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The Relevance of UX/UI Design in Technology Product Development: A Literature Review of the Last Decade

Relevancia del diseño UX/UI en el desarrollo de productos de tecnología. Una revisión bibliográfica de la última década

A Importância do design de UX/UI no desenvolvimento de produtos tecnológicos: uma revisão da literatura da última década

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Abstract: UX/UI design currently faces some major challenges: the limited adaptability of interfaces for diverse contexts, also transcultural and accessibility barriers, and the need to reduce user cognitive load in gradually complex technological contexts. Considering these issues requires understanding how converging technologies cooperate with design practices. The objective of this study was to conduct a systematic literature review to detect the interactions between Technology and UX/UI design. This research was performed in Scopus (Period: 2014–2024) using the equation: “Technology” AND “UX” AND “UI”. Results were analyzed by annual publication, countries, subject area, and keyword clustering through Excel and

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VOSviewer. Findings show steady growth in publications with a peak in 2024, concentrated in Computer Science, Engineering, and Mathematics. The United States and India lead contributions, reflecting advanced digital ecosystems. Keyword clustering highlights usability, e-commerce, and educational technology, confirming the interdisciplinary and technology-enhanced nature of UX/UI research for competitive business strategy.

Keywords: Information and Knowledge; Information and Internet Services; Management of Technological Innovation and R&D; Technological Change.

Resumen: El diseño UX/UI se enfrenta actualmente a algunos desafíos importantes: la limitada adaptabilidad de las interfaces para diversos contextos, también las barreras transculturales y de accesibilidad, y la necesidad de reducir la carga cognitiva del usuario en contextos tecnológicos gradualmente complejos. Considerar estos problemas requiere comprender cómo las tecnologías convergentes cooperan con las prácticas de diseño. El objetivo de este estudio fue realizar una revisión sistemática de la literatura para detectar las interacciones entre la tecnología y el diseño UX/UI. Esta investigación se realizó usando Scopus (Datos de 2014-2024) utilizando la ecuación: “Tecnología” Y “UX” Y “UI”. Los resultados se analizaron por publicación anual, países, área temática y clústeres de palabras clave a través de Excel y VOSviewer. Los hallazgos muestran un crecimiento constante en las publicaciones con un pico en 2024, concentrado en Ciencias de la Computación, Ingeniería y Matemáticas. Estados Unidos e India lideran las contribuciones, lo que refleja ecosistemas digitales avanzados. La agrupación de palabras clave destaca la usabilidad, el comercio electrónico y la tecnología educativa, lo que confirma la naturaleza interdisciplinaria y mejorada por la tecnología de la investigación UX/UI para una estrategia empresarial competitiva.

Palabras Clave: Información y Conocimiento; Servicios de Información e Internet; Gestión de la Innovación Tecnológica y la Investigación y el Desarrollo; Cambio Tecnológico.

Resumo: O design de UX/UI enfrenta atualmente alguns desafios importantes: a adaptabilidade limitada das interfaces para vários contextos, também barreiras interculturais e de acessibilidade, e a necessidade de reduzir a carga cognitiva do usuário em contextos tecnológicos gradualmente complexos. Considerar essas questões requer entender como as tecnologias convergentes cooperam com as práticas de design. O objetivo deste estudo foi realizar uma revisão sistemática da literatura para detectar as interações entre tecnologia e design de UX/UI. Esta pesquisa foi realizada por meio do Scopus (Dados de 2014-2024) utilizando a equação: “Tecnologia” e “UX” e “UI”. Os resultados foram analisados por publicação anual, países, área temática e grupos de palavras-chave via Excel e VOSviewer. Os resultados mostram um crescimento constante de publicações com pico em 2024, concentradas em Ciência da Computação, Engenharia e Matemática. Os Estados Unidos e a Índia lideram as contribuições, refletindo ecossistemas digitais avançados. O agrupamento de palavras-chave destaca usabilidade, comércio eletrônico e edtech, confirmando a natureza interdisciplinar e aprimorada da pesquisa de UX/UI para uma estratégia de negócios competitiva.

