



## **Competency-Based Development for Technical Service Personnel at PT Haleyora Power: Semester II 2025 - 2027**

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**Kata Kunci**

Ketenagalistrikan, PLN Mobile, Pelayanan Teknik, Kompetensi, Pengembangan SDM Strategis

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**ABSTRAK**

PT Haleyora Power, anak perusahaan PLN, menyediakan layanan operasi dan pemeliharaan di sektor transmisi dan distribusi untuk wilayah Sumatera, Jawa, dan Bali, dengan layanan utama berupa Pelayanan Teknik (Yantek). Dalam transformasi PLN 2.0, Yantek berperan penting dalam mencapai inisiatif Digital Moonshot, khususnya melalui Turbocharge PLN Mobile. Namun, PT Haleyora menghadapi tantangan dalam mencapai KPI terkait durasi pemadaman dan waktu tanggap akibat kurangnya kompetensi petugas Yantek dalam beradaptasi dengan digitalisasi, yang berdampak pada kualitas layanan pelanggan yang diukur melalui aplikasi PLN Mobile. Penelitian ini bertujuan merumuskan strategi berbasis kompetensi untuk meningkatkan keterampilan petugas Yantek dalam mengadaptasi alat digital baru dan proses kerja untuk meningkatkan kinerja dan kualitas layanan pelanggan. Penelitian ini menggunakan pendekatan kualitatif, dengan fokus pada pelatihan intensif aplikasi digital baru, perubahan proses kerja, dan peningkatan keterampilan teknis, serta evaluasi kompetensi secara berkala untuk memastikan kesesuaian dengan tuntutan transformasi PLN. Hasil penelitian menunjukkan bahwa strategi ini berhasil meningkatkan keterampilan petugas Yantek, memungkinkan mereka memenuhi KPI dan meningkatkan kualitas layanan pelanggan melalui PLN Mobile. Kesimpulannya, pengembangan berbasis kompetensi sangat penting untuk meningkatkan kinerja dan mencapai tujuan transformasi digital PLN. Implementasi strategi ini diharapkan meningkatkan efisiensi operasional, meningkatkan layanan pelanggan, dan mendukung keberhasilan inisiatif transformasi digital PLN.

**Keywords:**

*Electricity Services, PLN Mobile, Technical Services, Competency, Strategic Human Resource Development.*

**ABSTRACT**

PT Haleyora Power, a subsidiary of PLN, provides operation and maintenance services in the transmission and distribution sector across Sumatra, Java, and Bali, with its key service being Technical Services (Yantek). In PLN's 2.0 transformation, Yantek plays a significant role in achieving the Digital Moonshot initiative, particularly through Turbocharging PLN Mobile. However, PT Haleyora faces challenges in meeting key performance indicators (KPIs) related to outage duration and response time due to a lack of competence among Yantek personnel in adapting to digitalization, which impacts customer service quality as measured by the PLN Mobile app. This research aims to develop a competency-based strategy for enhancing Yantek personnel's skills in adapting to new digital tools and

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processes to improve their performance and customer service. The study adopts a qualitative approach, focusing on intensive training on new digital applications, work process changes, and technical skills enhancement, with periodic competency evaluations to ensure alignment with PLN's transformation demands. The findings show that this strategy successfully enhanced Yantek personnel's skills, enabling them to meet KPIs and improve customer service quality via PLN Mobile. In conclusion, competency-based development is crucial for improving performance and achieving PLN's digital transformation goals. The implementation of this strategy is expected to enhance operational efficiency, improve customer service, and contribute to the success of PLN's digital initiatives.

