International Journal for Multidisciplinary Research (IJFMR)



E-ISSN: 2582-2160 • Website: www.ijfmr.com

• Email: editor@ijfmr.com

# **Engineering Digital Trust Through Governance: Brunei's Government Measures in the e-HRM Transition from GEMS to SSM**

# Rofiani Haji Ismail

Student, School of Business, Universiti Teknologi Brunei

# Abstract:

A key part of Brunei Darussalam's Vision 2035 is digitalizing HRM to promote government growth with the help of latest technology. This initiative is mainly focused on transitioning to Sistem Sumber Manusia (SSM), a comprehensive e-HRM platform. The paper explores the role of government measures to help this transformation focusing on policy framework, infrastructure, capacity building and data security. The Digital Economy Masterplan 2025 has given guidelines for building a digital-friendly environment and civil service ready for the future. Technology initiatives led by Authority for Info-Communications Technology Industry (AITI) have established the foundational infrastructure, while these improvements facilitated digital literacy through structured training for civil services. The introduction of the Cybersecurity Act is to protect user information and gain trust. However, challenges including data integration, inconsistent user preparedness, and system interoperability remain significant. This paper addresses these challenges and evaluates the government interference, providing critical insights to increase digital trust and how government actions can shape it. Therefore, this study contributes to the broader discussion on digital public administration by highlighting Brunei as an important example of e-HRM reform in Southeast Asia.

Keywords: Cybersecurity, Data Security, Digital Transformation, e-HRM, Government Measures, SSM

# 1. Introduction

Brunei Darussalam, like other countries aiming for digital progress in their civil service, has set out on a public sector transformation with the help of e-Human Resource Management systems. Transition from legacy system, GEMS to the more integrated and digitally oriented SSM which represents a significant government investment under the national development blueprint, Brunei Vision 2035. When administrative tasks move online, the results depend significantly on the government's actions to gain trust, reduce risk, and ensure continued support for the systems.

The transformation from manual and fragmented systems to a modern HR digital ecosystem demands more than infrastructural readiness. The public trust in digital platforms can be easily to undermine, especially when the system uses confidential pay and personnel data. A number of studies indicate that e-Government strategy depends on three major factors: the adoption of updated technology, laws and trust among governments (Bannister & Connolly, 2011; Weerakkody et al., 2017). For Brunei, it is important for the government to create this trust through having real, enforceable laws, strong organization, skillbuilding programs, and making communication clear. The Authority for Info-Communications



# International Journal for Multidisciplinary Research (IJFMR)

E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

Technology Industry (AITI) and the E-Government National Centre (EGNC) worked hard together to establish a solid digital structure for the country. Simultaneously, the Digital Economy Masterplan 2025 outlines the government prioritizes to make the civil service connected, secure, and literate in technology. Accordingly, SSM is not just a technological upgrade but a critical enabler of organizational agility, policy coherence, and improved service quality. However, like in Estonia and Singapore, achieving transformation requires multi-level coordination, including legislation, inter-agencies alignment, and constantly supporting the user (Janssen & Voort, 2020).

This paper critically explores the role of government measures in this transformation. It investigates on how transition is being managed by public sector in Brunei through a combination of policy instruments, infrastructure investment, cybersecurity assurance, and civil service readiness systems. By examining strategic documents, regulatory developments, and policies, this study discovers the enablers and inhibitors of digital trust during the SSM transition. Moreover, this paper discusses a gap in the literature about digital transformation in small, resource-rich governance contexts, where e-HRM systems are implemented top-down with significant state oversight but limited empirical exploration. The study focuses on law and policy rather than behaviour and design to understand how open government happens by visible government behaviour.

This paper hopes to accomplish two things: to provide a conceptual mapping on how Brunei's government helped the digital HR transformation and decide if these actions are effective, sustainable, and replicable. The study completes discussion on public sector digital transformation by offering a focused, governance-centric perspective on e-HRM in Brunei.

