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The Current State of the Quality of Human Resources at FPT Software Co., Ltd. – Hanoi Branch in the Context of Digital Transformation

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Abstract

Digital transformation has fundamentally reshaped business operations, organizational structures, and workforce competency requirements in technology enterprises. In this context, human resource quality has become a strategic determinant of organizational competitiveness and sustainable development. Although numerous studies have examined digital workforce development and human capital from national and industrial perspectives, limited research has comprehensively evaluated human resource quality within Vietnamese software enterprises by integrating knowledge, skills, attitudes, and digital competencies. This study addresses this research gap by investigating the current state of human resource quality at FPT Software – Hanoi Branch in the context of digital transformation.

The study develops an integrated analytical framework based on the ASK (Attitude–Skills–Knowledge) model while incorporating the Digital Competence Framework (DigComp), Human Capital Theory, and the Balanced Scorecard to provide a comprehensive assessment of workforce quality. A mixed-method research approach was employed, combining qualitative analysis of theoretical and documentary sources with quantitative analysis based on survey data collected from managers and employees at FPT Software – Hanoi Branch. Descriptive statistics, comparative analysis, trend analysis, synthesis, and expert

consultation were utilized to evaluate workforce quality and identify competency gaps under digital transformation.

The findings reveal that FPT Software possesses a highly qualified workforce with strong professional knowledge, technical expertise, and digital adaptability. Nevertheless, several challenges remain, including disparities in advanced digital competencies, continuous learning capability, innovation capacity, foreign language proficiency, and readiness to adapt to rapidly evolving technologies such as artificial intelligence, cloud computing, and big data analytics. The study further proposes a comprehensive set of managerial solutions focusing on strategic recruitment, competency-based training, digital capability enhancement, performance evaluation, organizational culture development, and talent retention to improve workforce quality in the digital era.

This research contributes to the existing literature by proposing an integrated framework for evaluating human resource quality in technology enterprises undergoing digital transformation. The findings also provide practical implications for managers and policymakers seeking to strengthen digital workforce capability and enhance organizational competitiveness within Vietnam's software industry.

Keywords: Human Resource Quality, Digital Transformation, Software Industry, Digital Competency, ASK Model, FPT Software

1. Introduction

Digital transformation has become one of the most influential drivers of organizational change in the twenty-first century. Rapid advances in artificial intelligence, cloud computing, big data analytics, blockchain technology, and the Internet of Things (IoT) have fundamentally transformed business models, production processes, and organizational management across industries. For technology enterprises, digital transformation extends far beyond the adoption of new technologies; it requires substantial changes in organizational culture, leadership, management systems, and, most importantly, human resource capability.

Among the various factors determining the success of digital transformation, human resources have consistently been recognized as the most critical strategic asset. Advanced technologies alone cannot generate sustainable competitive advantage

unless organizations possess employees capable of effectively applying, managing, and continuously improving these technologies. Consequently, the quality of human resources—including professional knowledge, technical skills, digital competencies, innovative thinking, adaptability, and professional attitudes—has become increasingly important for technology firms operating in highly competitive global markets.

Vietnam has experienced remarkable growth in its digital economy over the past decade. Supported by the National Digital Transformation Program and the rapid expansion of the information technology sector, software enterprises are facing unprecedented opportunities as well as significant challenges. International competition, increasingly sophisticated customer requirements, and accelerating technological innovation require Vietnamese software companies to continuously improve workforce quality to maintain competitiveness.

FPT Software, one of Vietnam's leading software outsourcing and digital transformation service providers, represents an appropriate case for investigating human resource quality within the context of digital transformation. The company has rapidly expanded its workforce while simultaneously investing in emerging technologies such as artificial intelligence, cloud computing, cybersecurity, automation, and digital engineering. These strategic developments require employees to continuously upgrade their professional competencies and adapt to rapidly changing technological environments.

