



Digital Technology Acceptance in Work Performance of Employees in the Provincial Electricity Authority: A Case Study in Thailand

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Abstract

This study aimed to: (1) examine the level of digital technology acceptance in the workplace among employees and staff in the logistics and corporate services sector of the Provincial Electricity Authority (PEA); (2) investigate the level of digital technology acceptance across personal demographic variables; and (3) analyze the influence of digital technology characteristics on the acceptance of digital technology in the workplace among employees and staff in the logistics and corporate services sector of the PEA. The sample consisted of 200 employees selected using the Krejcie and Morgan sampling table. Data were collected using a questionnaire. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to describe the data, while inferential statistics, including t-test, one-way ANOVA, and regression analysis, were employed to test the hypotheses. The findings indicated that the overall level of digital technology acceptance among employees and staff in the logistics and corporate services sector of the PEA was at the highest level. Significant differences were found in digital technology acceptance based on age, marital status, educational attainment, job position, monthly income, and participation in training programs, at the 0.05 level of significance. Furthermore, the characteristics of digital technology were found to have a statistically significant influence on the acceptance of digital technology in the workplace at the 0.05 level.

Keywords: Digital Technology Acceptance, Provincial Electricity Authority, Logistics and Corporate Services

Introduction

In the digital era, the rapid advancement of information technology—particularly the widespread use of the internet and smartphones—has become an integral part of daily life worldwide, including in Thailand. These changes are not confined to personal lifestyles but have also profoundly impacted the operations of organizations in both the public and private sectors. Organizations increasingly recognize the importance of digital transformation as a means to enhance operational efficiency, improve competitiveness, and respond effectively to the evolving needs of customers and the dynamic business environment. The Provincial Electricity Authority (PEA), a state enterprise under the Ministry of Interior, has embraced this transformation by adopting the vision of becoming a “Smart Electricity Provider for Sustainable Quality of Life.” As part of its strategic direction, the PEA is committed to enhancing its management systems through digital innovation, with human capital playing a central role in driving change. To this end, the PEA has implemented various digital technologies across its operations, including Smart Grid infrastructure, the PEA Smart Plus application, the ERC Sandbox project, the E-LG system on Blockchain, the PEA Smart Construction Service (SmartCONs), the PEA VOLTA Platform, the PEA Life application, and a centralized digital document management system. These initiatives contributed to the PEA being recognized as an outstanding organization in digital human resource development in 2022, reflecting its commitment to becoming a fully digital utility.

However, achieving the status of a Digital Utility requires more than just the deployment of advanced technologies; it also depends on the extent to which employees and staff accept and apply these technologies in their day-to-day tasks. This human-centered dimension of digital transformation is critical to its long-term success. Although the PEA has provided training programs in IT governance and digital management to prepare its workforce, 2023 training data showed that the Logistics and

Corporate Services sector achieved a 93.33% pass rate on evaluation benchmarks—indicating potential areas for further development. The Logistics and Corporate Services sector is a key operational area within the PEA and has integrated numerous digital systems such as SAP, the e-Government Procurement (e-GP) platform, electronic document systems, the PEA Life application, electronic auction systems, the Last Price system, the Queue D scheduling software, and inventory management systems using RFID and barcode technologies. In addition, employees have received training in tools such as Power BI and Robotic Process Automation (RPA). Given the increasing digitalization of this sector, it is essential to examine the factors influencing the acceptance of digital technologies among its employees and staff. Understanding these factors will support the development of strategic human resource initiatives that promote active participation and ensure sustainable organizational advancement.

Accordingly, this study aims to: (1) examine the level of digital technology acceptance in the workplace among employees and staff in the Logistics and Corporate Services sector of the Provincial Electricity Authority; (2) investigate differences in acceptance levels based on personal demographic factors; and (3) explore how characteristics of digital technologies influence the acceptance of their use in the workplace within this sector.

Research Methodology

Population and Sample

The population of this study consisted of 296 employees and staff members in the Logistics and Corporate Services sector of the Provincial Electricity Authority (PEA), as of October 1, 2024. This included 256 permanent employees and 40 contract workers. The sample size was determined using the Krejcie and Morgan (1970) sampling table at a 95% confidence level, resulting in a required sample of 175 participants. To enhance data quality and accommodate potential non-responses, the researcher collected data from 200 respondents. A stratified random sampling technique was employed to ensure equal representation across organizational units.

