



INTEGRATING HUMAN CAPITAL INFORMATION SYSTEMS AND EMPLOYEE SELF-SERVICE IN VIRTUAL OFFICES FOR ENHANCED EMPLOYEE PERFORMANCE

Neneng Hayati¹✉, Erwin Yulianto²

¹Ekuitas University, Indonesia

²Langlangbuana University, Indonesia

✉ nenenk.hayati@gmail.com

Jl. P.H.H. Mustofa No. 31, Kel. Neglasari, Kec. Cibeunying Kaler, Kota Bandung, Indonesia

Abstract

This study examines the integration of Human Capital Information Systems (HCIS) and Employee Self-Service (ESS) in a virtual office environment to enhance employee performance. Using a qualitative exploratory case study, data were collected through interviews with 12 participants, system observations, and document analysis, and interpreted using the Technology Acceptance Model (TAM) and Human Capital Theory. Findings show that HCIS–ESS integration improves administrative efficiency, work flexibility, and HR service quality. Employees perceived the system as useful and easy to use, supporting continued adoption. Key challenges included unstable internet connectivity, limited system customization, and varying digital literacy. Successful implementation required organizational readiness, leadership commitment, clear standard operating procedures, and continuous technical support. This study contributes qualitative evidence on digital HRM transformation through HCIS–ESS integration in virtual work environments.

Keywords: Human Capital Information System; Employee Self-Service; Virtual Office; Digital HRM; Technology Acceptance Model; Employee Performance.

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INTRODUCTION

The rapid evolution of digital technologies has fundamentally transformed human resource management, particularly through the integration of Human Capital Information Systems (HCIS) and Employee Self Service (ESS) platforms within virtual office environments. The critical role of digital workforce solutions in improving organizational efficiency and employee performance. For instance, large-scale surveys across various industries reveal a positive correlation between the adoption of HCIS-ESS integration and enhanced employee productivity, job satisfaction, and reduced administrative burdens. Experimental studies further demonstrate how self-service technologies empower employees by granting autonomy over personal data and work-related processes, fostering a proactive work culture in remote settings. Organizations implementing virtual offices supported by robust HCIS and ESS frameworks can achieve cost efficiencies and agility, crucial for competitive advantage in a dynamic market. (Yona & Meilani, 2024; Savitri, Buchori & Supratikta, 2024)

The digital transformation of human resource management has accelerated with the widespread adoption of Human Capital Information Systems (HCIS) and Employee Self Service (ESS) in virtual office settings, driven by remote work trends post-2020. Empirical studies, including quantitative surveys and qualitative case analyses in management economics, demonstrate that these integrations enhance employee performance by streamlining administrative tasks, improving data access, and boosting productivity metrics like efficiency ratios and ROI. For example, surveys of over 100 employees in digital firms show HRIS usage positively correlates with job satisfaction and performance ($\beta=0.4058$, $p=0.001$), while experimental designs confirm perceived human-computer interaction fosters role breadth self-efficacy and helping behaviors in virtual environments. (Riatmaja, 2024; Amirova, et al, 2025)

Conceptually, HCIS and Employee Self-Service (ESS) perform complementary roles within digital human resource management. HCIS functions as the organizational backbone that manages workforce information, payroll, recruitment, performance evaluation, and strategic HR analytics, whereas ESS serves as the employee-facing interface that enables individuals to independently access and update personal information, submit leave requests, monitor attendance, and participate in performance management processes. (Savitri, Buchori & Supratikta, 2024; Novita & Edriani, 2024; Amirova, et al, 2025). Rather than operating as separate technologies, the integration of HCIS and ESS establishes a unified digital HR ecosystem in which centralized data management, automated workflows, and real-time information exchange reduce administrative fragmentation and improve service responsiveness. Within virtual office environments, such integration becomes increasingly important because HR processes rely entirely on digital interaction, making seamless interoperability essential for maintaining workforce productivity, transparency, and organizational agility. (Ramadian, Nurlinda & Ramadhina, 2025; Dimcheva, 2025)

Despite the growing body of literature on digital HRM, several important gaps remain. First, previous studies predominantly investigate HCIS (or HRIS) and ESS as independent technologies, overlooking how their integration creates a comprehensive digital workforce solution capable of supporting end-to-end HR processes within virtual office environments. (Joshi & Sengupta, 2025). Second, most empirical studies focus on direct statistical relationships between technology adoption and employee performance, providing limited explanation of the organizational and behavioral mechanisms through which integrated HCIS–ESS implementation generates performance improvement. (Guo, et al, 2026). Third, existing studies rarely examine how organizational readiness, leadership support, standardized procedures, and user acceptance interact during the implementation process. Consequently, the current understanding of HCIS–ESS integration remains fragmented, particularly in explaining how technological integration, organizational context, and employee acceptance jointly influence employee performance in virtual work settings. (Enstroem, Singh and Bhawna, 2025; Yusof and Aziz, 2015)

Accordingly, this study proposes an integrated perspective by positioning HCIS–ESS integration as a digital workforce solution rather than merely a combination of two information systems. Drawing upon the Technology Acceptance Model (TAM) and Human Capital Theory, this study explains the mechanism through which integrated digital HR platforms improve employee performance by enhancing administrative efficiency, employee autonomy, work flexibility, and organizational capability. Using an exploratory qualitative case study, this research further extends previous literature by capturing employees', administrators', and HR leaders' experiences in implementing HCIS–ESS within a virtual office environment. (Alexandro, 2025; Piardi, et al, 2024) The research objectives are threefold to evaluate the effectiveness of HCIS and ESS integration on employee performance in virtual office settings, to explore user acceptance and engagement with these systems; and to identify key organizational factors that influence successful implementation.

The theoretical foundation of this study integrates the Technology Acceptance Model (TAM) and Human Capital Theory to explain how HCIS–ESS integration contributes to employee performance within virtual office environments. Rather than functioning independently, the two theories provide complementary perspectives. TAM explains the behavioral mechanism through which employees accept and continuously use integrated digital HR systems based on perceived usefulness (PU) and perceived ease of use (PEOU). Once employees perceive HCIS–ESS as useful and easy to operate, they are more likely to adopt the system in their daily work activities. Human Capital Theory subsequently explains how sustained technology utilization transforms employee capabilities into organizational value by improving knowledge accessibility, administrative efficiency, work flexibility, and decision-making quality. Consequently, employee acceptance of HCIS–ESS represents the behavioral antecedent, whereas human capital development represents the organizational outcome, jointly explaining how digital workforce solutions enhance employee performance in virtual office settings (Amri, 2024; Syafri, 2025; Anggraeni et al., 2024; Yona & Meilani, 2024).