Despite the growing body of literature on digital transformation and human resource management, several research gaps remain. Existing international studies primarily examine digital workforce development from macroeconomic or multinational perspectives, whereas empirical evidence concerning Vietnamese software enterprises remains limited. Domestic studies generally focus on digital human resources at the national level or investigate broader issues of digital transformation without comprehensively evaluating workforce quality at the enterprise level. Furthermore, previous research rarely integrates knowledge, skills, attitudes, and digital competencies into a unified analytical framework suitable for software organizations.

To address these limitations, this study aims to evaluate the current quality of human resources at FPT Software – Hanoi Branch within the context of digital transformation. Specifically, the research seeks to: (i) assess workforce quality based on knowledge, skills, attitudes, and digital competencies; (ii) identify competency gaps between existing workforce capabilities and organizational requirements; (iii) analyze key factors influencing workforce quality; and (iv) propose managerial solutions to enhance human resource quality and support sustainable digital transformation.

The study employs the ASK competency model as its primary analytical framework while integrating complementary perspectives from the Digital Competence Framework (DigComp), Human Capital Theory, and the Balanced Scorecard. This integrated approach enables a more comprehensive assessment of workforce quality by considering both individual competencies and organizational performance requirements.

The research contributes to the existing literature in three important ways. First, it extends previous studies by developing a multidimensional framework for evaluating human resource quality in software enterprises undergoing digital transformation. Second, it provides empirical evidence from a major Vietnamese technology enterprise, thereby enriching the limited literature on digital workforce development in emerging economies. Finally, the study offers practical recommendations for technology enterprises seeking to strengthen workforce capability, improve organizational performance, and achieve sustainable competitive advantage in the digital economy.

2. Literature Review

2.1 Human Resource Quality in the Digital Era

Human resources have long been recognized as a strategic asset that determines organizational performance and competitiveness. According to Human Capital Theory developed by Becker (1964) ^[1], investments in education, training, and skill development enhance employee productivity and contribute directly to organizational growth. In technology-intensive industries, human resources represent not only labor input but also a source of innovation, knowledge creation, and sustainable competitive advantage.

The concept of human resource quality has evolved significantly in response to digital transformation. Traditionally, workforce quality was assessed through educational attainment, professional qualifications, work experience, and technical competence. However, the emergence of digital technologies has expanded this concept to include digital literacy, data analytics capability, adaptability, innovation capacity, and lifelong learning ability.

According to the World Economic Forum (2024) ^[20], organizations increasingly prioritize employees who possess analytical thinking, technological proficiency, creativity, resilience, and adaptability. Similarly, OECD studies emphasize that future workforce competitiveness depends on the ability to continuously acquire and apply new digital skills in rapidly changing environments.

For software enterprises, human resource quality encompasses not only technical expertise but also the capacity to collaborate in digital ecosystems, manage complex projects, communicate effectively with global clients, and adapt to emerging technologies such as artificial intelligence, cloud computing, and cybersecurity.

2.2 Digital Transformation and Workforce Development

Digital transformation has become a strategic imperative for organizations worldwide. It involves the integration of digital technologies into organizational operations to create new value and improve performance.

Previous studies indicate that successful digital transformation depends substantially on people, leadership, organizational culture, and workforce capability rather than technology investment alone. Consequently, workforce development has become a central component of digital transformation strategies.

In the software industry, digital transformation generates both opportunities and challenges. While technological innovation creates new markets and business models, it

simultaneously increases skill requirements and shortens the lifecycle of professional knowledge. Therefore, software enterprises must continuously upgrade workforce capabilities through recruitment, training, reskilling, and upskilling initiatives.

2.3 The ASK Competency Model

Among various frameworks used to evaluate workforce quality, the ASK model has gained considerable attention because of its comprehensive and practical nature. The model consists of three fundamental dimensions.

Knowledge (K) includes professional expertise, educational background, technical knowledge, and understanding of digital technologies.

Skills (S) include technical abilities, problem-solving capability, teamwork, communication skills, project management, and digital competencies.

Attitude (A) includes motivation, responsibility, commitment, adaptability, innovation orientation, and willingness to learn.

The ASK model is particularly relevant to technology enterprises because organizational success depends on the integration of knowledge, skills, and attitudes rather than technical competence alone. Employees possessing balanced ASK competencies are generally more capable of adapting to technological change and contributing to organizational innovation.

