

Features of New Design Principles for Mobile Applications UI/UX for Smartphones

Associ. Prof. Dr. Maha M. A. Lashin

Associated Professor, Princess Nourah Bint Abdul Rahman University, KSA

On Leave from Mechanical Engineering Department, Faculty of Engineering Shoubra,
Banha University, Egypt

Mahalashin@pnu.edu.sa

Associ. Prof. Dr. Walaa M. Helmy

Associated Professor, College of Arts and Design, Princess Nourah Bint Abdul Rahman
University, KSA

Wmhelmy@pnu.edu.sa

Abstract

As smart phones are a major tool in our modern lifestyle and its applications play a very important role in our daily life, its applications simplicity make dealing with them very interesting. A mobile application is a computer program or software application designed to run on a mobile device such as a phone and tablet. They are generally downloaded from application distribution platforms such as App Store (iOS) or Google Play Store. Designing the application and measuring its quality done through principles that based on UI (User Interface) and UX (user experience) respectively. Recently some developments applied on that principles to improve the mobile application performance. That improved principle called new design of mobile application principles. In this paper the new principles of UI/UX design of mobile applications or website discussed in detail to explain the features of these new principles and its effects on improving the application quality. The satisfaction of the users for these applications which were designed depending on these new principles, the designed application with simplicity, easiness, and comfort. Also how this new features can help the designer to make his/her designed application or website more attractive to the user experience, related to this new design principle the designer can increase the number of visitors and users for his/her designed application or website. Implementation of these new design principles will produce a new phase of the mobile applications and website with new characters, spectrum and features. That new generation of design principles will cause a revolution at mobile applications.

Keywords:

Mobile applications, Design principles, UI & UX, Smartphones

المخلص

نظراً لأن الهواتف الذكية هي أداة رئيسية في أسلوب حياتنا الحديثة وتؤدي تطبيقاتها دوراً فعالاً ومهماً للغاية في حياتنا اليومية، فإن بساطة تطبيقات الهواتف الذكية تجعل التعامل معها جذاباً وممتعاً للغاية. ويمكن وصف وتعريف تطبيق الهاتف المحمول بأنه برنامج كمبيوتر أو تطبيق برنامج لتصميم تطبيق مصمم للتشغيل على جهاز محمول مثل الهواتف المحمولة (الذكية) أو الكمبيوتر اللوحي. يتم تنزيلها عموماً من منصات توزيع التطبيقات مثل (App Store (iOS) أو Google Play Store. يتم تصميم التطبيق وقياس جودته من خلال الأسس التي يتم الاستناد إليها لأتمام عملية التصميم مثل واجهة المستخدم (UI) و تجربة المستخدم (UX). تم تطبيق بعض التطورات مؤخراً على تلك الأسس لتحسين أداء تطبيقات

الهاتف المحمول. هذا المبدأ المحسن يسمى قواعد التصميم الجديد لأسس تطبيقات الهاتف المحمول (الذكي). في هذا البحث، تمت مناقشة هذه الأسس الجديدة لتصميم UX–UI لتطبيقات الهاتف المحمول أو موقع الويب بالتفصيل لشرح مميزات هذه الأسس الجديدة وتأثيرها على تحسين جودة التطبيق. رضا المستخدمين عن هذه التطبيقات التي صممت اعتماداً على هذه الأسس الجديدة، بساطة التطبيق المصمم، سهولة استخدام براحة بدون جهد. وأيضاً كيف يمكن لهذه المميزات الجديدة أن تساعد المصمم في جعل تطبيقه أو موقعه الإلكتروني أكثر جذباً للمستخدم ليحجبه، فيما يتعلق بمبادئ التصميم الجديدة هذه، يمكن للمصمم زيادة عدد الزوار والمستخدمين لتطبيقه أو موقعه المصمم. سينتج عن تطبيق مبادئ التصميم الجديدة هذه مرحلة جديدة من تطبيقات الهاتف المحمول وموقع الويب مع خصائص ومميزات ذات طابع خاص ذات بصمة جديدة. سيؤدي هذا الجيل الجديد من أسس قواعد التصميم إلى حدوث ثورة في تطبيقات الأجهزة المحمولة.

