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Dynamics of Human System Interaction in the Implementation of Information Technology in Work Environment

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Abstract: Human interaction with information systems can elicit diverse responses. Some users may find that technology accelerates task completion and improves access to information. Conversely, system changes can lead to adaptation difficulties, increased workloads, system dependency, or resistance to change. From a systems perspective, the implementation of information technology can be understood as a process involving the interrelationships among people, technology, tasks, information, and the organizational environment. A change in one component can influence the others. This study employs a literature review method aimed at identifying and examining prior research on human-system interactions during the implementation of information technology in the workplace. The result of this research shows that the implementation of information technology in the workplace is a sociotechnical process involving dynamic interactions among people, systems, tasks, and the organizational environment. Successful implementation depends not only on the system's technical capabilities but also on adaptability, user competence, usability, resistance to change, digital workload, and organizational support such as training, mentoring, and communication.

Keywords: Human System Interaction, Information Technology, Work Environment

INTRODUCTION

Advancements in information technology have brought about significant changes in how organizations conduct their operational activities. Information technology is no longer merely a tool to support administrative tasks; it has become an integral part of various organizational processes ranging from communication, data management, and service delivery to decision making and coordination between work units. Implementing information systems enables organizations to manage information more rapidly and systematically while supporting increasingly complex workflows (Asmawi et al., 2019). However, the successful implementation of information technology depends not only on the sophistication of the system itself but also on how human users interact with, adapt to, and respond to the changes brought about by that system.

Within the work environment, the relationship between humans and information technology is dynamic. Systems implemented by organizations can alter work patterns, task allocation, communication mechanisms, and employee decision-making processes.

Conversely, user behavior, competence, experience, and needs can influence how a system is utilized in practice. Thus, information technology and humans cannot be viewed as isolated components together, they form an interdependent socio technical system. A technically well designed system does not necessarily yield optimal benefits if it fails to align with the characteristics and needs of its users (Rijal et al., 2023).

Human interaction with information systems can elicit diverse responses. Some users may find that technology accelerates task completion and improves access to information. Conversely, system changes can lead to adaptation difficulties, increased workloads, system dependency, or resistance to change. These outcomes demonstrate that implementing information technology is a process involving not only technical aspects but also psychological, social, and organizational dimensions (Annisa & Pratama, 2022). Therefore, understanding the dynamics of the interaction between users and systems is crucial to comprehending how technology truly functions within the workplace environment.

This issue has become increasingly relevant alongside the growing digitalization of organizations. The simultaneous use of various digital systems can create a highly interconnected work environment while also increasing the complexity of user-technology interactions. Employees are required to understand multiple systems, adapt to procedural changes, ensure accurate information management, and align their work patterns with technological advancements. If the adaptation process is unsuccessful, a gap may emerge between user capabilities and system demands. Such a gap has the potential to impact the effectiveness of technology usage and the achievement of organizational goals (Rahmadi & Rusmiati, 2025).

From a systems perspective, the implementation of information technology can be understood as a process involving the interrelationships among people, technology, tasks, information, and the organizational environment. A change in one component can influence the others. For instance, changes to an information system may require employees to learn new procedures, while changes in user competence can determine the extent to which system features are utilized (Sabarini & Ali, 2024). Therefore, evaluating information technology implementation requires considering these inter-component relationships rather than merely measuring the system's technical performance.

Beyond the aspect of adaptation, the quality of the interaction between humans and systems is also linked to the acceptance and sustained use of technology. Information systems that are difficult to understand or unaligned with job requirements may prompt users to seek alternatives, perform tasks manually, or use the system solely to fulfill organizational obligations. Conversely, systems that are intuitive, job-relevant, and capable of supporting user needs can foster more optimal technology utilization (Silvia, 2026). This demonstrates that the successful implementation of information technology is ultimately deeply connected to the quality of the relationship between the system and the people who use it.

