CHAPTER II

LITERATURE ANALYSIS

2.1 Definition of Design

Heskett (2017, p. 21) said, “Design is to design a design to produce a design.”. Design is not limited to any subdivision of practice. The followings are the definition of design by some experts (Ryusnita, 2017; Young, 2014):

1) Ken Hurts defines design as an iterative process that includes regressive and parallel steps of observation.

2) Dedi Nurhadiat explained that design is a plan to realize an idea.

3) Janner Simarmata said that design could be an application created to fulfill the needs and wish

4) Young explained that design is a method to achieve goals set and to solve a problem.

Based on those definitions of design, the author concluded that design is a method that consists of recurring activities to solve a problem by fulfilling the needs or wishes of users and achieving a goal. Design is not limited to any profession and can be applied in applications such as redesigning UX/UI in this research.

2.2 Design Elements and Principles

Dieter Rams (Young, 2014), a famous industrial designer, explained ten principles of good design: innovative, handy, aesthetically pleasing, easy to understand, unobtrusive, honest, long-lasting, thorough, environment-friendly, and minimal design. Those principles are used to create an innovative and eye-catching. A design must have an objective, fit the needs and wishes of the user, understandable. It must not exaggerate so it will not fail the user’s expectations. A

design must be durable and environmentally friendly, or at least not damaging anything around the user.

Figure 2.1 Seven elements of design
Source: Shikhrakar (n.d.)

Here are some elements and principles of design along with their explanation (Poulin, 2011):

2.2.1 Point, Line, Shape, Form

Euclid (as cited in Poulin, 2011, p. 12) explained that a point is that which has no part. Point is a visual element and one of the fundamental objects used in any field, whether in science or art (Poulin, R., 2011, p. 13).

A combination of two points creates a line. Line (Poulin, 2011, p. 20) is a visual element that has limitless functions – whether it is actual or implied: to join, organize, divide, direct, construct, move, implying positive, or implying negative gap. A line can lead the eyes and create a movement to

help in improving readability, immediacy, and the meaning of the visual message (Poulin, 2011, p. 21).

A combination of lines creates a shape. Shape (Poulin, 2011, p. 30) is a visual element that refers to the form's contour or outline, which is generally got define by boundary and mass.

Figure 2.2 Point, Line, Shape, Form
Source: Shikhrakar (n.d.)

2.2.2 Light and Color

According to Kim (2020), color is the first thing to see but least realized by most people. Colors are related to human perception in psychology, but perception changes over time, as blue could also be known as warm color because it is known as the hottest part of a fire.

Hersh (2019) explained that there are two models of the color spectrum, they are RGB (additive) and CMYK (subtractive). RGB is used in the digital platform because it emits light, which is additive (Matt, 2018).

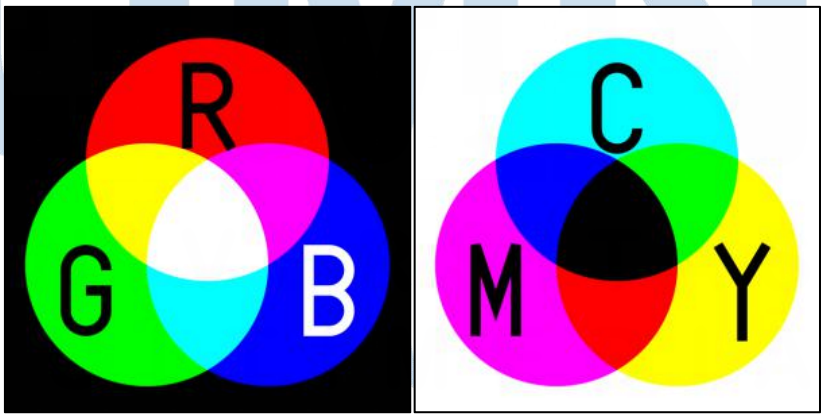

Figure 2.3 RGB and CMYK
Source: SharkD (2018a; 2018b)

Light (Poulin, 2011, pp. 48-49) is a design element with a constant source of kinetic energy that allows us to see and visually experience our world as we know it. Color (Poulin, 2011, pp. 58-59) is a design element that provides visual energy and variety in visual experience to get attention, organize visual elements, create meaning, and enhance visual compositions.

Flanagan (2019) explained that there are warm and cool colors. Color creates emotion, provokes a response, creates emphasis and varieties, communicates a specific message, strengthens a hierarchy, and causes psychological effect (Flanagan, 2019; Poulin, 2011, p. 59; User Testing, 2019). A balanced design is made from a well-thought color palette (Flanagan, 2019).

Figure 2.4 Color and emotional association
Source: User Testing (2019)

Figure 2.5 Branding in industry
Source: User Testing (2019)

2.2.3 Pattern and Texture

Texture is a design element (Shikrakar, n.d.) and pattern is a design principle (Poulin, 2011, p. 236). Pattern and Texture (Poulin, 2011, p. 72; p. 236) guide the user to define the visual quality of the surface to show its look and feel and see the distinctions between each object. While the pattern consisted of repeated compositional structure (Poulin, 2011, p. 237), the texture is an enhanced version of a pattern. Texture adds richness and dimension to the surface that can be seen and experienced by touch or interpreted: smooth, rough, soft, hard, flat, shiny, glossy, wet, furry, slimy, and so on (Poulin, 2011, pp. 72-73).

Figure 2.6 Pattern and Texture
Source: Andra (2019)

2.2.4 Scale and Proportion

Scale (Poulin, 2011, p. 82) is a relative. Scale classifies the Proportion progressively. Scale compares the size, amount, importance, and rank of each design element's size, while Proportion tells the relationship between the elements and the composition's area (Poulin, 2011, pp. 82-83).

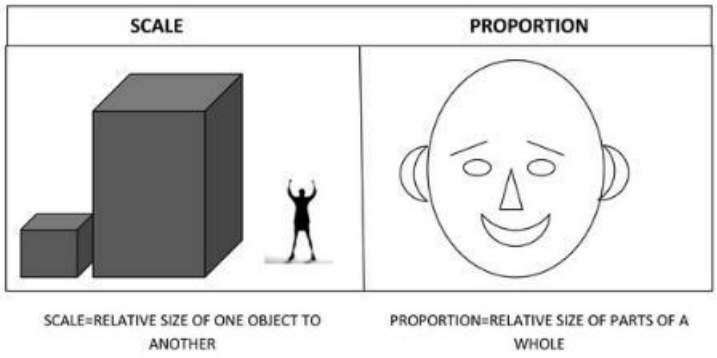

Figure 2.7 Scale and proportion
Source: Lamp (n.d.)

2.2.5 Typography

Text is the most solid medium of information presented with a font or typeface, namely typography (Kim, 2020). Type (Poulin, 2011, p. 246) creates words, sentences, and narrative with letterforms-alphabet, numbers,

and punctuation. Typography (Poulin, 2011, p. 246) is the term for the design of those characters.