Palavras-chave: Informação e Conhecimento; Serviços de Informação e Internet; Gestão da Inovação Tecnológica e Investigação e Desenvolvimento; Mudança Tecnológica.

JEL Codes: D83, L86, O32, O33

Introduction: Converging Technology for UX/UI Design Improvement

This article seeks to shed light on the hypothesis: “The bibliographic review on the interaction between “Technology” AND “UX” AND “UI” will identify a sustained growth in publications, the concentration in areas such as Computer Science, Engineering and Mathematics; with a leadership in publications of countries with advanced digital ecosystems; and there is going to appear the formation of thematic clusters around usability, e-commerce and educational technology”. To this end, we proceeded to analyze some studies on these topics (Introduction chapters “The Role of UX Design in User Decision-Making” and “Innovative technologies that are shaping the future of UI Design”), but the most relevant tool to validate the hypothesis is the bibliographic review analysis on the aforementioned topics was developed, in the period 2014-2024.

Adaptive interfaces, AI-based personalization, and new usability evaluation methods are meeting in user experience (UX) and user interface (UI) design fields. Adaptive User Interfaces (AUIs) development under Smart Product-Service Systems (S-PSS) requires the customization of recommendations to enrichment of the user’s experience, which are made context-aware, responding dynamically to user interaction demonstrates increasing reliance on artificial intelligence (AI)-tailored user interfaces, wherein machine learning (ML) schemes modify the experience through various aspects of application to personal preference and behavior in order to incorporate the user further while satisfying them. For Maharjan et al. (2024), new applications, such as voice-activated virtual exercise coaches with instantaneous user feedback, substantiate this sense through amiable and supportive paradigms of interaction with their users, thus stimulating motivation.

By way of introduction to the relationship between technologies and UX/UI design –such as AI, adaptive interfaces, personalization, optimized navigation and heuristic evaluation methods– and the benefit of them in companies, according to Husna & Wibowo (2024) improvements to the UX/UI design favor loading speed, improve personalization which increases conversions, this is achieved thanks to the addition of intuitive navigation in the e-commerce of companies. The research of Xu et al. (2024), conclude that companies in the FinTech sector (78 % of the study they carried out, implemented AI-powered UX/UI) improved their efficiency of use, product adoption and customer satisfaction rates. From another applied study, it is shown that through the optimization of the navigation and the interface of the Shopee application (Indonesia), which favored an intuitive design and a more efficient negation, it achieved an increase in user conversions (Gumay et al., 2024).

Moreover, following the ideas of Quiñones et al. (2024), the proposed generative design evaluation heuristics on specialized offerings will ensure that UX-related concerns are adequately addressed in relation to the specific challenges brought about by these technologies for their usability and efficiency. Put together, these advancements depict a transforming paradigm in UX/UI design concerning user-centeredness and necessitating the integration of different classes of technological capabilities.

From education and environmental management to financial applications, new converging technologies challenge traditional UX/UI design. User-centered design (UCD) in general is underscored in literature as a precondition for intuitive interfaces to engage and satisfy users in applications outside e-learning as well, for instance waste-disposal systems (Harumsari et al., 2024; Singh et al., 2021). The integration of AI and ML technologies is, thus, reshaping UX and UI as they are adaptive to personalized experiences and working toward other changing interaction patterns (Oluwayemisi Runsewe et al., 2024; Paneru et al., 2024). Furthermore, design methodologies such as design sprints and System Usability Scale (SUS) can assess how well the user interface has been optimized to align with user aspirations concerning accessibility and safety (Abiansyah et al., 2025; Oluwayemisi Runsewe et al., 2024). Convergence of these technologies and methodologies will essentially favor innovation for dealing with complex user demands across diverse sectors (Paneru et al., 2024; Ribeiro et al., 2024).

