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Application of contemporary cloud-based design tools in web interface

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Abstract. The relevance of this study is determined by the rapid development of the digital environment and the increasing demands placed on the quality of user interfaces, which require the effective use of contemporary graphic design tools in web design practices. The purpose of the study was to provide a comprehensive analysis of the role of the platforms Figma, Adobe XD, and Sketch in web interface development processes and their impact on task efficiency, design speed, the level of collaboration, and the development of design systems. This purpose was achieved through an integrated approach combining theoretical analysis, case studies, and an empirical experiment with a student learning group. Key characteristics of the tools were analysed, their effectiveness in performing typical project tasks was evaluated, and their impact on productivity and interface quality was assessed. The study established that contemporary graphic editors substantially transform professional User Interface design practice by ensuring scalability, consistency, and efficiency of digital products. Successful examples of tool application in e-commerce, healthcare services, educational platforms, and SaaS solutions were analysed. The advantages of cloud-based collaboration, integration with other software ecosystems, and support for accessibility standards were identified. Based on empirical data, recommendations were formulated regarding the selection of tools depending on project requirements, and potential risks of excessive design standardisation were outlined. The findings may be used by designers, front-end developers, managers, and educators to optimise User Interface processes, enhance team productivity, and improve the quality of web interfaces

Keywords: UI design; Figma; Adobe XD; Sketch; digital interfaces; design systems; graphic editor

INTRODUCTION

In the digital era, graphic design has undergone a substantial transformation: from a tool of visual representation, it has evolved into a means of designing user experience. At the centre of this transformation lies the development of interface practices that require designers to possess not only aesthetic sensitivity but also a deep understanding of behavioural psychology, usability principles, adaptability, and multichannel communication. Contemporary graphic design tools do not merely simplify layout processes, but establish a new model of interaction within team-based, iterative, and agile design. Their application is a key factor in shaping effective UI/UX design (User Interface / User Experience Design) that meets user expectations and adapts to different platforms and contexts of use. The interaction between design tools and the quality of user experience occupies a central place in many studies. The impact of specific graphic platforms (Figma, Adobe XD, Sketch) on UI design practices, however, requires deeper conceptual consideration.

S. Zhang *et al.* (2025) indicated a shift in the very approach to interface design. The researchers emphasised that the transition from desktop tools (Photoshop, Illustrator) to cloud-based collaborative platforms (Figma) altered the logic of designers' work: designers became part of the software development cycle rather than external consultants. X. Ye *et al.* (2024) focused on analysing the effectiveness of different stages of the UI

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process involving designers, developers, and product managers. The researchers demonstrated that platforms supporting real-time collaboration reduced the number of revisions at the final stage by nearly 40%. This confirms that contemporary graphic tools are not only convenient but also reduce resource expenditure. Component-oriented design systems, such as those implemented in Figma, demonstrate high flexibility and enable the creation of reusable elements, which ensures design consistency in large-scale projects. S.S. Goraya (2024), however, noted that excessive standardisation may limit individuality and creative expression, as pre-built templates and reusable components may impose structures that are not always suitable for specific cases or innovative solutions.

O. Rajala (2024) addressed an important issue: how UI design tools support the scalability of digital products. The researcher established that the use of components and libraries substantially improves the updatability of design, since replacing a single element in a library automatically updates it across all related layouts. The academic field gradually forms an understanding of UI design as an interdisciplinary practice in which tools function not only as technical means, but also as instruments for organising work, thinking, and creativity. Ukrainian researchers pay particular attention to the organisation of design systems as a foundation for creating sustainable and scalable interfaces. S. Samulinas & N. Zhytienova (2025) analysed in detail the role of Figma as a cloud-based environment that supports a component-based approach, auto layout, adaptive typography, and collaborative work on UI cases. The researchers noted that the implementation of a design system increases consistency between developers and designers, reduces the time required for updating visual elements, and decreases the number of coding errors. They also emphasised the role of Figma as an educational platform: due to its accessibility, intuitive interface, and the possibility of creating templates, the tool forms new standards of visual thinking in student projects.

Other researchers, P.V. Krokhmal *et al.* (2024), in an interdisciplinary study, demonstrated how Adobe XD transforms the creation of media-oriented interfaces. The focus lay on the integration of animation, voice triggers, logical transition sequences, and the construction of narrative in digital educational environments. The researchers indicated that multimodality ensures deeper user engagement, particularly in projects related to education, museum environments, or cultural communication. R.S. Uhlyk (2025), by contrast, drew attention to critical aspects of template-based design. In the study, the researcher examined the consequences of excessive use of ready-made UI components in Figma, which leads to aesthetic standardisation, loss of context, and depersonalisation of brands. The researcher called for a balance between functional standardisation and creative experimentation, arguing that successful interfaces result from a contextual approach that considers the target audience, cultural code, social habits, and the environment of use.

