

THE USE OF FLAT ILLUSTRATIONS IN WEBSITES AND SMART PHONES APPLICATIONS' USER INTERFACE (UI) DESIGN

استخدام الرسوم التوضيحية المسطحة على واجهة المستخدم الخاصة بمواقع الانترنت وتطبيقات الهواتف الذكية

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ABSTRACT

Smartphones and computers are the most usable communicative tools in modern times. This urged the need to develop software, webpages and mobile applications that work as a mediator between users and devices. This is in addition to user interfaces (UI) that need to be designed to help users while using these websites and mobile applications. In this paper, the researcher reviews the Flat design style and its use in UI design. Then, it studies Flat illustrations that are added to user interfaces to help users imagine things better, enhance the brand identity of the UI and make texts and interactions easier to understand. The researcher then reviewed samples of Flat illustrations done for universal user interfaces. Finally, a practical study was made to examine the importance of using Flat illustrations in mobile app's UI. Through which the researcher could reach to the final results and conclusions via analysis of outputs.

KEYWORDS

Flat illustrations; Flat design; User interface (UI).

الملخص

يتناول البحث دراسة نوع حديث من الرسوم التوضيحية يطلق عليه اسم "الرسوم التوضيحية المسطحة"، وهي رسوم رقمية بسيطة و مسطحة، تتكون من مجموعات من الأشكال الهندسية، وتخلو من أي تفاصيل معقدة، ويتم استخدام هذه الرسوم بشكل كبير حالياً على واجهة المستخدم الخاصة بمواقع الانترنت و تطبيقات الهواتف الذكية، والتي تصمم على نفس النهج المسطح، وذلك من أجل تعزيز الهوية البصرية لهم، وتيسير الأمور على المستخدم أثناء التفاعل مع هذه المواقع و التطبيقات، حيث ان الرسوم التوضيحية هي اسهل و اسرع وسيلة يمكن من خلالها توصيل المعلومات لأي مستخدم، كما تم دراسة نماذج من المواقع و تحليلها.

و في نهاية البحث تم عمل تجربة عملية، من خلال رسم بعض الرسوم التوضيحية المسطحة، ليتم استخدامها على واجهة المستخدم، كما تم عمل استطلاع رأي لدراسة مدى نجاح هذه الرسوم في توصيل رسائل الي المستخدم و في ايضاح المحتوى و تعزيز الهوية البصرية للتطبيق.

الكلمات المفتاحية

الرسوم التوضيحية المسطحة؛ التصميم المسطح؛ واجهة المستخدم.

1. INTRODUCTION

An illustration is a picture, design, diagram, etc. used to decorate, explain or prove something (Webster's New World College Dictionary, 2010). Illustrations have always been used in books to make the content more pleasing or easier to understand. Also it helps the viewer imagine things better. The earliest illustrations in humanity were found in cave paintings created in Lascaux, France around 15,000 B.C. Illustrations have been used widely since then in different ancient civilizations such as ancient Egypt, ancient Greece and Italy. Illustrations in these civilizations were used to narrate victories of kingdoms, ceremonies and religious rituals. Later in the middle Ages, narrative pictorials have been used in Christian illuminated manuscripts. Around 1452 A.D, Johannes Gutenberg invented the mechanical printing process which enabled the mass production and distribution of books with images and illustrations. Moreover, since the start of the Industrial Revolution in the mid-1700s, printing technologies have improved rapidly with more publications and more illustrations, that was and still produced by artists and illustrators from around the world. All illustrations since the Industrial Revolution were made manually and then printed by machines. However, after the invention of the computer in the 20th century things changed, illustrations have been added in a different way to the software of these devices, they needed at first to be simple due to weak potentials at that time. And then, things changed again through the 21st century, new devices have been introduced to markets, as iPhones, smart phones, iPods. Moreover, different software needed to show up to help and serve users while using these new devices. Endless numbers of websites and mobile applications are launched annually to make human's life easier. Also, new expressions evolved to humanity in this digital world, as the expressions of user experience (UX) and user interface (UI) that are studied and designed carefully to fulfil user's needs and make their experience while using websites and mobile application an easier one.

Illustrations are used widely nowadays in the design of websites and mobile applications' user interface, to make user interface appeal to users, give them a universal appearance and help users understand contents as well. These illustrations follow a new contemporary style known as the Flat style. This paper will study the flat style concept and how it is applied to digital illustrations nowadays. Also, it will discuss the factors that helped in its evolution and will state its uses and its importance in user interface designs.

