

Enhancing Enterprise Usability: Integrating Adaptive UI and Inclusive Design Strategies

Nuraini Purwandari¹, Ratna Kusuma Dewi²

¹Institut Bisnis dan Informatika (IBI) Kosgoro 1957, Indonesia

²Universitas Jayabaya, Indonesia

Correspondent: nuraini.purwandari@gmail.com¹

Received : December 18, 2024

Accepted : January 20, 2025

Published : January 31, 2025

Citation: Purwandari, N., Dewi, R. K. (2025). Enhancing Enterprise Usability: Integrating Adaptive UI and Inclusive Design Strategies. *Data: Journal of Information Systems and Management*, 3 (1), 34-46.

ABSTRACT: In the last five years, there has been a significant shift in how user interface (UI) and user experience (UX) design are approached within enterprise systems, reflecting the growing demand for more intuitive, adaptive, and inclusive solutions. This study employs a narrative review based on 1,500 initial records screened from Scopus, IEEE Xplore, ACM Digital Library, and Google Scholar (2019–2024). After rigorous selection, 82 empirical studies were included, focusing on user-centered design (UCD), adaptive interfaces, and inclusive practices in enterprise environments.. The review draws upon academic sources indexed in Scopus, IEEE Xplore, ACM Digital Library, and Google Scholar. Keywords including "Enterprise Systems," "User Experience," "Interface Design," and "Adaptive User Interfaces" were utilized to identify relevant literature, with inclusion criteria focusing on empirical studies from the last decade. Findings from 82 included studies show that UCD practices enhance usability and user satisfaction, with some reporting 20–30% higher usability scores and faster task completion rates when end-users are actively involved throughout development.. Adaptive interfaces employing machine learning have demonstrated potential to increase task efficiency and user engagement by personalizing content and layout. Moreover, inclusive design strategies, such as universal accessibility features and assistive technologies, contribute to improved user experiences across ability levels. However, systemic barriers like organizational resistance and limited training still hinder optimal implementation. The review highlights the need for strategic design interventions, ongoing usability assessments, and context-sensitive adaptations. As enterprise systems continue to evolve, future research must explore long-term effects of adaptive design and develop unified frameworks for inclusive, responsive interfaces. These efforts are vital to ensure equitable access and effectiveness of enterprise technologies across global and cross-sectoral contexts.

Keywords: User-Centered Design, Enterprise Systems, Adaptive Interfaces, Inclusive UX Design, Usability Evaluation, Human-Computer Interaction, Digital Experience Platforms.



This is an open access article under the CC-BY 4.0 license

INTRODUCTION

In recent years, the evolution of user interface (UI) and user experience (UX) design for enterprise systems has become a focal point in both academic and professional discourses. The growing complexity of enterprise applications, along with the increasing need for seamless interaction and

efficient data representation, has led to innovative paradigms in UI/UX. One of the most significant developments is the introduction of Enterprise Knowledge Graphs (EKGs), which facilitate improved business decision-making by providing enriched and interconnected data representations (Sellami & Zarour, 2022). EKG-driven UI designs prioritize usability and intuitive interactions, ultimately boosting collaboration and productivity among users (Haase et al., 2019). Simultaneously, the integration of interactive dashboards and virtual assistants has demonstrated tangible benefits in enhancing the user experience, particularly in smart manufacturing environments (Jwo et al., 2021). These developments respond to a growing demand for more accessible and context-aware systems that allow users to engage more effectively with enterprise data.

This transition in interface design is particularly relevant as enterprise systems such as Enterprise Resource Planning (ERP) and Digital Experience Platforms (DXPs) play an increasingly pivotal role in organizational operations. Poorly designed interfaces in such systems have been found to directly hinder productivity and user satisfaction. For instance, non-intuitive interfaces can lead to confusion, task errors, and frustration, significantly affecting workflow efficiency (Toribio et al., 2019). A growing body of research emphasizes the critical role of usability evaluations in identifying and rectifying UI deficiencies (Hüsson et al., 2020). These evaluations ensure that user interaction with enterprise platforms is not only functionally adequate but also engaging and efficient. The adoption of design frameworks such as the Lean User Experience Center for Excellence (LUXCE) further exemplifies a proactive stance toward mitigating usability issues by promoting collaborative and consistent design practices (Wang & Barhorst-Cates, 2023).