# 2. Literature Review

# 2.1 Introduction to e-HRM and Digital Transformation

Electronic Human Resource Management (e-HRM) refers to the integration of digital technologies into HR functions, assist in recruitment, payroll, performance appraisals, training, allowances, and employee data management. The adoption of e-HRM systems introduced o enhance efficiency, reduce administrative burdens, and provide strategic insights through collected data. Globally, the shift towards e-HRM is part of wider progress towards better electronic administration in the public sector, aligning with objectives of increased transparency, improved service delivery and enhanced citizen participation (Bondarouk & Ruël, 2013).

In the context of Brunei Darussalam, the transition from GEMS to SSM signifies a major change to modernise the civil service. Along with technology, the shift also means changing organisations, reforming policies, and building skills, therefore, comprehensive government measures is necessary to ensure successful implementation and user adoption.

#### 2.2 Brunei's Digital Economy Masterplan 2025

The Digital Economy Masterplan 2025 serves as Brunei's strategic blueprint in digital transformation, focused to position the nation as a "Smart Nation through Digital Transformation". The Masterplan outlines three strategic outcomes (*Digital Economy Masterplan 2025*, 2020):

- 1. Vibrant and Sustainable Economy: Leveraging the digital technologies to diversify the economy and promote innovation.
- 2. Digital and Future-Ready Society: Enhancing digital literacy and equipping the workforce with necessary skills.
- 3. Digitally Conducive Ecosystem: Establishing robust digital infrastructure and governance framework.



The alignment matrix (Table 1) was developed based on a comparative review of the ASEAN Digital Masterplan 2025 (*ASEAN Digital Masterplan 2025 - ASEAN Main Portal*, n.d.) and Brunei's Digital Economy Masterplan 2025.

Table 1. Druher vy ASLAN ( 1 oney Anglinent Matrix					
Strategic Pillars	ASEAN Digital	Brunei Digital Economy			
	Masterplan 2025	Masterplan 2025			
Digital Literacy					
Secure Infrastructure					
<b>Public Sector Integration</b>					
<b>Cybersecurity Policy</b>					
Capacity Building					

Table 1: B	runei vs AS	SEAN Policy	Alignment	Matrix
	I unter vorte.	JEIN I Oney	- insure .	

The Masterplan points out the e-Government initiatives, including the implementation of integration platforms like SSM, improving the civil service delivery and efficiency. Both frameworks emphasise the importance of digital literacy, secure infrastructure, and public sector integration as foundational elements of regional and national digital governance ("Assessing Brunei Darussalam Public and Private Sector Readiness Towards Big Data Application," 2022; Chin, 2021; Irwandi et al., 2023; Nusir et al., 2023; Ramadhan, 2022; Wongwuttiwat et al., 2023; Zulianto, 2024).

# 2.3 Institutional Frameworks Supporting e-HRM in Brunei.

Several key institutions play pivotal roles in Brunei's e-HRM transformation:

# 2.3.1 Authority for Info-communications Technology Industry (AITI)

Established in 2003, AITI is a statutory body responsible on regulates telecommunications, managing the radio-frequency spectrum, and developing the IT and communications industry. AITI's functions are critical to ensures the technological infrastructure necessary for e-HRM systems, including manages data protection initiatives and promotes cybersecurity.

# 2.3.2 E-Government National Centre (EGNC)

The EGNC supervises the development and deployment of IT personnel across government agencies, manages central IT procurement, and provides a range of services commonly used across different government bodies. It plays a key part in getting e-HRM systems like SSM, effectively integrated into the public sector's digital ecosystem ("Assessing Brunei Darussalam Public and Private Sector Readiness Towards Big Data Application," 2022).

# 2.4 Data Protection and Cybersecurity Measures

Cyber Security Brunei (CSB) was established Priority is given to e-HRM systems on protecting data and cybersecurity. Brunei has taken steps to establish legal framework for data protection: -

• Personal Data Protection Order (PDPO):

It is expected to be endorsed soon, the PDPO purpose is to manage the collection, use and disclosure of personal data by private organisations, align with international standards. (Constitution of Brunei Darussalam, 2025)



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

• Cybersecurity Act: This Act was enforced to address cybersecurity threats, offers guidelines on how to safeguard critical information infrastructure and how to respond to threats. (Cyber Security Brunei, 2023).