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## INTRODUCTION

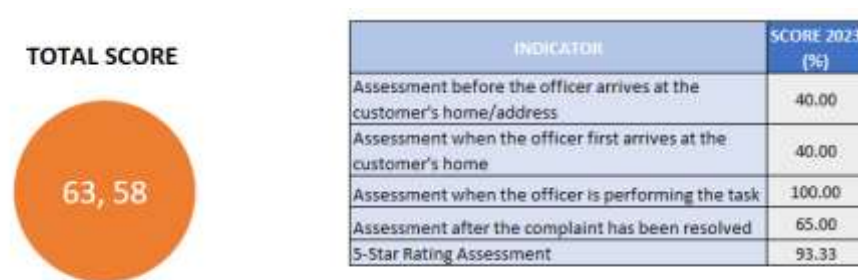
Prior to the implementation of PLN Transformation 1.0, public trust in PLN was significantly low (Ahmadi et al., 2023; Andrian & Hardoyo, 2020; Aneta et al., 2014; Karisma et al., 2023; Satria et al., 2024). News coverage related to power outages frequently dominated national media, culminating in a public reprimand from the President of the Republic of Indonesia at PLN's headquarters. In response, the Minister of State-Owned Enterprises, Mr. Erick Thohir, issued a clear directive to PLN's Board of Directors: "PLN must undergo transformation, digitalization, and efficiency to confront the era of technological disruption and energy transition." This directive was welcomed by PLN's leadership—first under the direction of Mr. Zulkifli Zaini and later by Mr. Darmawan Prasodjo, the current President Director—through the launch and execution of PLN Transformation 1.0.

PLN has launched a digital transformation and operational efficiency initiative through the "PLN Transformation 1.0" program, which is in line with global trends toward decarbonization, digitalization, and decentralization in the electricity industry (Armanda & Pawenary, 2023; Zainal-Arifin et al., 2019). This initiative includes the digitalization of power plants, distribution, and smart grid systems to improve the reliability, efficiency, and flexibility of PLN's network (Armanda & Pawenary, 2023; Setyawati, 2023). PLN has also partnered with Huawei in the implementation of digital infrastructure such as digital substations and smart grids for network modernization and broadband electricity development (Huawei & PLN, 2022). The application of this technology supports the use of AI for maintenance prediction, real-time load management, and improved customer service through the PLN Mobile app, which has proven to increase user satisfaction (Brdesee, 2021; Kuhlmann & Heuberger, 2023; Llopis-Albert et al., 2021; Saarikko et al., 2020; Shehadeh et al., 2023; Yang et al., 2023). On a macro level, these technological developments also support Indonesia's energy transition toward low-carbon, although regulatory and commercialization challenges remain significant (Resosudarmo et al., 2023).

On the 78th National Electricity Day (Hari Listrik Nasional) in 2023, PT PLN (Persero) officially launched PLN Transformation 2.0, guided by the PLN 2027 vision: "To become a Top 500 Global Company and the #1 customer choice for energy

solutions.” This new phase of transformation focuses on four strategic pillars (Moonshots): Growth Moonshots, Digital Moonshots, Net Zero Emissions (NZE) Moonshots, and the enabling platform known as Moonshot Launchpad. According to the official dissemination materials on PLN Transformation 2.0 (illustrated in Figure 1.2), one of the core initiatives is the development of the New PLN Mobile application—a milestone in PLN’s digital service transformation. Previously, PLN services were often perceived as complex and non-transparent. With PLN Mobile, services have become streamlined, transparent, and responsive.

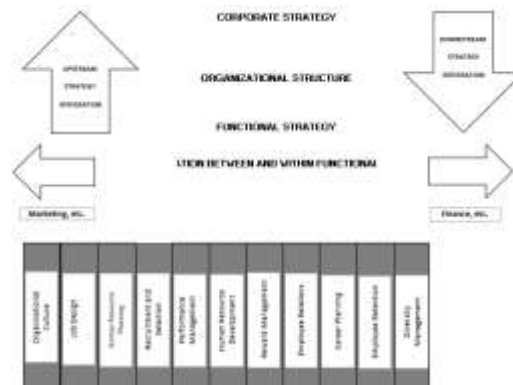
PT Haleyora Power, as a subsidiary of PLN, has been mandated to provide operation and maintenance services in the transmission and distribution sectors for the Sumatra, Java, and Bali regions. This mandate is regulated under the PLN Board of Directors’ Regulation No. 0030.P/DIR/2017 dated April 18, 2017, which amends Regulation No. 0734.K/DIR/2013 on the Security of Operation and Maintenance Services for Electricity Transmission and Distribution. One of the key service products in the distribution sector is Technical Services (Yantek). As a PLN subsidiary, PT Haleyora Power holds the majority market share for Yantek services in Sumatra, Java, and Bali—regions where 79.71% of PLN’s customers are located.



