to career management strategies in the digital era. The literature study was conducted by collecting, reviewing, and examining various relevant academic and non-academic sources.

RESULTS AND DISCUSSION

The Role of Upskilling and Reskilling in Facing Automation and AI

According to the Cambridge Dictionary, reskilling is defined as the process of learning new skills to enable someone to perform different jobs. Meanwhile, upskilling refers to the process of learning new skills or providing training to workers in new skills to improve their abilities in their current jobs or roles. A study conducted by Kresnadi & Narendra (2023) found that the industrial revolution brought a technological revolution and changes in the scope and job profiles, leading to a more internet-based approach.

The ILO (2023) emphasized that workers unable to upgrade their competencies (upskilling) or transfer skills (reskilling) will be the most impacted. Therefore, workers must understand how AI is shifting routine work and creating new job opportunities. Therefore, it is crucial for HR to formulate effective adaptation strategies for workers, companies, and policymakers.

To minimize technological change, companies must conduct reskilling and upskilling for their employees. In this regard, the government is responsible for fostering awareness of reskilling. Reskilling

and upskilling are crucial for increasing company productivity. Research conducted by Puspitasari & Kuswinarno (2024) shows that improving existing skills or learning new ones will benefit individuals in succeeding in their current job description or transitioning to a new position.

Furthermore, reskilling and upskilling help sales and marketing become more customer and market-focused, more agile, and more flexible in adapting to change. In fact, reskilling and upskilling help companies reduce recruitment costs in the long term. Employees who participate in reskilling and upskilling can ensure company sustainability because they are able to adapt to current business needs.

To prevent employee skill decline, companies can prioritize employee reskilling and upskilling. Companies can increase employee motivation, work experience, and loyalty by adopting these principles. Companies can utilize training to enhance their capabilities and build strong relationships with employees or clients.

Building Agility and Networking as a Rapid Response to Market Change

In the digital era, familiar with automation and AI, HR management must develop a career management strategy with a responsive approach to address rapid market changes. Agility and networking have emerged as key factors in quickly responding to the replacement of routine tasks by AI, forcing individuals to respond progressively to change.

According to a 2023 World Economic Forum report, these changes will affect more than 40% of global jobs, making upskilling and reskilling options for regularly developing and updating skills. Agility here refers to the ability to learn and adapt quickly, while networking provides access to the information and opportunities necessary to navigate a volatile job market. This approach is not only reactive but also proactive, enabling individuals to anticipate trends such as the integration of AI in various industry sectors.

Agility in career management involves developing mental and technical skills that enable rapid response to market changes, such as adaptation skills resulting from automation. A study by De Vos et al. (2020) showed that individuals with high levels of agility are better able to make successful career transitions, focusing on continuous learning and gradual experimentation. For example, in the face of AI automating manufacturing processes, workers can develop agility through short online courses to master predictive data analysis.

The OECD Skills Outlook (2022) report confirms that this agility is strengthened by investments in reskilling, which helps reduce the risk of unemployment by up to 20% in sectors affected by automation. Thus, agility is not simply adaptation, but rather a preventative strategy that integrates self-learning with monitoring market trends.

Networking plays a role in building networks that facilitate access to real-time information about market changes. Gonzalez (2025) in the AI Asia Pacific Institute describes networking as a tool for creating a human-AI symbiosis, where professional relationships through digital platforms like LinkedIn enable the exchange of knowledge about new job opportunities.

In the AI era, networking helps individuals identify cross-industry collaborations, such as alliances between technology and business, which accelerate responses to transformation. Purwanto et al. (2025) highlighted that effective networking increases career resilience, with empirical data showing up to a 30% increase in access to reskilling opportunities through professional communities. Therefore, networking not only broadens horizons but also opens the door to the practical implementation of upskilling.

The integration of agility and networking provides a more holistic response to market changes, particularly in the context of upskilling and reskilling to address automation and AI. The World Economic Forum (2023) stated that combining the two can optimize career transitions, where networking provides resources for building agility, such as access to mentors or training programs. For example, a finance professional could use networking to learn about AI applications in risk analysis, then apply those skills agilely in new projects.

Research conducted by the OECD (2022) adds that this approach is relevant in the next five years, when the projected growth of AI will require more adaptive career strategies, with networking as a catalyst for global collaboration.

Building agility and networking are essential strategies for career management in the digital age, enabling rapid response to market changes driven by automation and AI. While sources such as the World Economic Forum (2023) and OECD (2022) provide empirical insights, further research is needed to quantify the long-term impact. Recommendations for career practitioners include developing educational programs that integrate both elements, to ensure career resilience in an evolving employment landscape.