This integrated perspective extends previous digital HRM studies by positioning HCIS–ESS not merely as an information technology application but as a strategic digital workforce solution. The integration of centralized human capital databases with employee self-service functionalities enables automated workflows, real-time information sharing, and employee autonomy while simultaneously strengthening organizational capability. Therefore, TAM explains why employees accept the technology, whereas Human Capital Theory explains why such acceptance generates higher workforce productivity and sustainable organizational performance. Together, these theories establish a comprehensive conceptual foundation for understanding HCIS–ESS integration within virtual office environments. (Arini, et al, 2025; Sari and Wening, 2025; Potel, 2023)

Despite the increasing adoption of digital HRM technologies, several important conceptual gaps remain in the existing literature. First, previous studies generally investigate Human Resource Information Systems (HRIS/HCIS) and Employee Self-Service (ESS) as separate technologies, emphasizing their individual contributions to organizational efficiency rather than examining their integrated implementation as a unified digital workforce solution. Second, although prior research consistently reports positive relationships between digital HR technologies and employee performance, the underlying mechanism explaining how HCIS–ESS integration enhances employee performance within virtual office environments remains insufficiently explored. Third, existing studies largely overlook the organizational conditions that determine successful integration, including leadership commitment, organizational readiness, standardized digital processes, and employee digital capability. Consequently, current literature provides only fragmented explanations regarding the interaction between technological acceptance, organizational capability, and employee performance. This study addresses these conceptual gaps by integrating Technology Acceptance Model (TAM) and Human Capital Theory to explain the behavioral and organizational mechanisms through which HCIS–ESS integration functions as an effective digital workforce solution in virtual office environments. (Constantinides, et al, 2025; Trenerry, et al, 2021)

This study contributes theoretically by proposing an integrated conceptual perspective that combines Technology Acceptance Model (TAM) and Human Capital Theory to explain the relationship between HCIS–ESS integration and employee performance. Unlike previous studies that primarily focus on technology adoption or organizational outcomes separately, this research demonstrates that employee acceptance of integrated digital HR systems serves as the behavioral mechanism through which digital technologies generate human capital development and organizational value. Practically, the findings provide strategic guidance for organizations implementing HCIS–ESS within virtual office environments by identifying organizational readiness, leadership support, standardized operating procedures, and continuous technical assistance as critical success factors for sustainable digital workforce transformation. (Patil, 2026; Shahreki and Lee, 2024).

The Technology Acceptance Model (TAM), proposed by Davis (1989), explains technology adoption through two fundamental constructs: Perceived Usefulness (PU) and Perceived Ease Of Use (PEOU). Employees are more likely to adopt digital systems when they perceive that the technology enhances job performance while requiring minimal effort to operate. Within digital Human Resource Management (HRM), TAM has been widely applied to explain employee acceptance of Human Resource Information Systems (HRIS), Human Capital Information Systems (HCIS), and Employee Self-Service (ESS) platforms. In virtual office environments, where employees rely extensively on digital technologies to perform HR-related activities, TAM provides a behavioral explanation of why integrated HCIS–ESS systems are accepted and continuously utilized. (Menant, et al, 2021).

Human Capital Theory argues that investments in employee knowledge, capability, and technological infrastructure generate long-term organizational value through enhanced productivity and organizational effectiveness. From this perspective, HCIS–ESS integration represents not merely a technological innovation but also a strategic organizational investment that improves workforce capability by facilitating knowledge accessibility, administrative efficiency, employee autonomy, and data-driven decision making. Consequently, technology utilization contributes to both individual performance improvement and organizational competitiveness. (Hossain et al, 2025; Alnachef and Alhajjar, 2017).

Although Technology Acceptance Model (TAM) and Human Capital Theory originate from different theoretical perspectives, they provide complementary explanations for understanding HCIS–ESS implementation within virtual office environments. TAM explains the behavioral mechanism through which employees perceive, accept, and continuously utilize integrated HCIS–ESS systems based on perceived usefulness and perceived ease of use. However, technology acceptance alone does not necessarily create organizational value. Human Capital Theory complements TAM by explaining that continuous technology

utilization enhances employee capability, administrative efficiency, work flexibility, and knowledge sharing, thereby increasing workforce productivity and organizational performance. Accordingly, employee acceptance represents the initial behavioral mechanism, whereas human capital development constitutes the strategic outcome of HCIS–ESS integration. This integrated theoretical perspective positions HCIS–ESS as a digital workforce solution capable of simultaneously improving employee performance and organizational effectiveness. (Handayani, et al, 2025).

Existing literature consistently reports that Human Resource Information Systems (HRIS), Human Capital Information Systems (HCIS), and Employee Self-Service (ESS) contribute positively to administrative efficiency, employee satisfaction, and organizational performance. Nevertheless, critical examination of previous studies reveals several important conceptual limitations. First, most studies investigate HCIS (or HRIS) and ESS independently, emphasizing the effectiveness of each technology rather than examining their integrated implementation as a unified digital workforce solution. Second, although positive relationships between digital HR technologies and employee performance are frequently reported, previous research rarely explains the mechanism through which HCIS–ESS integration influences employee performance, particularly in virtual office environments. Third, organizational determinants such as leadership commitment, organizational readiness, digital literacy, technical support, and standardized operating procedures remain insufficiently explored despite their potential influence on implementation success. Furthermore, previous findings predominantly focus on technological adoption or organizational outcomes separately, resulting in fragmented theoretical explanations regarding the interaction between technology acceptance and human capital development.

Therefore, this study addresses these conceptual gaps by integrating Technology Acceptance Model (TAM) and Human Capital Theory to explain both the behavioral and organizational mechanisms underlying HCIS–ESS integration. Using an exploratory qualitative case study, this research further provides empirical evidence regarding how employees, HCIS administrators, and HR leaders experience HCIS–ESS implementation within virtual office environments, thereby contributing a more comprehensive understanding of digital workforce solutions.

Based on the integration of Technology Acceptance Model (TAM) and Human Capital Theory, this study proposes a conceptual framework illustrating the behavioral and organizational mechanisms through which HCIS–ESS integration improves employee performance within virtual office environments. The framework is presented in Figure 1.

