

## CHAPTER II

### LITERATURE REVIEW

#### 2.1 Design Visual Communication

Landa, (2013) defines graphic design as a form of visual communication that utilised design elements that is created, selected, and organized in such a way that brings a message to the observer. Design is used to enhance information, identity, and branding in a way that motivates, engages, and carry messages towards the audience.

##### 2.1.1 Elements of Design

Elements of design are the aspects of design that is commonly used in the design process. Landa, (2013) mentions that there are 4 basic elements of design: line, shape, color, and texture.

##### 2.1.1.1 Line and Shape

A dot is the smallest unit that can be made in design. A line is an elongated dot that gets from one point to another, and a shape is a series of lines meeting together to create a closed path, or an outline (pg 19-22). Landa wrote that there are several kinds of shapes:

- 1) A geometric shape

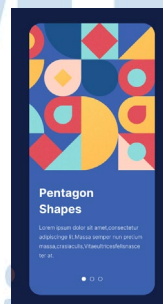


Image 2.1 Example of geometric shape

Source:

<https://www.figma.com/community/file/1141961764644651905>

A shape that is created with straight edges with measurable angles and curves. It is also known as a rigid.

## 2) A curvilinear shape



Image 2.2 Example of curvilinear shape

Source:

<https://www.figma.com/community/file/1141961764644651905>

Also known as an organic or biomorphic shape, curvilinear shapes are formed by using curves and flowy edges. The shape tend to have a natural feel to it.

## 3) A rectilinear shape

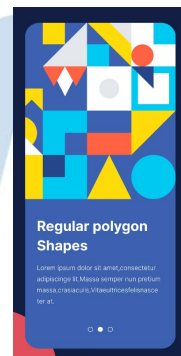


Image 2.3 Example of rectilinear shape

Source:

<https://www.figma.com/community/file/1141961764644651905>

A shape that is comprised of only straight lines and angles.

#### 4) An irregular shape

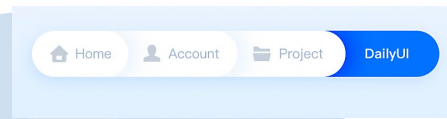


Image 2.4 Example of irregular shape

Source: <https://collectui.com/designers/qiangjun1990/breadcrumbs>

An irregular shape is a shape that is comprised of both straight and curved lines.

#### 5) Accidental shapes

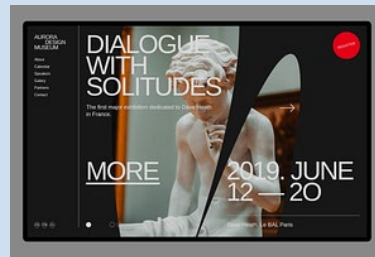


Image 2.5 Background of image is example of accidental shape

Source: <https://dribbble.com/shots/6207305-Aurora-Events-Design-Kit>

Kit

Shapes that is a result of a physical action caused to the design. The action and shape can be either an accident or on purpose while looking like an accident.

#### 6) A nonobjective or nonrepresentational shape

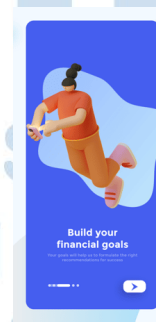


Image 2.6 Background of illustration is an example of nonrepresentational shape

Source: Afrills (2020)

An object that is purely invented and not meant to be visually identical to anything that has been invented before.

7) An abstract shape



Image 2.7 Distorted circle meant to communicate the pie chart  
Source: Afrills (2020)

Shape that takes a preexisting object and alter its appearance for stylistic or communication purposes.

8) A representational or figurative shape

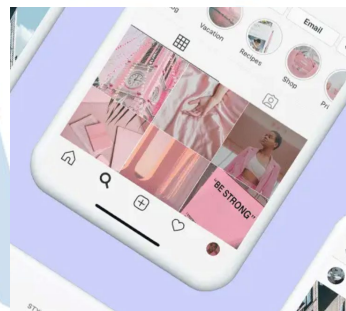


Image 2.8 Menu icons is an example of figurative shape

Source: <https://www.springboard.com/blog/design/ui-examples/>  
Shapes meant to be recognizable and remind the audience of actual objects that they have seen.

## 9) Figure

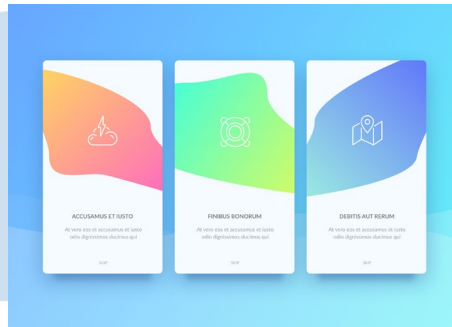


Image 2.9 Background is an example of negative space

Source: Vladimir Grucev (2016)

Also known as positive or negative space. It is comprised of several shapes that creates an illusion of a different shape in between.