In the context of practical development of digital services, the position of T. Huang (2024) was of particular interest, as the researcher developed integrative approaches to the use of Figma in design. The method Figma-Enhanced App Design Framework for Improving UI/UX in Educational App Development demonstrated how variable components, prototyping, and interactive links in Figma enable the modelling of user behaviour logic and its testing in the form of a visual script. This approach contributes to the democratisation of design, since even small teams without advanced front-end knowledge can effectively create competitive web products while adhering to user-centred design principles and improving user interaction with interfaces. A distinct dimension of the issue concerns the cognitive aspect of interaction. In their study, M. Zhang *et al.* (2022) analysed the role of microinteractions and colour coding in reducing cognitive load. Drawing on UX testing of mobile applications, the researchers demonstrated that a well-structured visual hierarchy, spatial rhythm, typographic organisation, and colour accents significantly enhance user orientation. They also examined the role of emotional triggers, such as transition animations, changes in button states, and tactile effects, as factors contributing to trust in the interface.

The academic discourse is therefore increasingly enriched by interdisciplinary approaches to the analysis of UI/UX design. Most studies, however, remain narrowly specialised or focused on the review of individual tools without a comprehensive analysis of their impact on design thinking, user interaction, and interdisciplinary connections between technology, psychology of perception, and visual communication. In this context, the purpose of the study was to examine the role of contemporary graphic tools as a foundation for shaping an effective, inclusive, and emotionally meaningful user experience in the digital environment, with reference to the context of Ukraine, educational and cultural practices, and the experience of Ukrainian design communities.

MATERIALS AND METHODS

The study was conducted using an integrated approach that combines theoretical analysis, case study, and empirical evaluation. This combination ensured a comprehensive examination of the effectiveness of contemporary UI/UX design tools and strengthened the robustness of the results obtained. At the first stage, an analysis of academic sources and current practices of using UI/UX design tools was carried out. This enabled the identification of key evaluation criteria, including ease of use, task completion speed, level of collaboration, prototyping capabilities, support for design systems, integration features, and overall effectiveness

of the application. At the second stage, a case analysis was conducted, covering five practical scenarios of using UI/UX design tools in different sectors, including e-commerce, healthcare, education, analytical services, and media. Each case involved the performance of typical interface design tasks using a specific tool, namely Figma, Adobe XD, and Sketch. Within this stage, key performance indicators were recorded, including changes in design time, errors in the interface design process, level of collaboration, development of design systems, and accessibility provision.

Task completion time and the number of errors under control and experimental conditions were examined to determine changes in the duration of key development stages within controlled and experimental task environments. Under control conditions, basic tool functionalities were used without collaboration or component libraries, whereas experimental conditions involved full use of functionality, including component libraries, auto layout, and real-time collaboration. For Case 1, a detailed table with absolute values for each stage of development is provided as an illustration of the general measurement procedure. Percentage indicators of changes in design time and error rates during interface development were determined through comparison of the results of identical project tasks performed under control and experimental conditions.

Task completion time was recorded through continuous time tracking during the execution of cases. The starting point was defined as the moment when participants received instructions for task completion, and the endpoint as the presentation of the final version of the layout or prototype. Data on the duration of each stage were recorded in an observation protocol. The number of errors was determined through expert analysis of the created layouts and included cases of inconsistency of interface elements with the technical specification, violations of navigation structure, and incorrect use of design system components or visual styles. Errors included inconsistency of interface elements with the technical specification, violations of navigation structure, and incorrect use of design system components or visual styles. The recording of task duration and the registration of errors were carried out by the researcher based on observation of the participants' workflow and analysis of the obtained results. Percentage changes in time and error rates were calculated as the ratio of the difference between control and experimental values to the control values, multiplied by 100%. The obtained data were systematised and generalised, which enables transparent comparison and verification of the results.

The third stage of the study involved a training experiment in the form of a controlled empirical investigation. The target group of the empirical study consisted of third- and fourth-year students of technical and information-related specialisations at the Libyan College of Electronic Technology, including programmes in information technology, computer science, and digital design. All participants provided consent to take part in the survey, and the entire process complied with the Declaration of Helsinki (World Medical Association, 2013). The selected group possessed a sufficient level of theoretical training and basic practical experience in the field of digital product development, which ensured the possibility of informed analysis of the presented cases and a grounded comparative evaluation of the tools used. The experiment involved 13 participants who had prior experience with UI/UX design tools. The participants were divided into three groups of 4, 4, and 5 individuals, respectively. Each group worked under identical conditions and received a unified instruction for task completion. The experiment lasted three days, during which each group performed designated cases using a specific tool: the first group worked with Figma (Cases 1 and 4), the second with Adobe XD (Cases 2 and 5), and the third with Sketch (Case 3). External experts were not involved in the evaluation, and the recording of results was carried out by the researcher.

A standardised questionnaire consisting of seven questions was used for data collection, each corresponding to a specific evaluation criterion. Respondents evaluated the tools on a five-point scale, where values from 1 to 5 reflected the degree to which a given characteristic was expressed, from lowest to highest. Data were processed through the calculation of an integral efficiency index for each tool. The index was defined as the arithmetic mean of the scores across all criteria, which enabled the aggregation of individual indicators into a single quantitative metric. Formally, this can be expressed as:

$$I = \frac{1}{n}\sum_{i=1}^{n} S_i, \quad (1)$$

where – the integral efficiency index, – the score for an individual criterion, – the number of criteria.