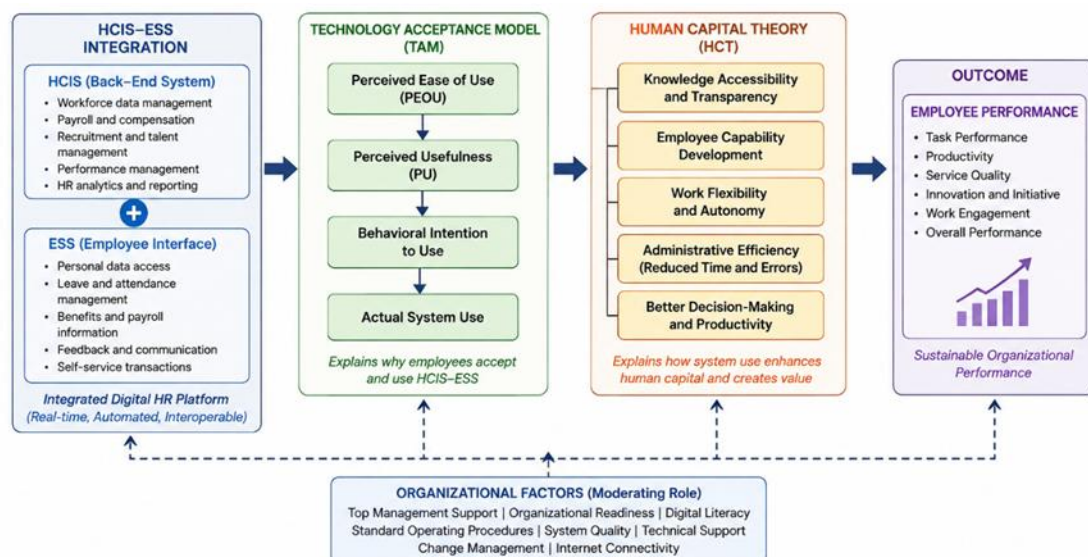


Figure 1. Conceptual Framework of HCIS–ESS Integration Based on Technology Acceptance Model and Human Capital Theory

METHOD

The study was conducted in a medium-sized service organization in Indonesia that had implemented HCIS–ESS integration within its virtual office system since 2023. The organization applies hybrid and remote

work arrangements for administrative and operational employees. This research uses a qualitative approach with an exploratory case study design, because the research objective is to understand in depth how the integration of Human Capital Information System (HCIS) and Employee Self Service (ESS) is implemented in a virtual office environment, as well as how technology acceptance affects employee performance. The study was conducted at an organization that had implemented a virtual office with HCIS and ESS support for at least 12 months. The research subjects consisted of employees using HCIS-ESS (staff-manager level), HCIS/HRIS administrators, HR unit leaders and Remote/hybrid employees as operational users. This research uses the following data collection techniques:

In-Depth Interview, conducted with 12 informants in the following categorized as shown in Table 1 below.

Table 1. In-Depth Interview

Informant Category	Numbers	Interview Focus
ESS user employees	6 people	Usage experience, benefits, convenience, obstacles
HCIS admin	3 people	System design, features, integration constraints
HR Leader	3 people	Impact on efficiency, strategic role, policy

This study employed purposive sampling to select informants who had direct experience using HCIS–ESS within the virtual office environment. Informants were selected based on three criteria: (1) active use of HCIS–ESS for at least six months, (2) involvement in HR administration or workforce management processes, and (3) direct interaction with the virtual office system in daily work activities. Semi-structured interviews were conducted between January and March 2026. Each interview lasted approximately 45–60 minutes and was conducted online through video conferencing platforms. Interview questions focused on system usability, perceived benefits, implementation challenges, work flexibility, and employee performance experiences.

System Usage Observations, researchers conducted direct observations of the activities as shown in Table 2 below.

Table 2. System Observation

ESS/ HCIS Activities	Observation Description
Leave requests	Access patterns and completion times
Personal data updates	User errors and system responses
Digital approvals	Process duration and interaction flow
Performance dashboard	How employees understand indicators

Observation data indicated that digital approval processing became more efficient after HCIS–ESS implementation. Based on internal observation records, average leave approval processing time decreased from approximately 2–3 working days under the previous manual process to less than one working day after digital integration.

Secondary Data, The documents analyzed include SOPs for using HCIS–ESS, virtual office work guidelines, and employee performance reports. Data collection was conducted until thematic saturation was achieved, meaning that additional interviews no longer generated substantially new information or themes related to HCIS–ESS implementation and employee experiences. Internal HR performance reports reviewed by researchers indicated a reduction in delayed administrative submissions and improved compliance with digital attendance reporting during the virtual work period.

Data reduction was carried out to simplify, focus, and transform raw qualitative data obtained from interviews, observations, and document analysis. Interview transcripts were analyzed using thematic analysis following three iterative coding stages, namely open coding, axial coding, and selective coding. Open coding identified initial concepts emerging from participants' narratives. Axial coding grouped related concepts into broader categories based on the Technology Acceptance Model (TAM) constructs and organizational implementation factors. Finally, selective coding synthesized these categories into overarching themes explaining HCIS–ESS integration within virtual office environments. The coding process was supported by data reduction, constant comparison, and triangulation across interviews, observations, and organizational documents to ensure credibility and thematic consistency. This process followed three main stages.

Coding interview narratives based on TAM categories the coding process followed three stages: open coding, axial coding, and selective coding. Open coding identified initial concepts from interview transcripts,

axial coding grouped related categories based on TAM constructs and organizational factors, while selective coding synthesized broader themes explaining HCIS–ESS integration within the virtual office context.

Interview transcripts were systematically coded using the core constructs of the Technology Acceptance Model (TAM), namely perceived usefulness (PU), perceived ease of use (PEOU), behavioral intention (BI), and actual system use (AU). Statements related to work efficiency, productivity improvement, and performance support were categorized under PU, while narratives describing system usability, interface simplicity, and learning ease were coded under PEOU. Intentions to continue using HCIS–ESS and recommendations to peers were grouped under BI, and frequency of system usage was coded as AU. This coding process enabled the identification of dominant acceptance patterns across different user groups. The following is Table 3, Data Reduction Results.

Table 3. Data Reduction Result

TAM Category	Coding Indicators	Example Findings	Interpretation
Perceived Usefulness (PU)	Efficiency, productivity, performance support	Faster HR processes, reduced administrative workload	System perceived as performance-enhancing
Perceived Ease of Use (PEOU)	Ease of learning, interface clarity	Minimal training required, intuitive navigation	Low resistance to adoption
Behavioral Intention (BI)	Willingness to use, recommendation	Intention to continue using HCIS–ESS	High acceptance likelihood
Actual System Use (AU)	Frequency, dependency	Daily use for HR transactions	Sustained utilization

Grouping user experiences after coding, user experiences were grouped into thematic clusters based on similarities and contrasts among employee users, HCIS administrators, and HR leaders. Employee users emphasized operational convenience and autonomy, administrators focused on system integration and data accuracy, while HR leaders highlighted strategic value and workforce monitoring. These grouped experiences provided a comprehensive view of HCIS–ESS implementation from multiple organizational perspectives as presented in Table 4.