A new generation of technologies has emerged that combines several fields to create far-reaching impacts on UX/UI design. Lee et al. (2021) argued that with augmented reality (AR) and immersive technologies in the mix, Controlled Unclassified Information (CUI)s have developed into more than instruments for designers; these interactions with their users become critical bearers of discourses about urgent issues, such as sustainability, as they stimulate the users' imagination concerning futures borne from designers' proposals. According to O'Connor et al. (2023), the same way that augmented reality applications in health education prove the co-design processes between end users for the intervention to be a real one, as has been demonstrated in a study on an AR asthma inhaler application with a System Usability Scale score of 90.14. Also, Odushegun (2023) pointed that this aesthetic semantics in UX design investigates the importance of correlating visual aesthetics to affective responses from users, which increases user engagement overall. Assisting UX practitioners in matching the ML capabilities with user intentions thus bringing in ethical considerations and prompting meaningful interaction (Feng & McDonald, 2023). Finally, according to Tang et al. (2023) immersive technologies, including virtual reality, have been proven to enhance product usability by enabling more successful user interviews and design iterations. Thus, these technologies transform the UX/UI design sphere, rendering the experiences even more engaging and effective as well as user focused.

This study will focus on the bibliographic analysis of the interaction between Technology and UX/UI in the period 2014-2024, with emphasis on the education, e-commerce, and mobile applications sectors. Likewise, case studies will be presented about topics like accessibility for visually impaired people and the impact of artificial intelligence on interface design are referenced, which allows contextualizing the global trend in countries with advanced digital ecosystems.

The Role of UX Design in User Decision-Making

UX design has become an important factor in today's digital world, it determines how people interact with technology and make decisions. By enhancing usability and accessibility, UX design shapes user choices by facilitating navigation which improves overall satisfaction with digital interfaces. Studies have found that creating an effective UX design comes from understanding users decision-making styles this leads to support behavioral intervention and elevate decision-making experiences (Shin, 2022). As Mejtoft et al. (2019) suggests, positive UX has a great level of importance in user decision-making processes, where techniques such as digital nudging are incorporated to give user favored outcomes. Regarding emerging technologies, fostering intuitive interactions is essential to align technological innovations with user needs, always making use of user-centered design (Gorantla & Devineni, 2023). Moreover, it is important to consider agile development, where the integration of design and prototype creation facilitates quick iteration ensuring products align with user expectations and business objectives (Adeleke et al., 2024). In addition, as an example of UX design playing a substantial role in the healthcare sector by refining the efficiency of digital medical systems, this benefits not only patients but stakeholders within the industry, as noted by Familoni & Babatunde (2024) a well-designed user experience helps promote patient retention in treatments, improving their outcomes, all through intuitive interfaces and effective communication. In general, optimizing user decisions in various domains heavily relies on strong UX design principles.

Transcultural Challenges Affecting UX Adaptability to E-commerce

Customer experience is deeply influenced by cultural and geographical factors which are essential to take into account to improve satisfaction and continue to attract loyal customers from various markets, therefore, it is said that UX customization in e-commerce is determined by transcultural challenges, which makes knowing the expectations and culture of users essential (Carter, 2021; Suadamara, 2024). For instance, as mentioned by Nejati et al. (2024) designs tailored to culture are of maximum relevance, for populations, such as the Arab population, user participation

is given by how similar the interface to their culture is. Thus, in web design it is important to analyze content layout and navigation, since, in high-context cultures, information is subtler, while in low-context cultures people prefer more explicit structures. To improve usability and promote both user satisfaction and loyalty, it is important to adapt interfaces to cultural expectations, the way they not only impact on aesthetics, but also in the way users interact with technology. Building on this idea, researchers such as Appeltauer & Korr (1975) have identified differences in design, such as variation in elements and navigation between high and low-context cultures, consequently it is necessary to create custom design guides for each user. Likewise, cultural sensitivities aggravate accessibility, especially to older people and disabled users in multilingual societies where design must be inclusive to address all their needs (Petrie et al., 2018). Thus, e-commerce success is guaranteed by addressing transcultural challenges through organizational practices and enhanced UX design to excel in a competitive landscape.

Furthermore, it is important to integrate intercultural variables into UI design to strengthen human-machine interaction, focusing on the relevance of context in usability engineering (Heimgärtner, 2020). In the same way, the global landscape of accessibility must ensure that local design practices are resourced with relevance in different cultural settings (Tigwell et al., 2021). Ultimately, it is important to align digital interfaces with transcultural expectations to strengthen user participation and augment user retention while optimizing experiences alongside converging technologies to reach global market overcoming transcultural challenges in UX design.