Note: The overall score is the sum of each parameter's score multiplied by its respective weight

**Figure 1. Mysteri Guest Result on Technical Services**

Despite its critical role, PT Haleyora Power still faces Opportunities for Improvement (OFIs) in the implementation of OMYO (Outage Management and Yantek Optimization), particularly in enhancing the competencies of Yantek personnel in handling customer service during power outages. Several OFIs are related to limited proficiency in using digital applications among Yantek personnel. Based on the PT PLN (Persero) Competency Directory, 8th Edition, 2021, several competencies identified for improvement include: Digital Orientation (DOR), Work Standards (WST), Adaptability (ADA), and Continuous Learning (CLE). One significant performance issue is when Yantek personnel arrive at a customer's residence without mentioning the customer's name or ID—despite this information being available in the PLN Mobile app—indicating a lack of application mastery.



**Figure 2. Strategic Integration Standard**

These challenges highlight the urgent need for a strategic approach to competency-based development of Yantek personnel at PT Haleyora Power. This study aims to formulate a structured development strategy for Yantek personnel for the period 2025–2027, in order to support PLN Transformation 2.0, particularly in achieving the Digital Moonshots pillar through the Turbocharge PLN Mobile initiative.

Previous studies have examined the impact of digital transformation on operational efficiency, particularly within utility sectors. For example, Lusch and Nambisan (2015) discuss the shift toward digital platforms in service-oriented industries, noting the importance of employee digital orientation and the role of technology in enhancing service delivery. However, while this research emphasizes the broader role of digital platforms in improving business outcomes, it does not specifically address the competency gap among employees in the electricity sector, particularly those handling customer-facing services during outages. Another relevant study by Elia et al. (2020) looks at the adaptation of utilities to digital transformation, focusing on the skills required to utilize new technologies effectively. They highlight that a lack of employee readiness, particularly in adapting to digital tools, can significantly hinder the successful implementation of digital services. However, their study does not delve deeply into the structured strategies for competency development in the context of critical service areas, such as outage management and technical services.

This study aims to develop a competency-based development strategy for Yantek personnel at PT Haleyora Power to support the implementation of PLN Transformation 2.0, specifically focusing on achieving the Digital Moonshots pillar through the Turbocharge PLN Mobile initiative. The strategy includes targeted training on digital applications, work standards, adaptability, and continuous learning to enhance the operational effectiveness of Yantek personnel during power outages. The findings from this research will provide actionable insights for PT Haleyora Power and PLN to improve service delivery, operational efficiency, and customer satisfaction through better utilization of digital tools, ultimately contributing to the success of PLN’s digital transformation goals.