#### 2.5 Challenges and Consideration on Legacy Systems and New Platform Transition.

The shift from legacy systems and new platform requires facing several challenges:

- System Integration and Interoperability Issues: Ensuring continuous data migration, interoperability and information flow between legacy systems and the new platform (Irmak et al., 2023).
- User Adaption and Digital Legacy: Ensuring the workforce is ready to adapt by facing resistance to change and giving adequate training to civil servants (Willems & Graham, 2019).
- Data Privacy and Cybersecurity Concerns: Maintaining the integrity and confidentiality of sensitive employee information remains safe and wellprotected throughout the transition (Akor et al., 2024; Bakhrudin et al., 2023).

This study evaluates the effectiveness of SSM by highlighting the importance of user satisfaction and the need for continuous improvement in system functionalities.

#### 2.6 Regional Context: ASEAN Digital Initiatives

Brunei's transformation of e-HRM follows the goals of the ASEAN Digital Master Plan 2025, which promotes using digital technologies across member states to foster economic growth and resilience. These regional frameworks provide a collaborative platform for sharing best practices and addressing the common challenges in digital transformation ("Assessing Brunei Darussalam Public and Private Sector Readiness Towards Big Data Application," 2022; Nusir et al., 2023; Zulianto, 2024).

#### 2.7 Summary

Brunei's strategy to upgrade e-Human Resource Management is found in the literature, which involving strategic planning, institutional support, legal frameworks, and regional collaboration. The government's actively measures in policy formulation, infrastructure development, and capacity building to ensure the successful implementation and adoption systems like SSM.

#### 3. Role of Government in e-HRM Transformation

The successful implementation of E-HRM systems within the public sector is critically depends on the government's interventions. In Brunei Darussalam, the transition from the GEMS to the SSM represents government commitment to modernising human resources practices inline with national development objectives. This section discusses the multifaceted roles of government in facilitating this transformation, focusing on policy framework, technological infrastructure development, capacity building, and data security measures.

#### **3.1 Policy Frameworks and Initiatives**

Digital Economy Masterplan 2025 is the central to Brunei's transformation agenda, which aims to make the county a "Smart Nation through Digital Transformation". This Masterplan provides strategic outcomes focused at fostering a vibrant and sustainable economy, create a digital and future-ready society, and establishing digitally conducive ecosystem ("Assessing Brunei Darussalam Public and Private Sector



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

Readiness Towards Big Data Application," 2022). The implementation of SSM directly reflect to these objectives, seeking to enhance efficiency and transparency within civil servants. The establishment of the Digital Economy Council (DEC) shows the government's commitment to leading digital process. Under the DEC, the government sets clear policies that guide the development and deployment of e-HRM systems like SSM.

# **3.2 Technological Infrastructure Development**

A robust technological infrastructure is the backbone of any successful e-HRM system. The government in Brunei has strongly invested in modernising the nation's ICT sector ("Assessing Brunei Darussalam Public and Private Sector Readiness Towards Big Data Application," 2022). The AITI plays pivotal role in the development of ICT infrastructure and ensuring communication networks secure and available for public use. The focus on infrastructure includes introducing cloud computing and organizing centralized databases, which supports consistent sharing and availability of information inside the government system. These new technologies supporting the functionalities of SSM, enabling efficient management of human resources tasks ("Assessing Brunei Darussalam Public and Private Sector Readiness Towards Big Data Application," 2022; Belyaeva et al., 2023).

# **3.3 Capacity Building and Training Programs**

Recognizing that technology is not enough for transformation, the Brunei government has prioritized capacity building among civil servants (Brix, 2019). Action plans aimed at enhancing digital literacy and equipping civil servants with necessary skills to navigate the new systems. Training sessions focusing on the functionalities of SSM, cybersecurity and data handling methods are conducted to ensure the users are confident utilizing the system. It is also proven that the government commitment in collaboration with educational institutions and international organizations to provide special training and certification (Akor et al., 2024). These efforts not only making adoption of e-HRM easier but also contribute to developing a digital competent workforce.

# 3.4 Data Security and Privacy Measures

It is important to ensure the security, privacy and sensitive data of employee in implementing e-HRM systems. The Brunei government has endorsed legislative measures to identify cybersecurity threats and protect personal data. According to Cybersecurity Act, steps should be taken to prevent, control, and resolve cybersecurity incidents that could influence national security and public safety. (*Home* | *Cyber Security Brunei*, n.d.).