Typography (Poulin, 2011, p. 247) can function as point, line, form, shape, and texture in a composition, but it primarily has verbal or visual functions. As a functional element, Kim (2020) explains that typography's objective in the UI is to guide users, take actions, and help users distinguish between headings, titles, body text, buttons, and other parts of the text. The use of typography must fit with its function. For example, the typography of the body text must be functional, prioritizing readability and reader comfort.

Typography also has an aesthetic value. Kim (2020) explains that aesthetic typography is generally applied to accentuate branding and make the users remember the product. Aesthetic typography is appropriate in short writing, headings, or quotes to attract attention (emphasis).

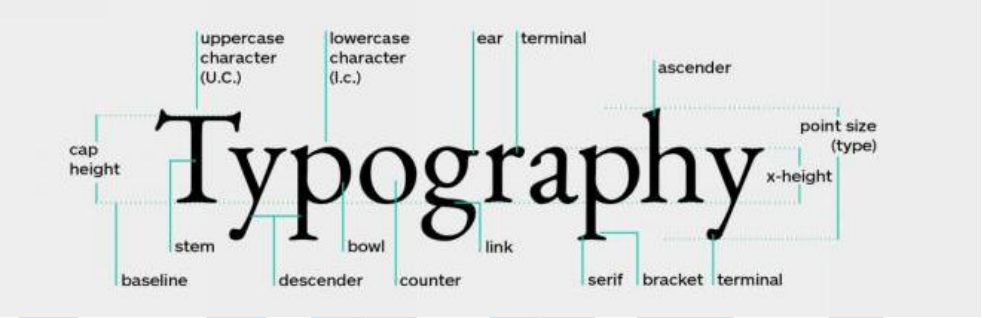

Figure 2.8 Anatomy of typography
Source: Prokhorov (2019)

There are several types of typography (Binus University Bandung, 2019; Chapman, n.d.): serif, sans serif, script, monospaced, and display.

2.2.5.1. Serif

The serif is the starting or end of a letter's stroke or stem (Poulin, 2011, p. 250). Serif style is the type of text that has serif on its letters.

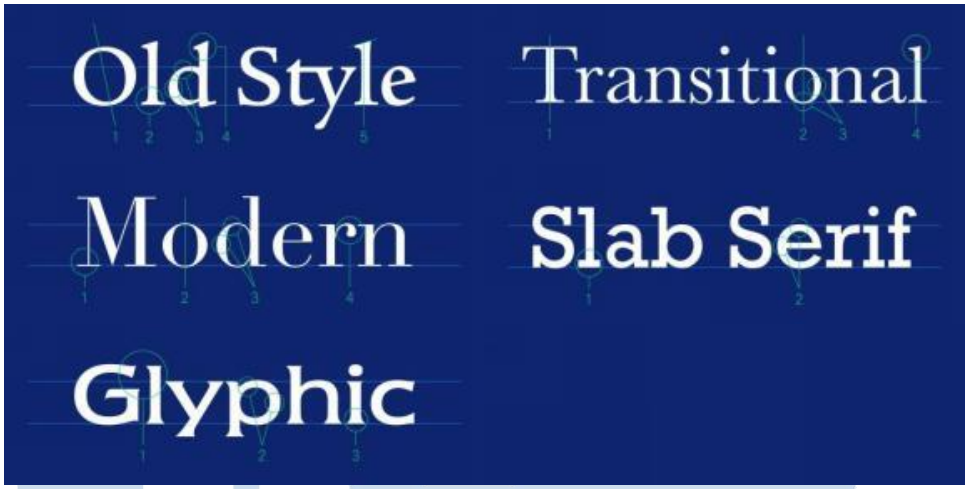

Figure 2.9 Types of serif style
Source: Chapman (n.d.)

2.2.5.2. Sans Serif

The san serif is the opposite of serif, which means that the font does not have any serif in its letters.

Figure 2.10 Types of sans serif style
Source: Chapman (n.d.)

2.2.5.3. Script

The script style is a font with calligraphic style and continuous lettering.

Figure 2.11 Types of script style
Source: Chapman (n.d.)

2.2.5.4. Monospaced

The monospaced style is a font that has the same spacing distance on each letter.

Figure 2.12 Monospaced style
Source: Chapman (n.d.)

2.2.5.5. Display

The display style is a font that is not within any of the categories above. It is used to get attention.

Figure 2.13 Display style
Source: Chapman (n.d.)

2.2.6 Grid and Layout

Grid (Poulin, 2011, p. 260) is a design principle composed of horizontal and vertical lines to provide alignments and intersections with limitless functions. The grid can provide order, unity, and enhancement of rhythm and pacing of any visual message (Poulin, 2011, p. 261). A grid may help in forming the layout and creating a hierarchy between contents.

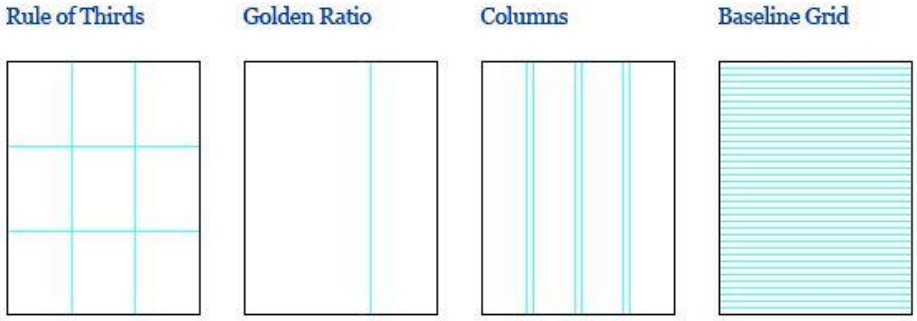

Figure 2.14 Types of grid
Source: Glorify (2020)

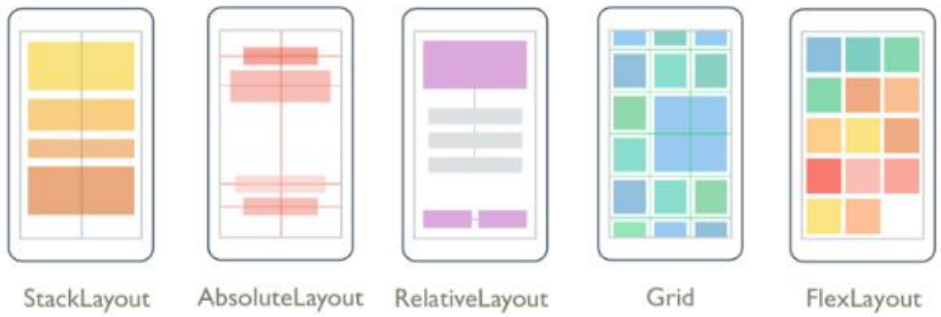

Figure 2.15 Mobile layout
Source: Britch et al. (2018)

2.2.7 Movement and Rhythm

Movement (Poulin, 2011, pp. 92-93) is the act or process of change in location or effort in an actual or implied form to guide the eyes. Rhythm is a way to make movement and establish pattern or texture by applying repetition or compositional elements' alternation (Poulin, 2011, p. 98).