Benefits of UX Design in Overcoming Cultural Barriers to Usability and Accessibility

UX design is a key tool for developing more sophisticated experiences for users, minimizing cultural gaps to ensure complete accessibility for all users. Nowadays it is important to design functional interfaces that address the diverse needs of users. Based on the findings of Zahib et al. (2022a) and Young et al. (2024a) it was found that by employing human centered design principles, designers can create accessible tools that adapt to users' needs by enriching their overall experience. In addition, by Zahib et al. (2022) improved accessibility of visually impaired users to transport services, thanks to the User Centered Design approach, applying Cognitive Walkthrough assessments, which with even increased success rates and reduced errors; for its part Rosa & Valentim (2020) detected that many mobile applications do not allow font size adjustments or color adjustment options for colorblind people or with cases of partial blindness, so they recommended designing applications for VIP (Visually Impaired People), thus integrating criteria of usability, accessibility

and better user experience from early stages. According to Choi & Seo (2024) to foster inclusion in educational contexts, it is necessary to integrate universal design principles, as they consider diverse experiences of students, thus promoting equitable access to resources.

Overall, effective UX design prioritizes users' needs and cultural contexts, mitigating accessibility barriers, resulting in a more inclusive digital environment (Zaina et al., 2022) (Young et al., 2024b). When it comes to e-government services, it is essential to prioritize human centered design, in this way it is ensured that digital public services meet users' needs, improving engagement and increasing public value (Alazemi & Al-Shehab, 2024) (Bachmaier & O'Donohoe, 2022). Additionally, exploring the ideas of Giacobone et al. (2024); in cultural heritage projects co-designing user experience is used, thus raising the importance of stakeholder's participation in the creation of digital platforms to enrich collective cultural experience. Nowadays it is important to integrate cultural consideration into UX design; this is essential for creating and increasing digital settings.

Innovative technologies that are shaping the future of UI Design

Technologies that are considered innovative, such as AI, virtual reality and AR are shaping user interface development. Both authors, Li et al. (2024), highlight AI's ability to analyze user behavior and enhance design considering users' evaluations regarding certain products and services, thus promoting the creation of more intuitive interfaces. For example, using tools like ChatGPT, AI supports the optimizing design efficiency, giving feedback, creating ideas, and testing interactions with users, in this way designers are given diverse options to contemplate (Zhang, 2024). In a study by Hari Chandana et al. (2023) it was found that new technologies that provide immersive experiences require UX design principles that, when integrated with augmented reality and virtual reality technologies offer comfort, interaction and realism. By applying it effectively, challenges such as cognitive load are overcome. Moreover, the emphasis on intuitive and inclusive design, in conjunction with ethical considerations, portrays a holistic approach to UI and UX design future technologies, guaranteeing that emerging technologies soon will satisfy diverse user needs (Ghosh & Dubey, 2024). These tendencies combined indicate that UI design is constantly evolving to become more intelligent, thus user satisfaction will be facilitated by offering detailed and unique experiences, considering diverse factors such as user empathy, emotions, and ethical concerns.

Benefits of UI Design for businesses.

Businesses can obtain a wide range of benefits through the use and improvement of UI design, for instance, increasing user satisfaction and more efficient workflows. According to Rahmadani & Fardida (2024) and K N (2023) interactions are simplified by well-crafted user interfaces and user experiences, making them more enjoyable and easier to use, leading to increased conversion rates and customer retention. In the same line, Da Costa (2024) argues that in sectors like real estate; to build user trust and facilitate navigation, it is essential to make use of intuitive UI design for decision-making in high-stakes transactions. Furthermore, according to Prajeesh & Meenakshi (2024) sophisticated UI/UX features, specifically real-time updates and secure payment gateways, cultivate user trust and simplify the booking process in hotel reservation system. Additionally, as demonstrated by Pallavi (2023) in e-commerce, polished UX/UI features are associated with boosting website traffic and revenue growth since users are more likely to be attracted to visually appealing and user-friendly platforms. Hence, to solidify market presence, businesses must align their needs with UI design through methods like Design Thinking to ensure applications meet user expectations (Kristin et al., 2022). Overall, investing in UI Design is important for maintaining a competitive edge and to nurture long-term customer relationships across diverse industries (Harahap et al., 2024).