2.4 Research Gap

Although the existing literature has extensively examined digital transformation and workforce development, several gaps remain.

First, most international studies focus on developed economies and multinational corporations, limiting their direct applicability to emerging markets such as Vietnam. Second, previous domestic studies largely investigate digital workforce development from a macroeconomic perspective and rarely examine software enterprises in depth. Third, there is limited research integrating knowledge, skills, attitudes, and digital competencies into a unified framework for evaluating workforce quality. Finally, empirical evidence regarding workforce quality within Vietnamese software enterprises undergoing digital transformation remains insufficient.

Consequently, this study addresses these gaps by examining workforce quality at FPT Software – Hanoi Branch through an integrated ASK-based framework.

3. Research Framework and Methodology

3.1 Conceptual Framework

Based on the ASK model and the Digital Competence Framework (DigComp), the study proposes four dimensions for evaluating human resource quality.

Table 1: Human Resource Quality Evaluation Framework

Dimension	Indicators
Knowledge	Educational level, professional expertise, certifications, technological knowledge
Skills	Technical skills, digital skills, communication, teamwork, project management
Attitude	Commitment, responsibility, innovation mindset, adaptability
Digital Competence	Data analytics, AI awareness, cloud technology, cybersecurity awareness

The framework assumes that these dimensions collectively determine workforce quality and organizational readiness for digital transformation.

3.2 Research Design

The study adopts a mixed-method approach combining qualitative and quantitative methods. Qualitative analysis was used to review theoretical foundations and identify evaluation criteria. Quantitative analysis was conducted through workforce surveys and organizational performance data collected from FPT Software – Hanoi Branch.

3.3 Sample Characteristics

A total of 150 employees and managers participated in the survey.

Table 2: Sample Characteristics

Criteria	Number	Percentage (%)
Managers	30	20.0
Employees	120	80.0
Male	96	64.0
Female	54	36.0
Under 30 years old	62	41.3
30–40 years old	58	38.7
Above 40 years old	30	20.0
Total	150	100.0

Source: Authors' survey (2025).

3.4 Data Analysis Techniques

The study employs descriptive statistics, comparative analysis, trend analysis, expert consultation, synthesis, and interpretation. These methods are used to assess workforce characteristics, identify changes during the 2023–2025 period, and evaluate human resource quality under the ASK framework.

4. Results and Discussion

4.1 Workforce Structure and Qualification

The workforce of FPT Software – Hanoi Branch expanded continuously during the period of digital transformation.

Table 3: Workforce Size (2023–2025)

Year	Employees
2023	6,873
2024	7,438
2025	8,127

Source: Compiled by the authors from FPT Software reports (2023–2025).

The data indicate a growth rate of approximately 18.2% over three years, reflecting increasing demand for digital talent and the expansion of business activities.

The educational structure also demonstrates a relatively high level of workforce qualification.

Table 4: Educational Structure

Education Level	2023	2024	2025
Below University	825	818	813
University	5,017	5,356	5,851
Postgraduate	893	1,041	1,219

The proportion of employees with university and postgraduate qualifications increased steadily, indicating improvements in workforce quality.

Professional certification also represents an important indicator of employee capability.

Table 5: Employees Holding International Certifications

Year	Number	Percentage (%)
2023	2,887	42.0
2024	3,422	46.0
2025	4,226	52.0

Source: Compiled by the author from FPT Software HR Reports (2023–2025)

The increase in certification attainment demonstrates growing investment in professional development and digital competency enhancement.

4.2 Human Resource Quality Assessment under the ASK Framework

The quality of human resources at FPT Software – Hanoi Branch was evaluated using the integrated ASK framework, comprising knowledge, skills, and attitudes, with digital competence incorporated as a cross-cutting dimension. The results indicate that the company's workforce possesses relatively high levels of professional competence while continuing to improve digital capability in response to technological change.

4.2.1 Knowledge Dimension

Knowledge represents the foundation of employee competency and significantly influences innovation capability and organizational performance.

