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Business Strategy And Sustainable Digital Transformation With Swot Analysis At PT PLN (Persero) Certification Center

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Abstract. The contemporary global economy, driven by digital transformation, positions digitalization as a strategic imperative, especially within the Testing, Inspection, and Certification (TIC) services sector. PT PLN (Persero) Certification Center (Pusertif) has responded to this need by implementing the PICTS (Pusertif Inspection Certification and Testing Service) system, an integrated platform designed to digitalize TIC services end-to-end. The primary goal of this implementation is to overcome challenges such as manual processes, limited service visibility, and the need for real-time data. This research utilized a qualitative descriptive approach, gathering data through interviews, surveys, observation, and literature studies, and then analyzing it using the SWOT framework to formulate innovation strategies. The analysis indicates that PICTS is a structured action aimed at maximizing competitive advantage and mitigating internal/external issues. The TOWS Matrix yielded four main strategies: Digital Service Expansion (SO), leveraging accredited human resources for market expansion; End-to-End Process Digitalization (WO), utilizing Business Process Reengineering (BPR) to address human resource limitations; Enhanced Collaboration (ST), strengthening customer loyalty against the threat of new competitors; and Adoption of Single Source of Truth (SSOT) (WT), ensuring data consistency in the face of dynamic regulations. Essentially, PICTS serves as a crucial enabler that significantly enhances the speed, transparency, and accountability of TIC services, making it a vital pillar in PLN's Transformation agenda.

Keywords: *Digital Transformation; PICTS; Testing, Inspection, and Certification (TIC); SWOT Analysis; Single Source of Truth (SSOT).*

INTRODUCTION

The contemporary global economy is characterized by the substantial influence of digital technology. This innovation is aggressively transforming operational methodologies and business practices across sectors, leading to increased corporate efficiency and the acceleration of innovation across the entire spectrum of economic activity (Robiul Rochmawati et al., 2023). In this era of globalization, digital transformation is recognized as a fundamental process in business development, especially dynamic in Indonesia, driven by the accelerated use of technology in various sectors and the continuous increase in market competition (Adiandari & Rai, 2022). The dominance of all-digital and electronic activities, underpinned by data as its

primary asset, has erased the boundaries of space and time in individual interactions. Consequently, market players can execute electronic transactions universally (anywhere, anytime) (Mahera & Suryadi, 2025). Digital monetary systems take a central role in this ecosystem, automating everything from employee remuneration to trading activities and other value exchange processes digitally. This transition is driven by the inherent attributes of digital technology which offer enhanced speed, effectiveness, and operational efficiency (Siregar & Rahmayati, 2023). Amidst this landscape, the electricity system, as a vital infrastructure, requires a high level of quality control and operational reliability. Thus, for PT PLN (Persero), ensuring quality and reliability is a top priority to prevent massive economic losses and disruptions to public services.

PT PLN (Persero) Certification Center (Pusertif) functions as the implementing unit for internal and external TIC (Testing, Inspection, and Certification) services. In alignment with PLN's overarching Transformation agenda (which promotes Green, Lean, Innovative, and Customer Focused aspirations), digitalization for Pusertif has become a necessity, not an option. In the face of Industry 4.0 dynamics, conventional business processes that are manual, paper-based, and prone to inefficiency are no longer adequate. To achieve globally recognized accountability, transparency, and service speed, Pusertif launched PICTS (Pusertif Inspection Certification and Testing Service), an integrated digital application. PICTS is designed to transform inspection, certification, and testing services from manual processes into online, fast, transparent, and accountable ones. Its primary innovation is providing a single platform with a Single Source of Truth that covers all Pusertif business processes (Customer Service, Finance, Commissioning, Certification, Testing, and Calibration), allowing applicants, PLN internal staff, and external parties to monitor job progress in realtime and efficiently, while also recording the duration of each process for performance improvement.

Despite the launch of PICTS, significant challenges persist, particularly because many customers are not yet fully accustomed to or understanding of the digital transformation, potentially threatening Pusertif's existence. To sustain its presence, continuous innovation in the customer service system is required to comprehensively digitalize process workflows, increase service speed, strengthen internal monitoring, and open up two-way real-time communication access between customers and job implementers. This research is motivated by academic interest in analyzing the application of the SWOT framework within the context of Business and Digital Transformation at PT PLN (Persero) Pusertif. This Digital Transformation SWOT Analysis holds strategic relevance for achieving optimal performance—by capitalizing on internal Strengths, mitigating internal Weaknesses, proactively exploiting market Opportunities, and neutralizing potential external Threats. Essentially, the SWOT method serves as a vital tool in the formulation and determination of fundamental strategy, ensuring the consolidation of competitive advantage, correction of internal disparities, and protection from internal risks and external competitive threats.