الكلمات المفتاحية:

تطبيقات الهاتف المحمول، مبادئ التصميم، UI - UX، الهواتف (المحمولة) الذكية

1. Introduction

Baktha K., 2017, define mobile application as a software that are developed specifically for use on small wireless computing devices, such as smartphones.

Seymour T., et al. 2014, explained the steps of designing mobile application which start with getting an idea or a problem then identify the need to lay out the flow and features for removing the non-core features and using experience and graphics to put the design then hire a designer/developer the following step is creating developer accounts and integrate analytics to get feedback quickly and improvise for introducing features.

The mobile application classified into three categories that included native, hybrid and web applications which contains communications, games, multimedia, productivity, travel and utilities, Islam R., et al. 2010.

Application noticeability, screen variability and performance vs battery life are the main challenges that face developers during working on a new application, Mc Wiierter J. and Gowell S., 2012.

Lienhard K. R. and Legner CH., 2017, choose a medical mobile application to explain the principles of design on it. The principles of design medical mobile application should consist of four functional components that guide a patient: instruction, setup, clinical measurement, and analysis and feedback. The user interface should be adapted to cope with patients' physical and cognitive restrictions. A mobile medical app should build on a robust medical knowledge base, ensuring an evidence-based approach to mobile app design. Mobile medical apps should facilitate both patients' and physicians' routines.

Mobile user experience (UX) design refers to the design of positive experiences during the use of mobile devices and wearables, and applications or services running on such devices. It is the research field which identified users' needs, expectation and acceptance when there is an interaction with a product or service, Yazid M. and Jantan A. 2017.

A mobile user interface (mobile UI) is the graphical and usually touch-sensitive display on a mobile device, that allows the user to interact with the device's apps, features, content and functions. Designing the user interface (UI) is a very important feature for developing the application for mobile devices. Designing UI for mobile applications is so difficult. Therefore,

developing applications for mobile devices is challenging and rewarding in its outcome, Ghiduk A. and Elashiry M., 2012.

A smartphone is a cellular telephone with an integrated computer and other features. Social media platforms such as Facebook, Instagram, Twitter and LinkedIn all have mobile apps that a user can download from their phone's app store. Smartphones, and web applications on mobile devices should be effective. The applications can communicate using JSON instead of the XML language. Android simulators can be used for ensuring proper functionality and for compiling the applications, Alqahtani A. and Goodwin R., 2012.

In this paper, section one the mobile application design principles survey that discussed for defining the elements used by UX designer in part in section two and UI designer requirements in section three. The conclusion of the UI/UX principles for designing mobile app or website come in the last part.

2. UX Designer Principles

The main required from the user of mobile app to be fast and easy. The designers of mobile app take personalization, simplicity, accessibility, affordance, reversibility, minimalism, convenience and feedback in consideration during design process.

User goals, Versatility and adaptability, Intuitive navigation, Personalization, Animation, Harmonious colors and Human writing. Split-screen and low- key gradients, Design for the disabled people, Keep things simple, Focus on speed, Voice interaction and Chatbot UI design are the new principles of UX design trends of 2020. Explanation for features of that new principles will helping in understanding it for facilitate dealing with them.

2.1. User goals

For the UX designer its required to understand what the user need. The user prefers that mobile app do not take a long time for opening.

2.2. Versatility and adaptability

Mobile, pc or tablet and different devices that the user may use them for the same app. So, the device size must not affect the functionality of the app and the UX designer has to take this in consideration.

2.3. Intuitive navigation

The UX designers should take care when design mobile sites and app because it needs to be easy and simple more than any desktop sites as the user wish.

2.4. Personalization

The app designer is required to focus on the user's functional, cultural and situational status. For the user of app, it will be good to give him/her flexible and personalized recommendations depending on his/her history with this app as in Netflix and YouTube.

2.5. Animation

UX designer need to attract the user for it's designed app by adding astonishing animation in the app or website to work efficiently and smoothly on any device.

2.6. Harmonious colors

The user's mood change is related to app or website color, this mean that the designer should be focused and use harmonic colors.

2.6. Human writing

For user' app/website usage easily and clear of text, of mobile app/website keyboard sometimes it can be encouraging for using them. That means the designer prefers to add multi styles of keyboard to its designed app/website to make it easier for user.