Foundational to these advancements is the recognition that UI/UX design significantly impacts organizational performance. Empirical data underscore the link between interface quality and key performance indicators such as task completion time, user satisfaction, and system adoption rates. As organizations become increasingly data-driven, the need for real-time, reliable, and user-friendly interfaces has grown. The ability of systems to provide relevant information quickly and clearly is now seen as a competitive advantage. For example, studies reveal that organizations with high usability scores report greater ROI from digital transformation initiatives, underscoring the financial implications of effective interface design (Haase et al., 2019).

Furthermore, the rise of hybrid work models and globalized business environments necessitates systems that can accommodate diverse user needs and preferences. This diversity introduces additional layers of complexity to UI/UX design, as systems must cater to varying levels of digital literacy, cultural expectations, and work practices. Consequently, adaptive and responsive UI design has become a strategic priority. Systems that fail to address these needs risk alienating users and undermining business processes. As such, continuous UI assessment and redesign are essential for sustaining organizational agility and user engagement.

Despite these advancements, end users continue to encounter significant challenges when interacting with enterprise systems. The most commonly reported issues include overly complex interfaces, unintuitive features, and insufficient support during onboarding or when navigating new system updates. These obstacles contribute to user frustration and often result in underutilization of system capabilities (Wang & Barhorst-Cates, 2023). Research by Dakić et al.

(2024) highlights that inadequate interaction design impairs the ability of users to locate and utilize critical information efficiently, reducing both individual and team productivity. Such findings point to a persistent misalignment between system capabilities and user expectations.

To address these challenges, the field has witnessed increasing interest in adaptive user interfaces (AUIs), which aim to tailor user experiences based on individual behavior and contextual variables. AUIs dynamically adjust interface elements to match user preferences, expertise levels, and task contexts, thereby enhancing usability. Evidence suggests that these interfaces can significantly improve user satisfaction and task performance (Haase et al., 2019). However, implementing adaptive systems presents its own set of difficulties, particularly in maintaining design consistency across different teams and platforms (Wang & Barhorst-Cates, 2023). Moreover, the technical infrastructure required for adaptive design, including data tracking and machine learning capabilities, introduces additional complexity to system development and maintenance.

These challenges underscore the need for more robust and scalable design strategies that align HCI principles with the realities of enterprise environments. While progress has been made, there remains a gap between theoretical advancements in UI/UX and their practical implementation across industries. Notably, many enterprise systems still rely on static design paradigms that do not accommodate the evolving needs of their user base. Addressing this gap requires both conceptual innovation and empirical validation.

One significant gap in the literature is the limited exploration of how industry context influences the effectiveness of user-centered design (UCD) methods. While UCD is widely acknowledged as a beneficial approach to interface design, most studies focus on general outcomes such as usability improvements without accounting for sector-specific requirements. For example, the UI needs in the education sector—which emphasize continuity of learning and social engagement—differ considerably from those in manufacturing, where speed and data accuracy are paramount. Current literature rarely investigates how UCD strategies must be adapted to these differing needs, resulting in a lack of actionable guidance for practitioners operating in diverse domains.

In addition to contextual variation, there is a scarcity of longitudinal studies that assess the sustained impact of UI/UX improvements over time. Much of the existing research concentrates on short-term gains, overlooking whether enhanced designs continue to deliver value after initial implementation. This limitation hinders the development of sustainable design practices and makes it difficult to establish long-term ROI for UX investments. More longitudinal data are needed to evaluate how user interaction patterns evolve and to determine which design features contribute to enduring system engagement.

Given these gaps, this narrative review aims to synthesize recent advances in UI/UX design for enterprise systems with a particular focus on adaptive interfaces, user-centered methodologies, and sector-specific design considerations. The review will examine how these approaches influence user satisfaction, task efficiency, and system adoption, while also identifying challenges in implementation. By analyzing current trends and empirical findings, this study seeks to provide a comprehensive understanding of best practices and emerging strategies in enterprise UI/UX.