Additionally, the PDPO, which is expected to be endorsed, will make sure private organisations in Brunei aligning to international standards for protecting personal data (Bakhrudin et al., 2023). Though the PDPO is mostly concerned with private companies, it sets guide and encourage policies to protect data in the public sector. Agency such as BruCERT (Brunei Computer Emergency Response Team) is one of the agencies designed by the government to monitor and respond to cybersecurity incidents, providing an added layer of protection for systems like SSM (*BruCERT* | *Cyber Security Brunei*, n.d.).

#### 3.5 Summary

The Brunei government's strategies in implementing e-HRM systems includes the development of policy frameworks, investment in technological infrastructure, capacity building initiatives, and proper data security measures. These intensive efforts are designed to ensure the successful deployment and adoption of systems like SSM, eventually contributing to the understanding of Brunei's vision of becoming a Smart Nation.





# 4. Challenges in the Transition from GEMS to SSM

The transition from Government Employee Management System (GEMS) to the Sistem Sumber Manusia (SSM) is significant transformation of digital within Brunei Darussalam's civil service infrastructure. This transition aligns with national ambitions under Brunei Vision 2035 and the Digital Masterplan 2025, even though has to face challenges during the implementation. Difficulties exist in technology, organizations' structure, and the way society is structured, reflecting the complexity to update legacy HR system in an administratively layered environment.

#### 4.1 System Integration and Interoperability Issues

It has been a major problem in migrating from GEMS to SSM exclusively on the integration of legacy data and interoperability between new and existing platforms. GEMS have been in operation for several years, their data structures and procedural workflows not easily modified to integrate SSM's new design. Technical issues such as data formatting inconsistencies, missing metadata, and mismatched records created data migration risks, including losing data or having repeated entries. In addition, interoperability with other e-Government platforms such as TAFIS 2.0 and Payroll system was critical. The absence of unified digital framework had to customize APIs (Application Programming Interfaces), resulting in delays and increased costs. These integration challenges not only slowed the deployment process but also frustrated users, which lessened their initial interest in the SSM rollout (Bradley, 2009; Hora, 2020; Kim, 2015; Nawaz et al., 2022).

#### 4.2 User Adaptation and Digital Literacy

Another significant problem was the varying levels of digital literacy among the civil servants across ministries. Adapting to the new system and navigating the SSM was easy for the younger as tech-savvy employees, but a big challenge for older employees. Even though training programmes were offered, they were not carried out uniformly across ministries, which led to inconsistent user readiness (Ritschel et al., 2022; Salas et al., 2012). This created disparities in usage patterns, particularly in HR departments with limited IT support. Culture also influenced the process of digital transformation. In many bureaucratic groups, especially those run by hierarchy, people may be reluctant to adapt, which keeps innovations from happening. Some employees still kept using manual methods, which reduced the new system's intended benefits of efficiency and centralisation.

#### 4.3 Organisational and Governance Challenges

The change was supported by members of several government agencies, including the Prime Minister's Office (PMO), Ministry of Finance and Economy (MOFE), and the Public Service Department (PSD). However, the lack of single centralised authority to monitor and enforce e-HRM protocols led to fragmented implementation timelines and varying levels of system customisation across ministries (Huo et al., 2024; Iqbal et al., 2018; Parry & Tyson, 2010). A few agencies concentrated on the SSM deployment as an isolated IT project instead of making it a company-wide transformation initiative and aligned their IT objectives with HR changes. Moreover, delaying and causing uncertainty among stakeholders was a result of the absence of proper formal change management frameworks (Jahan, 2023; Shaikh & Shar, 2023). The perception that the system was adopted from the top down without enough feedback loops further strained adoption efforts.

# 4.4 Data Privacy and Cybersecurity Concerns

Although the government has made in effort to enhance cybersecurity legislation, during the transitional period, some users expressed concern over the visibility and enforcements of data protection policies (Mollel & Rutenge, 2024; Poisat & Mey, 2017). Without real-time user feedback mechanisms or



transparent logs for access control, trust in the system's data security features was doubtful, particularly among users handling sensitive personnel files and financial records (Badii et al., 2020; Spiekermann, 2012). Overall, the transition from GEMS to SSM faced multi-dimensional challenges, both technical, organisational, and behavioural. While these difficulties are common in digital transformations, therefore, importance holistic planning with all ministries and continuous user engagement is needed to ensure the system's long-term sustainability and acceptance (Salas et al., 2012; Smidt et al., 2009).