To enhance interpretability, the index was also normalised into percentage form relative to the maximum scale value:

$$I_{\%} = \frac{I}{5} \times 100\%. \quad (2)$$

The proposed methodology ensures a systematic, transparent, and reproducible approach to evaluating the effectiveness of UI/UX tools. The use of a combination of theoretical analysis, case study, and empirical experiment enables precise measurement of changes in key indicators, including design time, error rate, level of collaboration, and development of design systems, and allows their presentation in percentage form for ease of comparison. This approach ensures objectivity and reliability of the results and establishes a basis for their substantiated analysis in the subsequent section of the study.

RESULTS AND DISCUSSION

In the rapidly evolving landscape of web design, UI development has become a key element in ensuring a seamless digital experience. As users interact with websites across multiple devices and platforms, the visual and interactive quality of interfaces directly influences levels of engagement, satisfaction, and retention. Graphic design, previously treated as a distinct artistic discipline, now constitutes an integral component of UI design and shapes the logic of presenting and interacting with digital content. Within the context of this study, particular attention is given to analysing how the use of contemporary graphic design tools transforms web interface development processes, affects the efficiency of team collaboration, and influences the quality of final UI solutions. The emergence of cloud-based and collaborative design platforms transformed conventional workflows into dynamic, iterative models that involve continuous interaction between designers, developers, and stakeholders.

The results of the study indicated that the use of contemporary graphic design tools in the development of web interfaces exerts a systemic influence not only on the technical aspects of UI/UX design, but also on the organisation of development processes, the efficiency of collaboration among participants, and the quality of the final digital product. The analysis of five practical cases, combined with a comparison of the results with data from recent studies, enabled the identification of consistent patterns in the transformation of interface development processes under the influence of cloud-based and desktop platforms. A considerable shift in the structure of the design process was identified in the first instance.

The first case concerns the redesign of the web interface of an e-commerce platform. The primary objective was to improve navigation usability, optimise the catalogue structure, and enhance the visual hierarchy of interface elements. Component libraries and responsive layouts were used to implement these tasks, which enabled rapid testing of alternative interface variants. During the process, a design system with reusable UI components was developed, which ensured consistency of visual style and simplified subsequent product scaling. As illustrated in Figure 1, the interface of the platform in Figma includes component libraries and responsive layouts, which clearly demonstrate the organisation of elements and the structure of the design.

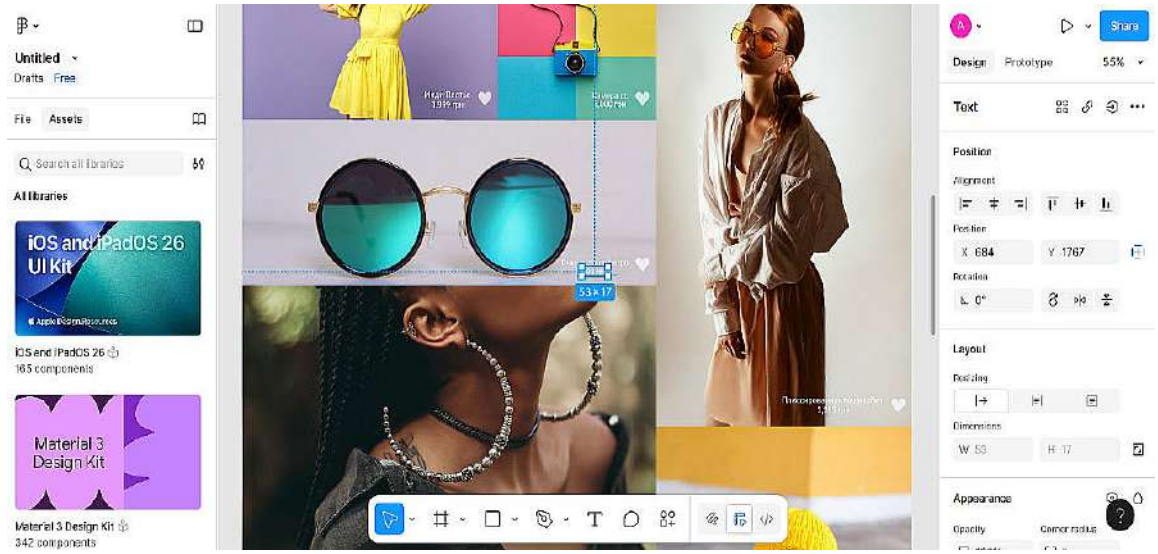

Figure 1. Development of an e-commerce platform using Figma – time optimisation and reduction of errors through collaboration and component libraries

Source: compiled by the author

The second case concerns the development of the interface of an online medical service in the Adobe XD environment. The main objective of the project was to create a clear structure of user scenarios, including registration, login, and service selection. The use of a contemporary design tool enabled iterative testing of prototypes and rapid modification based on feedback from potential users and stakeholders. During the design process, a series of screens was developed that represent the sequence of user interaction with the system, including data input forms, selection of activities, medical specialists, and appointment time. As illustrated in Figure 2, the interface is presented as a set of interconnected screens that demonstrate the main stages of the user journey and the logic of transitions between them in the Adobe XD environment. All screens were designed in accordance with accessibility standards WCAG 2.1 level AA (World Wide Web Consortium, 2018), which ensures their usability for individuals with disabilities.