2. LITERATURE REVIEW

As stated before, illustration is an old human art and activity that has been practiced through history, that's why many researches and scholars worldwide have made their researches and studies on different kinds of illustrations. However, these researches mainly focused on printed book illustrations. The researcher couldn't find any former researches that studied Flat illustrations and their use in UI design of websites and mobile apps. However, Flat illustrations have been reviewed lately in blog articles as the article of (Yalanska, M.). The article considers the key benefits of applying illustrations to user interfaces for web and mobile. It is also making it clear that illustration is a functional element rather than decoration in a user interface, as the vast majority of people perceive images faster than words.

On the other hand, some researchers have worked lately on related topics such as Flat design and UI design. For example, the work of (Spiliotopoulos, K. Rigou, M. Sirmakessis, S. June 2018) made a comparative study between Skeuomorphic and Flat design from a UX Perspective. The

paper investigated how users perceive the two design styles at the level of icon design (in terms of icon recognizability, recall and effectiveness). That was based on a series of experiments and on data collection. In addition to that, the paper solves a question whether users perceive flat design as more aesthetically attractive or more usable than a skeuomorphic one or not. Other researchers have worked on the origins of Flat design and how it is applied in contemporary web-design (Oliinyk, V. Semenchuk, N. 2020). The aim of the research was to study the contemporary trends and styles being formed in graphic design. Mainly the Swiss style (the real inspiration behind the flat design). It also reviewed basic aspects of Swiss style in web-products.

Moreover, the thesis of (El-Sherbiny, H. F. 2020) made a study on how to design a brand identity for a mobile app using sensory branding. The study included an art project and a holistic design for a UI, following the Flat design concept. Flat illustrations have been used through the app's UI but without studying or analyzing the main concept of Flat design.

Therefore, the gap concluded from the literature review includes the absence of study of illustrations used in UI design. In this paper, the researcher will study flat illustrations as visual elements that are used nowadays in the UI design of websites and mobile apps. The aim is to review how the Flat style could be applied on these illustrations as it is applied on the UI design and on flat icon sets. In addition to that, how users perceive these illustrations and the messages behind it. The paper will also examine how they make actions easier to be understood by users as well as their role in the fulfillment of UI's brand identity.

3. PROBLEM STATEMENT

The research problem is looking for answers for the following questions:

- What is meant by Flat illustrations?
- What are the real factors that helped in their emersion?
- What are their main characteristics and aesthetic values?
- What is the advantage of using them in mobile applications user interface design?

4. OBJECTIVES

- Define the Flat design concept and thus flat illustrations.
- Review samples of flat illustrations from worldwide and their relation to UI design.
- Achieve number of flat illustrations with a clear objective that fulfills the needs of a mobile app UI design. Through which the researcher could measure their importance in conveying messages and enhancing UI brand identity.

5. METHODOLOGY

This work applies a descriptive, analytical and practical methodology. It begins by explaining the flat design concept and its origins as a preface. How it is used widely nowadays in websites and mobile applications' UI design. Then, it studies Flat illustrations in order to review their main characteristics and to clarify how they contribute in the display of information and commands. This makes UX and UI easier to understand by users. Moreover, the paper reviews Facebook as a case study from the digital market to show the steps and procedures they followed to create a branded Flat illustration system for its UI. Finally, the researcher makes a practical experiment in

order to measure the importance of using Flat illustrations in conveying messages and enhancing UI brand identity. A framework of sequential steps was made as follows:

First: Drawing and suggesting three storytelling flat illustrations. That can be used in “Otlob” mobile application’s UI, specifically on its on-boarding tutorial screens. Brand identity guidelines have been followed to make a visual link between the illustrations and the targeted app.

Second: A survey has been held in August 2020 on “survey monkey” website. Its aim was to measure the importance of illustrations in clarifying contents for users while using mobile apps. The researcher examined as well if the respondents can understand the messages behind the illustrations done for “Otlob” mobile app and if they could link it to “Otlob” or not.

Third: Analysis and discussion of results of the survey. Where the paper could finally reach to the conclusions of the research and reviews its recommendations.

6. FLAT DESIGN

Flat design is a contemporary digital style that is characterized by a minimalistic look, and it is focused on removing all extra elements and effects from the design, such as shadows, bevels, lighting effects, texture and all element that gives depth or extra dimensions to the design. (Pratas, 2014)

It also applies the principles of grids, geometric approach, and visual balance. Which results in creating a very simple and clean looked design that seems flat on the screen and this can be achieved by using simple shapes, two-dimensional elements, minimal textures and vibrant colours.