Table 4. User Group Experiences

User Group	Dominant Experience Themes	Key Insights
Employee Users	Convenience, autonomy, flexibility	HCIS–ESS supports virtual work efficiency
HCIS Administrators	System integration, data accuracy	Reduced manual intervention
HR Leaders	Strategic monitoring, decision support	Digital HR enables workforce oversight

Identifying technical barriers technical barriers were identified through repeated mentions across interviews and observations. The most prominent barriers included unstable internet connectivity, limited system customization, and initial user resistance due to varying levels of digital literacy. These barriers were documented as contextual factors influencing system acceptance and performance outcomes, as shown in Table 5.

Table 5. Technical Barriers

Barrier Type	Description	Impact
Connectivity	Unstable internet access	Delays in system access
System Design	Limited customization	Reduced flexibility for specific needs
User Capability	Uneven digital literacy	Initial adaptation challenges

Data Presentation, presented in the form of thematic tables, analysis matrices, and relationship diagrams between variables. Following data reduction, findings were organized and displayed through thematic tables, analysis matrices, and relationship diagrams to facilitate interpretation. Thematic tables summarized key findings related to HCIS–ESS effectiveness, TAM constructs, and organizational factors. Analysis matrices were used to map relationships between user acceptance variables and employee performance indicators. Additionally, a conceptual TAM relationship diagram was used to illustrate the interaction among perceived ease of use, perceived usefulness, behavioral intention, and actual system usage. This structured data presentation clarified how HCIS–ESS integration functions as a digital workforce solution within a virtual office environment, as summarized in Table 6.

Table 6. Data Presentation

Presentation Tool	Content Displayed	Analytical Purpose
Thematic Tables	TAM constructs, effectiveness indicators	Summarize core findings
Analysis Matrix	Acceptance vs performance	Identify causal relationships
Path Diagram (TAM)	PEOU → PU → BI → AU → Performance	Visualize adoption flow

Analytical Drawing, confirming findings through triangulation Source triangulation (employees, administrators, leaders). Method triangulation (interviews, observations, documents), Theory triangulation (TAM & Human Capital Theory). Data Validity, to ensure the credibility of the research, two techniques were used triangulation Interviews, observations, and documents. Member Checking validation of interview results with informants.

The following is Table 7, the Matrix of the Relationship between Objectives, Data, and Data Collection Techniques.

Table 7. Matrix of the Relationship between Objectives, Data, and Data Collection Techniques

Research Objectives	Data Type	Collection Technique	Output
HCIS–ESS effectiveness evaluation	User experience data	Interviews	Benefits & barriers findings
User acceptance exploration	Perception data	Interviews + Observations	Technology Acceptance Model (TAM)
Identify organizational factors	HR documents & interviews	Documentation	Supporting & inhibiting factors

The research implementation flow as shown in Figure 2 below.

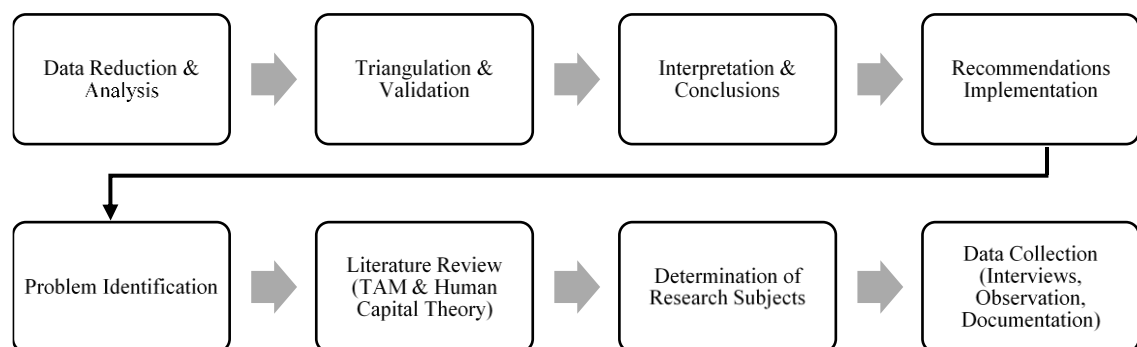


Figure 2. Research Implementation Flow

RESULTS

This section presents the major themes emerging from the qualitative analysis regarding the implementation of HCIS–ESS integration within a virtual office environment. The findings are organized according to the research objectives and demonstrate how HCIS–ESS functions as a digital workforce solution supporting employee performance.

One of the dominant themes emerging from the qualitative analysis is that the integration of Human Capital Information Systems (HCIS) and Employee Self-Service (ESS) substantially improves administrative efficiency while enhancing work flexibility within the virtual office environment. Participants consistently described the integrated platform as simplifying routine human resource processes by reducing manual procedures, minimizing paperwork, and enabling employees to complete HR-related activities independently without direct assistance from HR personnel.

Employee users explained that routine administrative activities, including attendance recording, leave applications, reimbursement submissions, employee profile updates, and access to payroll information, could be completed through a single integrated platform. Compared with previous manual procedures, participants perceived that HCIS–ESS significantly reduced processing time and improved service accessibility regardless of employees' physical locations. Several participants emphasized that the integrated system eliminated unnecessary administrative delays because requests could be processed electronically and monitored in real

time. *"Previously, submitting leave requests required several manual approval steps. With HCIS–ESS, the process can now be completed online within minutes."* (Employee User 3)

From the administrators' perspective, HCIS–ESS integration improved operational efficiency by centralizing employee data and reducing duplicate data entry across different HR functions. Before system integration, several HR activities required repetitive manual verification and data reconciliation between separate applications. The integrated platform minimized these inefficiencies by synchronizing employee information across recruitment, attendance, payroll, leave management, and performance evaluation modules. Consequently, administrators reported lower administrative workloads and improved data consistency throughout the organization. *"The integration has significantly reduced duplicate data entry because employee information is automatically synchronized across HR modules."* (HCIS Administrator 2)

HR leaders also perceived significant strategic benefits arising from HCIS–ESS integration. Instead of relying on manually compiled reports, management could access workforce information through centralized dashboards that provided real-time employee data, attendance records, leave balances, and performance indicators. This capability enabled faster managerial decision-making and facilitated workforce monitoring within the virtual office environment. Participants indicated that digital access to comprehensive HR information strengthened managerial responsiveness and supported more evidence-based human resource planning. *"The dashboard enables us to monitor workforce conditions in real time, which greatly supports managerial decision-making."* (HR Leader 1)

The findings further indicate that administrative efficiency was closely associated with increased work flexibility. Employees emphasized that the integrated HCIS–ESS platform enabled HR transactions to be completed anytime and from any location using internet-connected devices. Such flexibility became particularly valuable within virtual office arrangements where employees worked remotely and physical interaction with HR departments was limited. Participants reported that digital accessibility reduced dependence on office hours and enabled HR services to remain available without geographical constraints.