2.2.8 Balance

Balance (Poulin, 2011, pp. 112-113) is a term to tell a condition when visual elements got equally distributed in a composition by arranging various visual elements with different characteristics. There are two categories of Balance: symmetry and asymmetry. Symmetry is when the visual elements are completely balanced or centered (Poulin, 2011, p. 112), while asymmetry is when the visual elements in the composition are well-balanced without being mirrored (Poulin, 2011, p. 130). However, balance in UI is more of an optical balance (Steinberg, 2020).

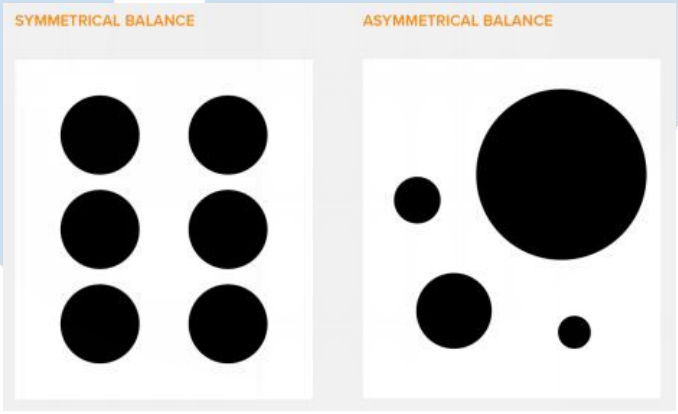

Figure 2.16 Symmetric and asymmetric balance
Source: Steinberg (2020)

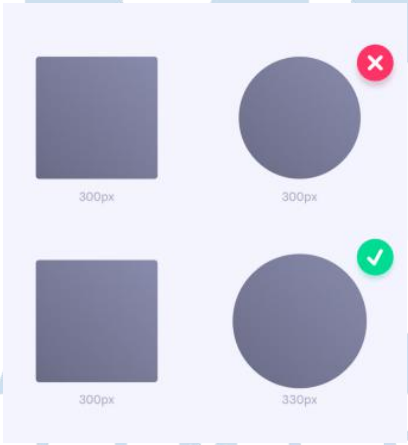

Figure 2.17 Balance in size of shape
Source: Yilmaz (2020)

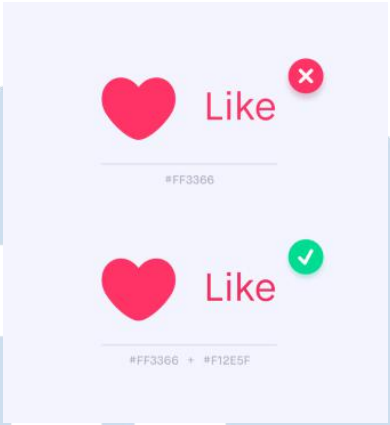

Figure 2.18 Balance in color
Source: Yilmaz (2020)

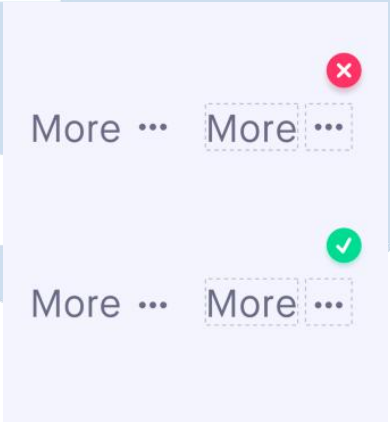

Figure 2.19 Balance in position
Source: Yilmaz (2020)

2.2.9 Emphasis, Tension, and Contrast

Tension (Poulin, 2011, pp. 140-141) is a part of the balance that gets the attention that can cause psychological effects: anxiety, stress, angst, or excitement, richness, and joy. Tension creates emphasis.

Contrast is one of the ways to create tension. Contrast is the visual principle that provides the vision with differences of two or several things by their size, shape, color, lightness, temperature, and texture (Poulin, 2011, p. 188).

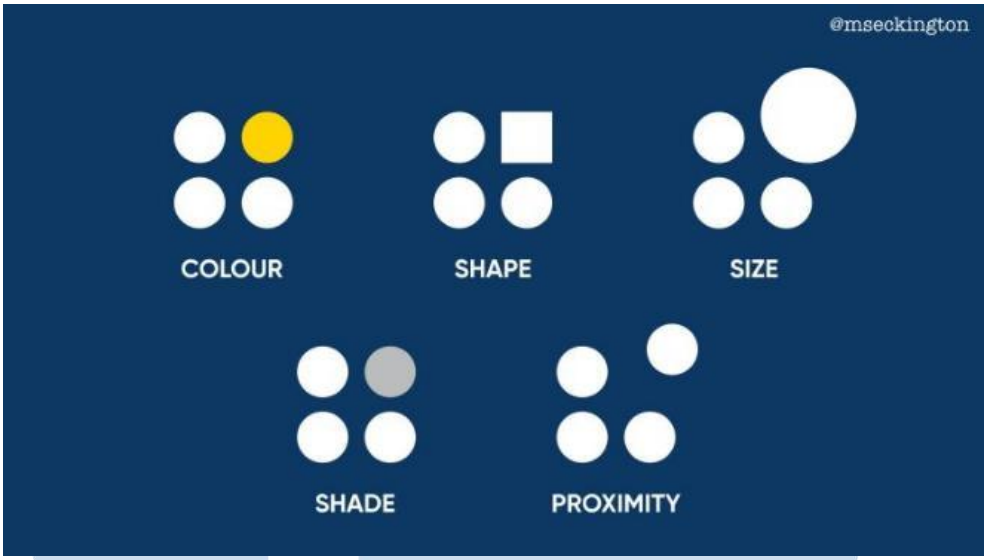

Figure 2.20 Examples of contrast
Source: Seckington (2017)

2.2.10 Abstraction

Abstraction (Poulin, 2011, p. 168) is an illusion of visible reality. It is solely a sensory experience that provides alternative ways of communicating a visual message of specific facts and experiences. Abstract visual can reshape the familiar into something more expressive because it is free from objective content, context, and meaning (Poulin, 2011, p. 169).