2.7. Split-screen and low- key gradients

Feel comfortable to split-screen setups and low-key gradients belong to most important factors affecting the user, which can cause him/her to flee from using the application or love to deal with it. So, the designer can use artificial intelligent techniques to increase quality of the screen performance.

2.7. Design for the disabled

Variety of users of mobile app or website is a main variable that UX designer needs to keep in his mind. A blind or low vision user need special features like acoustic signals and vibration for hearing text. Also using established gestures in the designed app give good results.

2.8. Keep things simple

The most important principle needs to be applied in the app/website. For the designer it is necessary to know how to produce simple and understandable designed app for users, moreover the designed app/website tends to focus on the needs and requirements of the user.

2.10. Focus on speed

Mobile app/websites need to be fast in relevance to the speed of the user. For 3G or slower data packs the users need mobile app which does not need to be downloaded every time, the designer can implement placeholders until the whole content loads.

2.11. Voice interaction

Voice assistants of app/website their usefullness to the user is ignorant, it is making lives better and soothing like Google assistants, Alexa and Siri.

2.12. Chatbot UI design

Chatbots interaction is used in [dialog systems](#) for customer service or information acquisition, it is the most recent trends for the designing of an app/website for handling the emotions of a user, learn language semantics, and understanding of phrases and slangs.

3. UI Designer Principles

Before starting in minimalist design for app or website it is needed to take in consideration the enhance of the app stickiness related to the role of "Make it simple but make it significant".

3.1. Minimalist Design

The minimalist approach means simplicity of app's UI designed with removing any unnecessary elements to make the app easy to understand without any complexity in usage.

Minimalist design approach mainly depends on app stickiness which come from combination of user engagement and user retention to make sure that users continue to use the designed app without losing interest.

The principles must be taken in consideration during design and producing process to get app more attractive depending on minimalist design approach. Some steps can adapt as follow to create a minimalist User interface (UI) apps.

3.1.1. Incorporate White Space

White space in the designed app is not having any color which is an essential component related to designer's perspective. It is used for developing contrast and focusing on the various design elements. There are three types of white space, text white space, content, visual and layout whitespaces as shown in figure 1.

3.1.1.1. Text white space

Text whitespace is the space between lines and letters

3.1.1.2. Content whitespace

The area that separates columns and text.