Although participants generally expressed positive perceptions, several implementation challenges were also identified. Intermittent internet connectivity occasionally delayed transaction processing, particularly for employees working in areas with unstable network infrastructure. In addition, some participants noted that certain system features required further customization to accommodate specific organizational procedures. Differences in digital literacy among employees also influenced the speed of adaptation during the early stages of implementation. Nevertheless, participants agreed that these challenges did not outweigh the overall benefits generated by HCIS–ESS integration.

Overall, the findings demonstrate that HCIS–ESS integration contributes to administrative efficiency through process automation, centralized information management, and reduced manual intervention while simultaneously increasing work flexibility by enabling remote access to HR services. From the perspective of the Technology Acceptance Model (TAM), these findings indicate that employees perceived the integrated system as highly useful in supporting daily work activities, thereby encouraging continued system utilization. Furthermore, Human Capital Theory suggests that improved administrative efficiency and work flexibility represent organizational investments that enhance employee capability, optimize resource utilization, and strengthen organizational productivity. Therefore, HCIS–ESS integration functions not merely as an operational information system but as a strategic digital workforce solution that supports sustainable employee performance within virtual office environments.

The findings discussed above are summarized in Table 8, which presents the major themes, supporting evidence, and their organizational implications regarding the effectiveness of HCIS–ESS integration in improving administrative efficiency and work flexibility. The table demonstrates that the integration generates value not only by streamlining routine HR processes but also by supporting strategic workforce management and identifying implementation challenges that require organizational attention.

Table 8. Major Findings on HCIS–ESS Integration and Administrative Efficiency

Main Theme	Sub-theme	Representative Findings	Interpretation
Administrative Efficiency	HR process automation	HR transactions became faster through digital workflows	Reduced administrative workload and processing time
	Centralized employee data	Information synchronized across HR modules	Improved data accuracy and minimized duplicate records
	Self-service capability	Employees independently completed HR activities	Increased employee autonomy and reduced HR dependency
Work Flexibility	Remote accessibility	HR services accessible anytime and anywhere	Supported virtual office implementation
	Real-time information	Immediate access to HR information and transaction status	Improved responsiveness and transparency
Strategic HR Value	Workforce monitoring	HR leaders utilized centralized dashboards for decision-making	Enhanced managerial effectiveness and evidence-based planning
Implementation Challenges	Technical and organizational barriers	Internet instability, limited customization, digital literacy differences	Continuous technical support and organizational readiness remain essential

As presented in Table 8, the qualitative findings indicate that HCIS–ESS integration delivers benefits at both operational and strategic levels. At the operational level, automated workflows, centralized employee data, and self-service capabilities reduced administrative workload, minimized manual intervention, and improved the speed and accuracy of HR service delivery. At the strategic level, the availability of integrated workforce information enabled HR leaders to monitor employee activities more effectively and make timely, evidence-based decisions. The findings also reveal that work flexibility has become an essential outcome of HCIS–ESS implementation, as employees can access HR services remotely without being constrained by time or location. Nevertheless, the implementation process remains influenced by organizational and technical factors, including internet connectivity, system customization, and employees' digital competencies. These findings collectively demonstrate that HCIS–ESS integration functions not merely as an operational HR information system but as a comprehensive digital workforce solution that supports sustainable employee performance within virtual office environments.

The second major theme concerns employee acceptance of the integrated Human Capital Information Systems (HCIS) and Employee Self-Service (ESS) platform. Across all participant groups, user acceptance was primarily influenced by positive perceptions of system usefulness, ease of use, and continuous utilization. These perceptions encouraged employees to integrate HCIS–ESS into their daily work routines and supported the successful implementation of digital HR services within the virtual office environment.

Participants perceived HCIS–ESS as a valuable tool that simplified administrative activities, including attendance recording, leave applications, reimbursement requests, payroll access, and personal data management. The integrated platform reduced administrative workload, enabled employees to complete HR transactions independently, and improved overall work efficiency. Most participants also described the system as intuitive and easy to learn, with clear navigation and standardized workflows that facilitated user adaptation.

Although several participants experienced minor challenges related to internet connectivity, system responsiveness, and varying levels of digital literacy, they agreed that continuous training, technical assistance, and organizational support helped overcome these obstacles. Employee users emphasized convenience and flexibility, HCIS administrators highlighted data integration and operational efficiency, while HR leaders recognized improved compliance and more effective workforce monitoring.

Overall, the findings indicate that employees perceived HCIS–ESS as both useful and easy to use, resulting in stronger intentions to continue using the system. Consistent with the Technology Acceptance Model (TAM), perceived usefulness and perceived ease of use emerged as the primary drivers of user acceptance, which subsequently supported administrative efficiency and organizational effectiveness within the virtual office environment.

The findings related to user acceptance are summarized in Table 9, which presents the dominant dimensions of technology acceptance identified during the interviews, together with representative evidence and their implications for HCIS–ESS implementation. The table demonstrates that successful system adoption

was influenced by employees' positive perceptions of usefulness, ease of use, and organizational support, while several technical and organizational barriers remained important considerations during implementation.

Table 9. Major Findings on User Acceptance toward HCIS–ESS

TAM Dimension / Theme	Representative Findings	Interpretation
Perceived Usefulness (PU)	Employees completed HR processes faster and more efficiently through integrated digital services.	HCIS–ESS improved work efficiency and reduced administrative burden.
Perceived Ease of Use (PEOU)	The system interface was intuitive, easy to learn, and required minimal technical assistance.	Simple system design encouraged technology acceptance.
Behavioral Intention (BI)	Most participants expressed willingness to continue using HCIS–ESS and recommended its use.	Positive perceptions strengthened long-term technology adoption.
Actual System Use (AU)	HCIS–ESS became part of employees' daily work routines for HR transactions.	Continuous utilization reflected successful digital transformation.
Organizational Support	Training, leadership commitment, and technical assistance facilitated user adaptation.	Organizational readiness reinforced sustained technology acceptance.
Implementation Challenges	Internet instability and differences in digital literacy occasionally affected user experiences.	Continuous improvement and support remained necessary for successful implementation.