LITERATURE REVIEW

Digital Transformation in TIC Services

Digital transformation is not merely a trend; it has become a strategic necessity for both public and private organizations to enhance efficiency, accuracy, and service responsiveness. In the context of Testing, Inspection, and Certification (TIC) services within PT PLN (Persero) Certification Center, digital transformation plays a crucial role in addressing challenges such as manual processes, limited service visibility, and customer demands for transparency and real-time data-based services. As stated by (Rothaermel, 2021), advancements in digital technology drive the convergence of information systems, accelerate data exchange, and enable the automation of business processes. This supports operational efficiency and improves user experience. In practice, digital transformation requires the integration of technology (AI, CRM, ERP), streamlined business processes, and accountable data governance. This digitalization aligns with the policy of the Ministry of State-Owned Enterprises (SOEs) (Sustainable BUMN Transformation) and PLN's internal Transformation 2.0 agenda, specifically under the Digital Moonshots pillar. Several priority

initiatives within this pillar include the digitalization of all business lines, including supporting units like Pusertif, through concepts such as Smart Power Plant, Smart Grid, Smart Customer Services, and others.

A key element of this transformation is the implementation of a Single Source of Truth (SSoT), a data integration system that consolidates all information into one reliable source. SSoT aims to overcome data duplication, delayed reporting, lack of transparency, and the disjointed nature of existing systems (such as SAP and AMS). With SSoT, decision-making will be based on measurable and real-time data. At Pusertif, the answer to this integration need is the PICTS (Pusertif Inspection Certification and Testing Services) system. PICTS is an end-to-end TIC service platform, covering applications, test execution, and results reporting. The system is equipped with tracking features, an SLA dashboard, and digital notifications to support service speed and transparency. Similar success is expected at Pusertif, mirroring the success of PLN Mobile, which has increased customer satisfaction and accelerated complaint response times (PLN, 2022). The success of public service digitalization is influenced by the readiness of ICT infrastructure, the competency of Human Resources, and regulatory support. Success also depends on cross-unit integration, business process reform, continuous training, and improved digital literacy (Kementerian Pendayagunaan Aparatur Negara dan Reformasi Birokrasi, 2021). PICTS is designed as part of this transformation, oriented towards a digital work culture and quality. A successful example of digitalization at PLN is PLN Mobile, which managed to reduce complaint response time by 45% and increase the customer satisfaction index above 85%.

Quality Management in TIC Services

Quality management is the main foundation of Testing, Inspection, and Certification (TIC) services, aiming to guarantee the reliability of test results and the accountability of processes. The PICTS system is built upon the principles of ISO 9001:2015, which emphasizes a process-based approach and continuous improvement through the Plan-Do-Check-Act (PDCA) cycle. The relevant ISO 9001 principles implemented through PICTS include: Customer Focus (responding to the needs for transparency and response speed), Leadership (supervised by management as a commitment to PLN 2.0's Digital Moonshots), and Process Approach (digitalizing the end-to-end TIC service workflow to ensure real-time documented processes). Furthermore, there is Continuous Improvement (supported by SLA monitoring and the PDCA cycle), Evidence-based Decision Making (managerial dashboards for objective performance metrics), and Relationship Management (a collaborative platform connected to customers and external systems like SIUJANG GATRIK and SMAR PLN).

Digital System Development Approach for PICTS

PICTS was developed using an integrated framework that focuses on users and process efficiency, not just technology. This approach involves three main frameworks. First, Design Thinking, a five-stage human-centered innovation framework (Empathize, Define, Ideate, Prototype, Test), which ensures the PICTS solution is rooted in end-user needs and enhances the user experience. Second, Business Process Reengineering (BPR), which promotes the complete reorganization of traditional business workflows to achieve significant changes in performance and efficiency, was used to overhaul manual TIC service processes into an end-to-end digital workflow. Third, the Agile Development Framework, which emphasizes modular and collaborative development through short iterations (sprints), allows PICTS to respond flexibly to changing needs and involves users at every stage.