Table 6: Educational Qualification of Employees

Qualification	2023	(%)	2024	(%)	2025	(%)
Below university	825	12.0	818	11.0	813	10.0
University	5,017	73.0	5,356	72.0	5,851	72.0
Postgraduate	893	13.0	1,041	14.0	1,219	15.0
Others	138	2.0	223	3.0	244	3.0
Total	6,873	100	7,438	100	8,127	100

Source: Authors' compilation based on FPT Software HR Reports (2023–2025)

The proportion of employees holding postgraduate degrees increased from 13% in 2023 to 15% in 2025, indicating continuous improvement in workforce qualifications. Meanwhile, the proportion of employees below university level gradually declined. These findings demonstrate the company's commitment to recruiting and developing highly qualified professionals capable of supporting advanced software development and digital transformation projects. Furthermore, FPT Software has continuously encouraged employees to pursue international professional certifications.

Table 7: Employees Holding International Professional Certifications

Indicator	2023	2024	2025
Employees with international certificates	2,887	3,422	4,226
Percentage (%)	42.0	46.0	52.0

Source: Compiled by the authors from FPT Software HR Reports (2023–2025).

The number of internationally certified employees increased by more than 46% during the study period, reflecting substantial investment in professional development. Certifications in cloud computing, project management,

enterprise systems, networking, and other technology domains have become increasingly important as the company expands its digital transformation services.

4.2.2 Skills Dimension

Skills constitute the core element enabling employees to apply knowledge effectively within complex technological environments.

Table 8: Improvement of Digital Skills (2023–2025)

Digital Skill	2023 (%)	2024 (%)	2025 (%)
Programming competency	74.2	76.5	78.6
Digital tool utilization	80.1	82.3	84.2
Participation in digital transformation projects	62.8	66.7	69.5
English communication	68.3	70.5	72.4

Source: Author's survey and calculations (2025).

The findings reveal continuous improvement across all digital skill dimensions. Programming competency increased from 74.2% to 78.6%, while digital tool utilization reached 84.2% in 2025. Employees also demonstrated stronger participation in organizational digital transformation initiatives, suggesting growing confidence in applying emerging technologies.

English communication competency also improved steadily, supporting collaboration with international clients and multinational project teams. However, compared with technical skills, language capability remains relatively weaker, indicating an area requiring additional investment.

4.2.3 Attitude Dimension

Employee attitudes toward organizational change significantly influence digital transformation success. Survey results from 150 respondents reveal generally positive attitudes regarding commitment and organizational engagement.

Table 9: Employee Commitment

Level	Number	Percentage (%)
Very High	38	25.3
High	67	44.7
Moderate	30	20.0
Low	10	6.7
Very Low	5	3.3

Source: Author's survey and calculations (2025).

Approximately 70% of respondents reported high or very high organizational commitment. This finding indicates a positive organizational culture supporting innovation and continuous improvement.

Similarly, employees expressed favorable attitudes toward technological change.

Table 10: Readiness for Digital Transformation

Readiness Level	Percentage (%)
Very Good	30.0
Good	40.0
Average	20.0
Poor	6.7
Very Poor	3.3

Source: Author's survey and calculations (2025).

Nearly 70% of employees perceived themselves as well prepared for digital transformation. Nevertheless, approximately 10% still reported insufficient readiness,

implying that additional digital capability development programs remain necessary.

4.3 Workforce Productivity

Beyond competency evaluation, workforce quality can also be assessed through organizational performance indicators.

Table 11: Productivity Indicators

Indicator	2023	2024	2025
Revenue per employee (billion VND)	1.72	1.79	1.90
Profit per employee (billion VND)	0.28	0.29	0.31
Utilization Rate (%)	83	85	87

Source: Authors' calculations based on FPT Software financial and HR reports (2023–2025)

The gradual increase in revenue and profit generated per employee indicates improved workforce productivity and greater organizational efficiency. Simultaneously, the utilization rate increased from 83% to 87%, reflecting better workforce allocation and project management.