The third major theme highlights that successful HCIS–ESS implementation depends not only on technological capabilities but also on organizational readiness and management support. Participants consistently emphasized that leadership commitment, clear standard operating procedures (SOPs), continuous technical assistance, employee training, and adequate digital infrastructure were critical factors influencing the effectiveness of HCIS–ESS implementation within the virtual office environment.

Employee users indicated that regular training sessions and responsive technical support helped them adapt more quickly to the integrated system, particularly during the early stages of implementation. HCIS administrators also reported that standardized procedures and management commitment facilitated system integration, reduced operational inconsistencies, and improved compliance with digital HR processes. Meanwhile, HR leaders emphasized that leadership support encouraged employees to adopt HCIS–ESS as part of their daily work practices and strengthened organizational readiness for digital transformation.

Despite these enabling factors, participants identified several organizational challenges, including uneven digital literacy among employees, occasional internet connectivity issues, and limited system customization to accommodate specific organizational needs. These challenges occasionally slowed system adoption but were generally mitigated through continuous training, technical assistance, and periodic system improvements.

Overall, the findings indicate that successful HCIS–ESS implementation is influenced by the interaction between technological readiness and organizational capability. Strong leadership support, well-defined operational procedures, continuous capacity building, and reliable technological infrastructure collectively create an organizational environment that enables sustainable digital workforce transformation and supports improved employee performance. The organizational factors identified by participants are summarized in Table 10, which categorizes the enabling factors and implementation barriers affecting HCIS–ESS integration within the virtual office environment.

Table 10. Organizational Factors Affecting HCIS–ESS Implementation

Organizational Factor	Key Findings	Implication
Leadership Support	Strong managerial commitment encouraged system adoption.	Accelerated digital transformation and employee engagement.
Standard Operating Procedures (SOPs)	Clear digital workflows reduced operational inconsistencies.	Improved process standardization and compliance.
Training and Technical Support	Continuous assistance increased employee confidence in using HCIS–ESS.	Facilitated technology adoption and reduced resistance.
Digital Infrastructure	Reliable internet and integrated systems supported uninterrupted HR services.	Enhanced operational efficiency in virtual work settings.
Implementation Challenges	Digital literacy gaps, internet instability, and limited system customization.	Required ongoing organizational support and system enhancement.

DISCUSSION

The findings demonstrate that HCIS–ESS integration functions not merely as an administrative tool but as a digital workforce solution that enhances employee performance in virtual office environments. This supports Human Capital Theory, which posits that investment in digital infrastructure amplifies workforce productivity and organizational value.

The findings indicate that the effectiveness of HCIS–ESS integration extends beyond improving administrative efficiency and represents a broader organizational transformation in managing human resources within virtual office environments. Rather than functioning solely as an automation tool, the integrated system enables organizations to redesign HR processes by providing centralized information, reducing manual intervention, and facilitating real-time access to HR services. This transformation is particularly important in virtual work settings where employees depend on digital platforms to perform routine administrative activities without direct interaction with HR personnel. Consequently, HCIS–ESS integration enhances not only operational efficiency but also organizational responsiveness and workforce agility.

These findings are consistent with previous studies reporting that digital HR systems improve administrative efficiency and employee productivity by automating routine HR processes and reducing operational delays (Yona & Meilani, 2024; Savitri, Buchori, & Supratikta, 2024). However, this study extends previous research by demonstrating that the effectiveness of HCIS–ESS integration is not merely reflected in faster administrative processes but also in employees' increased autonomy and flexibility in managing HR-related activities. While most previous studies primarily evaluated system effectiveness using quantitative indicators such as productivity or efficiency ratios, the present study provides qualitative evidence explaining how employees experience these improvements in their daily work practices within a virtual office environment.

The virtual office context also contributes to the distinctive findings of this study. Unlike conventional workplace settings, remote employees rely extensively on integrated digital systems to access HR services, communicate organizational information, and complete administrative transactions. Under these conditions, the integration of HCIS and ESS becomes a critical organizational capability rather than an optional technological enhancement. The findings suggest that seamless access to HR information reduces administrative uncertainty, shortens response times, and supports more flexible work arrangements. This contextual explanation expands earlier research by illustrating that the benefits of HCIS–ESS integration become more prominent when organizations operate under digitally mediated work environments.

From the perspective of the Technology Acceptance Model (TAM), the observed administrative efficiency can be interpreted as a consequence of employees' positive perceptions regarding the usefulness of the integrated system. Employees who experienced faster HR services, simplified administrative procedures, and easier access to organizational information developed stronger perceptions that HCIS–ESS supported their job performance. These positive experiences reinforced continued system utilization and strengthened employees' willingness to incorporate the platform into their daily work activities. Thus, the effectiveness of HCIS–ESS is closely associated with employees' acceptance of the technology rather than with technological functionality alone.

The findings can also be interpreted through Human Capital Theory, which views investments in technology as strategic investments that enhance employee capability and organizational value. The integration of HCIS–ESS reduced the amount of time employees devoted to repetitive administrative activities, allowing

greater attention to core job responsibilities and value-creating tasks. Consequently, technological investment generated returns not only in terms of operational efficiency but also through improved workforce productivity, greater employee autonomy, and enhanced organizational performance. This finding reinforces the argument that digital HR systems contribute to human capital development by creating conditions that enable employees to utilize their knowledge and competencies more effectively.

An important contribution of this study lies in integrating the explanatory mechanisms of Technology Acceptance Model (TAM) and Human Capital Theory. The findings indicate that employees initially accepted HCIS–ESS because they perceived the system as easy to use and beneficial for their daily work activities. This positive acceptance encouraged continuous system utilization, which subsequently enabled improvements in administrative efficiency, work flexibility, and employee capability. In other words, TAM explains the behavioral mechanism through which employees adopt and continuously use HCIS–ESS, whereas Human Capital Theory explains how sustained technology utilization translates into enhanced workforce capability and organizational performance. This integrated explanation provides a more comprehensive understanding of digital HR transformation than studies relying on either theoretical perspective independently.