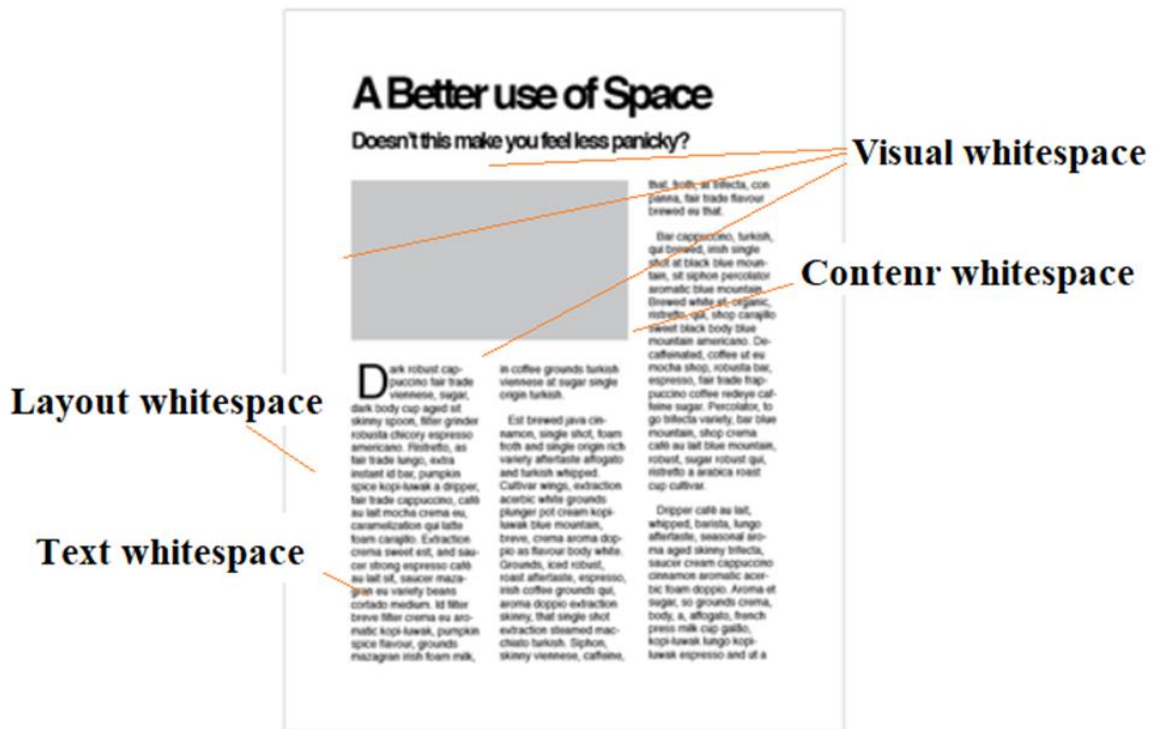


Figure 1: Text Whitespace

3.1.1.3. Visual whitespace

The space around the images, graphics, and icons.

3.1.1.4. Layout whitespace

The spacing of paddings and margins.

The UI designers can use any whitespace more than that explained above depends on the designer's expertise to produce app with emphasizing certain aspects, of the design to improve readability, usability and create elegant application.

3.1.2. Remove Unnecessary Elements

As appeared in figure 2, when the designed app has fewer design elements, users can focus on the essential components and that help them for achieving their goals. If the app has many elements, then it will be a messy application and that mean the app will be hard to navigate and impossible to understand.



Figure 2: App Design with Few Elements

3.1.3. Try to Use Fewer Colors

Colors of the app play a very important role to makes it attractive and elegant for users for engaging with it. On the other side using too many colors reduces the mobile app sophistication and can repel users. Related to minimalist app design, designers can use any one of the following color schemes.

3.1.3.1. Monochromatic color scheme

As shown in figure 3, in the monochromatic color scheme, a single color is selected with its different color variants for using in app. Monochromatic colors are tints, shades, and tones of a single color.

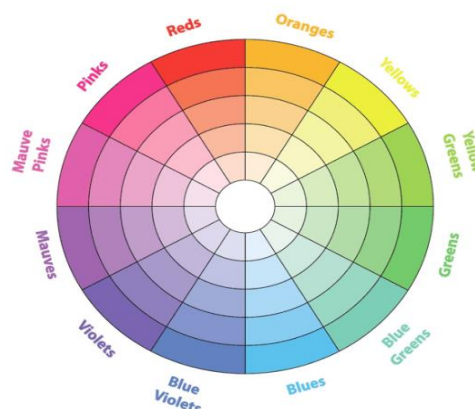


Figure 3: Monochromatic Color Scheme

3.1.1.2. Analogous color scheme

Analogous colors are the types of colors which comes in next to each other in color wheel like in figure 4. They match together well to create a serene and comfortable design that is approachable and pleasing to the eyes.



Figure 4: Analogous color scheme

3.1.4. Keep Balance and Harmony

Mobile application designers depending on symmetry theory to make the designed app masterpiece more attractive and inviting. The designer should use the grid system to arrange the elements to be consistent, chaotic mess and visually pleasing as shown in figure 5.

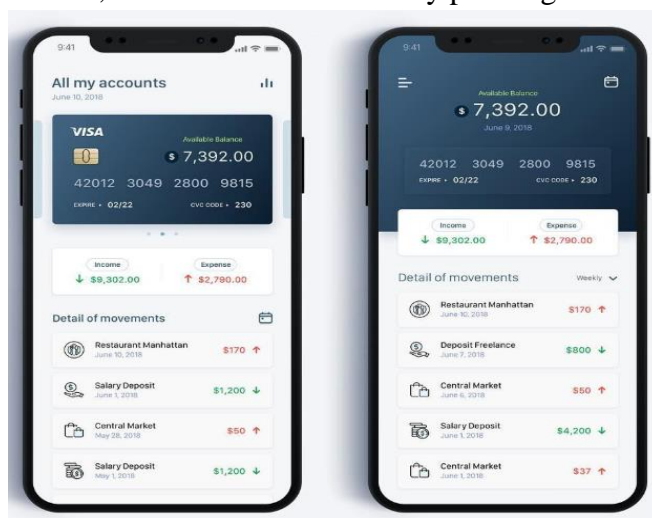


Figure 5: Balance Design of Apps.