It also ensures that interactive designs in websites and mobile applications work well and load faster for users, and thus making user experience (UX) an easier and more optimal one.

6.1 Origins

Flat design developed as an alternative to skeuomorphic designs that gives the illusion of three dimensions through copying real-life properties.

“Skeuomorphism” is a design technique accomplished by Apple into its graphical user interface upon the release of iOS operating system in January 2007. IOS is a multi-platform operating system that is used in many other hardware devices developed by Apple. As, iPhones, iPod Touch, iPad, Apple TV, Apple Watch and the CarPlay dashboard interface. This design technique relied heavily on the use of visual adornments like gradients, shadows, beveled edges, lighting effects and reflections in applications and interface design. (Curtis, 2015)

The earliest trials of using the Flat design concept in digital products were taken by Microsoft when it presented a new flat and minimalist style of their products through the launch of the Zune music player in 2006. Then, this movement was widely adopted in the products of 2010, particularly in mobile interface design for Windows Phone7. In 2013, Flat design had further development leap when Apple released iOS 7 based on the principles of flat graphic as the basis for user-friendly intuitive interfaces. (Yalanska, M)

In the following figures, the researcher displays the difference between Flat and Skeuomorphic design through old and newer versions of Apple’s visual elements.



Figure 1, Safari icon versions used in Apple operating system’s user interface, an old Skeuomorphic one and a new Flat one (source: <https://colorpeak.co.uk/flat-vs-depth-web-design/>)



Figure 2, Calculator Skeuomorphic design in iPhones iOS 6, 2013.

(Source: <https://www.macobserver.com/tmo/article/iphone-ios-and-the-hidden-scientific-calculator>)



Figure 3, Calculator Flat design in iPhone iOS 11, 2017.

(Source : <https://www.macrumors.com/2017/10/24/ios-11-calculator-animation-bug/>)

But the original roots of flat design go back to the Swiss style, also known as International Typographic Style. It is the direction that appeared and got criticized in the 1920s and later won its popularity in graphic design in Switzerland in the 1950’s. Later on, it became the solid foundation of graphic design of mid-20th century around the world. The leaders who founded this creative movement were the Swiss designers “Josef Müller-Brockmann” and “Armin Hofmann” (Yalanska, M.).

The Swiss style got inspired also by avant-garde movements such as Cubism, Constructivism, Futurism, Suprematism and Surrealism (Meggs, 2005).

In the following figures, we can see three posters designed by Josef Müller-Brockmann. His work is influenced by Bauhaus and Constructivism. Typography and geometry are predominant. Also, his compositions are based on very "rigid" grids which were his trademark.

The style of posters inspires graphic designers nowadays when they design websites and mobile apps' UI. The use of geometrical shapes moving in a rhyming way. Texts are added using clear and bold typography. Also, the use of basic vibrant colours paved the way for the contemporary flat designs' palettes used nowadays.



Figure 4, Poster design for a Beethoven night concert, June 1957, Zürich, by Josef Müller-Brockmann
(Source: <https://www.grapheine.com/en/history-of-graphic-design/graphic-designer-muller-brockmann-swiss-style>)



Figure 5, Poster design for a concert, January 1955, by Josef Müller-Brockmann
(Source: <https://www.grapheine.com/en/history-of-graphic-design/graphic-designer-muller-brockmann-swiss-style>)



Figure 6, Poster design for musica viva event, by Josef Müller-Brockmann
(Source: <https://www.grapheine.com/en/history-of-graphic-design/graphic-designer-muller-brockmann-swiss-style>)

6.2 Flat user interface design (UI)

User interface (UI) is a mediator mean that facilitates communication between human beings and devices as computers or cell phones. It includes both physical and communicative aspects of input and output, or interactive activity between the user and the device. UI designed for computer and cell phone systems embodies applications, operating systems, and networks. (Marcus, 2002, p.24)

User interface design is the design of all essential perceptual features in a website or a mobile application, including the visual, auditory, and tactile characteristics of these features. For example, the choices of colours, fonts, animation style, verbal style, sound cues, and vibration modes. (Marcus, 2002, p.22)