Overall, this study contributes to the digital HRM literature by demonstrating that the effectiveness of HCIS–ESS integration is determined not only by technological functionality but also by the interaction between user acceptance, organizational context, and human capital development. The findings therefore broaden existing knowledge regarding digital workforce solutions by explaining the processes through which integrated HR technologies generate sustainable performance improvements within virtual office environments.

The findings demonstrate that user acceptance represents the primary behavioral mechanism determining the success of HCIS–ESS implementation within virtual office environments. Rather than being influenced solely by the availability of digital technology, employees' willingness to adopt HCIS–ESS was shaped by their perceptions of how the integrated platform simplified administrative tasks, improved accessibility to HR services, and supported daily work activities. This suggests that technology implementation becomes effective only when employees recognize clear benefits and experience minimal difficulty in using the system.

The empirical findings closely correspond to the causal mechanism proposed by the Technology Acceptance Model (TAM). Participants consistently reported that the intuitive interface, standardized workflows, and straightforward navigation reduced the effort required to perform HR-related tasks. These experiences reflect the construct of Perceived Ease of Use (PEOU), which served as the initial driver of technology acceptance. As employees became familiar with the integrated system, they increasingly perceived that HCIS–ESS enhanced administrative efficiency, accelerated HR transactions, and improved access to organizational information. These experiences strengthened Perceived Usefulness (PU), indicating that employees evaluated the system not merely based on its technical characteristics but on its contribution to job performance.

The relationship between Perceived Ease of Use and Perceived Usefulness observed in this study supports Davis's original proposition that systems requiring less cognitive effort are more likely to be perceived as valuable. The qualitative findings suggest that ease of use facilitated employees' confidence during the early stages of implementation, while repeated positive experiences gradually reinforced the perception that HCIS–ESS generated tangible benefits for their work. This sequential process provides qualitative evidence explaining how technology acceptance develops over time, extending previous quantitative studies that primarily measured the statistical association between TAM constructs without exploring employees' lived experiences.

The findings further indicate that stronger perceptions of usefulness encouraged employees to develop a positive Behavioral Intention (BI) toward continued system utilization. Rather than using HCIS–ESS solely because it was mandated by organizational policy, most participants voluntarily incorporated the platform into their daily work routines because they considered it beneficial, reliable, and efficient. This behavioral intention subsequently resulted in Actual System Use (AU), where HCIS–ESS became an essential component of employees' administrative and operational activities. Therefore, the present study confirms the sequential pathway proposed by TAM, namely Perceived Ease of Use → Perceived Usefulness → Behavioral Intention → Actual System Use, while providing qualitative evidence illustrating how each construct emerged within the context of virtual work.

These findings are generally consistent with previous studies reporting that perceived usefulness and perceived ease of use positively influence employee acceptance of digital HR systems (Yona & Meilani, 2024; Anggraeni, Fa'uzobihi, & Santosa, 2024). However, this study extends the existing literature by demonstrating that the influence of TAM constructs becomes more pronounced within virtual office environments, where employees rely almost entirely on digital platforms to perform HR-related activities. Unlike conventional

workplace settings, remote work limits direct interaction with HR personnel, making system usability and accessibility more critical determinants of technology acceptance. This contextual perspective broadens previous research by showing that the effectiveness of TAM constructs is influenced by the organizational work environment in which the technology is implemented.

From the perspective of Human Capital Theory, sustained utilization of HCIS–ESS represents more than successful technology adoption; it reflects an organizational investment that strengthens employees' capabilities and enhances workforce productivity. As employees continuously used the integrated system, they developed greater digital competence, improved self-management, and became more autonomous in handling HR-related responsibilities. These improvements reduced administrative burdens and enabled employees to allocate more time to core organizational activities, thereby increasing both individual productivity and organizational effectiveness. Consequently, the behavioral outcomes explained by TAM become the mechanism through which investments in digital HR infrastructure generate returns in the form of enhanced human capital.

The integration of TAM and Human Capital Theory constitutes one of the principal theoretical contributions of this study. While TAM explains why employees accept and continuously utilize HCIS–ESS, Human Capital Theory explains how sustained technology utilization transforms digital investment into improved employee capability, work efficiency, and organizational performance. Accordingly, user acceptance should not be viewed merely as an indicator of successful system implementation but as a strategic process that connects digital technology adoption with long-term human capital development. This integrated perspective extends existing digital HRM literature by providing a comprehensive explanation of how HCIS–ESS contributes to sustainable employee performance in virtual office environments. Below is the Technology Acceptance Model (TAM) derived from the research as shown in Figure 3.

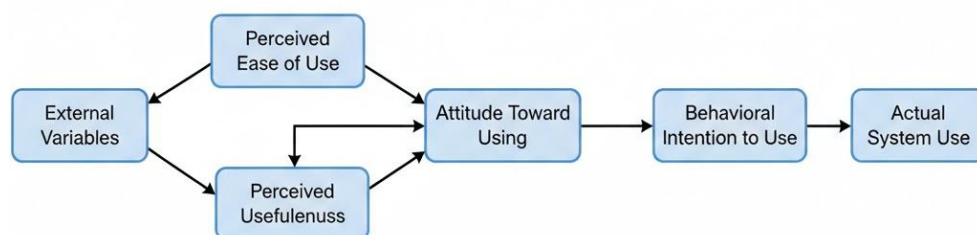


Figure 3. Technology Acceptance Model (TAM)

Several enabling and inhibiting factors were identified. Supporting factors include top management commitment, clear SOPs, system integration with performance evaluation mechanisms, and continuous technical support. Conversely, inhibiting factors consist of unstable internet connectivity, limited system customization, and delayed system updates. The triangulation of interviews, observations, and documents confirms that organizational readiness and change management play a critical role in sustaining the effectiveness of HCIS–ESS implementation within a virtual office context.

The study highlights that technology alone does not guarantee performance improvement. Organizational factors such as leadership support, communication, training, and policy alignment significantly influence outcomes. These results resonate with recent studies emphasizing the importance of governance and change management in digital workforce transformation. HCIS–ESS integration becomes a strategic necessity rather than an operational option. Organizations that effectively align technology adoption with human capital development are better positioned to achieve sustainable performance improvements.

The observed efficiency gains align with prior studies indicating that digital HR systems reduce administrative workload and allow employees to focus on value-adding activities. The automation of HR processes contributes to performance improvement by minimizing delays and errors, consistent with previous empirical findings in digital HRM research.