3.1.5. Use One Typeface

Designers must know the difference between various typefaces and which one suitable for use. Selecting of font type depends on type of written content, designer experience and which experience designer wants to give to the apps users.

Designer of a mobile app needs to choose perfect font type, font size, font length, spacing, style, weight and size till he/she finds the perfect type of typeface that suits the designed mobile app as following;

3.1.5.1. Font Selection

Different type of content needs different kind of font as shown in figure 6. The designer of app needs to choose the font wisely because fonts are used to express various feelings.

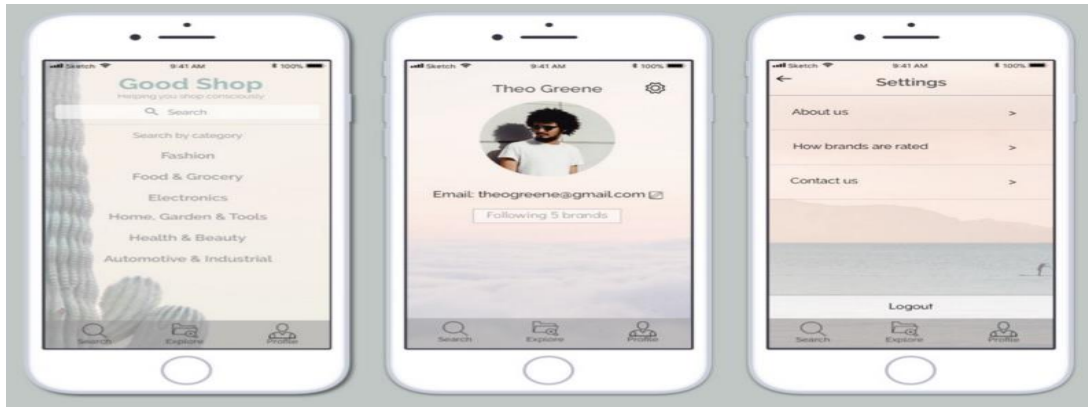


Figure 6: Different Font Types for Same App

3.1.5.2. Font Size

The designer must use suitable size of the font because big size takes screen space and small font hurts the user's eyes. Font size or number of characters per line are shown in figure 7.



Figure 7: Different Font Size

As in figure 8, the designer prefer to use only one typeface to avoid sloppy designed.

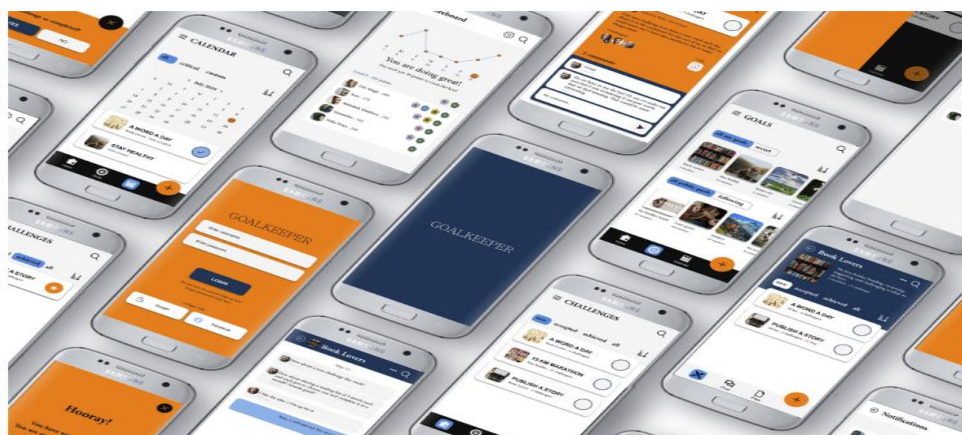


Figure 8: Typeface Types

3.1.5.4. Leading

Leading mean space between lines, and it should be adjusted according to the screen sizes as shown in figure 9.