The scope of this review encompasses studies conducted between 2019 and 2024, focusing on enterprise systems in both public and private sectors across various geographic regions. Particular attention will be paid to comparative studies that highlight regional or industry-specific nuances in UI/UX implementation. This approach enables the identification of both universal design principles and localized adaptations, thereby offering a holistic view of the state of the field. The review also includes studies employing diverse research methodologies, including usability testing, ethnographic observation, and experimental design, to ensure a balanced and comprehensive analysis.

Ultimately, this review aims to contribute to the refinement of UI/UX practices in enterprise contexts by offering evidence-based recommendations for design, evaluation, and implementation. In doing so, it aspires to support developers, researchers, and decision-makers in creating more intuitive, efficient, and satisfying user experiences. By bridging the gap between academic insights and real-world application, the study seeks to enhance the effectiveness of enterprise systems and promote a user-centered culture within organizations.

METHOD

This narrative review adopted a systematic yet flexible methodology to identify and analyze relevant literature concerning user interface (UI) and user experience (UX) design in enterprise systems. The purpose of this methodological approach was to ensure the comprehensive identification of studies that not only address the technological evolution of UI/UX but also evaluate the usability and adaptiveness of interfaces in various enterprise contexts. The methodology emphasized both breadth and depth, capturing a wide spectrum of peer-reviewed academic sources, conference proceedings, and institutional reports published between 2019 and 2024.

To locate relevant literature, the review utilized four primary electronic databases known for their extensive coverage of computing and information systems research: Scopus, IEEE Xplore, ACM Digital Library, and Google Scholar. Scopus served as a core source due to its indexing of multidisciplinary journals with rigorous peer-review standards. IEEE Xplore and ACM Digital Library were especially valuable for accessing high-quality conference papers and journal articles specific to software engineering, human-computer interaction (HCI), and enterprise technology. Google Scholar was incorporated to supplement the dataset, allowing the inclusion of grey literature, preprints, dissertations, and academic publications not consistently indexed in other databases. These databases were chosen to ensure both academic rigor and inclusivity in terms of publication type and institutional origin.

The literature search employed a series of strategic keyword combinations designed to capture the complexity and nuance of UI/UX research in enterprise systems. The primary search string used Boolean logic and included combinations such as: "Enterprise Systems" AND "User Experience" AND "Interface Design". Additional search terms were introduced to refine the results and align them with subthemes explored in this review. These included: "Adaptive User Interfaces",

"Usability Evaluation", "Human-Computer Interaction", "UX in ERP Systems", and "Digital Experience Platforms". To ensure contextual relevance, industrial qualifiers such as "Education" OR "Manufacturing" were appended to searches in certain iterations. The search strategy was adjusted iteratively, allowing for greater specificity based on preliminary findings and thematic saturation.

The inclusion and exclusion criteria were formulated to ensure relevance, methodological quality, and thematic alignment with the study objectives. Included articles were those published between January 2019 and March 2024, written in English, and focused explicitly on user experience or interface design within the context of enterprise systems. Studies had to report empirical findings, conceptual frameworks, or systematic assessments related to usability, adaptive interfaces, or user-centered design strategies. Articles that dealt exclusively with consumer-facing applications, video games, or general web development without a clear enterprise context were excluded. Similarly, literature lacking methodological transparency, such as blog posts or opinion pieces without empirical support, was also excluded. Preference was given to studies conducted in real-world organizational settings or those involving rigorous simulation environments that mimic enterprise workflows.

The review encompassed a variety of study designs to capture both breadth and depth of insights. These included case studies, randomized controlled trials, observational studies, quasi-experimental research, and systematic literature reviews. Case studies were particularly useful in providing in-depth examinations of UI/UX redesigns in enterprise resource planning (ERP) systems or digital experience platforms (DXPs), whereas quasi-experimental designs contributed empirical insights into interface usability metrics. Observational studies and ethnographic methods offered valuable contextual understanding of user behavior and interaction patterns in enterprise environments. Furthermore, systematic reviews were included to synthesize prior research and highlight established findings and existing research gaps. This multi-method approach allowed for triangulation of evidence and the development of a robust, nuanced understanding of the field.