Nowadays, features of the Swiss style or Flat design are widely used in the works of leading design studios, facilitating the promotion of such type of styles in web-design and mobile apps. The reason behind this is that the design of user interfaces is dominated by the trend of internationality. (Oliinyk, Semenchuk, 2020)

Moreover, UI designers are now keen to seek for means of conveying concepts and actions through the medium of signs, images, illustrations and symbols. The reason behind this is that user

interfaces mostly need to be independent of language, as they are presumed to be able to cross cultural boundaries. So, current interfaces make extensive use of graphical and iconic elements alongside with pop-up text labels that explain their meaning to users. (Dillon, 2006)

We conclude that, as flat style concept is being applied in the UI design then simultaneously, it must also be applied on illustrations and all graphic capabilities included in this UI. Hence, harmony is maintained between all elements and a unified strong brand identity is created for the website or the mobile app. And thus, let the UI stand out in the market.

7. FLAT ILLUSTRATIONS

Flat illustrations are vector-based digital kind of illustrations that follow the flat design style. They adopt the concepts of simplicity and minimalism. In addition to that, the use of simple geometrical shapes to compose its characters, objects and backgrounds. They also avoid realism in their style and look, instead they adopt concepts of abstraction.

In the following figures, we can see a clear example of flat illustrations done to be used in brevio website's UI. Figure (7) shows the website's home page and its branded colour palette. Figure (8) shows a flat illustration used in the website. Figures have been simplified into plain geometric shapes with minimum number of vibrant colour palette (blue, mint, yellow, peach, brown and black). Their colours follow the branding guidelines of the website in order to create a unified brand identity for brevio.

Also, we can see the Swiss style effect obvious on these illustrations.

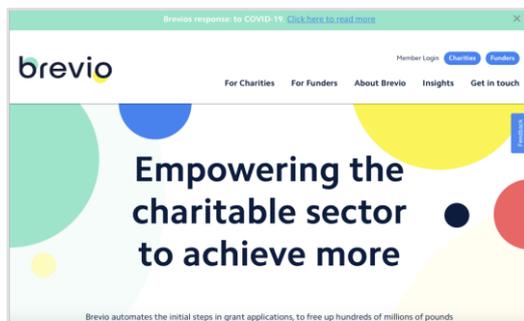


Figure 7, brevio website user interface.
(Source: <https://brevio.org/>)

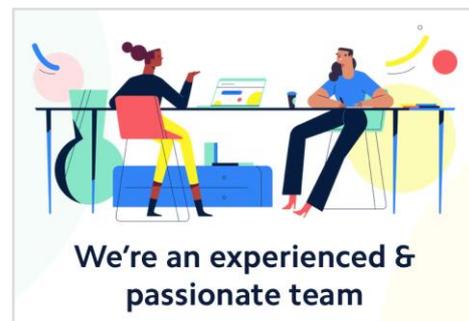


Figure 8, Flat illustration for brevio website user interface,
project by: Ilona Rybak, Mac Wojcik, Sigh Jones, 2020.
(Source: <https://brevio.org/>)

7.1 Flat illustrations use in UI design of websites and mobile apps

Flat illustrations may be used in different places in the UI design of a website or mobile application. They are functional elements rather than decoration. So, they should convey messages and explain interactions easier and clearer to users. They can be used in:

- Storytelling.
- Infographics.
- Icons and avatars.
- Mascots and characters.
- Onboarding tutorials and tooltips.

- Rewards and other gamification graphics.
- Notifications and system messages.
- Stickers (especially popular for messenger applications).

In the following figures, we can see examples of flat illustrations done for Hapi mobile app, a self-care app that connects a person with a trained compassionate listener through a voice call. The illustrations are flat and are following the app colour guidelines. They are used as storytelling illustrations to explain the use of the app on its onboarding screens.



Figure 9, Flat illustrations made by Mirko Grisendi for Hapi mobile application

(Source :

<https://www.behance.net/gallery/99873485/Talk-Listen>)

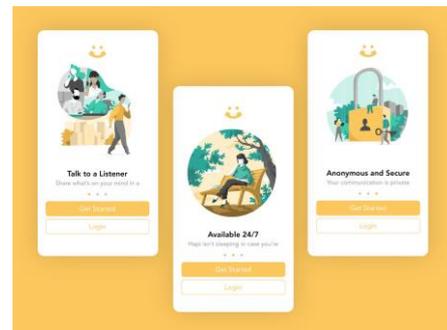


Figure 10, The use of these illustrations in the onboarding screens of the application

(Source :

<https://www.behance.net/gallery/99873485/Talk-Listen>)

7.2 Their main characteristics

- Flat illustrations in user interfaces need to be simple, free of details and realism.
- They consist of geometrical shapes, layers of solid colours and tonal shadows.
- They are coloured in vibrant RGB colours, as they are used only on screens and not for printing issues.
- Textures, gradients and complex forms must be avoided.
- Colour palette should be minimalistic and must follow the UI design brand identity.
- Anatomical proportions of characters may be exaggerated.
- Facial features might be neglected and instead using one or two solid colours for the face.