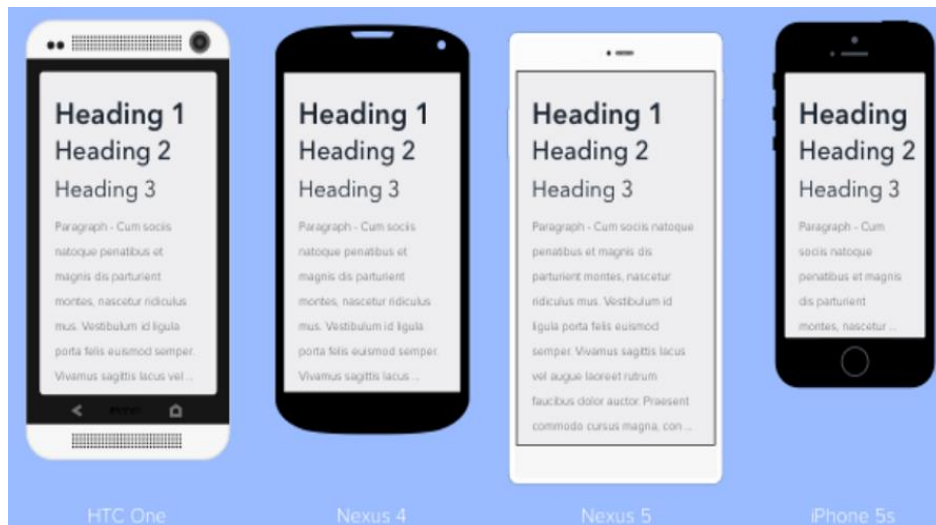


Figure 9: Line Spacing and Font Size

3.1.5.5. Color and contrast

The UI designer must choose right color contrasts to design attractive mobile app without any headaches which come from using primary colors together like 'red' font on a 'green' background. Figure 10 contrast colors as example of mobile app.

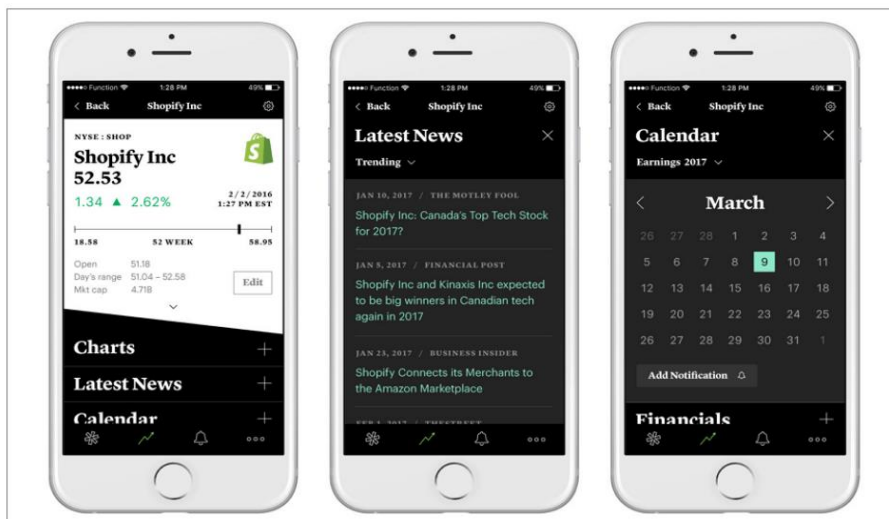


Figure 10: Colors of App

3.1.6. Use the blur effect

Using the blur effect as in figure 11, is a very good way to create a minimalistic design for the app UI. It is making the designer work with the layers and hierarchy of the app interface.



Figure 11: Blur Effect in Mobile App

Some benefits of using the blur effect for the app interface are mentioned below:

3.1.6.1. Simplify the user flow

Blur effects blur out unnecessary elements and give a clear understanding of an app's and focus on vital information from user. The flow of the app appears in figure 12 with explanation of the meaning of simplicity for user flow.