The process of literature selection involved several critical stages to ensure transparency and rigor. Initially, the database search returned over 1,500 records, which were imported into a reference management tool to remove duplicates and manage bibliographic data. After de-duplication, approximately 1,120 records remained for initial screening. This stage involved a title and abstract review conducted independently by two reviewers with expertise in information systems and user experience design. Articles that met the inclusion criteria were retained for full-text analysis. Discrepancies between reviewers were resolved through discussion and, where necessary, by consulting a third reviewer.

Full-text review formed the next stage of selection. At this point, 187 articles were shortlisted for in-depth analysis. During this phase, reviewers assessed the methodological rigor, relevance to enterprise systems, and the quality of UI/UX metrics used. A standardized coding scheme was applied to extract data concerning research objectives, study context, sample characteristics, UI/UX methodologies employed, evaluation tools, and key findings. Articles lacking sufficient methodological detail or relevance to enterprise UI/UX contexts were excluded. Ultimately, 82

studies were selected for inclusion in the final synthesis, representing a diverse and comprehensive body of research.

Data extraction and synthesis followed a thematic coding strategy designed to align with the objectives of the review. The primary themes identified included: usability evaluation practices, adaptive user interface implementation, sector-specific UI/UX challenges, and long-term impact of user-centered design methodologies. Subthemes such as collaborative design strategies, accessibility considerations, and cross-cultural usability were also coded where relevant. Thematic analysis allowed the consolidation of findings across different methodologies and contexts, thus enabling both macro- and micro-level insights into the state of UI/UX design in enterprise systems.

Quality appraisal of selected studies was conducted using adapted criteria from established guidelines such as the CASP (Critical Appraisal Skills Programme) checklist and the Joanna Briggs Institute (JBI) critical appraisal tools. Criteria included clarity of research objectives, appropriateness of methodology, validity of UI/UX measurement tools, transparency in data analysis, and contextual relevance. Each study was rated on a qualitative scale from low to high rigor. This appraisal informed the weight given to each study in the synthesis and enabled the identification of particularly influential contributions.

Throughout the methodological process, efforts were made to mitigate bias and ensure reproducibility. Search strings, database queries, and screening decisions were documented meticulously to facilitate transparency. Additionally, the use of multiple reviewers during screening and data extraction minimized the influence of individual bias and increased inter-rater reliability. Reflexivity was also maintained by periodically revisiting inclusion criteria and search terms in light of emerging findings, thereby maintaining methodological responsiveness without compromising consistency.

In summary, this methodological approach was designed to support a comprehensive and analytically rigorous review of literature on user interface and experience design in enterprise systems. By integrating multiple databases, employing targeted search strategies, and applying systematic screening and appraisal protocols, the review ensures both breadth and depth in capturing the most relevant and impactful studies in the field. This robust methodology lays the foundation for a reliable synthesis of existing knowledge, while also identifying gaps that inform future research directions and practical applications in enterprise UI/UX design.

RESULT AND DISCUSSION

This section synthesizes the key findings from the reviewed literature, organized thematically to reflect the major currents in user interface (UI) and user experience (UX) design research for enterprise systems. The emergent themes include the implementation of user-centered design (UCD), the development of adaptive and intelligent interfaces, the enhancement of accessibility and inclusivity, and comparative insights from global practices. Each sub-section presents relevant

empirical findings and theoretical insights that collectively illuminate the state of UI/UX practice in enterprise contexts.

The user-centered design paradigm continues to dominate UX research in enterprise systems. By involving end-users at various stages of system development, UCD practices have demonstrated measurable improvements in usability, user satisfaction, and system adoption. According to Wang and Barhorst-Cates (2023), a consistent UI design across different modules of an enterprise system contributes significantly to smoother user interaction and improved overall experience. Their study shows that system designs incorporating UCD methodologies achieve a 20% higher usability score than those designed using developer-centric approaches. Similarly, Toribio et al. (2019) examined the redesign of an academic ERP system and found that user participation during early design phases led to a notable increase in perceived ease of use and task efficiency.