2.2.11 Frame

The Frame (Poulin, 2011, p. 208) is a visual element to create distinction, arrangement, unification, groups, differentiation, and increase visibility to visual message. The frame can be visually apparent or implied. The frame can also act as a border to a page or inset of a surface (Poulin, 2011, p. 209).

Figure 2.21 Examples of frame: (1) border, (2) texture, and (3) layered
Source: Design Shack (n.d.)

Figure 2.22 Examples of frame: white space
Source: Bokhua(n.d.)

Figure 2.23 Examples of frame: text
Source: Mello (n.d.)

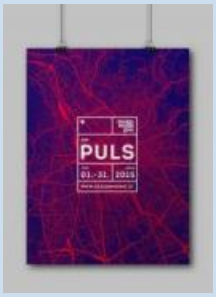

Figure 2.24 Examples of frame: border
Source: Neureiter et al. (2015)

2.3 Gestalt Principle

Gestalt is a principle of visual perception. Gestalt was developed by a German psychologist. Gestalt principle is to describe the way people perceive visual elements (Gkogka, 2018).

2.3.1 Proximity

Proximity is perceiving several visual elements as related to each other when they are put closely. In UI, items are related to each other are often put near each other.

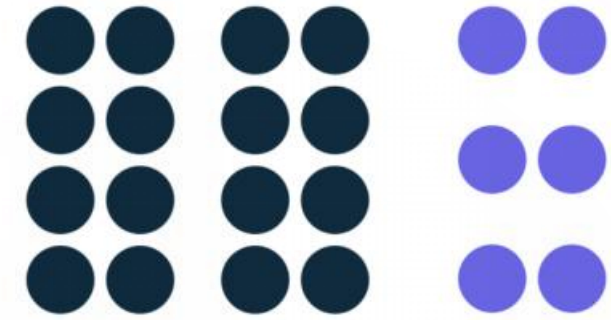

Figure 2.25 Gestalt principle of proximity

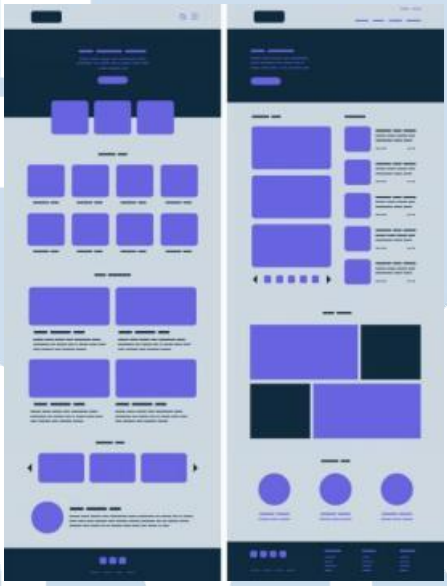

Figure 2.26 Gestalt principle of proximity in UI

2.3.2 Common Region

Common region is perceiving a group of visual elements as one object rather than several objects when they are placed in the same region. In UI, a common region is used to make a content separation. Common region made it look like the items are being grouped.

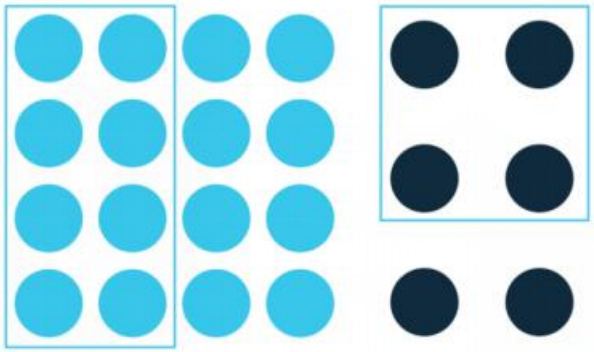

Figure 2.27 Gestalt principle of common region

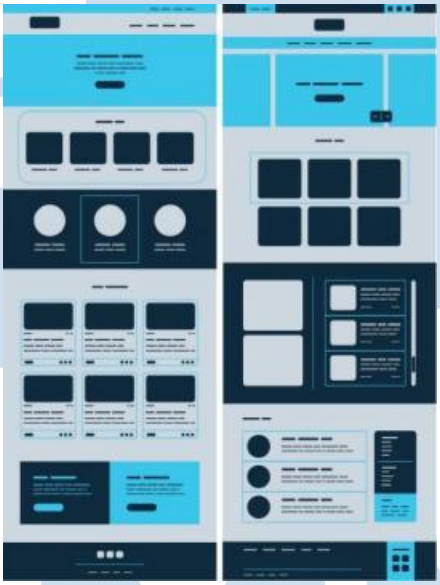

Figure 2.28 Gestalt principle of common region in UI

2.3.3 Similarity

Similarity is perceiving several visual elements as related to each other when they have the same characteristic. Similar elements can be perceived as elements in the same group or pattern and can help in classifying and linking objects. In UI, a similarity is to tell the meaning and purpose of elements with the same characteristic.

Figure 2.29 Gestalt principle of similarity

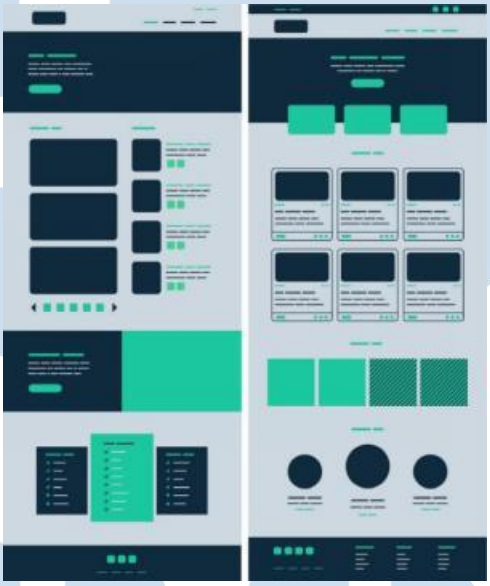

Figure 2.30 Gestalt principle of similarity in UI

2.3.4 Closure

Closure is perceiving one object from several elements placed close to each other. Closure can also happen when an object looks incomplete. In UI, closure is commonly used for icons and logos.

Figure 2.31 Gestalt principle of closure

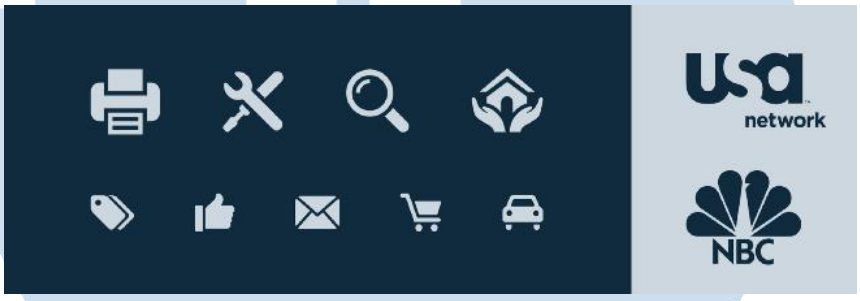

Figure 2.32 Gestalt principle of closure in UI

2.3.5 Symmetry

Symmetrical is perceiving several visual elements as related to each other even when they are put far from each other. Symmetry gives a solid and neat look. In UI, a symmetry gives stability to the viewer however can be dull and static. To avoid the negative impacts, adding asymmetrical elements in several spots may help in drawing attention and emphasizing some elements.