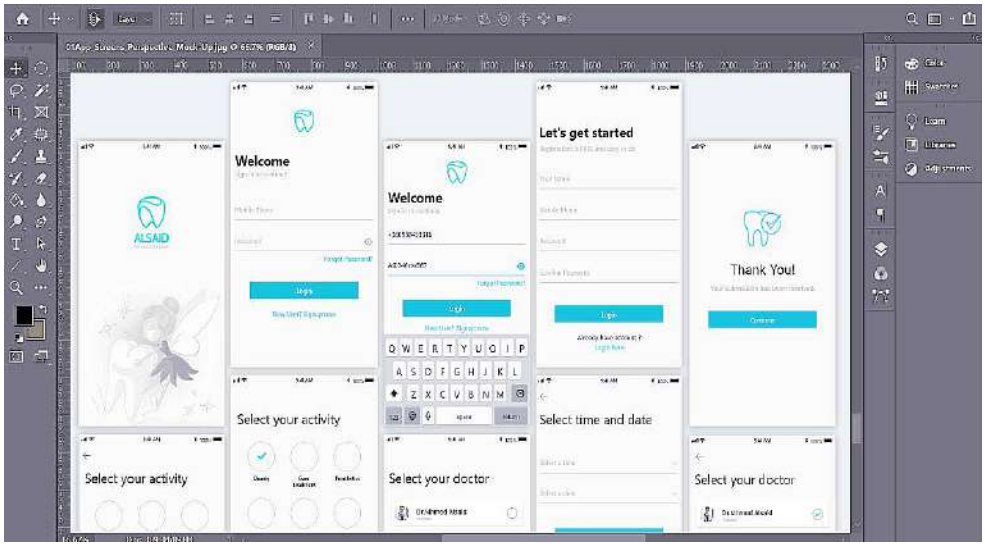

Figure 2. Development of a medical application using Adobe XD
Source: compiled by the author

The third case covered the development of an interface for an educational web platform intended for distance learning. The primary task was to establish a clear information architecture and ensure convenient navigation between learning modules, courses, and interactive materials. Prototypes of varying levels of fidelity were used during the design process, which enabled gradual refinement of the interface structure and alignment of design decisions. Figure 3 presented a set of design system elements, including typography, UI components, and interface solution variants developed in the Sketch environment.

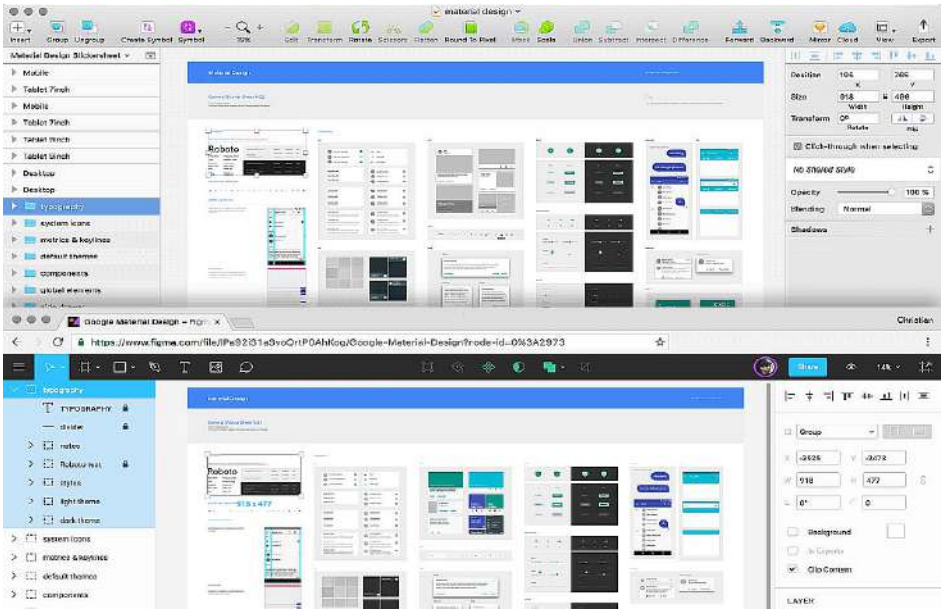

Figure 3. Example of an interface implementation for an educational web platform in Sketch: screen structure, typography, and design system components
Source: compiled by the author

The next case is devoted to the development of an interface for a SaaS platform for financial analytics. The main objective was to reduce visual overload and improve the perception of complex analytical data. Modular grids, iconography, and elements of visual hierarchy were applied to achieve this objective, which enabled the structuring of information and improved readability. During the design process, design system components and standardised interface solutions were used, which ensured consistency of elements and simplified

work with layouts within a unified environment. The interface of the SaaS platform for financial analytics, including a dashboard with data visualisation, charts, and design system elements developed in Figma, illustrates structured data presentation and the use of unified components (Fig. 4).

Figure 4. Example of a SaaS application interface for financial analytics created using a design system in Figma
Source: compiled by the author

The further development of these approaches is considered in the following case, which concerns the design of the interface of a news web portal. In this case, the main focus was placed on ensuring responsiveness, optimising page structure, and improving content readability. A component-based approach was applied, which enabled the standardisation of content presentation and ensured interface coherence. An example of implementation is presented in Figure 5.