Further supporting these findings, Engelmann and Ametowobla (2017) conducted a study in the hospital management sector, demonstrating that the implementation of UCD principles in operational planning software resulted in a marked improvement in coordination efficiency and stakeholder satisfaction. However, not all UCD implementations lead to success. As noted by Kirkpatrick et al. (2013), misalignment between user expectations and the implemented design, often due to superficial or tokenistic user involvement, can generate resistance and reduce the system's intended effectiveness. These divergent outcomes highlight the importance of comprehensive user engagement and iterative feedback loops to ensure that UCD practices translate into real-world value across varying enterprise settings.

The emergence of adaptive and intelligent interfaces marks a significant advancement in enterprise UI/UX development. Leveraging technologies such as machine learning (ML) and artificial intelligence (AI), these systems dynamically tailor the interface to individual user preferences and behavioral patterns. Hüsön et al. (2020) demonstrated that personal assistants embedded in business environments that harness ML for user behavior analysis significantly improve interaction relevance and user satisfaction. Their findings show a 30% increase in task efficiency when users operated systems that adapted interface elements to their preferences, compared to standard static designs.

The superiority of adaptive interfaces over static ones is further evidenced by Černý et al. (2013), who examined task completion and error rates in systems with adaptive UI components. Their research revealed that adaptive interfaces reduced task completion time by an average of 25% and halved the error rate compared to non-adaptive systems. Such improvements are attributed to the system's ability to prioritize relevant information, minimize cognitive load, and streamline navigation based on historical usage data. The authors argue that in dynamic enterprise environments, where task types and user profiles vary widely, adaptive interfaces are better suited to support productivity and user satisfaction.

Accessibility and inclusivity have increasingly become central concerns in enterprise UI design. Efforts to ensure that enterprise systems are usable by individuals with various disabilities have given rise to innovations grounded in the principles of universal design. Wang and Barhorst-Cates (2023) emphasized the importance of features such as keyboard navigability, screen reader compatibility, and high-contrast visual elements in facilitating access for users with visual and

motor impairments. These elements not only broaden the user base but also enhance usability for all users by promoting clearer and more intuitive interfaces.

Technologies such as text-to-speech and speech recognition have also gained traction as tools for supporting users with physical and cognitive challenges. For example, Kirkpatrick et al. (2013) reported that the integration of voice-interaction technologies into healthcare information systems improved the speed and accuracy of data entry by users with physical limitations. These enhancements not only made the systems more inclusive but also contributed to improved clinical outcomes by reducing errors and improving access to critical information.

Empirical evidence points to a positive correlation between inclusive design practices and broader organizational outcomes. Engelmann and Ametowobla's (2017) evaluation of a hospital information system incorporating accessibility features revealed improved communication among interdisciplinary teams and higher satisfaction among end-users, particularly those with previously unmet access needs. Similarly, Jwo et al. (2021) noted that organizations that embedded inclusivity into their enterprise systems experienced not only increased usage rates but also reported improvements in service delivery quality. While these findings are promising, it is important to note that the effectiveness of inclusive design strategies can vary depending on contextual factors such as sectoral norms, workforce demographics, and regulatory environments.

The comparison between enterprise UI/UX practices in developed and developing countries reveals critical contextual influences on design and implementation strategies. In developing regions, resource constraints often necessitate a stronger focus on accessibility, localization, and device compatibility. These considerations are particularly salient in sectors such as education and small-scale manufacturing, where end-users may have limited exposure to digital technologies. Sellami and Zarour (2022) observed that in such settings, user interfaces tend to prioritize clarity and simplicity over advanced functionalities, with the goal of reducing onboarding time and minimizing cognitive barriers.

In contrast, enterprises in developed countries benefit from more robust digital infrastructure, allowing for the implementation of cutting-edge features such as AI-driven customization and real-time analytics. Černý et al. (2013) highlight that enterprises in these environments are more likely to invest in adaptive and predictive systems that optimize user interaction across devices and contexts. As a result, UI/UX initiatives in developed settings are often geared toward enhancing personalization, automation, and integration with broader digital ecosystems.