Figure 2.33 Gestalt principle of symmetry

Figure 2.34 Gestalt principle of symmetry in UI

2.3.6 Continuation

Continuation is perceiving several visual elements like lines or curves. Although there are no lines or curves visible, a continuation can make it look as there is a line in the view. In UI, elements can be perceived as a group if they follow a continuous line.

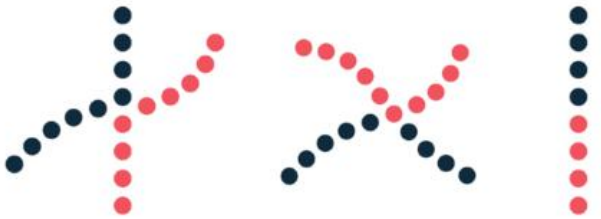

Figure 2.35 Gestalt principle of continuation

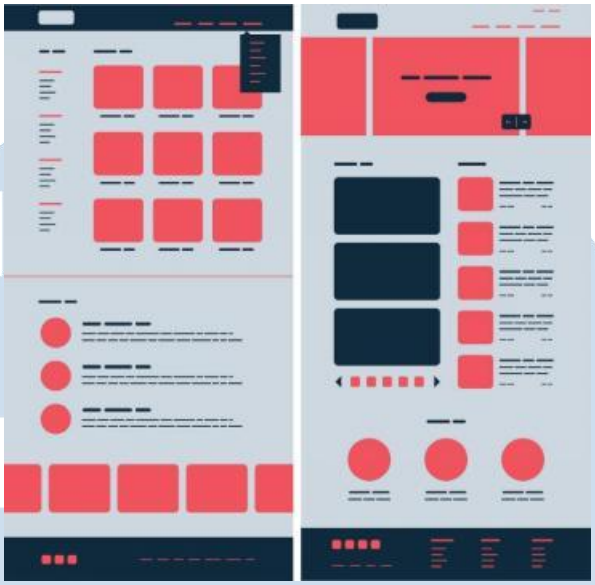

Figure 2.36 Gestalt principle of continuation in UI

2.3.7 Common Fate

Common fate is perceiving several visual elements as related to each other when they are moving in the same direction. Common fate also happens when movement is applied by other visual elements. In UI, common fate can help in grouping information and linking actions with their results.

Figure 2.37 Gestalt principle of common fate

Figure 2.38 Gestalt principle of common fate in UI

2.4 UX/UI

There are several additional essential visual elements and principles for UX/UI such as icons, animation, and information architecture.

2.4.1 User Experience (UX)

Luke Wroblewski (Experience, 2018) explained that the user experience consisted of information architecture, interaction design, and the design's ability to communicate with the users. UX can exist in any form, containing a structure of information and allowing the users to know the function and what it could do.

Jennifer Aldrich (Experience, 2018) explained that UX design is to understand the user through research, creating personas, and user tests to help them get what they want in the most satisfying way. Generally, there is no best UX because users' preferences are different. Through research, UX designers can find effective UX solutions for most users.

Kim (2020) explained that user satisfaction is not a goal, but a requirement for every designer and creates joy. Kim (2020) added that a good design is meaningful and memorable to be long-lasting.

Irene Au (Experience, 2020) also explained that a well-designed product has to be visually pleasing, simple, easy to understand, easy to learn, and easy to use. These are possible to achieve by utilizing design elements: colors, typography, icon, and animation.

UX is the product's ability to communicate and interact with users and simplify the way to achieve the goal. UX design is subjective and different for everyone, which requires research and user testing. UX design keeps evolving and never ends. But, as Irene Au said (Experience, 2018), UX needs to be learned by the users. So, constant updates only force the users to keep learning it. UX should be long-lasting and does not need to be frequently changed if designed well (Kim, 2020).

There are five elements of UX (Garrett, 2019):

1) Surface plane, the complete form of a design.

2) Skeleton plane, the low fidelity of a design.

3) Structure plane, the Information Architecture.

4) Scope plane, the audit, and details of a design.

5) Strategy plane, the process of research.

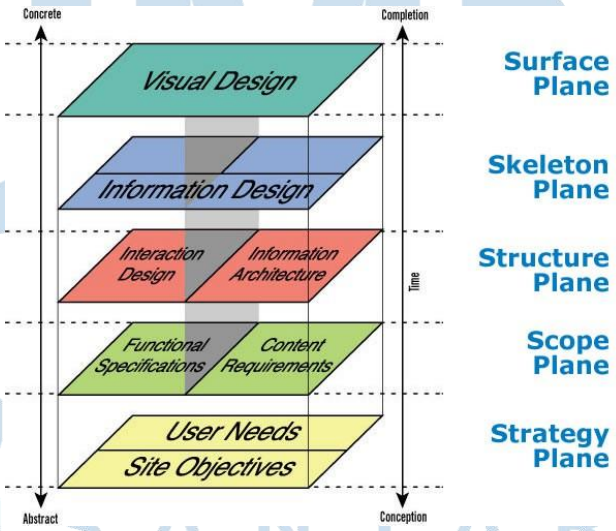

Figure 2.39 Structure of UX by J.J. Garrett
Source: Brillianto (2019)

2.4.2 User Interface (UI)

Kim (2020) explained that the user interface is the main point of a product that meets the users. The purpose of UI is to make interaction methods easy and efficient for users. Three concepts of the user interface (Kim, 2020) are condition, content, and context. It is important to know where to put the design, what it looks like, and who will use it. The first four things that the user sees are color, typography, icon, and animation. Those four show the brand's personality. A well-made design with the four of them can make the condition, content, and context unify.

2.4.3 Icon

Kim (2020) explained:

> Because nobody has time. Lists are how we make sense of the abundance around us. We list … [to] helps us structure the information and memorize it better. … everything can be categorized. That is how features, services, advantages, and payment plans started being aligned in lists. … lists are good for structuring but do no good in the visual aspect.