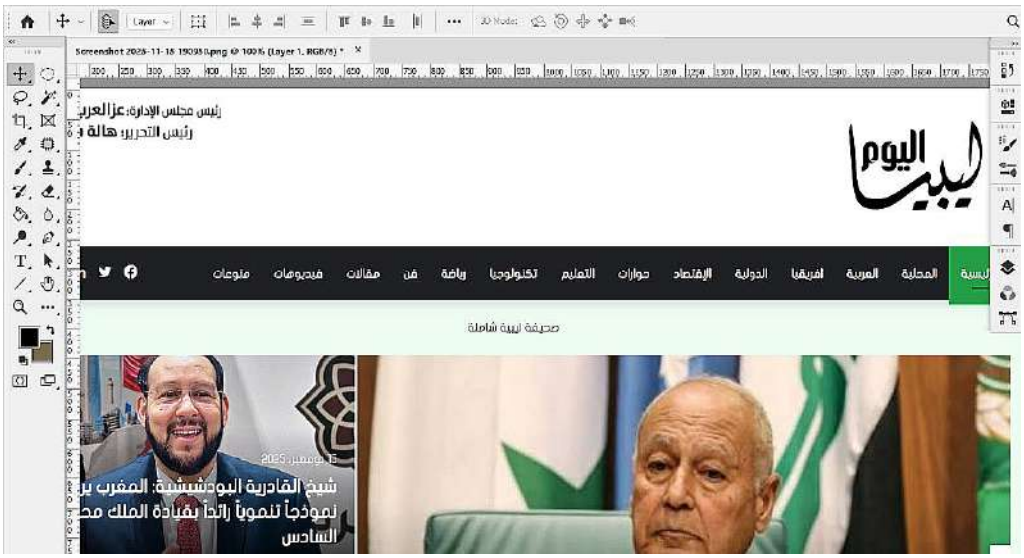

Figure 5. News portal – integration of Adobe XD with Creative Cloud for efficient graphics processing and interface adaptation across devices
Source: compiled by the author

A comparative analysis was conducted to quantify the actual impact of these platforms on workflows and team productivity, as well as to systematise their advantages and limitations, based on the results of an empirical survey of students of the Libyan College of Electronic Technology. The aggregation of respondents' answers, combined with the analysis of case studies, enabled the formation of a structured evaluation of three leading platforms – Figma, Adobe XD, and Sketch. The results of the analysis, presented in Table 1, were systematised across seven key criteria.

Table 1. Comparative assessment of tool effectiveness (scale 1-5)

Indicator	Figma	Adobe XD	Sketch
Interface usability	4.8	4.3	4.2
Collaboration (teamwork)	5.0	3.8	3.2
Adaptability / responsive design	4.7	4.4	4.1
Integration with other systems	4.5	4.9	3.7
Prototyping speed	4.9	4.6	4.0
Accessibility (WCAG, plugins)	4.4	4.8	3.9
Design system support	5.0	4.2	4.1
Average score	4.76	4.43	3.89

Source: compiled by the author

Lower collaboration indicators point to the limitations of the offline work model and reduced flexibility in collaborative editing. Sketch demonstrated the lowest average result, although it retains stability in core interface design functions. Its strengths remain rapid prototyping and interface simplicity. Limited collaboration and weaker integration with cloud services, however, constrained its use in large or distributed teams. The effectiveness of UI/UX design tools is therefore determined not only by the number of features but also by the level of integration, adaptability, and support for collaborative interaction. Cloud-based environments, particularly Figma, shape a new paradigm of digital design in which collaboration, scalability, and process standardisation become priorities. The selection of a specific tool depends on the type of project, available infrastructure, and requirements for design customisation. Within the experimental stage described in the methodology, Case 1 was analysed to provide a quantitative assessment of the impact of Figma on the efficiency of the interface development process. Table 2 presented the average indicators of task completion time and number of errors under control and experimental conditions.

Table 2. Comparison of task completion time and number of errors when using Figma (Case 1)

Stage	Time (hours)		Time reduction (%)	Number of errors		Error reduction (%)
	Control conditions	Experimental conditions		Control conditions	Experimental conditions	
Layout creation	40	25	38	12	6	50
Prototyping	30	20	33	5	2	60
Client approval	25	15	40	3	1	67
Total	95	60	37	20	9	55

Source: compiled by the author

As shown in the table, the transition to experimental conditions enabled a substantial reduction in task completion time and a decrease in the number of errors across all key stages of interface development. Following the transition to Figma, a significant reduction in overall design time was observed. The largest decrease occurred at the layout development stage (38%), which indicates the effectiveness of component libraries and collaborative editing. The reduction in prototyping time (33%) is explained by the ability to create interactive scenarios rapidly without exporting to external tools. The client approval stage also became shorter, since Figma provides simultaneous access for clients and developers to the current version of the layout, eliminating the need for multiple review cycles and file transfers. As a result, the implementation of Figma contributed not only to reduced design time but also to increased process transparency, fewer errors, and improved version control. This confirms the relevance of cloud-based environments in contemporary design teams, particularly in large or distributed projects.

The cases examined demonstrated the specific features of applying different UI/UX design tools depending on the type of project, defined tasks, and organisation of the development process. The presented examples reflect the variability of approaches to interface design, including the use of component libraries, prototyping, collaboration tools, and integration capabilities. The results of case execution were summarised in tabular form to systematise the data obtained and enable further comparison. Table 3 presented the main characteristics of each case, the tools used, the design objectives, and the recorded performance indicators.