The effectiveness of enterprise systems also varies significantly depending on the national context. Dakić et al. (2024) compared the implementation of digital experience platforms in organizations from both developed and developing nations and found that entities in wealthier nations exhibited faster adoption rates and better integration outcomes. This disparity was attributed to differences in IT infrastructure, availability of technical expertise, and institutional support. Similar findings were echoed by Kirkpatrick et al. (2013), who reported that clinical information systems deployed in countries with stable healthcare infrastructures yielded more consistent improvements in clinical workflows than those implemented in less-resourced settings.

Bodziony et al. (2021) further reinforced the role of national context by demonstrating that government policies, funding mechanisms, and regulatory standards significantly affect the pace

and quality of enterprise system deployments. Their study on electronic health records showed that countries with clear e-governance strategies and public investment in IT achieved higher success rates in deploying inclusive and user-friendly platforms. These insights underscore the necessity of tailoring UI/UX design strategies not only to organizational needs but also to the broader socio-economic and policy landscape in which systems are deployed.

In conclusion, the reviewed literature provides compelling evidence that user-centered design, adaptive technologies, inclusive practices, and context-sensitive implementation strategies collectively contribute to the effectiveness of UI/UX in enterprise systems. The synthesis of global perspectives highlights both the universality of certain design principles and the importance of local adaptation. These findings inform the ongoing development of best practices in enterprise UI/UX and suggest fruitful directions for future research, particularly in longitudinal studies, cross-sectoral comparisons, and the integration of emerging technologies.

The findings presented in this narrative review strongly corroborate established theoretical frameworks in human-computer interaction (HCI) and user interface design, particularly Nielsen's usability heuristics and the Technology Acceptance Model (TAM). Nielsen's principles emphasize system status visibility, consistency, error prevention, and user control—factors that are critical to the effectiveness of enterprise user interfaces (Engelmann & Ametowobla, 2017). Within enterprise environments, the integration of user-centered design (UCD) methodologies that align with these heuristics has been shown to improve user satisfaction and promote technology adoption. For example, Engelmann and Ametowobla reported positive user feedback when intuitive navigation, clarity of system feedback, and task-oriented designs were prioritized in enterprise systems. This aligns with TAM, which posits that perceived ease of use and perceived usefulness are primary determinants of technology acceptance.

Yet, despite the apparent benefits of UCD and well-established heuristics, systemic barriers continue to impede the successful deployment of effective enterprise interfaces. One of the most prominent challenges is cultural resistance to change. Organizational inertia often makes it difficult to implement new interface paradigms, even when they promise improved usability. Employees may be accustomed to legacy systems, and their reluctance to adopt new interfaces can slow the integration process significantly. This observation is echoed in the study by Toribio et al. (2019), which noted that poorly evaluated user interfaces often generate frustration, leading to low user engagement and system abandonment. Moreover, the absence of continuous usability evaluation creates a feedback void, where design flaws remain unaddressed, compounding user dissatisfaction over time.

A second systemic issue is the inadequacy of training and technical education among users. Even the most intuitively designed systems require a baseline of digital literacy to be used effectively. Organizations frequently underinvest in user training during software rollouts, expecting users to adapt without structured support. Such oversight hampers the long-term efficacy of even the most sophisticated interfaces. As Wang and Barhorst-Cates (2023) argue, adaptive learning mechanisms and progressive disclosure of features can ease the learning curve, but they are not substitutes for comprehensive user training initiatives.

To overcome these systemic barriers, several promising design strategies have emerged. Among them is the implementation of agile and iterative design processes. These allow developers to

continuously integrate user feedback at various stages, promoting responsive design evolution and a stronger sense of user ownership. Sekar (2017) suggests that early and consistent involvement of end-users in interface development fosters not only better design outcomes but also organizational buy-in. It also aligns well with participatory design philosophies that treat users as co-creators of technology rather than passive recipients.

In parallel, the incorporation of intelligent interface features, such as machine learning-powered adaptivity, offers new pathways to enhance user experience. Systems that adjust interface elements based on behavioral data can provide more personalized and efficient user interactions. Hüsön et al. (2020) demonstrated how business-oriented virtual assistants could dynamically adapt interfaces to user behavior, significantly enhancing task completion rates and user satisfaction. These systems reduce cognitive load and help users focus on task-relevant information, a benefit that is especially critical in high-stakes enterprise environments.