4.4 Training and Workforce Development

Continuous learning has become an essential requirement in the context of digital transformation.

Table 12: Training Activities

Indicator	2023	2024	2025
Training budget (billion VND)	78.46	88.73	104.92
Training hours	548,920	791,356	918,274
Average training hours/employee	79.9	106.4	113.0

Source: Compiled by the authors from FPT Software HR Reports (2023–2025).

Training investment increased significantly throughout the study period. Average annual training hours per employee reached 113 hours in 2025. These investments contributed to improving technical competency and organizational adaptability.

4.5 Discussion

The empirical findings demonstrate that FPT Software – Hanoi Branch has established a relatively high-quality workforce capable of supporting organizational digital transformation. Improvements were observed across educational attainment, digital skills, professional certification, productivity, and organizational commitment. However, several challenges remain. First, although digital competency improved considerably, advanced capabilities relating to artificial intelligence, data science, cybersecurity, and cloud-native architecture remain concentrated among specialized technical teams rather than the broader workforce.

Second, continuous technological innovation requires more systematic lifelong learning mechanisms. Existing training programs primarily emphasize technical knowledge, whereas innovation capability, leadership competency, strategic thinking, and interdisciplinary collaboration require greater attention.

Third, English communication and cross-cultural collaboration, although improving steadily, remain comparatively weaker than technical competency. Given the company's expanding international market, these competencies will become increasingly important.

Overall, the findings support Human Capital Theory by demonstrating that investments in employee development are associated with improvements in organizational performance. They also demonstrate the applicability of the ASK framework in evaluating workforce quality within technology enterprises undergoing digital transformation.

5. Managerial Implications

The findings of this study provide several managerial implications for FPT Software – Hanoi Branch and other technology enterprises operating in the context of digital transformation. As digital technologies continue to reshape organizational structures, business models, and customer expectations, enterprises need to view human resource development as a long-term strategic investment rather than merely an operational function.

5.1 Developing a Digital Human Resource Strategy

Human resource strategy should be closely integrated with the organization's digital transformation strategy. Rather than focusing solely on recruitment to meet short-term labor demands, enterprises should formulate a comprehensive workforce development roadmap aligned with long-term business objectives.

Strategic workforce planning should include forecasting future competency requirements, identifying emerging technological skills, and assessing potential competency gaps. Particular attention should be given to emerging fields such as Artificial Intelligence (AI), Machine Learning (ML), Cloud Computing, Data Engineering, Cybersecurity, Blockchain, the Internet of Things (IoT), and Generative AI. Furthermore, digital competency standards should be established for each job category to facilitate competency assessment, career planning, and succession management.

5.2 Strengthening Competency-Based Recruitment

Traditional recruitment approaches emphasizing educational qualifications and work experience are no longer sufficient in the digital economy. Recruitment should increasingly focus on competency-based assessment, evaluating applicants' technical expertise, digital capability, innovation potential, communication skills, and adaptability.

FPT Software should develop competency-based recruitment frameworks, expand partnerships with leading universities, increase internship and graduate development programs, apply appropriate digital technologies in recruitment, utilize online technical assessment platforms, and build talent pipelines for critical technology positions. Recruitment should also prioritize learning agility and a growth mindset, recognizing that technical knowledge can become obsolete rapidly in the software industry.

5.3 Promoting Continuous Learning and Reskilling

Technological innovation continuously changes competency requirements. Consequently, lifelong learning should become an integral component of organizational culture.

FPT Software should establish a digital learning ecosystem incorporating online learning platforms, micro-learning modules, internal technical academies, professional certification programs, mentoring and coaching systems, and knowledge-sharing communities.

Training programs should extend beyond programming languages to include cloud technologies, AI engineering,

cybersecurity, data analytics, agile methodologies, project management, design thinking, innovation management, and leadership development.

Employees should be encouraged to allocate dedicated learning hours each month, while learning outcomes should be integrated into performance evaluation systems.

5.4 Enhancing Digital Leadership

Leadership capability is another critical determinant of successful digital transformation. Digital leaders should possess competencies beyond conventional management skills, including strategic digital vision, data-driven decision-making, innovation management, agile leadership, digital communication, technology awareness, and cross-functional collaboration.

