

CHOOSING THE OPTIMAL ENVIRONMENT FOR VISUAL DEVELOPMENT OF A GRAPHICAL USER INTERFACE

Abstract. Adobe Experience Design, Sketch, Figma are the most common visual GUI development environments. In this paper, a comparative analysis of these most popular tools is carried out in accordance with the specified criteria. Choosing the right visual development environment allows to create the most accurate, realistic interface prototype, as well as increase the efficiency of the project.

Keywords: software, interface, web design, prototyping, UX, UI.

Problem Statement. The rapid development of the web industry of the modern service market requires certain customer-oriented marketing solutions to increase competitiveness in the context of a low entry threshold and high efficiency. The trend now is an updating approach in the organization of the software product development process because a huge number of web products has no response from a customer due to a poor marketing strategy, which must include the creation of an attractive and convenient design for a target audience. It is important for developers to correctly highlight their uniqueness and advantages, and also to lure to visual content taking into account the maximum working convenience for the product user and maximum coverage of the consumers' needs of different categories. The solution to these problems in the web industry is Web design – a direction of web development and a type of design, the tasks of which include the design of user interfaces for sites or web applications. A significant link between the idea and the final user interface is the visual development environment for graphical user interfaces.

The selection of an appropriate visual development environment makes it possible to create the most accurate and realistic interface prototype, to competently build joint work between a developer and a designer, to reduce time and labor costs, and also to increase the efficiency of work in the project.

Analysis of recent research. The work [1,4,5] investigated features of web design development and the basics of modern web technologies. Work [2] dealt with the specifics of the interface design (UX design) methodology and its basic concepts

in terms of modern practical representations. The review and comparison of user interface visual environments (UI, UX) were discussed in the work [3]. However, the scope for further improvement and development of the issue is not yet exhausted and needs to be considered.

Purpose of the work. The purpose of this article is to summarize and systematize the results of the research in order to solve the problem of selecting the optimal environment of visual development of a graphical user interface.

Main part. It is customary to separate two areas of web product design: UI-design and UX-design.

UI is an abbreviation that stands for User Interface. It is a direction of digital product development that comprises work on the visual presentation of a brand/site/application or service. UI-design examines the market, customers, modern trends and creates a new brand style based on competitors and preferences of a consumer. In this way, we get high-quality and balanced marketing promotion by utilizing the attraction by general product visuals. The user interface is the graphical structure of an application. It consists of basic structural elements (buttons, texts, images, text input fields, etc.) with which the user interacts and it also includes screen layout, transitions, interface animation, and every micro-interaction. The main goal is to achieve an optimal solution for memorizing the type of web product and to prolong the time of its use. This work is for user interface designers (UI-designers). They are related to aesthetics and must make ensure that the application interface is attractive, visually stimulating the user, and corresponds to the main topic, which in turn should be consistent with the goals and objectives of the application. To summarize, UI-designers create the appearance of the application interface and are responsible for the product's allure.

Main features of UI-design:

- applies only to digital products;
- focuses on the elements with which the user directly interacts;
- creates an ideal combination of fonts, color palettes, shapes, and animations;
- the result is a product that satisfies the user's aesthetic preferences.

UX stands for User Experience. User experience is defined by how users interact with the application, how effectively user interplay is organized with the user interface elements created by UI-designers.

Such a discipline as UX-design encompasses a variety of related sciences. It contains elements of psychology, business skills, analytical skills, understanding of

how contemporary services, applications and technologies work. These types of professionals are expected to provide a range of skills to create an ideal experience for potential users.

UX-designers are responsible for determining how the user interface works, plans interface work. They define the interface structure, functionality, organization and communication of all parts of the application.

Main features of UX-design:

- is used in digital and analog products;
- focused on the client's user experience – from acquaintance with the product to the last interaction with it;
- creates the structure of the future application reducing all possible difficulties encountered by the program users;
- the result is a product that helps people solve their problems.

Each direction of UX/UI design is essential because if the product is only convenient to use but completely visually unbearable, the client will choose a competitor with a less convenient interface but a more acceptable to the eye. In the opposite direction, it works the same way.

All aspects of the visual product saturation design have to be projected beforehand. After the process of creating the product's functionality and its tools has begun, you can start making layouts of the concept and visual content of your web product.

First of all, it is necessary to start with UX-design and create a prototype layout of the location of the main elements of interaction with the user, and then to begin to study the palette, combinations and small details to make the own brand style.

It is worthwhile to define the visual elements of your brand in advance. It is worth more time on UI-design. It is necessary to choose fonts, colors, repeating elements design, icons and the highlight of the style. For this purpose, the most popular competitors and their styles are carefully studied. An in-breadth analysis is performed on the selected solutions in order to create something similar, familiar but unique. This will make it easier for the client to move from the competitor to your solution.