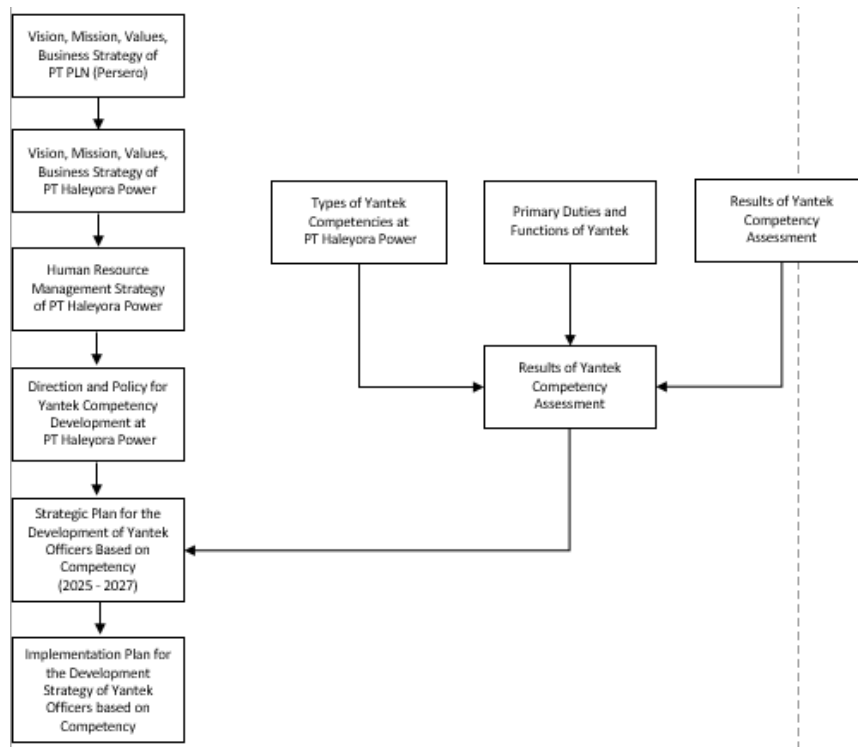


Figure 3. Conceptual Framework

## METHOD

This thesis employs a qualitative research method. Qualitative research is descriptive and subjective in nature. Data collection for qualitative research is conducted through interviews, observations, and document studies. Primary data refers to data obtained directly through interviews or questionnaires administered to informants. The primary data used in this thesis was collected from interviews with the Acting President Director, Director of Operations, Director of Finance and Human Resources, Vice President of Human Capital Management, Vice President of Operations, Manager of UP 5, and Manager of UP 7. Secondary data refers to data obtained indirectly, such as documents from PT Haleiyora Power and PT PLN (Persero). This thesis uses secondary data in the form of human capital development data from PT Haleiyora Power and data related to the Transformation 2.0 program at PT PLN (Persero).

The interviews were conducted to obtain firsthand information from key informants. Interviews with the Acting President Director, Director of Operations, and Director of Finance and Human Resources aimed to gather information about the process of cascading the Transformation 2.0 program of PT PLN (Persero) into PT Haleiyora Power. Meanwhile, interviews with the Vice President of Human Capital Management, Vice President of Operations, Manager of UP 5, and Manager of UP 7 were conducted to obtain information about the entire Human Capital Transformation process at PT Haleiyora Power and the direction of Competency-Based Development for Yantek Personnel.

The data analysis in this research was carried out by analyzing the results of

interviews and internal document studies. Interview data was transcribed verbatim, categorized based on specific codes, and then compared with other document sources. The final stage involved data analysis and drawing conclusions based on the interpreted data. The analysis was divided into three stages:

To explore issues related to Yantek (technical services), interviews were conducted with the Acting President Director, Director of Operations, Director of Finance and Human Resources, Vice President of Human Capital Management, Vice President of Operations, Manager of UP 2, Manager of UP 5, and Manager of UP 7. The interview results were used to analyze the data, beginning with collecting and organizing the data for use in the thesis.

Competency analysis was carried out based on interview results and the study of internal documents. The goal of the competency analysis was to determine the competency requirements for Yantek personnel within PLN, including identifying competency needs by comparing corporate competency lists with reference Yantek competency lists and also PT Haleyora Power has existing Yantek competency measurement results that were used to assess existing competency gaps.

The implementation of Yantek competency development strategies was identified through interviews and internal document reviews from PT Haleyora Power. A general overview of the data processing is presented in the following table:

This involved reviewing HR policy documents submitted to the Board of Commissioners and conducting interviews with the Acting President Director, Director of Operations, Director of Finance and Human Resources, VP of Operations, and VP of Human Capital Management to understand PT Haleyora Power's strategies for developing Yantek personnel.

Interviews and questionnaires were conducted with SRM Distribution and Network Assistant Managers (Asman Jaringan), along with a review of documents outlining the main duties and functions of Yantek personnel.

## RESULT AND DISCUSSION

### Respondent Profiles

Interviews were conducted with eight informants from different business units in Jakarta from January to April, 2024.

**Table 1. List of Interview Informants**

Source Person	Required Information
Acting President Director, Director of Operations, and Director of Finance and Human Resources	Vision, mission, values, business strategy, and human resource management of PT Haleyora Power
<i>Vice President</i> of Human Capital Management, <i>Vice President</i> of Operations, UP 5 Manager, and UP 7 Manager	Competency-Based Development of Yantek Personnel

Source: processed data

### **Analysis Opportunity Identification & Selection**

The Focus Group Discussion (FGD) was conducted with the aim of aligning perspectives on issues and topics related to the competency development of Yantek personnel, with the hope of reaching consensus and gaining new insights regarding the discussed matters. FGD participants included:

- Senior Managers (SRM) of Distribution at PT PLN (Persero) UID Jakarta Raya, PT PLN (Persero) UID Lampung, and PT PLN (Persero) UID Central Java and the Special Region of Yogyakarta
- Operations and Maintenance Managers at PT PLN (Persero) UID Jakarta Raya, PT PLN (Persero) UID Lampung, and PT PLN (Persero) UID Central Java and the Special Region of Yogyakarta
- Assistant Network Managers at PT PLN (Persero) UID Jakarta Raya and UID Central Java and Yogyakarta, and Assistant Manager of Network and Construction at PT PLN (Persero) UID Lampung

A document study was conducted to obtain information by reviewing literature relevant to this thesis. The document sources used in this study included:

- Data on the vision and mission of PT PLN (Persero)
- Data on the core values of PT PLN (Persero)
- Data on the business strategy of PT PLN (Persero)
- Data on the vision and mission of PT Haleyora Power
- Data on the core values of PT Haleyora Power
- Data on the business strategy of PT Haleyora Power
- Data related to human resource management strategies at PT Haleyora Power
- Data on the Yantek Competency Directory of PT Haleyora Power
- Results of competency assessments of Yantek personnel at PT Haleyora Power
- Data on the duties and main functions of Yantek personnel at PT Haleyora Power

### **Direction and Policy of Yantek Competency Development at PT Haleyora Power**

The competency assessment of Yantek personnel aims to evaluate their technical abilities, understanding of occupational safety procedures, and skills in efficiently and promptly handling power grid disturbances, while also providing excellent customer service based on digital transformation principles. Through this assessment, management ensures that each technician is prepared to face various challenges in line with the company's vision and mission. Competency assessments are conducted at each UP3 and UID/W level. Thus, PT Haleyora Power is expected to develop a professional and competent workforce to support the reliability of the power system.

To identify the competency gaps among technical service personnel, an in-depth classification of hard and soft competencies is required, referring to the 2021 PLN

Competency Directory. This directory is a comprehensive reference that contains all competencies, including behavioral (soft) and technical (hard) competencies, needed by the organization to fulfill its mission and vision. It includes Job Competency Requirements (KKJ) and Individual Competencies (KI). KKJ refers to the competencies required for each position, which include core, role, and functional competencies. KI refers to the competencies possessed by individual employees, derived from assessments using standardized tools and aligned with the Competency Directory and KKJ. The use of the 2021 PLN Competency Directory aims to identify key capabilities and behaviors that contribute to the success of personnel in performing their duties. Standardized language and understanding of competencies then serve as a reference or benchmark for discussing, interpreting, and measuring specific competencies.

### Yantek Competency Gaps at PT Haleyora Power

Based on analysis of secondary data and interviews with the directors of PT Haleyora Power, several competency gaps were identified regarding the expected competencies of Yantek personnel. By 2027, in an era of increasingly dynamic, digitally-driven industry transformation, several competencies must be classified as critical. These include:

- **Core Competencies:** Analysis (ANA), Digital Orientation (DOR)
- **Role Competencies:** Work Standards (WST)
- **Behavioral Competencies:** Adaptability (ADA), Customer Experience Excellence (CEE)
- **Functional Competencies:** Collaboration (COL), Building Trust (BTR), Continuous Learning (CLE)



Figure 4. Composition of Competencies VS Gap

Source: processed data

During the FGD, it was also noted that the types of competencies required until 2027 are sufficient. However, there is a need to raise the competency level of CEE from level 1 to at least level 3, meaning Yantek personnel must be capable of recommending and developing customer service systems. Similarly, DOR must be elevated from level

2 to level 3, where personnel can actively review implementation and provide development recommendations.

From this competency gap analysis, the necessary training and educational interventions can be mapped, as recommended by the Human Talent Development (HTD) division or PLN's Training and Education Center (Pusdiklat), aligned with each unit's competency needs.

### Competency-Based Development Strategy Design for Yantek Personnel (Semester II 2025–2027)

Based on strategic objectives, this research proposes a competency-based development strategy for Yantek personnel, within the defined research scope. The strategic goals are translated into specific strategic actions, each accompanied by measurable success indicators to evaluate implementation performance. These actions are broken down into structured activities, including preparation, implementation, and evaluation stages. Each activity stage is assigned a responsible person (PIC) based on the relevant field of expertise.