Study of Similar Practices and Cross-System Integration

Case studies of global Testing, Inspection, and Certification (TIC) institutions (TÜV Rheinland, JET, KTC) and national institutions (ELSA-BRIN) affirm the necessity for end-to-end digital systems, real-time tracking dashboards, and the utilization of advanced technology (such as cloud, IoT, AI). A crucial aspect adapted by PICTS is Cross-System Integration. PICTS is designed to connect with PLN's and regulators' strategic systems: AMS (Letter Management Application) to automatically capture application data, SMAR PLN (SCM Material Marketplace) so

that test results validate materials in the procurement process, and SIUJANG Gatrik (Directorate General of Electricity) for automating the reporting of commissioning test results to accelerate the issuance of the Operation Feasibility Certificate (SLO). This integration establishes PICTS as the command center for TIC service data, which accelerates decision-making and aligns with the national digital architecture.

RESEARCH METHOD

A research method for this paper initially with study literatures of all related books, national and international journals as well as related documents available in the library the PLN, a stated owned enterprises of The Republic of Indonesia as previously mentioned. By applying a famous SWOT method, it is finally achieved all results which will explained in the following section.

RESULTS AND DISCUSSION

The PICTS (Pusertif Inspection Certification and Testing Service) innovation was developed as a strategic response to various crucial issues within the Testing, Inspection, and Certification (TIC) services, which had historically been manual and fragmented. These problems frequently included slow administrative processes, a lack of service status visibility for customers, and the risk of inconsistency and loss of physical quality documents. PICTS emerges as an end-to-end digitalization solution, fundamentally changing the way TIC services are delivered. The main focus of PICTS is to integrate cross-functional processes—from the front-office (customer service) to the back-office (laboratory and certificate issuance)—into one seamless workflow. This directly enhances operational transparency for all parties, accelerates service delivery by eliminating manual delays, and most importantly, strengthens the governance of data and quality documents through secure, structured digital storage, ensuring the integrity and traceability of testing/inspection results.

SWOT Analysis

In the effort to formulate a comprehensive and sustainable strategy for the PICTS (Pusertif Inspection Certification and Testing Service) innovation, the crucial initial step was conducting an in-depth SWOT Analysis (Strengths, Weaknesses, Opportunities, Threats) to gain a holistic understanding of PLN Pusertif's internal and external position within the dynamic landscape of Testing, Inspection, and Certification (TIC) services. This analysis served as a diagnostic foundation, systematically identifying the internal Strengths that must be maximized (such as the technical competence of human resources and accredited laboratory infrastructure), the internal Weaknesses that must be addressed (for example, reliance on manual processes and data silos), the external Opportunities that can be leveraged (such as the regulatory push toward digitalization and increasing market demand), and the external Threats that need to be mitigated (including fierce competition from private providers and cyber security risks). The data and insights obtained from the SWOT were then translated into the fundamental basis for the development of reinforcement strategies formulated through the TOWS Matrix (Threats-Opportunities-Weaknesses-Strengths). This matrix, where combinations of internal and external factors generate four specific groups of strategies—aggressive, turnaround (or repair), diversified, and defensive—will guide the implementation of PICTS, ensuring that the innovation is not only operationally efficient but also competitive and sustainable in the global market.

A. Strengths

The main internal Strengths owned by PLN Pusertif and serving as capital for the PICTS innovation are:

- **Competent Human Resources (HR):** The testing personnel and inspectors are officially certified (by the National Professional Certification Agency/BNSP or relevant independent bodies) and possess high specialization in the fields of electricity and quality assurance.
- **Institutional Credibility:** The testing laboratories and certification bodies are accredited by the National Accreditation Committee (KAN) based on international standards (e.g.,

ISO/IEC 17025). This accreditation is official proof of technical competence, which is highly critical in the TIC business.

- Strategic Position: Its existence within the PLN ecosystem (as a captive market and main strategic partner) ensures a stable volume of work and provides access to relevant internal infrastructure and regulations. This also creates a great opportunity to become the internal quality standard for all PLN units.