How does UI Design reduce user cognitive load

User experience and cognitive ergonomics are essential keys to reducing user cognitive load through user interface design. As outlined by Zhou (2023) mental load resulting from task difficulty and cognitive costs can be significantly reduced through effective UI design. In addition, Zhang et al. (2020) suggest that using a structured measurement index system, interface elements can be optimized including clear iconography, and a reduction of unnecessary information to lower user cognitive load; this enhances user experience and facilitates interactions with applications. Moreover, it has been discovered that the choice of color combinations through the user interface affects task performance, and specific combinations like white-on-black are optimal for maintaining cognitive efficiency (Yang et al., 2024). In their publication, Faudzi et al. (2023) state that in educational mobile apps, unintuitive interfaces can lead to increased cognitive load, emphasizing the need to design frameworks that easily guide users through the interface to improve the learning experience. In addition, to reduce cognitive load and enhance engagement, research indicates that adaptive interfaces in learning management systems coordinate with users' cognitive processes, thereby enhancing usability (Suryani et al., 2024). Building on the work of Gürfidan (2024) it has been observed that by providing information such as driver fatigue levels in autonomous

vehicles, interfaces designed with cognitive ergonomics can improve safety and comfort allowing users informed decision-making. Lastly, multimodal interfaces incorporating speech and touch input have been shown to significantly lower cognitive load compared to unimodal interfaces, improving usability and user satisfaction (Zimmerer et al., 2022).

Methodology

This study was founded on a systematic review of the related literature with a view to analyzing the intersection between technology, user experience, and user interface design. It was based on Scopus database, as this is one of the most comprehensive standard databases in indexing scientific literature. The search strategy included the equation: “Technology” AND “UX” AND “UI”, and filtered the results for the period: 2014-2024. Such search results were found to include publications by year, knowledge areas, countries of publication, and associated keywords.

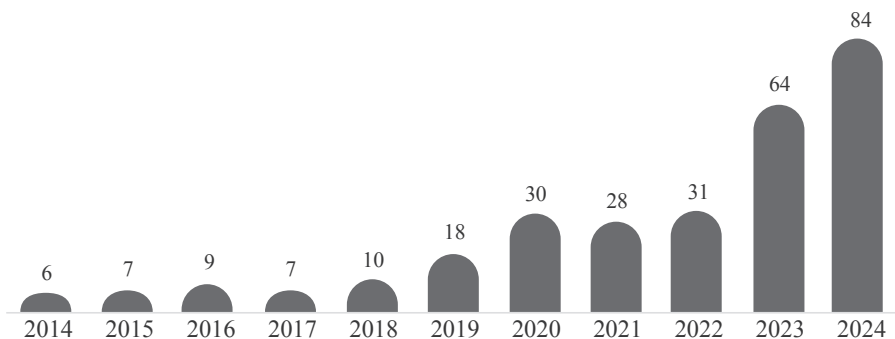
The terms used for the search-equation respond to the two major areas of research of the authors of this study, on the one hand, Convergent *Technologies*, and on the other, *UX/UI Design*, this article sought to achieve an understanding of the bibliographic dynamics in these areas, to know the points of encounter between these two major topics. On the other hand, the determined period (2014-2024) was defined because since 2014 the main author of this research began with the first publications, and it was sought to understand what has been the behavior of both topics in the past decade (the year 2025 was excluded, since it would not yet be possible to have consolidated publications for this current year). In order to provide an analysis tool to be used (keyword clusters), the main keywords were extracted from the Scopus results.

In addition, for the processing and analysis of the data using complementary tools. Microsoft Excel facilitated the construction of graphs that illustrate how publications over the years vary, by area of knowledge and the geographical concentration of studies. Furthermore, the software VOSviewer produced the cluster graph identifying thematic/keywords networks within Technology, UX, and UI interrelationship. Furthermore, the results were interpreted and analyzed taking into account possible explanations on the research growth in the field and its applicability to business and technological development.