7.3 Their Role in the Fulfilment of UI Brand Identity

A user interface should reflect brand values through every element and interaction. Illustrations have been used as a communication tool for a very long time. It helps people understand how something works and let them imagine their world with the benefit of a product or service. Grand companies have recently turned to illustration to reach more people and create emotional connections with their brands. They hire creative agencies and illustrators to design and create branded illustration systems for their websites and mobile applications' UI. Illustrations can help embody the look and feel of a user interface. Using shape, color, texture, depth, scale, etc. It also became a significant asset within branded websites and mobile applications, alongside logos, color

palettes, typography, photography and pattern libraries, etc. Illustrations can be memorable and catchy, so they work well in growing brand awareness and recognizability.

7.4 Facebook Alegria Illustration and Animation System (case study)

In 2017, Facebook hired Buck (LA-based creative agency) to create a holistic illustration and animation ecosystem for its UI. At that time, Buck assembled a team of talented illustrators and a year later, Alegria was born. Alegria is a Spanish word that means ‘joy’, as the main creative idea behind the project was to create this fun and playful world in Facebook user interface.

The core principle followed by the creative team was to design and innovate a scalable system rooted in flat, minimal and geometric shapes. All figures are abstracted, limbs are oversized and non-representational skin colours are used to help them achieve a universal feel. Visual guidelines have been established for the whole project showing figure construction, body proportions, anatomy of male and females, body types, hands positions, colour guidelines and much more.

Buck team built an extensive library for Facebook to be used in the Alegria world over time. The library includes a dozen assets of subcategories beyond just people such as flora, fauna, buildings, transportations, hands, etc. Along with a toolkit that help them expand.

These Illustrations permeate Facebook's entire interface, across mobile, desktop, and print. The use of Facebook’s unique blue colour is obvious in most illustrations. This helped in the reinforcement of Facebook’s visual brand identity across users all over the world.

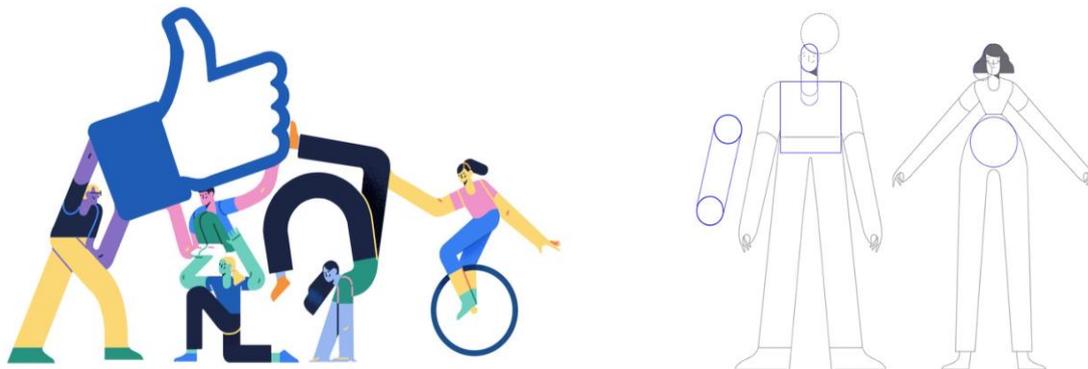


Figure 11, Other samples of flat illustrations made by Buck agency showing characters building and compositions
 (Source : <https://buck.co/work/facebook-alegria>)