**Table 2. HR Management Strategy and Yantek Competency Direction**

	<b>Service Quality and Maintaining Competence</b>	1. Delegation can be executed in a short time
		2. Assurance of service quality (goods and services)
		3. Following trends in the sector and balancing vendor rotation in AP
		4. Maintaining electricity sector competence remains within the PLN Group
<b>Securing Core Business of PLN</b>	<b>Business Process Digitalization</b>	1. Digitalization of reports by field officers using mobile apps to support K3 (occupational health and safety) and performance (YO, MO, TO)
		2. Smart Supply Chain (in progress)
		3. Home 4.0 as a portal for employees and organization planning (roadmap stage 2)
	<b>Management and Support System</b>	1. Project management supported by internal units (7 UP and 48 UL)
		2. Stakeholder Management System and Customer Information System
		3. Skills Management (Upskilling and Reskilling) with structured development through online learning modules
		1. Guarantee of employment fulfillment according to contract agreements

<b>Compliance with Regulations</b>	2. Fulfillment of technical competence development through technical certification and training
<b>Retail Electricity Business</b>	1. Retail Electricity Services 2. Priority Customer Asset Management 3. EV Ecosystem (Home Charging and Public Charging Stations)

Source: processed data

The implementation of Yantek competency development strategy requires well-defined and measurable phases. The implementation plan ensures systematic, measurable, and sustainable human resource capability enhancement. For the four identified competency gaps, the strategy emphasizes not only technical skill improvement but also the strengthening of soft skills, understanding of updated work standards, and adaptation to technological advancements.

The stages include identifying training needs, designing appropriate training models, collecting feedback, and revising training modules if necessary. Key activities include assessing competency gaps through performance data, preparing relevant training materials, and developing modules, e-learning platforms, and supporting tools. This phase spans from Q3 to Q4 of 2025.

#### 1. **Implementation-Stage**

This involves delivering training, active learning sessions, and technical assistance such as coaching and mentoring by senior personnel or instructors. Scheduling and module integration into e-learning platforms, sourcing trainers, and securing facilities take place in Q4 of 2026. Formal training begins in Q1 of 2027, followed by evaluation of training outcomes and periodic progress reporting.

#### 2. **Evaluation-Stage**

Begins with the development of an evaluation framework to measure the impact on personnel behavior using Yantek report cards, and ends with the preparation of a final training program report. This phase runs from Q3 to Q4 of 2027. Evaluation determines whether the competency training improved field performance. The final report includes follow-up and continuous development plans, including additional training sessions, supplementary modules, or enhanced mentoring at the unit level.

From the results of interviews to informants from IT Management, Business Customers Human Capital, and Finance Functions according to the opportunity identification & selection analysis stage consisting of customer analysis, audit resources and corporate planning input. Furthermore, it can be concluded that the criteria needed in the development of data analytics platforms to support.

## CONCLUSION

In conclusion, the implementation of a competency-based development strategy for Technical Service (Yantek) personnel at PT Haleyora Power is critical for aligning

with PT PLN (Persero)'s 2027 vision of becoming a Global Top 500 Company and the #1 customer choice for energy solutions. This research has identified key competencies required for improving the operational effectiveness and customer service of Yantek personnel, particularly in areas such as work standards, continuous learning, customer experience excellence, adaptability, and digital orientation. The proposed strategy, which includes the use of e-learning platforms, performance measurement, and a reward system, offers a structured approach to addressing competency gaps and ensuring the workforce is equipped to meet future challenges. PT Haleyora Power's commitment to aligning its human resource development with the organizational vision has contributed to building a competent and sustainable workforce that supports the broader goals of PLN Transformation 2.0.

Future research could explore the long-term impact of competency development strategies on employee retention, customer satisfaction, and operational performance. Additionally, studies could investigate the integration of advanced technologies, such as artificial intelligence and machine learning, in further enhancing the competency development process. Finally, future research could assess the scalability of this competency-based model across other subsidiaries within PLN to ensure a unified and efficient approach to human resource development throughout the organization.