B. Weaknesses

The weaknesses that need to be addressed through digital innovation include:

- Budget Limitations: The budget allocated for digital investment and technology development is often limited or incremental, which can slow down the pace of transformation. This limitation can hinder the adoption of state-of-the-art technology solutions or slow down comprehensive and real-time system integration.
- HR Limitations: Although technical HR personnel possess high competence, the quantity of Human Resources (HR), especially in administration, back-office, and digital support, is deemed insufficient to support the expected end-to-end service growth. This limitation causes bottlenecks in repetitive and administrative processes, extending service lead times, and burdening technical experts with non-technical tasks.
- Documentation and Communication: The existing quality document management system and communication mechanisms are often scattered (siloes) or based on physical documents/email, making them suboptimal in meeting the demands of digital services and real-time information. This results in difficulties in data traceability, frequent communication gaps between functions (laboratory, finance, certification), and slow validation processes.

C. Opportunities

These external Opportunities represent market momentum and industry trends that PLN Pusertif can leverage through the PICTS digital platform to achieve business growth and leadership in the Testing, Inspection, and Certification (TIC) sector:

- External Growth: There is a significant increase in the need for quality testing and certification not only from the captive market of PT PLN (Persero) but also from broader external customers, including the private sector, manufacturing, and industry.
- Energy Transition: The energy sector is undergoing a massive transition towards cleaner resources. The rapid development in the field of New and Renewable Energy (NRE/EBT), such as Solar Power Plants (PLTS), batteries, and other supporting infrastructure, creates a completely new demand for TIC services. Every NRE component and system, from PV panels and inverters to energy storage systems, requires performance testing, quality certification, and regular inspection to guarantee safety, reliability, and compliance with national and international standards (e.g., SNI).

D. Threats

These external Threats are factors beyond PLN Pusertif's control that could potentially disrupt the stability or reduce the market share of Testing, Inspection, and Certification (TIC) services. The PICTS innovation strategy must be capable of acting as a shield against these threats:

- New Competitors: The TIC service market environment tends to attract new competitors, especially from the private sector, supported by high-tech investments. These competitors are often more agile and dynamic in adopting new digital technology, offering better service speed, pricing flexibility, and a modern customer experience. If Pusertif continues to rely on manual processes, customers will switch to providers offering faster and more efficient digital services.
- Regulatory Changes: The energy sector, particularly concerning electricity and quality assurance (TIC), is governed by regulations that tend to be dynamic and frequently change, including quality standards, accreditation, and reporting obligations. Rapid regulatory changes (e.g., new standards for NRE, stricter quality reporting requirements, or SNI

updates) can demand that Pusertif change operational procedures and documentation formats within a short time frame. Manual or non-integrated systems will struggle to adapt quickly, risking non-compliance or service delays.

PICTS Reinforcement Strategy (TOWS Matrix)

The PICTS (Pusertif Inspection Certification and Testing Service) innovation is formulated not merely as a digitalization tool, but as a structured strategic action based on the TOWS Matrix. This strategy is designed to optimally leverage internal strengths against market opportunities, while simultaneously mitigating weaknesses and threats, thereby generating a sustainable competitive advantage in the provision of Testing, Inspection, and Certification (TIC) services.

SO Strategy (Strength - Opportunity): Digital Service Expansion

The Strengths-Opportunities (SO) strategy of the PICTS innovation focuses on leveraging PLN Pusertif's main internal Strengths—namely certified HR, accredited institution status, and a quality track record—to capture significant external Opportunities, particularly the growth of external customers and the urgent need for testing and certification in the New and Renewable Energy (NRE) sector, such as solar power plant (PLTS) infrastructure, batteries, and related components.

- **Rationale:** Pusertif possesses a foundation of credibility that is difficult to replicate due to its accredited status and highly competent HR in the TIC field. This advantage is the main capital for commercial market expansion. Current market growth opportunities are dominated by new services, specifically the certification of products like photovoltaic (PV) panels, inverters, and energy storage systems. With its existing Strengths, Pusertif can position itself as a key player in the national clean energy ecosystem.
- **Role of PICTS:** PICTS supports this strategy by providing a scalable digital platform with standardized and documented service processes. This is crucial for maintaining quality standards while expanding service scope and facing a wider commercial market. Furthermore, PICTS is prepared to support the quality validation of clean energy infrastructure (PLTS, batteries) through accountable and digitized certification processes.