Managers should receive continuous executive education on emerging technologies and digital business transformation. Leadership development programs should also prepare future digital leaders through succession planning, rotational assignments, executive coaching, and international exposure.

5.5 Improving Performance Evaluation Systems

Traditional performance evaluation systems often emphasize short-term productivity while overlooking innovation and digital capability. Performance management should therefore incorporate multidimensional indicators.

Table 13: Proposed Human Resource Performance Indicators

Dimension	Suggested KPI
Knowledge	Professional certifications, technical examinations, learning hours
Skills	Project quality, technical competency, client satisfaction
Attitude	Innovation participation, teamwork, organizational commitment
Digital Competence	AI utilization, cloud competency, automation capability
Business Contribution	Revenue contribution, productivity, innovation output

A competency-based evaluation framework would provide more objective measurement while encouraging continuous professional development.

5.6 Strengthening Organizational Culture

Organizational culture significantly influences employee behavior during digital transformation. FPT Software should cultivate a digital organizational culture characterized by continuous learning, innovation, collaboration, knowledge sharing, customer orientation, experimentation, and psychological safety.

Employees should feel comfortable proposing new ideas, experimenting with emerging technologies, and learning from unsuccessful projects. Internal innovation competitions, hackathons, AI challenges, and digital innovation awards could further stimulate organizational creativity.

5.7 Talent Retention

Competition for digital talent has intensified globally. Retaining highly qualified professionals requires more than competitive salaries.

Technology enterprises should provide flexible working arrangements, international project opportunities, career development pathways, competitive compensation, innovation incentives, employee well-being programs, and recognition systems.

Special attention should be given to retaining AI engineers, cybersecurity specialists, cloud architects, data scientists, and experienced project managers whose expertise is increasingly scarce.

6. Policy Implications

Besides managerial actions undertaken by enterprises, government policies and educational institutions also play important roles in developing high-quality digital human resources.

6.1 Government

The Vietnamese Government should continue implementing national digital transformation strategies by expanding digital education, supporting AI training, providing incentives for enterprise training investment, promoting university–industry collaboration, developing national digital competency standards, and encouraging lifelong learning initiatives.

Public investment in digital infrastructure, education, and research should also be strengthened to support innovation ecosystems.

6.2 Universities

Higher education institutions should regularly update curricula to match rapidly changing industrial requirements. Particular emphasis should be placed on Artificial Intelligence, Data Science, Cloud Computing, DevOps, Cybersecurity, Digital Project Management, soft skills, and English communication.

Industry internships and collaborative research should become integral components of software engineering education.

6.3 Enterprises

Technology enterprises should actively cooperate with universities through internship programs, scholarship schemes, joint research projects, guest lectures, curriculum development, and industrial laboratories.

Such collaboration can significantly reduce the competency gap between graduates and industry expectations.

7. Conclusion

Digital transformation has fundamentally altered workforce competency requirements within technology enterprises. Human resource quality has evolved beyond traditional measures of education and technical knowledge to encompass digital competencies, adaptability, innovation capability, lifelong learning, and organizational commitment.

Using FPT Software – Hanoi Branch as a case study, this research demonstrates improvements in workforce quality through investment in recruitment, professional development, international certification, digital capability enhancement, and organizational learning. The findings indicate continuous improvements in educational attainment, technical competency, productivity, training

intensity, and employee commitment during the period 2023–2025.

Nevertheless, several challenges remain. Advanced digital competencies, interdisciplinary knowledge integration, leadership capability, innovation management, and cross-cultural communication require further improvement to meet rapidly changing technological demands.

The study contributes theoretically by extending the ASK competency framework through integration with digital competency perspectives. It also contributes practically by providing managerial recommendations for technology enterprises seeking sustainable competitive advantage through human resource development.

Future research may expand the analytical framework by incorporating organizational resilience, digital leadership maturity, employee experience, artificial intelligence adoption, and international comparative studies across software enterprises.

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