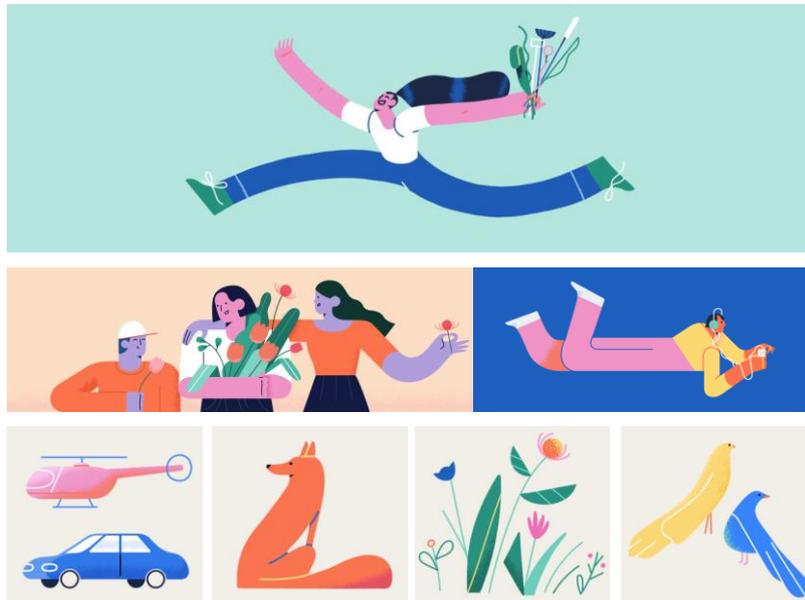


Figure 12, Samples of flat illustrations made by Buck agency for Facebook Alegria illustration system
 (Source : <https://buck.co/work/facebook-alegria>)

8. RESEARCHER’S PRACTICAL PROJECT

8.1 Otlob mobile app brand identity

Otlob is a mobile app and website for ordering and delivering food in Egypt. It works as a mediator between restaurants and customers, offering a delivery service from a large variety of food and beverages menus.

It has a simple interface; the user can search for nearby restaurants, order his food, and then wait for it to be delivered to his doorstep.

Otlob brand identity consists mainly of two colours, the yellow and the purple. The UI designer added a third colour which is the green colour in buttons as shown in the following figures.



Figure 13, A zoom on Otlob logo on the app welcoming screen
 (Source: screenshot from the application interface)

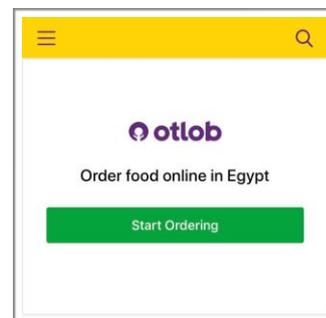


Figure 14, A zoom on the home screen in Otlob app
 (Source: screenshot from the application interface)

Otlob application doesn’t use characters illustrations in its UI’s design; instead they use some flat icons and live photographs.

8.2 Materials

The researcher did three storytelling flat illustrations to be used in the UI design of the app. The target was to create a more artistic, authentic and unique visual identity for the app. It is suggested that these illustrations could be used on the application's on boarding screens, to explain for users how to use it.

The researcher made flat illustrations based on a hero character who uses “Otlob” mobile app and enjoys its easy benefits. All illustrations are made from simple and flat geometric shapes, with solid vibrant colours and some tonal shadows. Colour palette was chosen based on the real brand identity of the UI. In addition to that, some lighter and darker colour tones are added to the main colours as shown in *figure* (15). That was to enhance the brand identity of the mobile app and help users link it to “Otlob”.

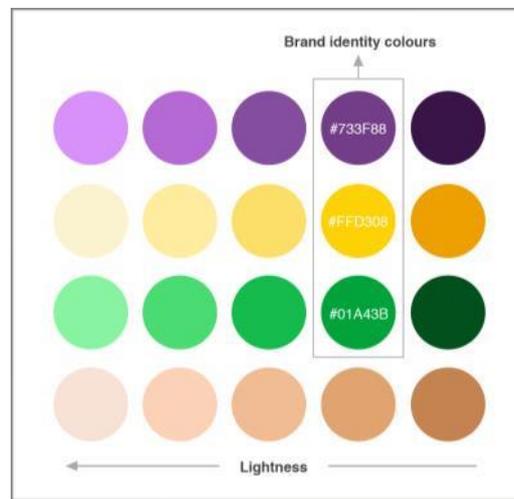


Figure 15, Colour palette used in the researcher's flat illustrations (Source : author)



Figure 16, flat illustration 1
(Source: Author)



Figure 17, flat illustration 2
(Source: Author)