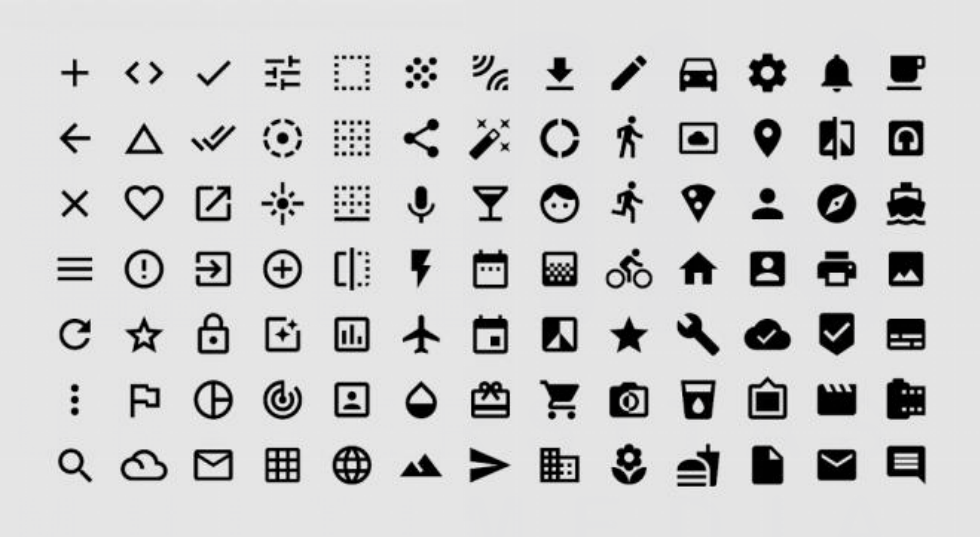

Figure 2.40 Icon
Source: Material Design (n.d.)

If the purpose of typography is to provide information, then the icon aims to simplify that information. Besides, icons can attract attention because they are in visual form. Icons can replace text because they have indescribable meaning to replace words that are difficult to describe. In short, icons are metaphors (Kim, 2020).

2.4.4 Animation

Kim (2020) explained that the eye and mind capture movement because it contains information because every physical object around humans is moving, or perhaps it is technically stationary, but something changes.

According to Kim (2020), animation is important in UX design because it is illustrative, amusing, familiar, and engaging. An animation aims to attract attention, feedback, and show a process. Like icons, it can also replace indescribable things with words and attract attention. The difference is the information: animation contains more information than the icon.

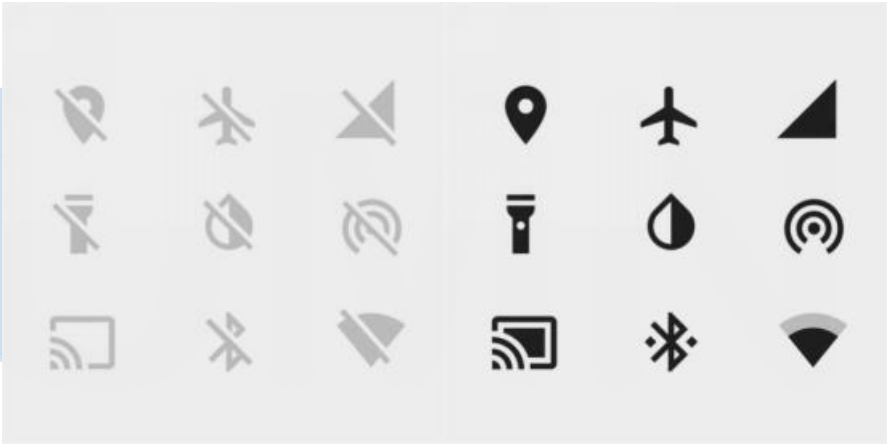

Figure 2.41 Animation in icon
Source: Material Design (n.d.)

2.4.5 Information Architecture

Information architecture (Rosenfeld et al., 2015, pp. 21-22) is design principles and architecture into a structured digital screen. The information

environment got distributed by organizing, labeling, searching, and navigating systems (digitally, physically, or between channels). Information architecture made the information able to support usability, findability, and understanding. Users can not see it, but it is there to guide users. Dan Brown (Gearon, 2020) explained about eight principles of good IA:

1) Principle of objects, by treating each object uniquely so the content shown could be identified differently.

2) Principle of choices, to make users able to decide without distracting and overwhelming the user with many options.

3) Principle of disclosure, to show enough information on the surface then let them find out the rest by themselves.

4) Principle of exemplars, showing examples in descriptions of contents.

5) Principle of front doors, by assuming some visitors did not come through the home page but make them know where they are with basic information.

6) Principle of multiple classifications, by making it possible to browse the content differently: browse freely or use search method.

7) Principle of focused navigation, by making a navigational menu with their contents, not location, the users can find what they want by intuition.

8) Principle of growth, by assuming the channel's growth rate and making sure it is scalable.

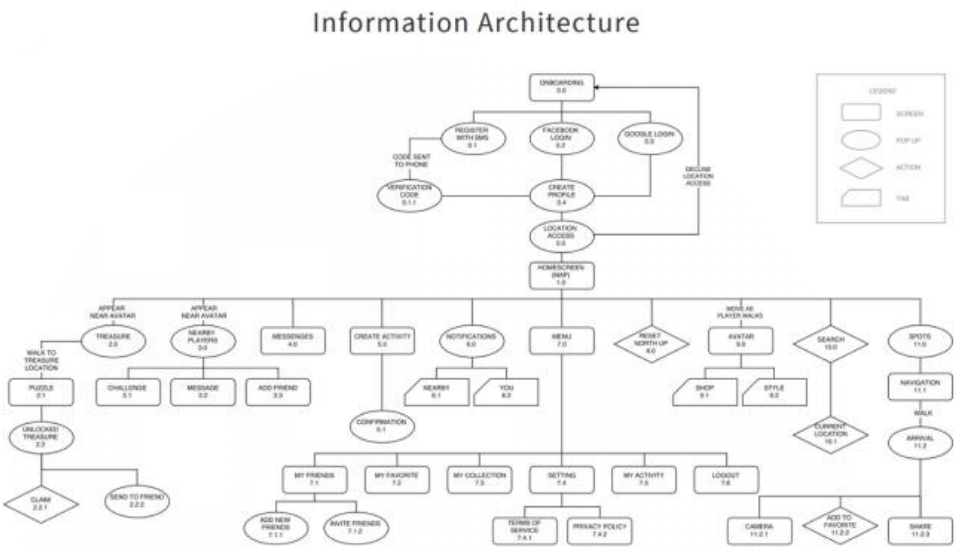

Figure 2.42 Information Architecture
Source: Shree (2020)

Information architecture in a Venn diagram has three main components referred to as information ecology: context, content, and user (Rosenfeld et al., 2015, p. 31).

1) Context is to influence the perception through the vocabulary and structure of the channel. In some cases, the context only exists in the mind of the viewer without being verbally shown. Considering the size of the channel is important because it can affect context or if there is more than one channel to make sure they correspond to each other. It includes mission, goal, strategies, staff, processes and procedures, physical and technology infrastructure, budget, and culture (pp. 33-34).