Research Instrument

The primary instrument used for data collection was a structured questionnaire, which consisted of three sections. Section 1 covered demographic information such as gender, age, marital status, highest level of education, average monthly income, job position, years of service, experience with digital technologies, and training participation. These were presented in a checklist format. Section 2 measured the characteristics of digital technology using 20 items rated on a five-point Likert scale. These items were categorized into five dimensions: relative advantage, compatibility, complexity, trialability, and observability. Section 3 assessed the level of digital technology acceptance in the workplace through five items, also using a five-point Likert scale, focusing on users' attitudes and behavioral intentions. To ensure content validity, the questionnaire was reviewed by three experts in the field. An item-objective congruence (IOC) index was calculated, and all items had IOC values equal to or greater than 0.67. A try-out was conducted with 30 individuals who shared similar characteristics with the main sample. The reliability of the instrument was tested using Cronbach's alpha coefficient, which exceeded 0.70 in

all sections, confirming internal consistency.

Data Collection

Primary data were collected from the 200 respondents through an online questionnaire distributed via Google Forms. The survey link was shared through communication platforms such as LINE and Facebook, with a clear explanation of the study's objectives and instructions for participation. In addition to primary data, the study also utilized secondary data obtained from academic articles, government publications, and previous research relevant to digital technology adoption.

Data Analysis

Data were analyzed using statistical software. Descriptive statistics included frequency and percentage for demographic variables, and mean and standard deviation for digital technology characteristics and technology acceptance. For inferential statistics, independent samples t-tests were conducted for binary group comparisons (e.g., gender), while one-way analysis of variance (ANOVA) was used for variables with three or more groups (e.g., age, marital status). When statistically significant differences were identified, post hoc pairwise comparisons were performed using the Least Significant Difference (LSD) method. Furthermore, multiple regression analysis was conducted to examine the influence of digital technology characteristics on the level of digital technology acceptance in the workplace.

Research Findings

General Demographic Characteristics of the Respondents

The study surveyed 200 participants, with an equal distribution of male and female respondents (50.00% each). The majority were between the ages of 30 and 40 (39.00%), married (60.00%), and held a bachelor's degree as their highest level of education (85.00%). Most participants held positions such as operational staff, technical officers, academic officers at levels 7–9, or equivalent (40.50%). In terms of income, 34.00% reported earning between 20,001 and 30,000 THB per month. The largest portion of respondents had over 15 years of work experience (33.50%), and 31.00% had 10–15 years of experience using digital technology. Additionally, 42.50% had participated in digital technology training once per year.

Perceptions of Digital Technology Characteristics

Respondents expressed a very high level of overall agreement regarding the characteristics of digital technology (mean = 4.42). When ranked by average score, the dimensions were as follows:

1. Relative advantage (mean = 4.66): Respondents strongly agreed that digital technologies are beneficial and essential for performing their work.
2. Observability (mean = 4.50): Many noted that applying digital technologies in the workplace contributes to organizational growth and success.
3. Compatibility (mean = 4.45): Digital technologies were seen as highly compatible with the work environment, particularly in providing accurate, fast, and reliable information.
4. Trialability (mean = 4.28): Respondents reported increased confidence in using digital technology following trial applications.
5. Complexity (mean = 4.23): Despite being a lower-ranked

dimension, most respondents agreed that they could access and use digital technologies at any time without difficulty.

Acceptance of Digital Technology Use in the Workplace

Overall, the level of digital technology acceptance among employees and staff in the Logistics and Corporate Services sector of the PEA was rated at the highest level (mean = 4.59). This included both sub-dimensions: behavioral intention to use (mean = 4.59) and attitude toward use (mean = 4.58).

- For behavioral intention to use, the highest-rated item was: “I intend to continue using digital technologies in my work in the future.”
- For attitude toward use, the highest-rated item was: “My coworkers should also use digital technologies in their work.”

These results suggest a strong willingness and readiness among personnel to adopt digital technologies as part of their professional routine, reinforcing the organization's digital transformation initiatives.