WO Strategy (Weakness - Opportunity): End-to-End Process Digitalization

The Weaknesses-Opportunities (WO) strategy of the PICTS innovation is specifically designed as a fundamental corrective action. This strategy aims to overcome internal Weaknesses that impede efficiency (especially limited HR capacity and manual or scattered procedures) by capitalizing on the continuously growing market Opportunities, such as the increasing volume of work and demand for NRE certification.

- **Rationale:** To serve the increase in work volume (Opportunity) coming from the external market, PLN Pusertif must no longer be hampered by manual, time-consuming processes and bureaucracy (Weakness) that heavily rely on administrative personnel. If the old processes are maintained, Pusertif risks losing market opportunities due to an inability to provide fast and efficient services. Therefore, digitalization is no longer an option, but a necessity to maintain competitiveness.
- **Role of PICTS:** PICTS is the key solution that creates an end-to-end digital service. Through Business Process Reengineering (BPR), the system simplifies workflows, eliminates duplication, and automates administrative stages. This directly minimizes the administrative workload and dependence on limited HR, allowing the organization to increase service capacity without drastically increasing personnel numbers.

ST Strategy (Strength - Threat): Enhanced Collaboration

This strategy utilizes internal Strengths (strong structural relationship with PLN and certified personnel) to counteract external Threats (the emergence of new, more agile, and dynamic competitors).

- Rationale: Agile new competitors can seize market share if Pusertif's services are perceived as slow or less informative. The strength of the relationship with PLN internal customers must be reinforced.
- Role of PICTS: PICTS strengthens this strategy by facilitating rapid communication and collaboration. The system provides a digital customer interface for real-time job status tracking, automatic notifications, and SLA Dashboards. This transparency and speed of response significantly increase customer satisfaction and strengthen loyalty, making it a defensive fortress against market penetration by new competitors.

WT Strategy (Weakness - Threat): SSOT Adoption and Monitoring

This strategy seeks to overcome internal Weaknesses (inconsistent and error-prone documentation) against the Threat of dynamic regulation and high accountability demands.

- Rationale: Inconsistent manual data is vulnerable to audit findings and can damage institutional credibility, especially under the threat of strict regulation and competition.
- Role of PICTS: The solution is the implementation of a Single Source of Truth (SSOT). PICTS standardizes all input, eliminates data duplication, and ensures that all units access the same information. Furthermore, the Monitoring Dashboard feature allows management to supervise performance, procedural compliance, and service lead times in real-time. This ensures that the digital process (the new method) is aligned with quality documents and accreditation requirements, effectively addressing risks and procedural non-conformity.

5. CONCLUSION AND RECOMMENDATION

This paper analyzes the digital innovation strategy at PT PLN (Persero) Pusat Sertifikasi (Certification Center) through the implementation of the PICTS (Pusertif Inspection Certification and Testing Service) system, a platform that digitalizes Testing, Inspection, and Certification (TIC) services end-to-end. Based on the SWOT analysis, PICTS is formulated as a structured action to maximize competitive advantage while simultaneously addressing internal and external challenges. The main strategies include: Digital Service Expansion (SO Strategy), leveraging competent HR and accreditation for market expansion; End-to-End Process Digitalization (WO Strategy), overcoming HR limitations and manual procedures through Business Process Reengineering (BPR) to serve growing market opportunities; Enhanced Collaboration (ST Strategy), strengthening internal customer loyalty through PICTS's real-time transparency to counteract competitor threats; and Single Source of Truth/SSOT Adoption (WT Strategy), standardizing data to address inconsistent documentation against the threat of dynamic regulation. Practically, PICTS functions as an enabler for increasing the speed, transparency, and accountability of TIC services, aligning with PLN's Transformation agenda. Furthermore, to ensure the sustainability and competitive advantage of PICTS, the innovation strategy must be balanced with investment in Strengthening Digital HR Competence through continuous training, ensuring staff are able to optimally operate and manage the integrated system. Concurrently, Increased User Adoption must be intensified through education and socialization to external customers so that they fully understand and utilize this end-to-end digital platform. Looking ahead, PLN Pusertif needs to prepare for AI/IoT-Based Feature Development—such as the integration of Artificial Intelligence (AI) for test data analysis and the Internet of Things (IoT) for remote inspection—in order to achieve deeper process efficiency and maintain an agile position against new competitors.

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