# 5. Discussion

The transition from GEMS to SSM in Brunei's public sector e-HRM systems emphasizes that digital trust can be deliberately cultivated or weakened through government intervention. The base of the trust among people in digital systems is the strategic measures of the government which consists of the policy frameworks, infrastructure and cybersecurity measures. However, the effectiveness of these measures depends on the consistent implementation and communication across all ministries. Although the national direction is established in Digital Economy Masterplan 2025, trust ultimately achieved through operational coherence and procedural transparency. Ministries with stronger IT and proactive leadership showed higher level of adoption and satisfaction, indicating that the trust also depends on internal readiness and culture. According to digital governance theory, institutional trust needs visible state actions, such as functional helpdesks, secure access, and user support. Brunei's initiatives such as civil servant training and BruCERT are valuable but inconsistencies in delivery undermine their impact.

This paper also emphasises that capacity building needs to be continuous to keep pace with system changes and rising user expectations. Trust can be lessened without formal structures of feedback loops. Establishing performance monitoring and feedback mechanisms will improve system responsiveness and legitimacy. Finally, securing trust in e-HRM systems demands with multi-level governance approach that integrates infrastructures, legal frameworks, and user engagement.

#### 6. Conclusion

This research highlights the critical role of government measures on the significance of digital trust during Brunei's transition from GEMS to SSM. SSM reflects the nation's broader commitment to public sector digital transformation aligned to Brunei Vision 2035 and the Digital Economy Masterplan 2025. Even though efforts in combating the adoption have been witnessed in institutional reform and investment in infrastructure, as well as in cybersecurity, adoption remains uneven across ministries due to system integration challenges, digital literacy levels, and a lack of cohesive change management. The findings suggest a key principle such as interministerial coordination, and user engagement. The study highlights three priorities which are establishing a central e-HRM task force, institutional user feedback systems, and continuing targeted digital capacity development. These pillars serve to strengthen the effectiveness not only SSM but also position Brunei as a model for secure, trusted digital governance in the Southeast Asian region.

#### 7. References

 Akor, S. O., Nongo, C. J., Udofot, C., & Oladokun, B. D. (2024). Cybersecurity Awareness: Leveraging Emerging Technologies in the Security and Management of Libraries in Higher Education Institutions. *Sajs*. https://doi.org/10.25159/3005-4222/16671