Results

The data obtained for the annual publications in Scopus based on the search equation (“Technology” and “UX” and “UI”) from 2014 to 2024 (See Figure 1), shows that there is a sustained growth trend in the production of articles related to Technology, and UX/UI Design. At the beginning of the years covered by the analysis (between 2014 and 2018), the number of publications remained low and stable, recording between 6 and 10 papers published in any given year. Beginning with 2019, there is general progressive expansion; thus, the year 2023 is the turning point for this upward trend and 2024 its maximum peak, with a total of 84 publications.

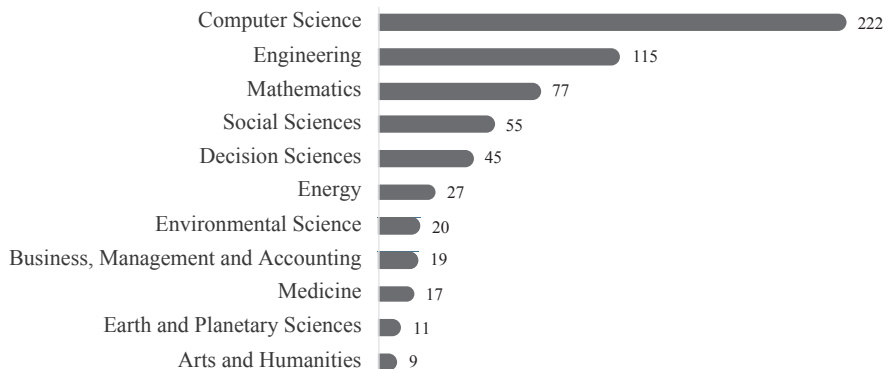
Figure 1. *Publications per year; Scopus results for Equation “Technology” + “UX” + “UI”; (2014 – 2024)*



Source: own elaboration.

In other hand, the analysis of Publications per Subject (See Figure 2), information obtained from Scopus database, exhibits a strong concentration in technical and applied disciplines. Computer Science is on top with 222 publications, followed by Engineering (115) and Mathematics (77), which illustrates the computational and algorithmic nature of UX/UI. These are followed by Social Sciences (55) and Decision Sciences (45) which show an interest in the human impact on technology use and decision-making. Although small in numbers, Business, Management and Accounting (19) and Medicine (17) are promising signs of early applications for optimizing interfaces focused on business and health.

Figure 2. *Publications per Subject; Top 10 Areas; Scopus results for Equation “Technology” + “UX” + “UI”; (2014 – 2024)*

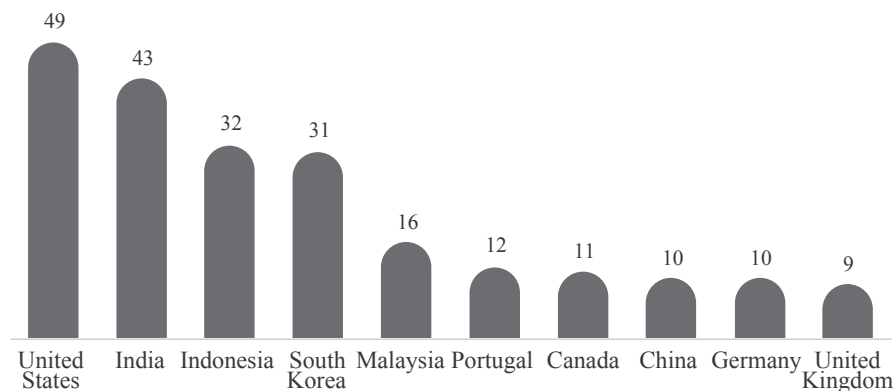


Source: own elaboration.

From another front of analysis, the results about number of publications per country, related to the terms (Technology + UX + UI), shows a strong concentration of countries in economies that have reached advanced technology progress, and emerging markets which have very rapidly growing digital industries (See Figure 3). The United States (49) and India (43) make up the two top-ranking countries in the list, owing to their leading role in software development, artificial intelligence, and user experience, enabled by their strong industries in technology and innovative hubs. Moreover, Indonesia (32) and Korea (31) have recorded their names in the list from a rapid drive towards digitalization coupled with the mass adoption of mobile interfaces, all thanks to saturated markets of smart devices.