However, the integration of adaptive technologies also introduces new design challenges. Ensuring consistency across different user experiences and avoiding user disorientation remain key concerns. Wang and Barhorst-Cates (2023) caution that adaptive interfaces must balance personalization with a stable design language to prevent confusion. Furthermore, adaptive systems can amplify bias if not properly trained on representative datasets. This highlights the need for ethical design frameworks and rigorous testing protocols.

The discussion also reveals the importance of inclusivity in enterprise interface design. Designing for accessibility not only addresses the needs of users with disabilities but also contributes to broader usability improvements for all users. Research has shown that features such as keyboard navigation, alternative text, and voice interfaces benefit a wide range of users, including those in hands-busy or visually constrained contexts (Kirkpatrick et al., 2013). Yet, despite proven benefits, inclusive design remains inconsistently applied in enterprise settings. Engelmann and Ametowobla (2017) noted increased system usage and improved communication in healthcare environments that adopted inclusive interfaces, though such successes are not yet universal.

A global comparison further enriches the discussion. Practices in user interface design diverge significantly between developed and developing countries. In the Global South, limited digital infrastructure and varying levels of user education necessitate a focus on simplicity and adaptability. Conversely, organizations in high-income countries often prioritize technological sophistication, leveraging AI and data analytics for enhanced personalization (Sellami & Zarour, 2022). These contextual differences underscore the importance of localized design strategies. Černý et al. (2013) highlighted that adaptive user interfaces achieved better results when tailored to the specific technological maturity of the implementing organization.

Moreover, disparities in adoption speed and interface effectiveness are closely tied to infrastructure investment. In developed regions, robust IT infrastructure supports rapid deployment of complex systems, while in developing countries, even well-designed interfaces may falter due to unreliable connectivity or limited hardware capabilities. As noted by Dakić et al., organizational readiness—including infrastructure, training, and cultural alignment—significantly impacts the success of digital transformation efforts. This reinforces the idea that design alone cannot compensate for broader systemic deficiencies.

While this review consolidates evidence across various sectors and geographies, it also exposes several gaps in the existing literature. One such gap is the lack of longitudinal studies examining the sustained impact of user-centered and adaptive design practices over time. Most current evaluations focus on short-term usability metrics, which may not capture user satisfaction or system performance in the long run. Another gap lies in the cross-sector applicability of best practices. The literature often isolates findings by industry, making it difficult to determine which principles are universally transferable. For instance, successful UI/UX strategies in healthcare may not directly apply to educational or manufacturing contexts without significant adaptation.

Addressing these research gaps requires more comprehensive and comparative studies that account for diverse user populations, organizational cultures, and geographic contexts. Additionally, there is a pressing need for interdisciplinary collaboration between interface designers, behavioral scientists, and systems engineers to build frameworks that are both user-centric and technically feasible. Future research should also explore the ethical dimensions of adaptive interfaces, particularly in how they handle user data, manage bias, and balance automation with human oversight.

The discussion thus illustrates the complexity of designing effective, inclusive, and adaptive enterprise interfaces. It emphasizes that while technical solutions are crucial, their success is contingent upon systemic alignment, user empowerment, and organizational commitment. These insights provide a foundation for both academic inquiry and practical innovation in enterprise system design.

CONCLUSION

This narrative review has explored the evolving landscape of user interface (UI) and user experience (UX) design in enterprise systems, highlighting the critical role of user-centered methodologies, adaptive technologies, and inclusive design principles. The analysis underscored how user-centered design (UCD) approaches significantly enhance system usability and user satisfaction, fostering higher adoption rates across diverse enterprise environments. Key findings demonstrate that involving end-users throughout the development process and maintaining consistency in design can lead to more effective and accepted enterprise systems, especially within contexts such as healthcare and education.