2) Content is everything in a channel. It has several facets: ownership (who), format (what), structure (where), metadata (clarity of information), volume (number of content), and dynamism (growth rate) (pp. 34-35).

3) User is the audience using the design. User has their desires, needs, concerns, and weak points. Every user is different and has their

preferences, which means that the information they needed also differs (pp. 35-36).

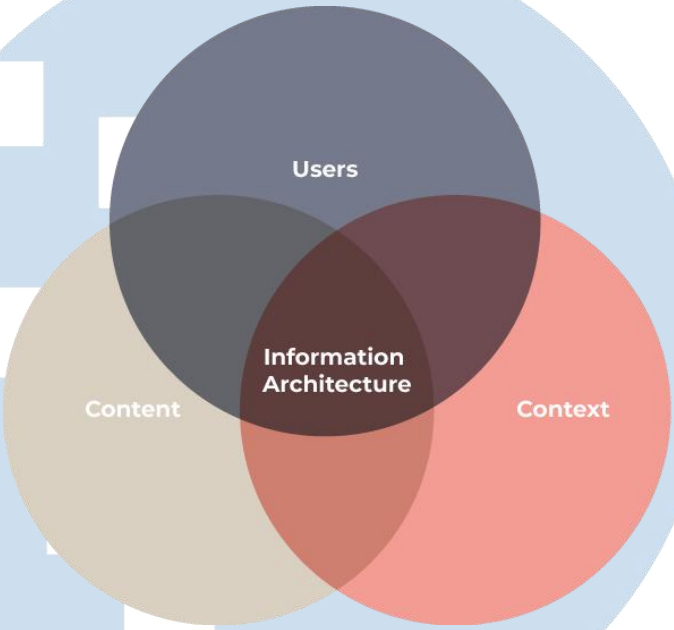

Figure 2.43 Components of Information Architecture
Source: Gearon (2020)

There are several components of IA (Gearon, 2020; Rosenfeld et al., 2015, p. 76):

1) Content inventory and audit. It is a list of any form of content on a channel to be organized into their category or labeled in their hierarchy to make it presentable.

2) Organization / Taxonomies systems. It is to put information into a group or classification based on their similarities or difference.

3) Labeling systems. It is to describe categories, options, and links in a word that is meaningful and unique. Labeling makes them clear and differs from each other.

4) Hierarchy and navigation systems. It is to differentiate the importance of every piece of information. So, it is easy to navigate and move through the content. There are three types of navigation by

Apple Developer (n.d) in their App Architecture of Human Interface Guideline: hierarchical, flat, and content-driven navigation. hierarchical navigation is to pick a choice on every screen until the user reaches the destination, flat navigation is to switch between several categories, content-driven or experience-driven navigation is to move freely which is usually used to give users immersive experiences such as games. Although divided into three, they can also be combined and used in one design.

5) Searching systems. It is so that the search method to find specific content while showing suggestions while typing, matching the user's and content's term.

Those several components of information architecture made meaning and sense of place to differentiate the IA of a product from another (Rosenfeld et al., 2015, p. 57). It is because humans have a complex relationship within their peripheral that allows them to know their position, move around, and know what they can or can not do in there (Rosenfeld et al., 2015, p. 52).

2.5 Design Elements of UX/UI

While there are some design elements in general, there are special elements for UX/UI. While design should be enjoyable and pleasing aesthetically, designers also need to consider the principle of usability (Experience, 2017). Those principles are learnability, efficiency, memorability, error, and satisfaction. Learnability (Experience, 2017) is a degree of how first-time users could adapt to the application, as Irene Au (Experience, 2020) explained that design should be simple and easy to learn. Efficiency (Experience, 2017) is how fast a user can perform a task quickly once they have learned the design, as Irene Au (Experience, 2020) explained how a design should be easy to use. Memorability (Experience, 2017) is how easy it is for a user to remember how to use the system, as Irene Au (Experience, 2020) explained about a design should be simple and easy to understand. Error (Experience, 2017) is the amount and how severe the errors that

users do and how easy for the users to fix them. Satisfaction (Experience, 2017) is the degree of how pleasant the users are in their experience using the design.

To achieve the usability principle, there are 10 elements required in UX/UI especially in mobile (Experience, 2017):

2.5.1 Content Prioritization

Figure 2.44 Content prioritization
Source: Experience (2017)

It is to show only the main content in the display and put the secondary menu at a special place or hidden. The menu must be shown in a progressive disclosure and simple manner.

2.5.2 Intuitive Navigation.

It is based on the learnability that users should be able to intuitively explore the design in clear pathways and complete all basic tasks without much explanation. This is also included in two of the IA components (Gearon, 2020; Rosenfeld et al., 2015, p. 76) about hierarchy and navigation systems.

Figure 2.45 Intuitive navigation
Source: Experience (2017)

2.5.3 Touchscreen Target Size.

It is to consider the size of every object to interact in a limited-space screen. Apple Developer (n.d) in Adaptivity and Layout of Visual Design set the minimum tappable area of 44px in width and height. Aside from this, the design also needs to consider the space between each target.

Figure 2.46 Touchscreen target size
Source: Experience (2017)

2.5.4 Provide User Control.

It is to allow the user to have control and make decisions based on their preferences. Giving users the freedom to make personalization themselves also gives them control of the design so they can make sense of

the system. The design may give suggestions or warnings, but it shouldn't be making decisions for the users.

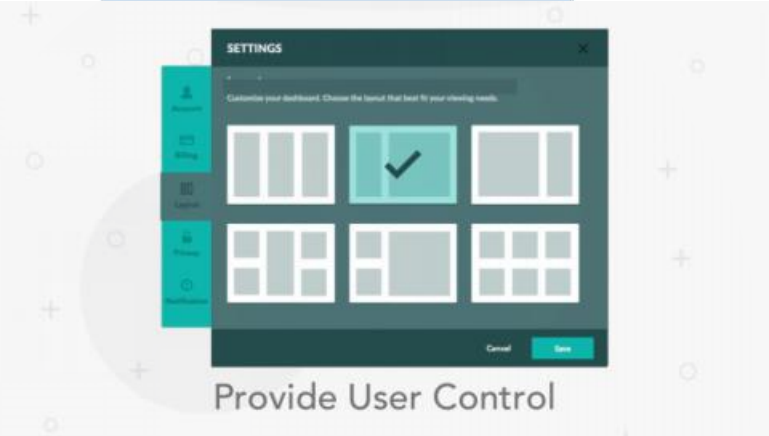

Figure 2.47 Provide User Control
Source: Experience (2017)

2.5.5 Legible Text Content.

Users need to be able to read the content so it should not be too small, but it is also awkward if the content is too big. The design needs to consider legibility and save space to allow effective communication. Too much information may strain the users, causing them to lose focus. Using spaces between texts may help the user in reading because it creates a sensation that the information is not too much. Therefore, it is recommended to use 30-40 characters in each line for mobile (Experience, 2017) and make good use of spacing and layout.