Optimal Career Management Strategy

In this digital era, an optimal career management strategy must encompass agility, resilience, and responsiveness to face challenges such as automation and AI. Agility refers to the ability to adapt quickly to market changes, resilience is the mental resilience to face failure or stress from technological change, and responsiveness involves proactively responding to new trends, such as learning AI skills through online courses.

A study conducted by Putra (2022) states that career management strategies in the digital era must adopt an aggressive approach through close collaboration with industry and increasing the portion of

practicums to 70% to ensure the relevance of graduate competencies. Transformation through upskilling and reskilling in technology and business is crucial for creating adaptive and competitive human resources in facing the challenges of automation.

Agility in career management is developed through continuous learning practices and structured experimentation, enabling rapid response to fluctuations in skill demand. Resilience is strengthened by establishing a professional support network, which helps cope with the stress of technological change. Responsiveness involves monitoring market trends in real time, such as through digital platforms, to identify new opportunities. Without the integration of these three aspects, individuals risk career stagnation amidst digital disruption. Empirical studies show that workers with high levels of agility tend to be more successful in career transitions (Widjaja & Samuel, 2025).

Responsiveness, as a component of an optimal strategy, requires active monitoring of technological innovations and participation in professional forums. Resilience plays a key role in recovering from challenges, such as temporary unemployment due to automation. Agility allows career path adjustments, for example, from traditional to digital sectors. This combination enhances overall career stability.

Resilience in Indonesia is essential given the impact of automation on employment, as reported by the Central Statistics Agency (BPS) in 2020, which recorded an 18% increase in unemployment during the pandemic. Agility can be achieved through government programs such as the Pre-Employment Card (Kartu Prakerja), which supports upskilling. Responsiveness involves engaging in online discussions to analyze career trends. A study by Jalal (2024) emphasized the role of networking in developing these three elements, finding that professional networks increase access to adaptation resources.

CONCLUSION

The rapid development of the digital era, marked by the integration of AI and automation, has fundamentally transformed the structure of the global job market, creating significant challenges for individual career stability. Based on this analysis, upskilling and reskilling strategies have emerged as crucial tools aimed not only at improving technical competency but also as a key foundation for maintaining productivity and professional sustainability. By adopting a lifelong learning mindset, the workforce can transform the threat of technological disruption into a growth opportunity, thereby minimizing the risk of unemployment due to automation through mastering new skills relevant to future industry needs. Beyond strengthening technical skills, successful career management in this era relies heavily on the integration of agility, resilience, and responsiveness. Leveraging professional networks has proven to be a crucial catalyst, accelerating access to information and retraining opportunities,

significantly easing career transitions amidst dynamic market changes. As a final conclusion, effective career management demands individual independence in designing their professional path, where the combination of mental adaptability and strong networks are the main keys to achieving sustainable career resilience in facing the ever-evolving work landscape. Based on the findings of this study, it is recommended that individuals adopt a lifelong learning mindset and independently build professional networks to increase accessibility to self-development opportunities. Companies need to innovate in HR management through personalized training programs and mentoring systems that can build employee resilience amidst disruption. Furthermore, educational institutions need to synchronize their curriculum by integrating elements of agility to ensure graduates remain relevant to industry needs. For further research, it is recommended to conduct empirical studies on the specific effectiveness of AI-based training methods in reskilling processes in specific industrial sectors, as well as an in-depth analysis of the psychological impact of automation on employees' long-term career motivation.