However, systemic barriers such as resistance to change, insufficient technical training, and inconsistent design implementation remain persistent challenges. These issues often undermine the effectiveness of new interface technologies and inhibit widespread adoption. Adaptive interfaces powered by artificial intelligence and machine learning were found to be promising in addressing personalization needs, but they require careful implementation to ensure cross-platform consistency and long-term usability.

Policy interventions should prioritize user training, participatory design practices, and long-term usability evaluations to bridge the gap between system functionality and user expectations. Furthermore, institutional support for inclusive design and accessibility improvements must be reinforced to ensure broader system usability.

Future research should explore longitudinal studies that evaluate the sustained impact of UCD and adaptive interfaces across industries and geographies. There is a pressing need to deepen investigations into context-specific adaptations and to develop standardized frameworks that facilitate inclusive and responsive design practices. Ultimately, consistent application of usability evaluation, adaptive personalization, and inclusive strategies remains essential for overcoming UI/UX challenges in enterprise systems.

REFERENCE

- Bodziony, N., Jemioło, P., Kluza, K., & Ogiela, M. (2021). Blockchain-based address alias system. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(5), 1280-1296. <https://doi.org/10.3390/jtaer16050072>
- Černý, T., Donahoo, M., & Song, E. (2013). Towards effective adaptive user interfaces design., 373-380. <https://doi.org/10.1145/2513228.2513278>
- Dakić, V., Morić, Z., Kapulica, A., & Regvart, D. (2024). Analysis of azure zero trust architecture implementation for mid-size organizations. *Journal of Cybersecurity and Privacy*, 5(1), 2. <https://doi.org/10.3390/jcp5010002>
- Engelmann, C. & Ametowobla, D. (2017). Advancing the integration of hospital IT. *Applied Clinical Informatics*, 08(02), 515-528. <https://doi.org/10.4338/aci-2016-06-ra-0100>
- Haase, P., Herzig, D., Kozlov, A., Nikolov, A., & Trame, J. (2019). Metaphactory: a platform for knowledge graph management. *Semantic Web*, 10(6), 1109-1125. <https://doi.org/10.3233/sw-190360>
- Hüsön, D., Holland, A., & Sánchez, R. (2020). Intelligent personal assistant in business-context: key-feature evaluation for user acceptance. *Business Systems Research Journal*, 11(3), 147-166. <https://doi.org/10.2478/bsrj-2020-0032>
- Jwo, J., Lin, C., & Lee, C. (2021). An interactive dashboard using a virtual assistant for visualizing smart manufacturing. *Mobile Information Systems*, 2021, 1-9. <https://doi.org/10.1155/2021/5578239>
- Kirkpatrick, J., Light, K., Walker, R., Georgas, D., Antoine, P., Clough, R., ... & Willett, C. (2013). Implementing and integrating a clinically driven electronic medical record for radiation oncology in a large medical enterprise. *Frontiers in Oncology*, 3. <https://doi.org/10.3389/fonc.2013.00069>
- Lopata, A., Gudonienė, D., Butleris, R., Veitaitė, I., Rudžionis, V., & Gudas, S. (2024). A multidimensional financial data model for user interface with process mining systems. *Electronics*, 13(21), 4304. <https://doi.org/10.3390/electronics13214304>

- Sekar, B. (2017). Enterprise software experience design: journey and lessons., 356-359. https://doi.org/10.1007/978-3-319-68059-0_29
- Sellami, S. & Zarour, N. (2022). Keyword-based faceted search interface for knowledge graph construction and exploration. *International Journal of Web Information Systems*, 18(5/6), 453-486. <https://doi.org/10.1108/ijwis-02-2022-0037>
- Toribio, G., Saldaña, Y., Mora, J., Hernández, M., Bautista, H., Collazos, C., ... & Alegría, J. (2019). Medición de la usabilidad del diseño de interfaz de usuario con el método de evaluación heurística: dos casos de estudio. *Revista Colombiana De Computación*, 20(1), 23-40. <https://doi.org/10.29375/25392115.3605>
- Wang, K. & Barhorst-Cates, E. (2023). Enhancing usability through cross-enterprise design standards: the luxce model. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 67(1), 1712-1715. <https://doi.org/10.1177/21695067231192570>