Within Europe, findings indicate that countries such as Portugal (12), Germany (10), and the United Kingdom (9) will have meaningful contributions, possibly due to their strong emphasis towards applied research and accessibility regulations in interface design. The relatively low number of contributions in Latin America (Brazil with 7 and Colombia with 4) is an indication of a challenge in building R&D ecosystems focusing on UX/UI, even as the interest in digital transformation rises in the region.

Figure 3. Number of publications per country, Top 10 countries; Scopus results for Equation “Technology” + “UX” + “UI”; (2014 – 2024)

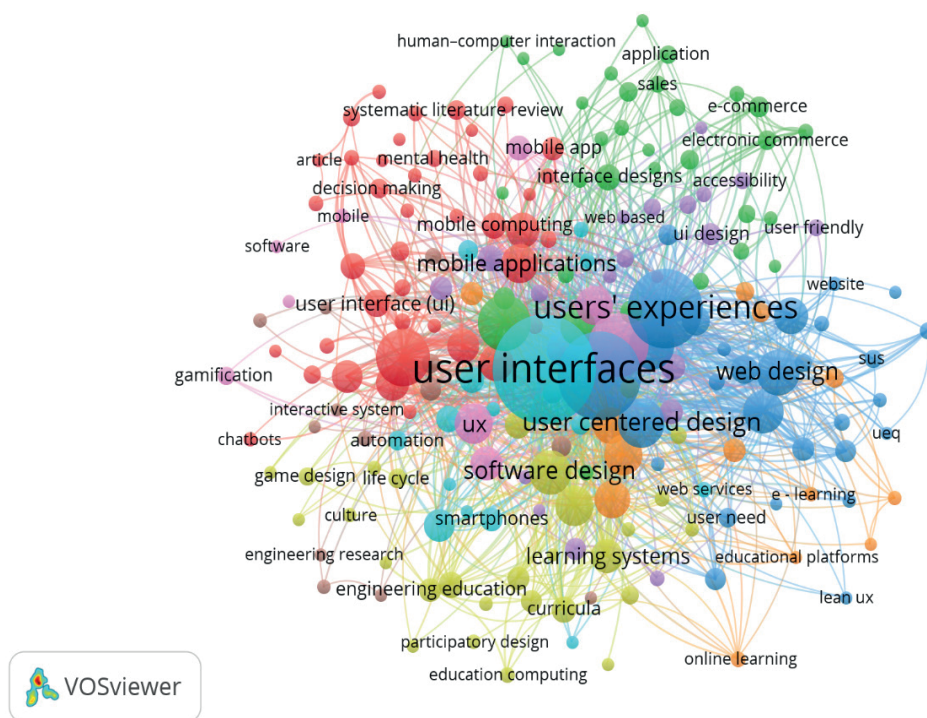


Source: own elaboration.

Keyword cluster graph (See Figure 4) in relation to a co-occurrence network is revealing an already established thematic architecture in its study of (Technology + UX + UI), where other variations suggest the evolution and extents of the field. The core of this network highlights a specific theme that relates closely to ‘user interfaces’, ‘users’ experiences’, ‘user-centered design’, and ‘software design’. This indicates that research within this area continues to pay considerable attention to interface development and optimization processes. Very specific lines of research emerge among these around the nucleus; One of such groups targets applications, mostly ‘mobile applications’, ‘user interactive interfaces’, ‘mobile computing’, and ‘decision making’, which apparently relates to interface designing and evaluation with special consideration for mobility applications in field automation and health, specifically, ‘mental health’. Another set has more to do with the fact that they are talking about the interplay of UX/UI and e-commerce, pointing to terms like ‘e-commerce’, ‘accessibility’, and ‘human-computer interaction’, showing the strongly increasing sensitivity about the user experience on digital platforms and their accessibility. Also, there would be significantly stronger interplay between UX/UI and digital education, represented through the keywords ‘learning systems’, ‘educational platforms’, and ‘participatory design’, underscoring the point of user experience design in online learning systems. Additionally, the analysis points to interest in application of UX/UI in gamification and automation contexts using terms like ‘gamification’, ‘chatbots’, and ‘engineering education’. This is definitely thematic with growth trends in publication cited in recent years, suggesting that

research in the sectors would tend to expand and diversify in the future adding to its establishment as an interdisciplinary field with potentials for application in sectors such as education, health, commerce, and mobile technology.