Hypothesis Testing Results

Hypothesis 1: The Influence of Personal Factors on Digital Technology Acceptance

The analysis revealed that gender did not have a statistically significant effect on digital technology acceptance in the workplace. However, several other personal factors showed significant effects. Specifically, age was found to influence digital technology acceptance at a statistically significant level. Respondents aged 30 or younger reported higher acceptance levels than those aged 50–60. Moreover, individuals aged 30–40 reported lower acceptance levels than those aged 40–50 but higher than those aged 50–60. Respondents aged 40–50 demonstrated higher acceptance than those in the 50–60 age group.

Marital status also significantly influenced digital technology acceptance. Respondents who were single or married showed higher acceptance levels compared to those who were divorced, widowed, or separated. In terms of educational attainment, participants with a qualification above a bachelor's degree exhibited significantly greater acceptance than those holding only a bachelor's degree.

Job position was another significant factor. Operational staff and academic officers at levels 1–6 reported higher acceptance levels than those in higher-level academic or executive positions (e.g., level 10 and above), and also higher than those in mid-level positions (levels 7–9). Regarding monthly income, significant differences were observed across several income groups. For instance, respondents earning less than 20,000 THB reported lower acceptance levels than those earning 60,001–70,000 THB, but higher than those earning more than 70,000 THB.

In contrast, years of service and experience with digital technologies did not significantly affect digital technology acceptance. However, training participation had a significant impact: individuals who had participated in more frequent digital technology training sessions demonstrated higher acceptance levels than those with limited or no training experience.

Hypothesis 2: The Influence of Digital Technology Characteristics on Technology Acceptance

A multiple regression analysis was conducted to determine the influence of digital technology characteristics on technology acceptance. The results indicated that observability was the only factor that significantly influenced digital technology acceptance among employees and staff in the Logistics and Corporate Services sector of the Provincial Electricity Authority, at the 0.05 significance level. Other dimensions—relative advantage, compatibility, complexity, and trialability—were not found to have statistically significant effects.

Discussion

1. The acceptance of digital technology in the workplace among employees and staff in the Logistics and Corporate Services sector of the Provincial Electricity Authority (PEA) was found to be at the highest level. This result may be attributed to the organization's strategic digital agenda, which emphasizes advancing global-level management through digital innovation, with human capital serving as a core driver. In particular, digital technologies are utilized to enhance operational efficiency, improve service quality, and accelerate organizational performance in line with the agency's goals (Digital Action Plan Executive Summary, PEA, 2023–2027, 1st Revision, 2023). The Logistics and Corporate Services sector has actively supported employees in adopting digital technologies across multiple functional areas. These include the centralized Digital Document system, which enables document management at both individual and departmental levels, supports electronic forms, and incorporates digital signatures; the SAP system, an enterprise resource planning (ERP) software for internal resource management; and the e-Government Procurement system (e-GP), which streamlines procurement processes. The PEA Life application facilitates leave approvals, offsite travel requests, expense reimbursements, and access to welfare information. Additionally, the sector uses RFID and barcode-based inventory systems to modernize warehouse management. Moreover, the organization has embraced Robotic Process Automation (RPA) to automate repetitive tasks and adopted Microsoft Power BI and Looker Studio to visualize data and support real-time decision-making. With ongoing support from the sector, employees increasingly recognize the benefits and importance of digital technologies. This has fostered opportunities for continuous learning, experimentation, and practical application, all of which have contributed to a high level of digital technology acceptance. Such acceptance plays a pivotal role in driving the PEA toward its vision of digital transformation and long-term organizational success.
2. Differences in Digital Technology Acceptance Based on Personal Factors. The study found that employees and staff in the Logistics and Corporate Services sector of the Provincial Electricity Authority (PEA) exhibited significant differences in digital technology acceptance depending on their personal characteristics. Specifically, gender, length of employment, and digital technology experience did not significantly influence technology acceptance. However, age, marital status, educational attainment, job position, income, and participation in digital technology training showed statistically

significant differences in acceptance levels at the 0.05 level. The discussion of these variables is as follows:

- 2.1 Employees of different age groups demonstrated varying levels of digital technology acceptance in the workplace. These differences are likely rooted in the diverse ways age influences cognition, perception, and attitudes toward technology adoption. Notably, respondents aged between 40 and 50 exhibited the highest levels of acceptance. This age group predominantly held positions such as senior officers or academic staff (levels 7–9), with digital technology experience ranging from 10 to 15 years. Their extensive exposure to digital tools, familiarity with organizational processes, and motivation to enhance their professional capabilities likely contributed to higher levels of technology acceptance. These findings are consistent with the independent study by Songpot Phoosin (2020), which indicated that public health personnel in Chonburi with over nine years of experience reported the highest levels of support for digital technology adoption in their work practices.
 - 2.2 Employees' acceptance of digital technology in the workplace also varied by marital status. Pairwise comparisons revealed that single respondents demonstrated significantly higher levels of technology acceptance than those who were widowed, divorced, or separated. This finding may be explained by broader generational trends: contemporary young adults are increasingly opting for singlehood and exhibit a strong preference for professional autonomy, personal growth, and engagement with new technologies (Policy Watch, 2024). In contrast, individuals who are widowed or divorced—many of whom were aged between 50 and 60—tended to approach life more cautiously, with a stronger attachment to established routines. These tendencies may explain their relatively lower acceptance of digital technologies.
 - 2.3 The level of education also influenced digital technology acceptance. Respondents with education beyond a bachelor's degree reported significantly higher acceptance levels than those with only a bachelor's degree. This finding aligns with the study conducted by Nattapapat Kulangkoon (2023), which examined technology adoption among state auditors in southern Thailand. The study showed that higher educational levels correlated with greater openness to adopting technology. It is likely that individuals with advanced degrees possess broader knowledge bases, more developed critical thinking skills, and more positive attitudes toward technological innovation, which, in turn, lead to higher levels of digital technology acceptance in the workplace.
 - 2.4 Employees and staff in the Logistics and Corporate Services sector of the Provincial Electricity Authority (PEA) exhibited varying levels of digital technology acceptance based on their job positions. Pairwise mean comparison results revealed that operational staff and academic personnel at levels 1–6 reported significantly higher levels of digital technology acceptance than those in higher-level academic roles (level 10 and above) or executive positions. This may be explained by the fact that lower-level employees are primarily responsible for data collection, processing, and report preparation for supervisors. These tasks require regular engagement with digital tools, thereby increasing their familiarity and comfort with technology in the workplace. However, this finding contrasts with the results of Pichayaphorn Prawkhieowsutta (2020), whose study on the use of electronic document systems in the Thailand Institute of Scientific and Technological Research found that directors perceived the system as more effective than operational staff did.
 - 2.5 Digital technology acceptance also varied significantly by income level. Pairwise comparisons indicated that employees earning less than 20,000 Baht per month exhibited significantly lower acceptance levels than those earning between 60,001 and 70,000 Baht per month. Higher-income individuals often have greater purchasing power, enabling more frequent access to and use of modern technologies both inside and outside of work. This result aligns with the findings of Jirawat Wongthongchai and Kanjana Sukansirikhun (2012), who studied Generation Y's acceptance of 2D barcode technology and concluded that income level significantly affects technology adoption.
 - 2.6 Participation in digital technology training also influenced acceptance levels. Pairwise analysis showed that respondents who had never received training demonstrated significantly lower acceptance of digital technologies than those who had attended training more than three times per year. This finding can be attributed to the active training programs organized by the Logistics and Corporate Services division, which include topics such as Robotic Process Automation (RPA), digital dashboard creation using Microsoft Power BI, and low-code development using the Joget platform. These training initiatives aim to enhance employees' digital skills and enable them to apply these technologies effectively in their daily tasks. The result is consistent with the research by Noppawan Wongsrikaew and Surawi Sunalai (2023), which found that both physical infrastructure support and opportunities for training and development significantly influenced the technology acceptance of support staff at Sukhothai Thammathirat Open University.
3. Influence of Digital Technology Characteristics on Technology Acceptance. The study found that the characteristics of digital technology had a significant impact on the acceptance of digital technology in the workplace among employees in the Logistics and Corporate Services Division of the Provincial Electricity Authority (PEA). The overall acceptance was rated at the highest level. When analyzed by specific attributes, relative advantage was the most influential factor, followed by trialability, compatibility, ease of experimentation, and complexity, respectively. These findings suggest that when the technology used is perceived as beneficial to work efficiency—by reducing work time and improving task accuracy—employees are more likely to accept it. Furthermore, the adoption of digital technologies enhances the organization's image and supports its operational goals. These results align with Rungtiwa Ngeonpun (2017), whose study on land information technology acceptance among officers in the Department of Lands revealed that perceived usefulness, ease of use, attitude toward use, motivation, and system-job fit were significant predictors of acceptance, along with computer literacy as an indirect factor. Similarly,