Among the tools examined, Figma demonstrated the highest integral efficiency, Adobe XD showed a moderate level, and Sketch – the lowest. The aggregation of survey results indicates that the key determinant of the effectiveness of contemporary UI/UX design tools is the integration of collaboration, prototyping, and asset transfer functions within a unified environment. This reflects a broader trend in the development of digital design platforms towards

cloud-oriented collaboration and the reduction of barriers between the stages of design, testing, and implementation of interfaces. The results of the analysis allow the identification of several key trends in the use of contemporary graphic design tools in web interface development. First, a flexible and adaptive approach to design is becoming increasingly widespread, enabling efficient work across multiple platforms, from desktop to mobile devices. Tools that support responsive design significantly facilitate this process. Second, the component-based approach has become a standard in professional practice. Third, the importance of collaboration is increasing. Tools that support real-time collaboration, such as Figma, demonstrated higher effectiveness, particularly in distributed teams or projects with tight deadlines.

Table 3. Comparison of case study results

Case No.	Industry / product	Tool used	Main objective	Key results
1	E-commerce platform	Figma	Redesign of a mobile application	Design time ↓ 35%, task-related errors ↓ 50%, collaboration – high (real time), design system – centralised components, accessibility – partial.
2	Medical system	Adobe XD	Accessibility and WCAG compliance	Design time ↓ 20%, task-related errors ↓ 30%, collaboration – medium, design system – medium, accessibility – full WCAG 2.1 AA compliance.
3	Educational portal	Sketch + Abstract	Version control management	Design time ↓ 15%, task-related errors ↓ 20%, collaboration – limited, design system – medium, accessibility – limited.
4	SaaS analytics	Figma	Design system development	Design time ↓ 30%, task-related errors ↓ 45%, collaboration – high, design system – 180+ components, scalability – high, accessibility – partial.
5	News portal	Adobe XD	Integration with Adobe Cloud	Design time ↓ 25%, task-related errors ↓ 35%, collaboration – medium, design system – medium, accessibility – partial.

Source: compiled by the author

The comparative analysis of the effectiveness of contemporary UI/UX design tools confirmed that both cloud-based and desktop solutions significantly influence the organisation of user workflows. In the study by J. Wang *et al.* (2022), testing of Figma, Adobe XD, and Sketch indicated that, although statistically significant differences were not identified overall, 58% of respondents noted that the "overall usability" of Figma was noticeably higher. Similar conclusions are presented in the report of The Competition and Markets Authority (2023), where Figma received a score of 31 in workflow evaluation, Adobe XD 23, and Sketch 21; the assessed criteria included learning, collaboration, version control, and other functional aspects. The technical analysis of C. Krammer (2017) emphasised that Figma provided more advanced "layout grid" and "vector networks" functionalities compared with Sketch and Adobe XD, which positively affects design adaptability and prototyping efficiency.

The use of tools that support real-time collaboration facilitates a transition from a linear design model to an iterative one, within which design, testing, and modification occur in parallel. Similar conclusions were presented by H. Maxwell & R. Brisco (2025), who stated that the integration of designers and developers within a shared digital environment reduced the number of repeated iterations and shortened the decision-making cycle. The results of this study confirmed this tendency: in cases where cloud platforms were used, the time required for layout approval and revisions decreased compared with conventional offline approaches. A second important outcome of the use of contemporary tools is the increase in respondent efficiency and the reduction in errors during task execution. In the study by Y. Lamine & J. Cheng (2022), the implementation of component-oriented design systems increased the consistency of visual solutions and organisational efficiency of teams. Similar results were observed in the case studies, where the use of component libraries ensured centralised updates of layouts, reduced the number of inconsistent elements, and improved the stability of UI solutions in large-scale projects.

Particular attention should be given to the impact of tools on team interaction, since the use of digital technologies in collaborative project environments can significantly alter team behaviour and improve the efficiency of group processes, as demonstrated in research on collaborative digital technologies in design (Yu *et al.*, 2024). Platforms that support simultaneous editing and real-time commenting enhance process transparency and reduce communication gaps between designers, developers, and other stakeholders. This corresponds with the results of K.J.K. Feng *et al.* (2023), who demonstrated that the integration of UI tools into a shared workspace increases team productivity and reduces the risk of discrepancies between design decisions and their technical implementation.

An important aspect of the results concerns the impact of contemporary tools on compliance with accessibility standards. The study by H. Shah (2024) emphasised that the presence of built-in mechanisms for verifying compliance with WCAG 2.1 AA at the design

stage significantly increases the level of inclusivity of digital products. Alongside these positive outcomes, certain limitations were identified. Excessive standardisation of design systems may reduce creative flexibility and lead to a loss of brand distinctiveness, which corresponds with the conclusions of A. Tevi *et al.* (2025) and A. Shokrizadeh (2025). The use of local tools without a fully developed cloud infrastructure also complicated the synchronisation of changes in large or distributed teams, which is supported by the findings of R. Jolak *et al.* (2023). The study demonstrated that contemporary graphic design tools transform not only the technological dimension of UI/UX processes, but also the organisation of teamwork, the scalability of projects, and compliance with accessibility standards. The key determinants of the effectiveness of UI/UX tools include real-time collaboration, a component-oriented approach, support for WCAG (World Wide Web Consortium, 2018), and integration with other tools. These factors ensure effective teamwork, interface consistency, inclusivity of digital products, and continuity of workflows. Among the tools examined, Figma demonstrated advantages across all these dimensions.