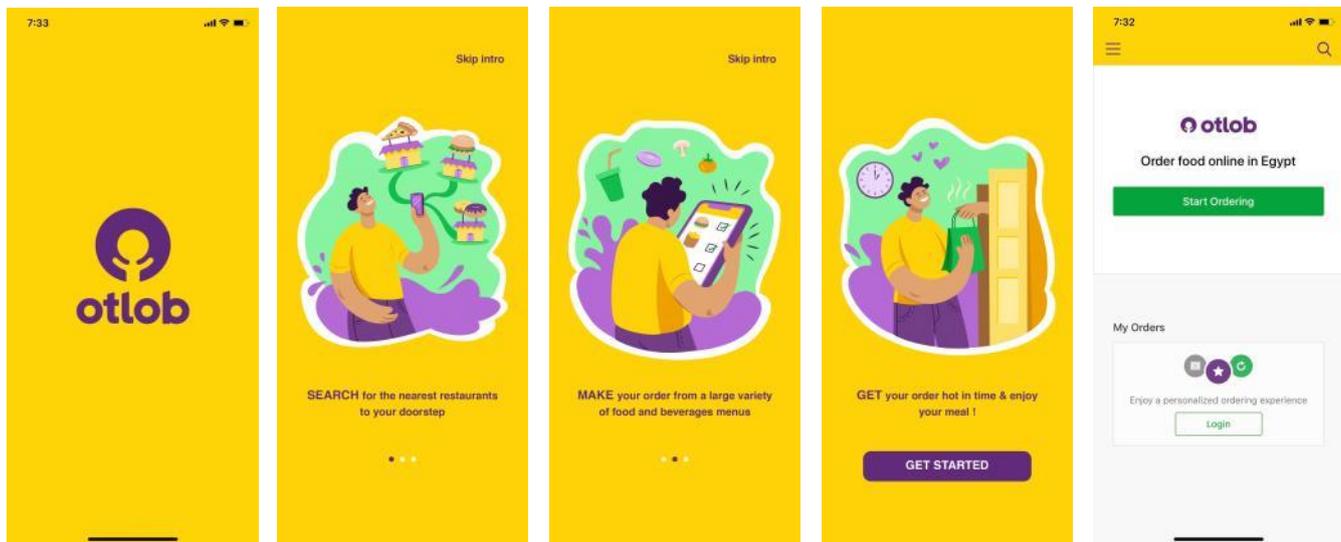
Figure 18, flat illustration 3
(Source: Author)

In figure (16), the researcher made an illustration to convey a message that the user can use “Otlob” mobile application to search for the nearest restaurants and coffee shops to his doorstep.

In figure (17), the hero character is now choosing his food order from a menu through the mobile app.

In figure (18), the researcher portrayed the hero character pleased while receiving his order, hot and in time. A wall clock is added in the background to mention the accuracy of time of “Otlob” service, and the flat smoke to confirm the freshness of food.

The illustrations were made digitally using Adobe computer softwares. First, the researcher made the outlined sketches on Adobe Photoshop. Then, final illustrations have been coloured and finalized as vector layers on Adobe Illustrator program.



*Figure 19, a visualization for the three storytelling flat illustrations on Otlob app's onboarding screens
(Source : author)*

In figure (19), the researcher finally makes visualization for the three flat illustrations on the app's on-boarding screens. They were placed with a white frame on the yellow background used already on the app's welcoming screen. Under each one, the researcher added informative text that explains the illustration. In the last illustrative screen, the researcher added a purple button with the text “Get started” to let the user get into the app's home screen and make his first order.

8.3 Protocol

A data collection tool was developed in the form of a questionnaire with multiple-choice questions, it had 7 questions. It begins by asking the participants about their gender and age. Then, it asks them about their opinion if illustrations make information clearer and easier to be understood on mobile apps or not. After that, Participants were asked to select the meaning of each illustration of the three from a predetermined list of three choices with one being the target or “correct” choice. Finally, the participants

were given three choices of brands and food restaurants that can use these illustrations in their UI design, the choices were “Otlob”, “La Poire” and “KFC”. The participants were asked to choose one choice and state the reason behind this choice, if it was the stories of the illustrations, or the matching of colours with brand identity, or the style of drawing, or that they are just guessing, or for another reason. Survey was circulated via social media platforms and participants completed it individually without any supervision

8.5 Participants

A total of 138 individuals participated in the research study, with a 72% completion rate and 2 minutes as an estimated time to complete the survey. The participants consisted of a total of 76 females (55%) and 61 males (45%). 12 individuals (8.7%) aged under 20, 118 individuals (86.1%) aged 20-45, 7 individuals (5.1%) aged above 45. All participants are highly educated.