Beyond confirming the positive relationship between HCIS–ESS integration and employee performance, this study offers several theoretical and practical contributions to the digital Human Resource Management (HRM) literature. Previous studies have predominantly examined HCIS, HRIS, or Employee Self-Service (ESS) independently and have generally focused on measuring statistical relationships between technology adoption and organizational performance. In contrast, this study provides qualitative evidence explaining how HCIS–

ESS integration creates value through the interaction between user acceptance, organizational readiness, and leadership support within virtual office environments.

A primary theoretical contribution of this study is the integration of the Technology Acceptance Model (TAM) and Human Capital Theory into a unified explanatory framework. The findings demonstrate that employees' perceptions of ease of use and usefulness encourage continuous system utilization, as proposed by TAM. Sustained utilization subsequently enhances employee capability, work efficiency, and organizational productivity, thereby illustrating the mechanism through which investments in digital HR technology generate human capital development. This integrated explanation extends previous studies by demonstrating that technology acceptance functions as the behavioral pathway linking digital HR investment with organizational performance.

Furthermore, this study contributes conceptually by identifying organizational readiness as a critical enabling condition for successful HCIS–ESS implementation. Leadership commitment, standardized operating procedures, employee training, and continuous technical support were found to strengthen technology acceptance and facilitate sustainable digital transformation. These findings suggest that organizational capability is equally important as technological capability, particularly within virtual office environments where employees rely extensively on digital systems for daily work activities.

From a practical perspective, the findings provide strategic implications for organizations implementing digital HR systems. Rather than focusing exclusively on technological infrastructure, organizations should simultaneously invest in leadership commitment, change management, digital competency development, and governance mechanisms to maximize the organizational benefits of HCIS–ESS integration. Accordingly, this study positions HCIS–ESS not merely as an administrative information system but as a comprehensive digital workforce solution that supports sustainable employee performance and long-term organizational competitiveness. Based on the synthesis of the empirical findings and the integration of the Technology Acceptance Model (TAM) and Human Capital Theory, the proposed conceptual framework is presented in Figure 4.

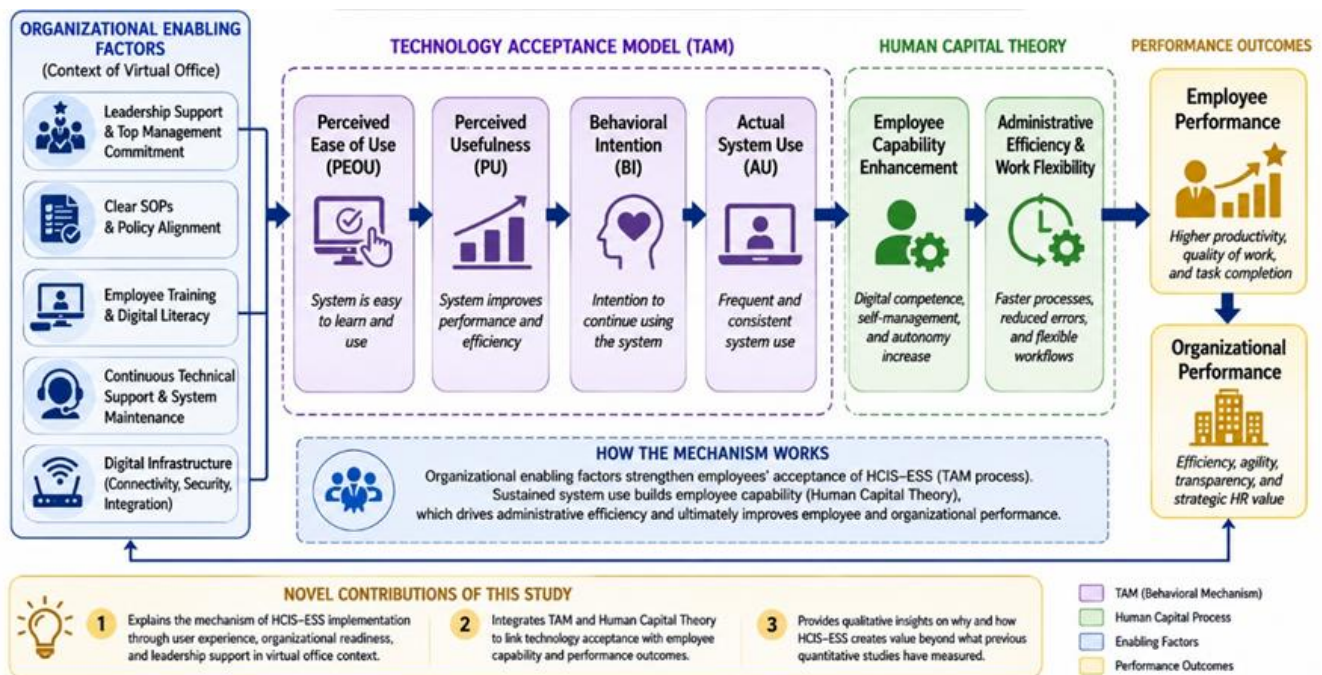


Figure 4. Integrated Mechanism of HCIS–ESS Implementation as a Digital Workforce Solution in Virtual Office Environments

CONCLUSION

This study concludes that the integration of Human Capital Information Systems (HCIS) and Employee Self-Service (ESS) functions as an effective digital workforce solution for enhancing employee performance in virtual office environments. The findings demonstrate that administrative efficiency and work flexibility are achieved through sustained user acceptance, while successful implementation depends not only on employees'

perceptions of usefulness and ease of use but also on organizational readiness, including leadership commitment, standardized operating procedures, and continuous technical support.

The study contributes theoretically by extending the application of the Technology Acceptance Model (TAM) and Human Capital Theory through an integrated explanation of HCIS–ESS implementation. Specifically, TAM explains how perceived ease of use and perceived usefulness encourage continuous system utilization, whereas Human Capital Theory explains how sustained technology utilization enhances employee capability, productivity, and organizational value. Furthermore, the findings demonstrate that organizational readiness complements these theories by acting as an enabling condition that strengthens the relationship between technology acceptance and successful digital HRM implementation within virtual office environments.

From a practical perspective, the findings provide guidance for organizations seeking to implement integrated digital HR systems by emphasizing that technological investment should be accompanied by leadership support, employee capability development, governance mechanisms, and continuous organizational support to achieve sustainable performance improvement.

This study is limited to a single organizational case study, which may restrict the generalizability of the findings. Future research is therefore encouraged to employ comparative case studies, mixed-method approaches, or longitudinal designs across multiple organizations and industries to further validate the proposed conceptual framework and examine HCIS–ESS implementation within hybrid and evolving digital work environments.

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