Thus, the findings of the study and the analysis of user experience also enable the identification of certain limitations of contemporary UI/UX design tools. Excessive unification of design systems may lead to reduced individuality and a loss of brand distinctiveness in interfaces. The use of cloud platforms is associated with technological dependence and high requirements for internet connectivity. In summary, the case results confirm that flexibility, component-based architecture, accessibility, and integration constitute key determinants of the effectiveness of contemporary cloud-based design environments, which is also supported by D. Masveta & M.E. Manyangara (2025), who emphasised the importance of adaptability and personalisation in contemporary digital interfaces for ensuring a positive user experience. The effectiveness of any tool remains contingent on the conditions of its use, the level of the team, and the context of the task.

Figma has a range of functional advantages that position it as one of the leading tools for UI/UX design. The platform supports real-time collaboration, enabling multiple designers to work simultaneously on a layout, which increases process transparency and reduces the likelihood of version conflicts. An important feature is the support of component libraries and design systems, which enable automatic updating of elements across all layouts, facilitate design standardisation, and reduce the time required for repeated modifications. Auto layout and responsiveness simplify the creation of responsive interfaces for different platforms and devices, while the cross-platform nature of Figma, with access via browser or desktop environments (Windows, macOS, Linux), renders the tool suitable for distributed teams. The availability of plugins and integrations extends functionality, enabling accessibility checks, the creation of interactive prototypes, and UX testing.

Among the limitations of Figma is the requirement for a stable internet connection for full functionality. In large projects, the organisation of components and libraries may require the use of additional plugins. The study by T. Huang (2024) emphasised that Figma substantially altered the conventional model of interface development by integrating users into the full cycle, from layout creation to user experience testing. The usability of the platform enables even users with limited experience to create interactive prototypes rapidly and test UX hypotheses, while the browser-based version and cross-platform accessibility ensure availability across devices. Within the experimental study involving students of the Libyan College of Electronic Technology, the use of Figma in the e-commerce platform case enabled participants to redesign a mobile application simultaneously, reducing design time by 35% and decreasing the number of errors by 50%. This supports the conclusions of T. Huang regarding increased efficiency and quality of work when using a cloud-based platform.

Adobe XD offers its own set of functional advantages. The platform integrates with Adobe Creative Cloud, which ensures seamless asset exchange between Photoshop, Illustrator, and XD, which is particularly relevant for multimedia projects (Krokhmal *et al.*, 2024). The tool supports prototyping and animation, enabling the creation of interactive scenarios without reliance on third-party applications. Adobe XD also supports plugins for UI/UX design and accessibility verification, which facilitates compliance with WCAG 2.1 AA standards (World Wide Web Consortium, 2018) and enables control of colour contrast and typography. The platform also presents certain limitations. In large teams, its real-time collaboration capabilities are less effective compared with Figma, and flexibility in constructing component systems is more limited, which may complicate work on large-scale design systems. The study by X. Ye *et al.* (2024) demonstrated that Adobe XD is an effective tool for creating inclusive interfaces, particularly in medical and educational services. The platform supports WCAG 2.1 AA standards, enabling verification of colour contrast, font size, and compliance of interface elements with accessibility requirements. It also provides prototyping capabilities with animation and interactive scenarios, which enable modelling of user behaviour with diverse sensory and cognitive needs. Integration with the ecosystem of Adobe Creative Cloud facilitates the processing of graphic assets in Photoshop and Illustrator and their rapid incorporation into layouts. A practical example supports this: in the case of a medical information system, the use of Adobe XD ensured full compliance of the interface with WCAG 2.1 AA standards (World Wide Web Consortium, 2018), which enabled the creation of a usable and accessible digital service.

In turn, X. Ye *et al.* (2024) indicated that Adobe XD has limitations in the context of team collaboration, particularly in projects with tight deadlines. The platform does not provide fully synchronous real-time collaboration for multiple users, which may lead to delays and an increased number of revisions at the final stage. Large or distributed teams often require additional tools for version control and file management. For example, in the case of the news portal, integration with Adobe Creative Cloud accelerated graphic processing, yet the approval of layouts between participants in the experiment and developers required more time than in Figma. Adobe XD thus combines strengths in inclusivity, integration, and multimedia prototyping with certain collaboration constraints. The platform is an optimal choice for projects in which compliance with accessibility standards and integration with graphic assets are critical; however, for rapid team cycles and work on large distributed projects, it is advisable to consider additional tools or alternatives that support real-time collaboration (Kowalczyk *et al.*, 2022). This approach preserves the advantages of Adobe XD in creating inclusive interfaces while reducing the risks of delays and decreased team productivity.

Sketch demonstrated a number of functional advantages that make it attractive for specific categories of users. First, the platform is characterised by stability and fast rendering of layouts, which makes it suitable for work on macOS and in offline mode, particularly for small and medium-sized teams. Second, Sketch supports an extensive plugin ecosystem, which enables the extension of functionality and integration with Abstract for version control in team projects. Third, the availability of flexible component libraries supports the reuse of interface elements and enhances design consistency within large projects. Sketch also presents certain limitations. The absence of a Windows version and limited online collaboration capabilities create difficulties for teams working across different operating systems or remotely. The platform depends to a considerable extent on local infrastructure and third-party services for synchronising work in large teams, which may complicate the scaling of development processes.