Given the preceding discussion, research into the dynamics of human-system interaction is crucial, as the implementation of information technology cannot be fully understood from a purely technological perspective. An approach that considers the reciprocal relationship between humans and systems can provide a more comprehensive understanding of the processes of adaptation, acceptance, and usage, as well as the various challenges that arise during the implementation of information technology in the workplace. This study aims to analyze how human-system interactions take shape during the implementation of information technology and how these dynamics relate to the effectiveness of system usage in supporting organizational activities.

Based on the background regarding the dynamics of human-system interaction during information technology implementation in the workplace, the research questions are as follows:

1. What are the dynamics of the interaction between humans and systems during the implementation of information technology in the workplace?

2. What factors influence the success of human system interaction in the use of information technology?
3. How do adaptability, user competence, usability, and organizational support influence the information technology implementation process?

METHODS

This study employs a literature review method aimed at identifying and examining prior research on human-system interactions during the implementation of information technology in the workplace. This approach enables a comprehensive understanding of interaction patterns between users and technology, the process of adapting to information systems, factors influencing technology acceptance, and the various issues that arise during implementation within organizational settings.

RESULTS AND DISCUSSION

Result

An analysis of prior research reveals that the dynamics of human-system interaction during information technology implementation in the workplace are influenced by various interconnected factors. The findings indicate that IT implementation depends not only on the technical quality of the system but is also shaped by user characteristics and organizational conditions.

This study aligns with research by Hidayah et al. (2024), which demonstrates that the technological revolution by shaping organizational culture and employee interactions can foster efficient team collaboration and create broader correlations. However, reliance on technology can also lead to social isolation and unnecessary conflict. It is essential for both individuals and companies to understand the potential benefits and drawbacks associated with technology access. Furthermore, strategies must be developed to ensure alignment within an increasingly productive work environment.

Research by Sangapan et al. (2025) indicates that the success of digital transformation is heavily influenced by technology, organizational structure, and human resource readiness. This study underscores that IT implementation cannot be viewed merely as a technological intervention; rather, it acts as a catalyst for systemic organizational change, affecting work structures, decision-making processes, and organizational culture. Moreover, the findings highlight that IT success is highly contextual, depending on structural readiness, human resource adaptability, and managerial-level policy support.

Discussion

Dynamics of Human-System Interaction in the Work Environment

A review of the literature indicates that the implementation of information technology in the workplace creates a dynamic, mutually influential relationship between humans and systems. Information technology serves not merely as a tool to support work; it can also transform how employees complete tasks, communicate, access information, and make decisions. Conversely, user responses to the system help determine the extent to which the technology can be utilized optimally.

This interaction demonstrates that the success of an information system's implementation cannot be judged solely by technical aspects such as speed, capacity, or feature completeness. The human factor plays a crucial role, as systems are ultimately used by individuals with varying levels of knowledge, experience, needs, and adaptability. Consequently, there is a reciprocal relationship between system characteristics and user characteristics.

From a socio technical systems perspective, technology and humans form an interconnected whole. Changes to the system can alter user behavior, while user behavior and needs can serve as a basis for system development or adjustment. This dynamic renders

technology implementation an ongoing process that requires continuous evaluation and adaptation.

User Adaptation to Technological Change

Studies show that user adaptability is a critical aspect of information technology implementation. Introducing a new system often requires employees to learn procedures, features, and work patterns that differ from their previous routines. The success of this adaptation can be influenced by factors such as prior experience with technology, digital competence, perceptions of the system's benefits, and organizational support.

Users with greater adaptability tend to adjust their work patterns effectively in response to system changes. Conversely, limited knowledge and experience can lead to difficulties in using the system. Such difficulties may manifest as a reliance on assistance from others, underutilization of features, or a tendency to cling to old ways of working. Adaptation should not be viewed as the sole responsibility of the user. Organizations play a vital role by providing training, guidance, and resources, as well as communicating the objectives of the technological change. Thus, user adaptation emerges from the interaction between individual readiness and an organizational environment that supports the change process.

The Role of User Competence and Training

User competence is a key factor influencing the effectiveness of human-system interaction. As technology becomes increasingly complex, users must possess capabilities that align with system requirements. Without adequate competence, the mere presence of technology does not guarantee improved work effectiveness.