the findings of Phattarawadee Sochitsrisakul (2022), who studied information system adoption among production personnel, confirmed that perceived usefulness was the most critical factor influencing technology acceptance. These results are consistent with the Technology Acceptance Model (TAM), which posits that users' perceptions of usefulness and ease of use affect their attitudes, which in turn shape behavioral intentions and actual usage.

4. **Observability as a Predictor of Technology Acceptance.** The study also found that among the characteristics of digital technology, observability significantly influenced technology acceptance at the 0.05 level. Employees in the Logistics and Corporate Services Division of the PEA perceived that digital systems such as SAP, the centralized electronic document system (Digital Document), and Robotic Process Automation (RPA) enabled more accurate and faster work. These systems made outcomes more measurable and comparable to non-digital processes, contributing to overall organizational efficiency and success. This perception enhances the willingness of employees to adopt digital technologies in their daily work. The findings are consistent with those of Nattapapat Kulangkoon (2023)^[39], who studied technology acceptance among auditors from the Office of the Auditor General in southern Thailand and found that both relative advantage and observability significantly affected technology acceptance at the 0.01 and 0.05 levels, respectively. These findings also support Rogers' (1983; 1995) Diffusion of Innovations Theory, which posits that innovation adoption is influenced by five key characteristics: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, and (5) observability.

Practical Implications and Recommendations

First, it is recommended that continuous promotion and support of digital technology usage be prioritized. The findings indicate that employees in the Logistics and Corporate Services Division of the Provincial Electricity Authority (PEA) demonstrate a high level of acceptance toward digital technology in their work. Therefore, the organization should actively encourage knowledge-sharing and capacity-building related to digital technology use. This includes creating a supportive work environment through internal and cross-functional knowledge exchange, developing user manuals for various applications, and providing access to appropriate hardware and software—such as modern computers, notebooks, and up-to-date digital tools—that are tailored to the practical needs of employees and digital specialists. These actions are expected to enhance task efficiency, reduce working time, and ultimately help the organization achieve its strategic goals.

Second, it is essential to tailor training programs to the needs of specific target groups. The research revealed that individual factors—particularly age and frequency of digital training—significantly influence technology acceptance. Consequently, the organization should focus on organizing digital skills training sessions that are well-aligned with the needs of employees and workers, especially targeting women and those aged 40 to 50 years, who were found to exhibit high levels of technology acceptance. Additionally, mechanisms for tracking and evaluating the impact of training on technology usage should be put in place to ensure long-term effectiveness.

Third, emphasis should be placed on demonstrating tangible outcomes from the use of digital technologies. The study

found that observability, one of the key attributes of digital technology, significantly influenced technology acceptance. Therefore, the division should develop a concrete digital technology action plan with measurable outcomes that align with the strategic objectives of the PEA. These objectives include integrating digital technologies into management processes, streamlining operational workflows, enhancing service quality for customers, and advancing business goals through innovations and technological inventions. Encouraging participation in digital technology-related training and activities will further support this transformation.

Recommendations for Future Research

Future studies should consider expanding the scope beyond the Logistics and Corporate Services Division of the Provincial Electricity Authority (PEA). As this research was limited to a specific division, broader investigations encompassing other divisions or the entire organization—including all categories of employees and staff—would provide more comprehensive data. Such expanded studies could contribute to the development of organizational strategies at a macro level. Additionally, future research may incorporate other relevant factors that potentially influence digital technology acceptance, such as organizational culture, top management support, or psychological characteristics of users, which were not addressed in the present study.

Furthermore, future research should explore the qualitative aspects of digital technology utilization, particularly its role in enhancing work efficiency. In-depth interviews could be conducted to identify internal factors that influence the effective use of digital tools among employees. The findings could then be applied to design more targeted development programs that improve the technological competencies of personnel, enabling them to apply digital technologies more efficiently and effectively in their professional tasks.

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