REFERENCES

- Adha, L. A. (2020). Digitalisasi industri dan pengaruhnya terhadap ketenagakerjaan dan hubungan kerja di Indonesia. *Jurnal Kompilasi Hukum*, 5(2), 267-298.
- Akbar, Z. A. (2025). Reskilling Dan Upskilling Tenaga Kerja Untuk Menghadapi Otomatisasi Dan Ai Peran Perusahaan. *Jurnal Jamaah*, 2(1).
- Asmoro, R. S., Amelia, R. P., Sawitri., & Sundari, S. (2025). Strategi Manajemen Sumber Daya Manusia dalam Menghadapi Rendahnya Kualitas SDM dan Peningkatan PHK di Era Digital 4.0. *Jurnal Cendekia Ilmiah*.
- Bolon, T. T. T., Girsang, L. O., Saragih, N. P., Simamora, D. R., Aprinawati, & Adhitya, W. R. (2025). Transformasi Digital dan Kebutuhan Reskilling BUMN: Analisis Program Reskilling dan Upskilling dalam Menghadapi Disrupsi Digital (Studi Kasus BRI di Medan). *Jurnal Manajemen Bisnis Digital Terkini*, 4(2), 177-184.
- Databoks. (2023, 13 November). *Ini Pekerjaan yang Bisa Digantikan AI Menurut Pegawai Startup*. Katadata. <https://databoks.katadata.co.id/teknologi-telekomunikasi/statistik/7d4a90a6bcaf254/ini-pekerjaan-yang-bisa-digantikan-ai-menurut-pegawai-startup>
- De Vos, A., Van der Heijden, B. I. J. M., & Akkermans, J. (2020). Sustainable careers: Towards a conceptual model. *Journal of Vocational Behavior*, 117, Article 103196. <https://doi.org/10.1016/j.jvb.2018.06.011>
- Deni, A. (2023). *Manajemen Strategi di Era Industri 4.0*. Cendikia Mulia Mandiri.
- Fantini, E., & Tamba, R. S. (2020). Mediamorfosis edukasi informal online melalui platform digital sebagai peluang bisnis baru. *Majalah Ilmiah Bijak*, 17(1), 114-127.
- Febrianty, S. E., & Ichdan, D. A. (2024). *Toolkit manajemen karir: Sumber daya esensial untuk profesional masa kini*. Perkumpulan Rumah Cemerlang Indonesia Anggota Ikapi Jawa Barat.
- Gonzalez, L. (2025, 28 Mei). *Symbiotic AI: The Future of Human-AI Collaboration*. AI Asia Pacific

- Institute. <https://aiasiapacific.org/2025/05/28/symbiotic-ai-the-future-of-human-ai-collaboration/>
- Hasanah, R., Munawwaroh, I., & Qushwa, F. G. (2024). Pengembangan career adaptability melalui inovasi sumber daya manusia. *EDUKASIA Jurnal Pendidikan dan Pembelajaran*, 5(1), 169-178.
- International Labour Organization. (2023). Technology and the future of work. ILO. <https://www.ilo.org>
- Jalal, N. M. (2024). Pengaruh Era Digitalisasi terhadap Kematangan Karir Siswa Remaja. *Jurnal Kolaboratif Sains*, 7(11), 4221-4227.
- Kresnadi, M. I., & Narendra, D. A. (2023). Transformasi Upskilling dan Reskilling Sumber Daya Manusia Dalam Menghadapi Tantangan Revolusi 4.0 Di Sektor Kepelabuhanan dan Logistik. *EKONOMIKA45: Jurnal Ilmiah Manajemen, Ekonomi Bisnis, Kewirausahaan*, 10(2), 169-174.
- Kurniawan, F. E., & Aruan, N. L. (2021). Digitalisasi dan pola kerja baru: Dampak bagi industrialisasi dan respons kebijakan ketenagakerjaan. *Jurnal Sosioteknologi*, 20(3), 395-409.
- OECD. (2022). *OECD Skills Outlook 2022: Learning for life*. OECD Publishing.
- Parker, S. K., Wang, Y., & Liao, J. (2021). Building resilience in the age of automation: The role of networking and continuous learning. *Academy of Management Perspectives*, 35(2), 215-234. <https://doi.org/10.5465/amp.2020.0195>
- Purwanto, S., Ardiansyah, M., Januru, L., Anami, Z., Putri, N. A. S. M., Gunadi, I., & Hastriana, U. S. (2025). *Pengembangan Karier dan Kompetensi SDM*. Yayasan Tri Edukasi Ilmiah.
- Puspitasari, M., & Kuswinarno, M. (2024). Pengaruh Masa Training Pada Karyawan Baru Untuk Peningkatan Skill Karyawan Di Pabrik Trafo. *Jurnal Media Akademik (JMA)*, 2(6).
- Putra, F. A., & Suseno, B. D. (2022). Industrial Revolution 4.0 as a Strategic Issue of Higher Education. *International Journal of Scientific Research and Management (IJSRM)*, 10(02), 3045–3051. <https://doi.org/10.18535/ijssrm/v10i2.em05>
- Sanda, K. Peran Readiness To Change Terhadap Career Adaptability Pada Karyawan Di Era Artificial Intelligence.
- Sulartopo, S., Kholifah, S., Danang, D., & Santoso, J. T. (2023). Transformasi proyek melalui keajaiban AI: mengeksplorasi potensi ai dalam project management. *Jurnal Publikasi Ilmu Manajemen*, 2(2), 363-392.
- Widjaja, D., & Samuel, S. (2025). *Adaptability Marketing in Digital Era: Strategi Pemasaran Adaptif di Era Digital yang Terus Berubah*. Penerbit NEM.
- World Economic Forum. (2023). *The Future of Jobs Report 2023*. World Economic Forum. <https://www.weforum.org/reports/the-future-of-jobs-report-2023/>