The production of the user interface can be roughly divided into phases [3]:

1. Formation and development of user scripts (drawing diagrams, tables);
2. Creation of the conditional framework of the future layout (preliminary sketches of an interface are created without specification, filling of details and styling);

3. Devising design layouts of the project as close as possible to the final product (creation of a real static layout);
4. Animation development in the layouts;
5. Implementation of user interaction.

Currently, there are many web design applications: Balsamiq Mockups, Webflow, Photoshop, Axure RP, Justmind, Figma, Adobe Experience Design, InVision Studio, Sketch [7-12]. The presented applications are as multipurpose as possible and permit the creation of mock-ups and prototypes of interfaces flexibly and accurately. Mock-ups are images that are used to show a customer the design of a corporate style in real-world objects. Usually, they are ready-made files in PSD format with layers allowing a designer to superimpose design elements on the photo of an object.

However, the most popular among them are the following applications: Adobe Experience Design, Sketch, Figma. The comparative analysis of the above-mentioned products will be carried out according to the criteria which, in our opinion, are the most significant for product selection: system requirements, costs of use, interface, possibilities of project editing and joint work, performance, features of prototyping and moisture design, plugins and integration, speed of development. Consider each of these criteria in more detail.

System requirements (operating system). Figma and Adobe XD are supported both on PCs with different operating systems and on mobile devices. Sketch is only supported on Macintosh systems.

Cost of use. Paid subscription for 1 user Adobe XD - \$9.99 (if you do not have a Creative Cloud membership), Figma - \$12, Sketch - \$99(one-time payment, one free update per year, if you want to use new features - \$79 per year). At the same time, free version of Adobe XD and Figma(as opposed to Sketch) have a wide range of functionality and capability to create full-fledged models and prototypes.

Interface. Interfaces of the software are largely very similar, as Figma and Adobe XD interfaces are based on Sketch.

Project editing. The performance of a designer's work is directly dependent on the choice of a tool with a well-thought-out editor because the main time expenditures are directed precisely at project management. In Sketch, there is a Smart layout feature that allows to automatically resize a layer when the length/size of the content changes (for example, the window size automatically adjusts to the text size). Figma offers a similar Sketch feature set in this area and additionally provides automatic features to reordering content with drag-and-drop. Adobe XD has a Content-

Aware layout attribute that helps to fill layers when content size changes and it is a unique feature compared to layer functions in other tools. Adobe XD offers an indentation function that provides filling content when editing. The possibility to automatically adjust the vertical position of the layers as the content height changes can be a significant time-saver. Figma has small advantages in this area.

Collaboration and teamwork. All three applications allow one team to work on a project and provide ways to share files. In the context of this article, we will focus on the collaborative functions that exist in the default programs without installing additional plugins.

In Sketch, files are stored on the cloud. In Sketch, the project must be separately loaded into the Sketch Cloud service from where it will already be available to other users. It is also possible to write versions. Historically, Sketch has been combined with other instruments such as Invision or Zeplin for collaborative functions such as joint design using and sharing. Sketch is developing to provide better versions of these features but is still behind its competitors in 2021.

Figma was originally created as a real-time collaborative web application that allows multiple users to view/edit the same file simultaneously. The real-time edit/preview function is convenient in the sense that anyone viewing a project will always see the history of recent changes. In addition to quick collaboration, Figma also has a version management system, a design and testing system that works alongside other tools.

Adobe XD launched its own collaborative editing feature as early as November 2019 with attributes such as multiplayer editing and file version control. Besides, XD has the same collection of exchange functions as other tools. Figma and Adobe XD automatically generate a project link to share with the team.

Performance. The use of an impressive number of artboards/frames, external plugins and graphics resources in the file can significantly affect the productivity and efficiency of the presented tools. An analysis of the use of Sketch and Adobe XD showed a low level of interaction with a file containing more than a few dozen editing areas on a single canvas as well as performance problems when using third-party plugins. The main set of productivity problems of Adobe XD was fixed by regular updates. The performance of Figma is less dependent on hardware because it is a browser tool (there is a desktop version, which is most likely a web application shell) and in most cases gives high productivity while using.

Features of prototyping and motion graphics. Figma and Sketch were originally conceived as static design-layout applications, while Adobe XD had the ability

to bind screens together to make low-precision prototypes. Figma and Sketch also added prototyping in 2017 and 2018, respectively. Sketch supports screen links to create an interactive prototype using hotspots. The prototype can be previewed locally or shared with others via Sketch Cloud. The presence of the functions “fixed position during scrolling” and “keeping the scroll position after clicking” allow to make more complex prototypes with click-through, and put Sketch on the same level with Invision.

Figma has almost the same set of prototyping aspects as Sketch. The main difference is in the transition effects that provide the Smart Animate function (automatic animation of the state of two frames) and permit more composite prototypes and transitions between frames.

Adobe XD has a more powerful collection of prototyping and motion design tools than Sketch and Figma. The availability of Auto-animate tool and voice prototypes make it possible to realistically reflect the animated experience of the future user. The use of Auto-animate in combination with user gestures provides interaction between artboards, opening up excellent attributes of prototypes such as progress indicators, carousel animations, lists and cards.