9. RESULTS AND DISCUSSION

The results of the survey came to solve some questions that the researcher needed to find answers for. As, 130 individuals (95%) stated that illustrations make information clearer and easier to be understood in mobile applications from their point of view, while 7 individuals (5%) disclaimed this. Concerning the messages behind illustrations, recognition rates were very high among all participants. In the first illustration, 125 individuals (92%) got the right choice while 11 individuals (8%) chose a wrong one. In the second illustration, 132 individuals (96%) got the right choice while 5 individuals (4%) chose a wrong one. In the third illustration, 132 individuals (96%) as well got the right choice while 5 individuals (4%) chose a wrong one.

Concerning the enhancement of brand identity through using flat illustrations in mobile apps, 110 individuals (86.6%) could link the illustrations to “Otlob” mobile app, while 10 individuals (7.8%) linked them to “La Poire” and 7 individuals (5.5%) linked them to “KFC”. The reasons behind the participants’ choices were diverse, as 67 individuals (48.5%) stated that they made their choice according to stories of illustrations, 33 individuals (24%) stated that they made their choice according to matching of colors of illustrations with brand identity, 17 individuals (12%) were just guessing the right answer, 7 individuals (5%) chose style of drawing as an answer, while 14 individuals (10%) stated that they have other reason.

From the previous results, the researcher could prove the important role flat illustrations can play in UI design. They are a good communication tool that can obviously help users understand actions easily while interacting with a mobile app. That can be concluded from the high recognition rates for the messages behind the illustrations.

The researcher also suggests that using the Flat style helped in creating simple storytelling illustrations. As a result, participants could easily perceive the illustrations and receive the messages behind them. This could agree with the work of (Spiliotopoulos, K. Rigou, M. Sirmakessis, S. June 2018). As they proved through their paper that users perceive Flat design as

more usable and that Skeuomorphism is not easily perceivable, instead it visually distracts users from intended targets, or misguides them.

The researcher also suggests that using the Flat style or the Swiss style give the illustrations an international and universal look. Which agrees with the work of (Oliinyk, V. Semenchuk, N. 2020). As a result, the flat style significantly helped most of the participants to recognize illustrations in spite of the difference in sex and age.

Moreover, the researcher found that illustrations can enhance the brand identity of the app according to the messages behind them. This is in addition to matching the colours with the brand identity of the app. This also might agree with the article of (Yalanska, M.), that stated that illustrations are a well-checked tool of creative storytelling, and that they are memorable and catchy, so they work well in growing brand awareness and recognizability,

10. CONCLUSION

Through this paper, the researcher could finally come up with some conclusions concerning Flat illustrations and their use in UI designs, which can be summarized as follows:

- Flat illustrations are a contemporary kind of digital illustrations. They are used nowadays by large companies in their websites and mobile apps' UI to make messages and interactions easier and clearer to users.
- Flat illustrations emanated to cope with the Flat design concept used nowadays in computers and smart phones' software. Applied Flat design gives UI a universal look. It also helps devices and software work well and load faster. This makes user experience an easier and more optimal one.
- Flat illustrations contribute in the enhancement of brand identity of a website or mobile app. It also makes user experience more amusing and appealing to users.
- Flat design and Flat illustrations got inspired by the grid system and geometric approach followed by the Swiss style (the International Typographic style) in Switzerland in the 1950's. As, they depend on using abstract geometric shapes and minimal vibrant colour palette. They also avoid the use of textures, gradients or complex forms.

11. RECOMMENDATIONS

After working through the paper, and after discussing the role of using flat illustrations in websites and mobile apps' UI, the researcher recommends that:

- Big companies, well-known websites and mobile apps as "Otlob" need to reconsider adding branded visual system and flat illustrations to their user interface design.
- Flat illustrations used in websites and mobile apps' UI need to have a universal look if they are targeting users and viewers from all over the world. As was mentioned before in Facebook case study.
- Flat illustrators need to be aware of abstracting techniques without neglecting the expressive aspect in their illustrations. As these illustrations are considered functional elements in UI design rather than being just for decoration.

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Web Resources:

- <https://www.interaction-design.org/literature/topics/flat-design>
- Buck creative agency. Retrieved from: <https://buck.co/work/facebook-alegria>
- Multiple owners. Alegria. Retrieved from: <https://www.behance.net/gallery/66231245/Alegria>