The study by P. Krokhmal *et al.* (2024) emphasised that Sketch remains an effective tool for creating stable layouts and managing local design processes, particularly in small teams and projects with a limited number of participants. The main advantages of the platform include fast rendering, stability on macOS, and a wide range of plugins that enable flexible extension of functionality and the creation of local component li braries through Abstract. These features make Sketch suitable for the development of design systems and for maintaining a high level of interface quality under controlled conditions. Nevertheless, as noted by R.S. Uhlyk (2025), the absence of a cloud environment and limited support for real-time collaboration create substantial constraints in large-scale and distributed projects. Participants working on complex products with numerous layouts encounter difficulties in synchronising changes, risks of duplicated work, and challenges in version control. In the case of the educational portal (Case 3), respondents indicated that, although Sketch enabled the creation of flexible design systems, limited collaboration and the absence of an integrated cloud environment slowed work on large interface sections and increased the coordination burden on project managers, who were required to manage changes manually. Sketch is therefore suitable for locally managed projects due to its stability and fast rendering, while limited support for online collaboration and cloud integration reduces its effectiveness in large or distributed teams.

Thus, graphic design tools such as Figma, Adobe XD, and Sketch considerably transform web interface development processes. They support integration between designers, developers, and product teams, and improve the efficiency of UI/UX processes through a component-oriented approach, adaptive design, and integration with other systems. The use of contemporary platforms enables the optimisation of workflows, improves interface quality, and ensures scalability and design consistency.

CONCLUSIONS

The analysis of the case studies and the comparative evaluation of Figma, Adobe XD, and Sketch indicated that the key determinants of UI/UX process efficiency include collaboration, a component-oriented approach, design adaptability, integration with other systems, and compliance with accessibility standards. The study demonstrated that the use of Figma in team-based workflows reduced design time by 35% and decreased the number of errors by 50% (Case 1). The analysis showed that the possibility of simultaneous layout editing and the use of shared component libraries ensured interface consistency and supported the efficiency of scalable projects.

The study indicated that Adobe XD is an optimal tool for projects with high requirements for accessibility and integration with the Adobe Creative Cloud ecosystem. In Case 2 of the medical information system, the platform ensured full compliance with standards, which confirmed its effectiveness in the development of inclusive interfaces. At the same time, the analysis demonstrated limitations of Adobe XD in synchronous collaboration for large or distributed teams. Sketch demonstrated high stability and fast rendering of layouts, which makes it effective for locally managed projects. The study confirmed that limited support for online collaboration and the absence of cloud integration reduce the effectiveness of Sketch in large-scale or distributed teams (Case 3).

Overall, the analysis indicated that Figma achieved the highest integral efficiency indicators among the

platforms under consideration (average score of 4.76), due to high team productivity, support for design systems, and integrated collaborative editing functions. Adobe XD and Sketch demonstrated strengths in specialised aspects, yet showed limitations in collaboration and scalability. Prospects for further studies include the quantitative evaluation of the impact of integrated cloud platforms on the productivity of teams of different sizes and project types, along with the examination of optimal strategies for combining tools to balance creativity, adaptability, and design standardisation. Particular attention should be given to the impact of the component-oriented approach on the innovativeness and uniqueness of interfaces across different sectors.

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Застосування сучасних хмарних інструментів дизайну у практиках розробки веб-інтерфейсів

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Анотація. Актуальність цього дослідження зумовлена стрімким розвитком цифрового середовища та зростанням вимог до якості користувацьких інтерфейсів, що потребує ефективного використання сучасних інструментів графічного дизайну у практиках веб-дизайну. Мета статті полягала у комплексному аналізі ролі платформ Figma, Adobe XD та Sketch у процесах розробки веб-інтерфейсів та їхнього впливу на ефективність виконання завдань, швидкість проєктування, рівень колаборації та розвиток дизайн-систем. Для досягнення цієї мети застосовано комплексний підхід, що поєднав теоретичний аналіз, кейс-стаді та емпіричний експеримент із навчальною групою студентів. Проаналізовано ключові характеристики інструментів, оцінено їхню ефективність у виконанні типових проєктних завдань та виявлено вплив на продуктивність і якість інтерфейсів. Визначено, що сучасні графічні редактори значною мірою трансформують професійну практику User Interface дизайну, забезпечуючи масштабованість, послідовність та ефективність цифрового продукту. Проаналізовано успішні приклади використання інструментів у сферах e-commerce, медичних сервісів, освітніх платформ та SaaS-рішень. Виявлено переваги хмарної співпраці, інтеграції з іншими програмними екосистемами та підтримки стандартів доступності. На підставі емпіричних даних сформульовано рекомендації щодо вибору інструментів залежно від потреб проєкту, а також окреслено потенційні ризики надмірної шаблонізації дизайну. Дослідження може бути використане дизайнерами, фронтенд-розробниками, менеджерами та викладачами для оптимізації процесів User Interface, підвищення продуктивності команд та покращення якості веб-інтерфейсів

Ключові слова: UI-дизайн; Figma; Adobe XD; Sketch; цифрові інтерфейси; дизайн-система; графічний редактор