Figure 2.48 Text legibility
Source: Experience (2017)

2.5.6 Clear and Visible Interface Elements.

Designers should expect that the user could use their phone anywhere. This means the lightness of the place is random. That is why designers have to consider the contrast between content and background to make it legible.

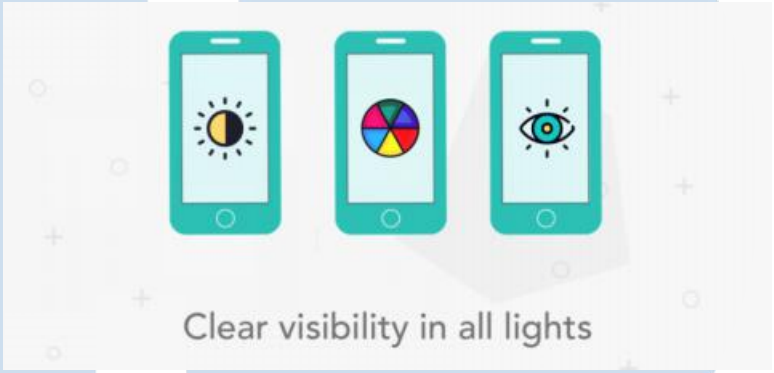

Figure 2.49 Clear visibility in all lights
Source: Experience (2017)

2.5.7 Hand Position Controls.

Designers need to keep in mind that users can hold their mobile in whatever ways they wish, such as a one-hand grip and one thumb. Basic features should be placed in an accessible area, while rarely used features or risky actions should be put in the hardest spot, such as the delete button. Designers also need to consider right-handedness and left-handedness.

Figure 2.50 Hand position controls
Source: Experience (2017)

2.5.8 Minimized Data Input.

Users always look for a way to get things done quickly and easily. Designers can help users to accelerate their experience and reduce data entry requirements by shortening forms, removing unnecessary remarks, providing autocomplete, recent search, search history, and location detection.

Figure 2.51 Minimize data input or motor load
Source: Experience (2017)

2.5.9 Seamless Experience.

Seamless experience means a smooth experience to make the users feel right when using the design. It can be achieved by minimizing steps and page loading to reduce the interaction time.

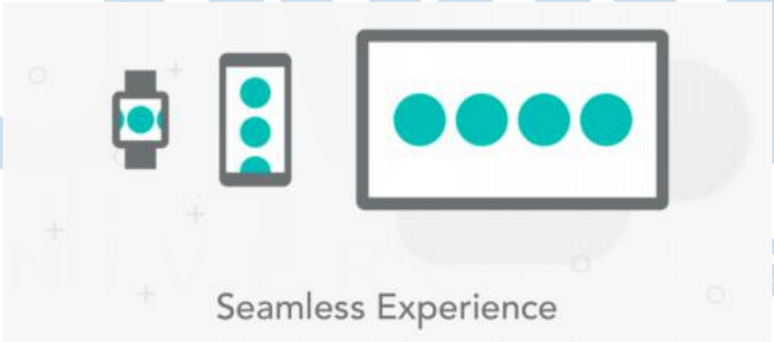

Figure 2.52 Seamless experience
Source: Experience (2017)

2.5.10 Continuous Design Test

In the end, everything is up to the users. So, it is important to keep designing and testing.

2.6 Singing

Singing is a talent but also a skill (Grenier, 2021). Some people are born with the talent to sing, but everyone has to practice to improve their skill in singing. There are several benefits in singing (Welch, 2019):

2.6.1 Physically

Singing is like an exercise. Singing improves health. It increases cardiovascular system efficiency. It improves the respiratory system, airflow, and oxygen rate. It also exercises the upper body's muscles, especially the lung. Singing regularly can help in developing vocal motor control and growth. It also stimulates parts of the brain in music and language. Everyone can train their singing physically by training vocal range and pitch.

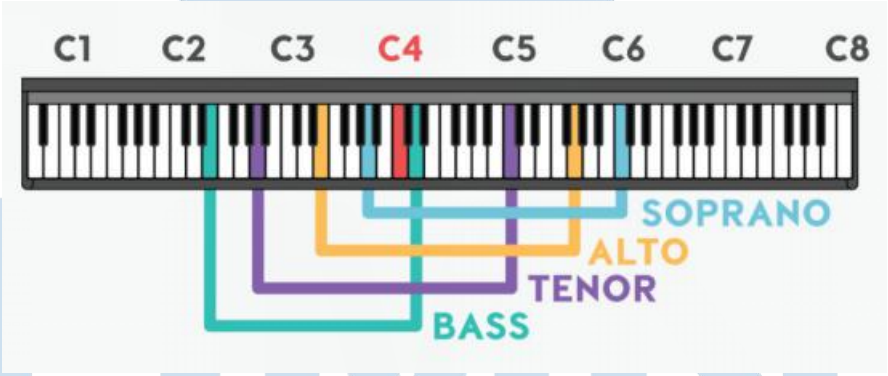

Figure 2.53 Vocal range in the piano
Source: Sefalitayal (n.d.)

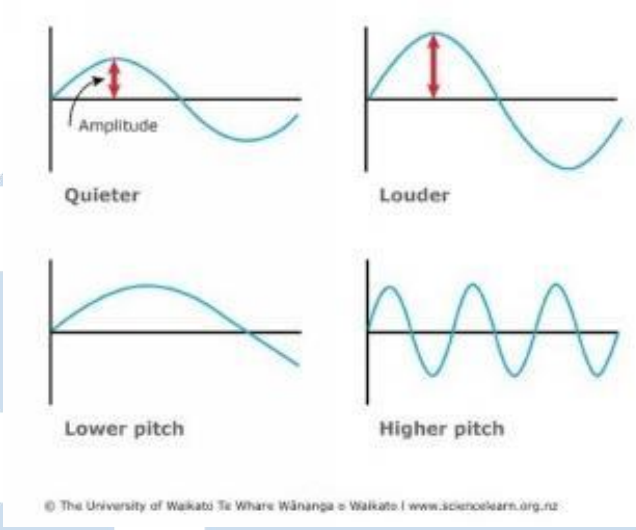

Figure 2.54 Vocal pitch in the frequency graph
Source: Science Learning Hub (n.d.)

2.6.2 Psychologically

Singing is also a form of communication, both intrapersonal and interpersonal. The human voice is also a part of them to reflect who they are, which is why singing helps in improving self-esteem, confidence, and feeling better about themselves and the world around them. Then, it improves the ability to communicate with other people and empathy.