Figure 4. Cluster Graph; Scopus results for Equation “Technology” + “UX” + “UI”; (2014 – 2024).



Source: own elaboration.

According to the graph of keyword clusters, Table 1 is presented, which is a summary of the 4 clusters that were generated through the use of VOSviewer software; It can be seen that there are various fronts of interrelation between the clusters and diversity of areas: Interfaces and Usability, User Experience & Web Design, E-Commerce and Accessibility, and Education and Technology.

Table 1. Description of 4 clusters

Color	Cluster Name	Main Keywords	Brief description of the cluster
Red	Interfaces and Usability	user interfaces, mobile applications, UX, software design, gamification	This cluster focuses on interface design and interaction, especially mobile applications and interactive systems. It highlights the importance of user experience (UX) and the impact of gamification on usability.
Blue	User Experience & Web Design	users' experiences, web design, user centered design, UI design, user need	It focuses on user experience on web platforms, with a focus on user-centered design and accessibility. It highlights the relationship between user needs and the web interface.
Green	E-Commerce and Accessibility	e-commerce, electronic commerce, accessibility, user friendly, application	Explore how accessibility and user-friendly design influence e-commerce and web applications. Analyze trends in digital sales and their relationship with human interaction.
Yellow	Education and Technology	learning systems, educational platforms, online learning, participatory design, engineering education	This cluster addresses the relationship between technology and education, focusing on online learning platforms and participatory design in educational environments.

Note. Own elaboration.

Conclusions

This literature review research, about the relation between technology-UX-UI, shows a significant increase in academic outcomes on these topics, indicating a pick in publication in 2024, showing the merging of facets, including digital evolution, widespread AI, and the tiered demand for interactive platforms, effective and interactive, user-friendly. This expansion is not simply an echo of theoretical improvements, but signifies an interdisciplinary tilt where user information is becoming a critical determinant of technological advances is fundamental in companies. The surface of studies dedicated to digital commerce, learning, and adaptability suggests that this field is moving beyond the realm of frontend design, now becoming a critical force in driving innovation across all sectors, from digital marketplaces to interactive education spaces. The power of AI capabilities in hyper-personalization as well as self-learning recommendation engines and the adaptivity of automated technologies can both be envisaged to greatly enhance user engagement, satisfaction, and usability of systems.

Also, these studies of UX/UI are clustered in highly and/or developing tech-ecosystems countries like the US, India (a developing country), South Korea, and Indonesia (a developing country), which evidences the connection of scientific production with the digital environments of these countries. UX/UI Design gains importance in practical environments, fostering innovation in user interfaces due to industrial incorporation. Countries with strong tech hubs (such as USA, South Korea, India, China, Canada, Indonesia...) are not only leading the production of publications of UX/UI design but also providing ideas and sharing experiences for industry use.

There is an obstacle in the way of developing UX/UI progress in Latin America and similar developing regions. Despite being a global tendency, digital transformation represents an opportunity for businesses in developing countries to adopt and adapt state-of-the-art UX/UI techniques in order to better compete in the markets. With an existing synergy in UX/UI studies and corporate needs, it is seen as an opportunity that companies could take advantage of the rewards offered by the era in which user-centric digital networks can be determinants of business success, the tactic of improving UX/UI design as an essential strategy rather than treating it as a complementary design element.

Finally, addressing the hypothesis stated at the beginning of this research, and according to the results of the bibliographic review, it is possible to validate the hypothesis, since the results show a marked increase in publications with a peak in 2024, especially in the areas of Computer Science, Engineering and Mathematics. Likewise, the United States, India, South Korea... (countries with robust digital ecosystems and/or potential) are consolidated as leaders in academic production, reflecting the weight of their digital ecosystems. Finally, the clusters identified—focused on usability, e-commerce and educational technology—confirm the expected thematic trends, which fully supports the relevance of the bibliographic review carried out.

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