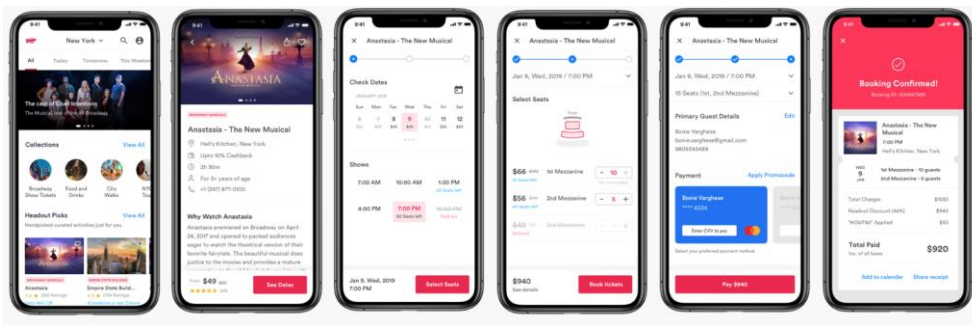


Figure 12: Flow of App

3.1.6.2. Direct the user's attention

For the blurred and unclear object, users ignored it and focus on object that is being in focus.

3.1.6.3. Improve text readability

Figure 13 appeared the contrast between text and background can be done by implementing blur effects which can affect the readability of the text.

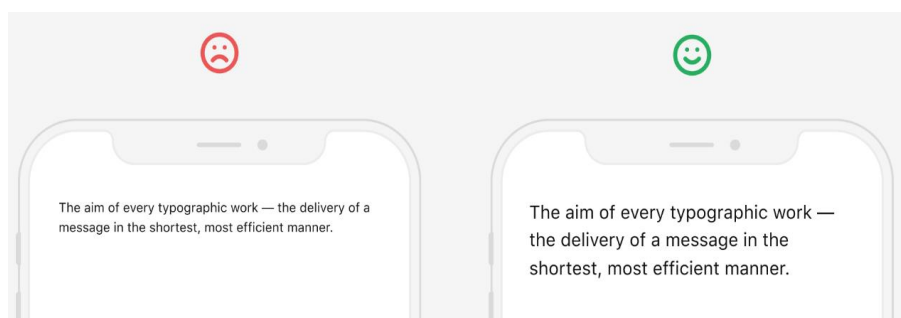


Figure 13 Text Readability

3.1.6.4. Make the content shine

A minimalist mobile application will minimize the abandoned website problem by removing unnecessary elements and using proper color. Using brighter colors or big font size for highlighting the main content to produce a friendly app for user.

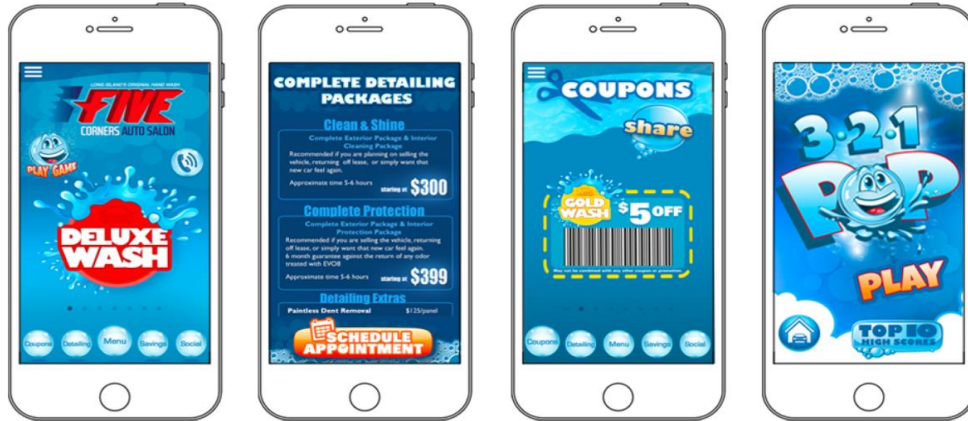


Figure 14: Content Shine

3.1.6.5. Sleek and unified icons

Icons generally used for representing elements, so they are needed to be easy in understanding and recognizing. It has element of simplicity which can be used by the designer to highlight active parts of the application.