# International Journal for Multidisciplinary Research (IJFMR)

E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

- 2. ASEAN Digital Masterplan 2025 ASEAN Main Portal. (n.d.). Retrieved June 15, 2025, from https://asean.org/book/asean-digital-masterplan-2025/
- 3. Assessing Brunei Darussalam Public and Private Sector Readiness Towards Big Data Application. (2022). International Journal of Asian Business and Information Management, 13(2), 0–0. https://doi.org/10.4018/ijabim.202208010a08
- Badii, C., Bellini, P., Difino, A., & Nesi, P. (2020). Smart City IoT Platform Respecting GDPR Privacy and Security Aspects. *Ieee Access*, 8, 23601–23623. https://doi.org/10.1109/access.2020.2968741
- Bakhrudin, B., Margolang, F. I., Sudarmanto, E., & Sugiono, S. (2023). Islamic Perspectives on Cybersecurity and Data Privacy: Legal and Ethical Implications. West Science Law and Human Rights, 1(04), 166–172. https://doi.org/10.58812/wslhr.v1i04.323
- 6. Bannister, F., & Connolly, R. (2011). Trust and transformational government: A proposed framework for research. *Government Information Quarterly*, *28*(2), 137–147.
- Belyaeva, M., Chernikova, E., Popov, A. A., & Nikitchuk, S. (2023). Digital Technologies in Management Tasks. *E3s Web of Conferences*, 413, 05001. https://doi.org/10.1051/e3sconf/202341305001
- 8. Bondarouk, T., & Ruël, H. (2013). The strategic value of e-HRM: results from an exploratory study in a governmental organization. *The International Journal of Human Resource Management*, 24(2), 391–414.
- 9. Bradley, J. (2009). *The Technology Acceptance Model and Other User Acceptance Theories*. 277–294. https://doi.org/10.4018/978-1-60566-659-4.ch015
- 10. Brix, J. (2019). Innovation Capacity Building. *The Learning Organization*, 26(1), 12–26. https://doi.org/10.1108/tlo-08-2018-0143
- 11. BruCERT | Cyber Security Brunei. (n.d.). Retrieved June 11, 2025, from https://csb.gov.bn/brucert
- Chin, P. P. L. (2021). Lessons (To Be) Learned? An Investigation of Online Learning During the COVID-19 School Closures in a Brunei Primary School. *International Journal of Education Training and Learning*, 5(1), 11. https://doi.org/10.33094/6.2017.2021.51.11.19
- 13. Constitution of Brunei Darussalam. (2025, January 8). Personal Data Protection Order, 2025. https://www.agc.gov.bn/AGC%20Images/LAWS/Gazette\_PDF/2025/EN/S%201\_2025%20[E].pdf
- 14. Cyber Security Brunei. (2023, May 20). *Cyber Security Chap* 272. https://www.csb.gov.bn/sites/default/files/downloads/CybersecurityAct/CAP\_272\_CYBERSECURI TY\_ACT.pdf
- 15. *Digital Economy Masterplan* 2025. (2020, April 13). https://www.mtic.gov.bn/Documents/de2025/Digital%20Economy%20Masterplan%202025.pdf#sea rch=masterplan
- 16. Home | Cyber Security Brunei. (n.d.). Retrieved June 11, 2025, from https://csb.gov.bn/
- Hora, A. (2020). APISonar: Mining API Usage Examples. Software Practice and Experience, 51(2), 319–352. https://doi.org/10.1002/spe.2906
- Huo, X., Ming, Q., & Wang, S. (2024). The Application of Electronic Human Resource Management Systems (E-Hrm) in HR Management. *Advances in Economics and Management Research*, 10(1), 316. https://doi.org/10.56028/aemr.10.1.316.2024