## REFERENCES

- Ahmadi, H., Sunitiyoso, Y., & Wicaksono, A. (2023). Scenario Planning of PLN Indonesia Power in 2030: To be a leading green and sustainable power generation company. *European Journal of Business and Management Research*, 8(4). <https://doi.org/10.24018/ejbmr.2023.8.4.2016>
- Andrian, R. C., & Hardoyo, A. (2020). A low-cost IoT WiFi solution for remote management and analysis residential usage of energy. In *Proceeding - 2nd International Conference on Technology and Policy in Electric Power and Energy, ICT-PEP 2020*. <https://doi.org/10.1109/ICT-PEP50916.2020.9249894>
- Aneta, Y., Akib, H., Kadji, Y., & Basri, M. (2014). Organizational transformation: The revitalization of the role and function for human resources (Case study of PT. PLN Area Gorontalo). *International Journal of Academic Research*, 6(3). <https://doi.org/10.7813/2075-4124.2014/6-3/B.19>
- Armanda, D. R., & Pawenary. (2023). Conventional substation upgrading plans into digital substations in Sulawesi – Indonesia. *SINERGI*, 27(2), 249–260.
- Brdese, H. (2021). A divergent view of the impact of digital transformation on academic organizational and spending efficiency: A review and analytical study on a university E-service. *Sustainability (Switzerland)*, 13(13). <https://doi.org/10.3390/su13137048>
- Elia, G., Margherita, A., & Passiante, G. (2020). Digital transformation in utilities: A skills perspective. *Technological Forecasting and Social Change*, 155, 119998. <https://doi.org/10.1016/j.techfore.2020.119998>
- Karisma, L., Harmen, H., & Honneyta Lubis, P. (2023). The influence of employee readiness and organizational readiness on organizational transformation and its

- impact on the performance of PT PLN (Persero) Aceh Regional Main Unit. *International Journal of Business Management and Economic Review*, 6(2). <https://doi.org/10.35409/ijbmer.2023.3474>
- Kuhlmann, S., & Heuberger, M. (2023). Digital transformation going local: Implementation, impacts and constraints from a German perspective. *Public Money and Management*, 43(2). <https://doi.org/10.1080/09540962.2021.1939584>
- Llopis-Albert, C., Rubio, F., & Valero, F. (2021). Impact of digital transformation on the automotive industry. *Technological Forecasting and Social Change*, 162, 120343. <https://doi.org/10.1016/j.techfore.2020.120343>
- Lusch, R. F., & Nambisan, S. (2015). Service innovation: A service-dominant logic perspective. *MIS Quarterly*, 39(1), 155–175. <https://doi.org/10.25300/MISQ/2015/39.1.08>
- Resosudarmo, B. P., Rezki, J. F., & Effendi, Y. (2023). Prospects of energy transition in Indonesia. *Bulletin of Indonesian Economic Studies*, 59(2), 149–177.
- Saarikko, T., Westergren, U. H., & Blomquist, T. (2020). Digital transformation: Five recommendations for the digitally conscious firm. *Business Horizons*, 63(6), 825–839.
- Satria, A., Faisal, & Sakir, A. (2024). The effect of implementation of 4 Disciplines of Execution of millennial leaders in the transformation era on employees' work effectiveness of PT PLN (Persero) UP3 Lhokseumawe. *International Journal of Scientific Research and Management (IJSRM)*, 12(03). <https://doi.org/10.18535/ijserm/v12i03.em08>
- Setyawati, D. (Ed.). (2023). *State of the art Indonesia energy transition*. In *Social acceptance and energy systems*. Springer. <https://link.springer.com>
- Shehadeh, M., Almohtaseb, A., Aldehayyat, J., & Abu-ALSondos, I. A. (2023). Digital transformation and competitive advantage in the service sector: A moderated-mediation model. *Sustainability (Switzerland)*, 15(3). <https://doi.org/10.3390/su15032077>
- Yang, Y., Chen, N., & Chen, H. (2023). The digital platform, enterprise digital transformation, and enterprise performance of cross-border e-commerce—From the perspective of digital transformation and data elements. *Journal of Theoretical and Applied Electronic Commerce Research*, 18(2). <https://doi.org/10.3390/jtaer18020040>
- Zainal Arifin, et al. (2019). Digitalization on power utility in Indonesia: Threat and opportunity. Paper presented at the 74th National Electricity Day Conference.