Plugins and integration. All three tools come with their plugin ecosystems. However, thanks to the huge plug-in library that is constantly replenished Sketch has no equal, and the software supports integration with various third-party applications and services, including other software for creating interfaces, such as Invision. Adobe XD launched its plug-in ecosystem in 2018. It may not yet be on the same level as Sketch but due to a good marketing strategy, the company quickly attracted developers to run and fill its plug-in ecosystem. So the dynamics of development look promising. Plug-ins in Figma have been supported since August 2019, and their amount is lower than its competitors but existing plugins have the potential to use and are effective in integrating with various services.

Rate of development. All three applications have a high rate of updating (on average 1 major update per month) so it is difficult to identify a leader. Based on the analysis, it can be concluded that all three of the software considered effectively meet the challenge of forming a high-quality user interface design. Adobe XD is the best at motion graphics and actively developing its plug-in system but unfortunately in other basic functions is inferior to its opponents. Sketch is an excellent native application with the ability to create more composite prototypes (such as voice-input triggers) but it can be a problem for many users to support only software on iOS. From the point of view of prototype development, Figma is a superior platform for

several reasons: it is constantly updated and developed, has accessible functionality even without subscription purchase, is supported on most platforms, having an effective interface to work in a team. However, it is necessary to take into account the fact that without a stable connection to the network, Figma service cannot be used.

As an example, consider the prototype developed in Figma (Fig.1), which was implemented using a wide variety of basic instruments. Due to simplicity and informativeness in use, a low threshold of entry, even a basic collection of tools will be enough for the user to make a full layout of the site page in a few hours.

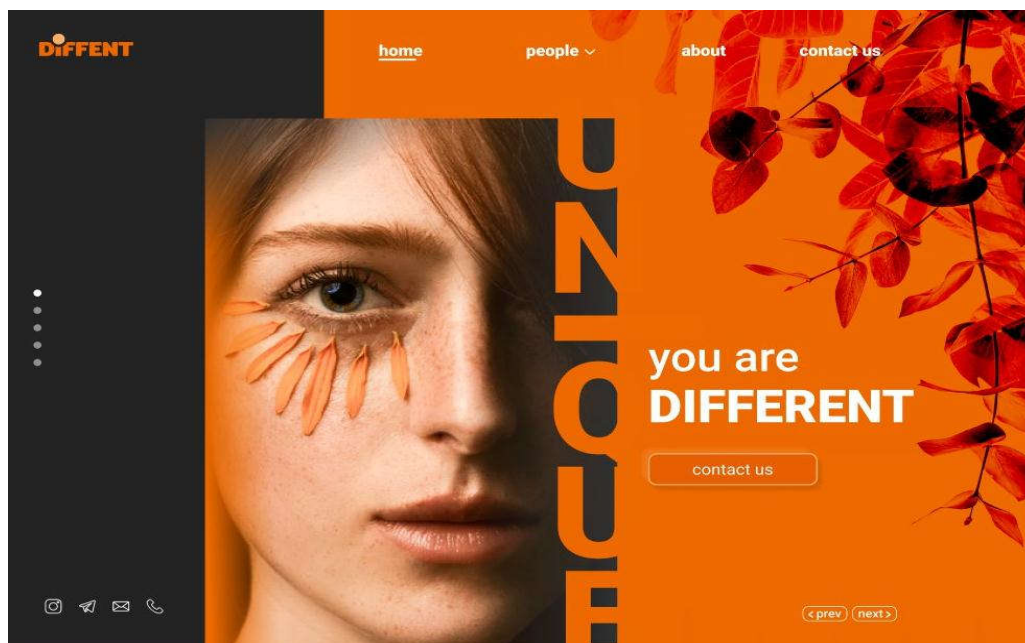


Figure 1 – Example of the design layout in Figma

Conclusions. The modern market of visual development environments of the graphical user is saturated with various applications that are complex and give an opportunity to produce mock-ups and interface prototypes flexibly and accurately. Despite this, there is an issue with software selection. It is the choice of a suitable visual development environment that permits devising of the most accurate, realistic interface prototype, allows to properly build joint work between a developer and a designer, diminishes the time and labor costs, and also raises the productivity of the work in a project. In this work, a comparative analysis of the three most popular tools (Adobe Experience Design, Sketch, Figma) was carried out and there were their pros and cons.

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***Вибір оптимального середовища для візуальної
розробки графічного інтерфейсу користувача***

Adobe Experience Design, Sketch, Figma є найбільш поширеними середовищами візуальної розробки графічного інтерфейсу користувача. В даній роботі здійснено порівняльний аналіз цих найбільш популярних інструментів відповідно до заданих критеріїв. Вибір відповідного середовища візуальної розробки дозволяє створити максимально точний реалістичний прототип інтерфейсу, а також збільшити ефективність робіт у проекті.

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