Training serves as an organizational mechanism to bridge the gap between user capabilities and technological demands. Training is necessary not only during the initial implementation phase but also on an ongoing basis whenever the system undergoes updates. Technical assistance, user guides, and support from the information technology unit can also help users navigate challenges encountered while using the system. Thus, successful implementation depends not only on organizational investment in hardware and software but also on investment in human resources. Developing user competence enhances an organization's ability to derive value from information technology.

Organizational Support in Technology Implementation

Organizational support is a crucial component in shaping human-system interaction. Technology implementation that focuses solely on system deployment without considering the readiness of the organizational environment risks creating usage gaps. Support can be provided through infrastructure provision, training, technical assistance, change communication, and clear policies regarding system usage. Furthermore, management needs to provide avenues for users to voice concerns and offer feedback on the system. Such support demonstrates that information technology is part of a broader organizational system. The effectiveness of technology is determined not only by system quality but also by the extent to which the organization creates conditions that enable users to interact effectively with the system.

Human System Interaction from a Systemic Perspective

When these findings are viewed holistically, the dynamics of human-system interaction can be described as a reciprocal relationship. System characteristics influence user experience and behavior, while user experience, competence, and needs can influence patterns of system utilization and development. Furthermore, this relationship is influenced by the organizational environment. Management support, training, organizational culture, infrastructure, and job characteristics can either strengthen or weaken the relationship between humans and technology. Consequently, the implementation of information technology should not be carried

out in isolation from its social and organizational context. A systemic approach reveals that problems in technology implementation do not necessarily stem from a flawed system or incompetent users. Issues may arise due to a lack of alignment among technology, people, tasks, and the organizational environment. Therefore, problem-solving requires consideration of all these interacting components.

Implications for the Effectiveness of Information Technology Implementation

A synthesis of the literature indicates that the effectiveness of information technology implementation results from the interaction of various factors. System quality must go hand-in-hand with user readiness, ease of use, competence, training, and organizational support. The implication is that organizations must position users as integral to the technology design and implementation process. System evaluation should not be limited to measuring technical performance; it must also consider user experience, task-system fit, feature utilization rates, and obstacles encountered in daily work. By adopting this approach, information technology implementation can be directed not merely toward digitizing work processes, but toward creating alignment between human needs and system capabilities. Such alignment lays the foundation for sustainable technology usage that supports organizational goals.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Based on the literature review, it can be concluded that the implementation of information technology in the workplace is a sociotechnical process involving dynamic interactions among people, systems, tasks, and the organizational environment. Successful implementation depends not only on the system's technical capabilities but also on adaptability, user competence, usability, resistance to change, digital workload, and organizational support such as training, mentoring, and communication. Alignment between user needs and system characteristics is a crucial factor in ensuring effective and sustainable technology usage. Therefore, organizations must view people as an integral part of the information technology system to ensure that digital implementation yields optimal benefits for organizational activities and objectives.

Limitations

This study has several limitations. First, it employs a literature review method; consequently, the findings depend on the availability, quality, and relevance of the prior studies used as sources. Second, the study does not involve the direct collection of primary data from information technology users in a workplace setting; thus, the dynamics of human-system interaction do not necessarily reflect the specific conditions of any particular organization. Third, variations in organizational characteristics, technology types, research methods, and user contexts across the reviewed studies may influence the comparison and synthesis of the findings. Therefore, the results are primarily conceptual and general in nature and do not empirically demonstrate the relationships between variables within the context of a specific organization.

Recommendations

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Author Contributions

The author's contribution to this research is divided into several main stages, including determining the research topic, formulating the problem, developing ideas, collecting data to analyzing the data, and then interpreting the results.

AI Disclosure Statement

The authors are solely responsible for the content, accuracy of the information, analysis, interpretation, and conclusions presented in this paper. All information obtained using AI was reviewed and reconciled by the authors with relevant literature sources before being used in the final manuscript.

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