E-ISSN: 2582-2160 • Website: www.ijfmr.com • Email: editor@ijfmr.com

- Iqbal, N., Ahmad, M., Allen, M. M. C., & Raziq, M. M. (2018). Does E-HRM Improve Labour Productivity? A Study of Commercial Bank Workplaces in Pakistan. *Employee Relations*, 40(2), 281– 297. https://doi.org/10.1108/er-01-2017-0018
- Irmak, E., Kabalcı, E., & Kabalcı, Y. (2023). Digital Transformation of Microgrids: A Review of Design, Operation, Optimization, and Cybersecurity. *Energies*, 16(12), 4590. https://doi.org/10.3390/en16124590
- 21. Irwandi, I., Hidayati, H., & Lukman, L. (2023). Enhancing Digital Literacy Through English Language Teaching: A Needs Analysis for English Students at Muhammadiyah University of Mataram. Jurnal Ilmiah Mandala Education, 9(3). https://doi.org/10.58258/jime.v9i3.5782
- 22. Jahan, S. (2023). A Study on Electronic Human Resource Management (E-Hrm) Practices in Apex Footwear Limited. *Bangladesh Journal of Multidisciplinary Scientific Research*, 8(1), 27–33. https://doi.org/10.46281/bjmsr.v8i1.2162
- 23. Janssen, M., & Voort, H. (2020). Agile and adaptive governance in crisis response: Lessons from the COVID-19 pandemic. *International Journal of Information Management*, 55.
- 24. Kim, H. (2015). Acceptability Engineering: The Study of User Acceptance of Innovative Technologies. *Journal of Applied Research and Technology*, *13*(2), 230–237. https://doi.org/10.1016/j.jart.2015.06.001
- 25. Mollel, H. L., & Rutenge, M. M. (2024). Adoption and Use of Electronic Human Resources Management Systems for Service Delivery in Tanzania: A Case to Tanzania Airports Authority. *African Journal of Empirical Research*, 5(4), 617–626. https://doi.org/10.51867/ajernet.5.4.50
- 26. Nawaz, M. S., Khan, S. U. R., Hussain, S., & Iqbal, J. (2022). A Study on Application Programming Interface Recommendation: State-of-the-Art Techniques, Challenges and Future Directions. *Library Hi Tech*, 41(2), 355–385. https://doi.org/10.1108/lht-02-2022-0103
- 27. Nusir, M., Alshirah, M., & Alghsoon, R. (2023). Investigating Smart City Adoption From the Citizen's Insights: Empirical Evidence From the Jordan Context. *Peerj Computer Science*, *9*, e1289. https://doi.org/10.7717/peerj-cs.1289
- 28. Parry, E., & Tyson, S. (2010). Desired Goals and Actual Outcomes of E-HRM. *Human Resource Management Journal*, 21(3), 335–354. https://doi.org/10.1111/j.1748-8583.2010.00149.x
- 29. Poisat, P., & Mey, M. R. (2017). Electronic Human Resource Management: Enhancing or Entrancing? *Sa Journal of Human Resource Management*, *1*(2). https://doi.org/10.4102/sajhrm.v15i0.858
- 30. Ramadhan, I. (2022). ASEAN Consensus and Forming Cybersecurity Regulation in Southeast Asia. https://doi.org/10.4108/eai.31-3-2022.2320684
- 31. Ritschel, N., Sawant, A. A., Weintrop, D., Holmes, R., Bacchelli, A., Garcia, R., Chandrika, K. R., Mandal, A., Francis, P., & Shepherd, D. (2022). Training Industrial End-user Programmers With Interactive Tutorials. *Software Practice and Experience*, 53(3), 729–747. https://doi.org/10.1002/spe.3167
- 32. Salas, E., Tannenbaum, S. I., Kraiger, K., & Smith-Jentsch, K. A. (2012). The Science of Training and Development in Organizations. *Psychological Science in the Public Interest*, *13*(2), 74–101. https://doi.org/10.1177/1529100612436661
- 33. Shaikh, H., & Shar, A. H. (2023). *The Impact of E-HRM on Teacher Performance a Case of Higher Educational Institutions in Sindh Province*. 1(3), 131–140. https://doi.org/10.48112/tibss.v1i3.526



- 34. Smidt, A., Balandin, S., Sigafoos, J., & Reed, V. A. (2009). The Kirkpatrick Model: A Useful Tool for Evaluating Training Outcomes. *Journal of Intellectual & Developmental Disability*, 34(3), 266– 274. https://doi.org/10.1080/13668250903093125
- 35. Spiekermann, S. (2012). The Challenges of Privacy by Design. *Communications of the Acm*, 55(7), 38–40. https://doi.org/10.1145/2209249.2209263
- Weerakkody, V., Irani, Z., Kapoor, K., Sivarajah, U., & Dwivedi, Y. K. (2017). Open data and its usability: an empirical view from the Citizen's perspective. *Information Systems Frontiers*, 19, 285–300.
- 37. Willems, T., & Graham, C. (2019). The Imagination of Singapore's Smart Nation as Digital Infrastructure: Rendering (Digital) Work Invisible. *East Asian Science Technology and Society an International Journal*, 13(4), 511–536. https://doi.org/10.1215/18752160-8005194
- 38. Wongwuttiwat, J., Lawanna, T., & Tantontrakul, T. (2023). The State of Digital Technology and Innovation Development: The Comparative Position of Thailand in <scp>ASEAN</Scp>. The Electronic Journal of Information Systems in Developing Countries, 90(4). https://doi.org/10.1002/isd2.12311
- 39. Zulianto, M. (2024a). ASEAN Digital Economy Framework Agreement (DEFA): Opportunities and Challenges for Vietnam. *Asia-Pacific Journal of Public Policy*, *10*(1), 53–62. https://doi.org/10.52137/apjpp.v10i1.214
- 40. Zulianto, M. (2024b). ASEAN Digital Economy Framework Agreement (DEFA): Opportunities and Challenges for Vietnam. *Asia-Pacific Journal of Public Policy*, *10*(1), 53–62. https://doi.org/10.52137/apjpp.v10i1.214