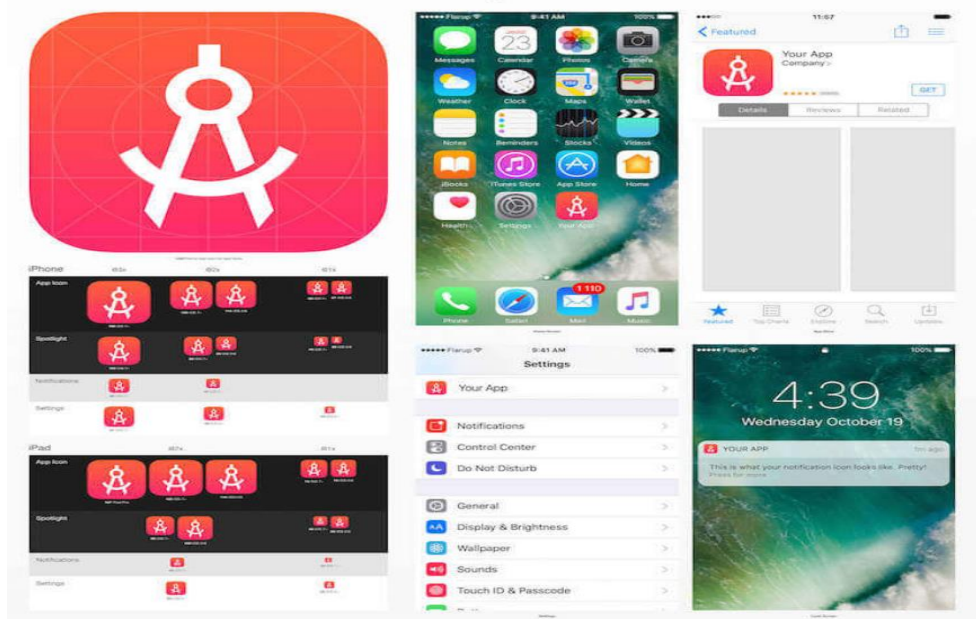


Figure 15: Sleek and Unified Icons

Here are some tips to improve iconography for a minimalist user interface.

3.1.6.5.1. Convey a distinct message

An icon should be understandable and memorable for conveying its meaning within seconds.

3.1.6.5.2. Be consistent

Be consistent while creating icons for the designed mobile application development with the same thickness, color, and curves.

3.1.6.5.3. Keep it simple

The designer needs to keep application' icons simple and understandable.

3.1.6.5.4. Simple navigation

A magnifying glass icon is widely accepted as the search icon. A shopping cart icon is used for intention of adding goods and making purchases, it will only mislead the application users.

4. Conclusion

Everything on the designing part of mobile application will be done by UX designer to make a soothing and seamless experience for users' and meet their needs and requirements. The UX designing principles for [mobile app design](#) must follow the year 2020 for a pleasing and soothing app/website.

For most designers a minimalist UI seems easy to create with content and elements which help visitors to navigate and understand the app.

UI designers make amendments only when necessary and aids for the users. The designer can create fantastic app by combining meaningful and well-crafted layouts. He/she also uses whitespace, elegant typography, simple navigation, stroke, and filled icons which are some minimalist design approaches that can help in designing apps that will last for a long time.

Acknowledgement

This research was funded by the Deanship of Scientific Research at Princess Nourah bint Abdulrahman University through the fast-track research funding program. The work reported in this article has been conducted while the researchers are affiliated with Princess Nourah bint Abdulrahman University.

References

- Baktha K., 2017, Mobile Applications Development: All the Steps and Guidelines for successful Creation of Mobile App: Case Study, International Journal of Computer Science and Mobile Computing, Vol. 6, Pp. 15-20.
- Seymour T., Hussain Z. J. and Reynolds S., 2014, how to create an App., international journal of management and information system, Vol. 18, Pp. 124-138.
- Islam R., Islam R and Mazumder A., 2010, Mobile application and its global impact, International journal of Engineering and technology, Vol. 10, Pp. 104-110.
- Mc Wierter J. and Gowell S., 2012, Professional mobile application development, John Wiley & Sons, Inc. 1st edition.
- Yazid M. and Jantan A. 2017, User experience design (UXD) of mobile application: An implementation of a case study, journal of telecommunication, Electric and computer engineering, Vol. 9, pp. 197- 200.
- Ghiduk A. and Elashiry M., 2012, Design of implementation of the uservinterfaces and the applications for mobile devices, international journal of computer applications, Vol. 46, Pp. 12-21.
- Alqahtani A. and Goodwin R., 2012, E-commerce smartphone application, International journal of advanced computer science and application, Vol. 3, Pp. 54-59.