## 10) Typographic shapes

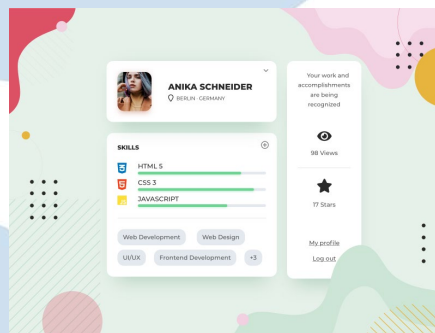


Image 2.10 Words in the UI as an example of typographic shapes

Source: <https://www.plusuidesign.com/ui-designs/skills-profile-card-ui/>

Typographic shapes are numerical, alphabetical, and punctuation marks that symbolize the sounds of certain languages.

### 2.1.1.2 Color

Color is a design element that is created using light that is reflected or absorbed by an object. Different colors are absorbed and

reflected at different rates, mirroring the different colors a human can see. Pigments are natural chemical substances that gives color to the surface of objects, thereby changing how we perceive the light that is reflected on the object (Landa, 2013).

#### 1) Color Nomenclature

To better understand individual colors, it is divided into three categories: Hue, Value, and Saturation. These categories allow us to label and organize colors, making it easier to refer to them (pg. 23-27).



Image 2.11 Hue, Saturation, and Value

Source: <https://www.virtualartacademy.com/wp-content/uploads/2018/12/hue-saturation-value.png>

##### a. Hue

Hue refers to the name of base colors. Colors divided by hue are also divided by temperature, which is how cool or how warm a color is. Warm colors are colors with red and orange undertones. Cool colors are colors with blue undertones.

##### b. Value

Value defines the luminosity of a color. The higher the value, the brighter a color appears. Meanwhile, the lower the value, the darker a color is perceived. Shade, tone, and tint also fall under value.

c. Saturation

While saturation refers to the vibrance or dullness of a color. The higher the saturation, the more vibrant the color. In contrast, the lower the saturation, the more dull a color is.

2) Color Schemes

Color schemes are palettes of harmonious color combinations that is widely used in design. General color schemes utilize colors in the color wheel that are based on hues in full saturation and middle value, so changing one or more of the value and saturation affects the harmony and tone of the schemes (pg. 132-134).



Image 2.12 Color Schemes

Source: [https://muralsyourway.vtexassets.com/assets/vtex.file-manager-graphql/images/8b3a107f-4fd8-4250-aa58-bfc41c7c74ed\\_\\_0f024a7d48d3ad76ea86cc20677c8efc.png](https://muralsyourway.vtexassets.com/assets/vtex.file-manager-graphql/images/8b3a107f-4fd8-4250-aa58-bfc41c7c74ed__0f024a7d48d3ad76ea86cc20677c8efc.png)

a. Monochromatic color

Monochromatic color schemes only employ 1 hue with different values and saturations.

b. Analogous

Analogous color schemes use 3 adjacent hues in the color wheel to create a congruent palette due to similarity.

c. Complementary color

Complementary color schemes use opposing hues in the color wheel to create contrast.

d. Split complementary

Split complementary color schemes work similarly with complementary, however it takes 3 hues instead of 2; one color on one side and two on the other side of the color wheel. This creates a softer contrast than the complementary color palettes while still being more intense than an analogous or monochromatic palette.

e. Triadic color

Triadic color schemes take 3 hues that are equal distance to each other on the color wheel, creating a balanced and diverse palette.

f. Tetradic

Tetradic color schemes are two complementary hues in one palette. It is suggested that one of the hues be more dominant than the others to harmonize the hues better.

g. Cool color

Cool color schemes utilize one half of the color wheel that has blue undertones. The resulting palette often evokes a calm and serene feeling.

h. Warm color

Warm color schemes are the other half of the color wheel with red and orange undertones. The resulting palette tends to be intense, heated, and sometimes spicy.

U N I V E R S I T A S  
M U L T I M E D I A  
N U S A N T A R A



### 2.1.1.3 Texture and Pattern



Image 2.13 Example of Texture  
Source: Tien Minh Nguyen (2020)

Texture is the perceived tactile quality of the design surface. The texture could be an actual tactile sensation or simply a visual illusion. Meanwhile pattern is a derivation of texture in which a configuration of a dot, line, or shape is repeated throughout the design in a similar, orderly manner.

## 2.1.2 Principles of Design

Principles of design are tools and rules to create a congruent visual design for a more effective message. Elements of designs are arranged in a design in accordance to the principles of design (Landa, 2013).

### 2.1.2.1 Format

Format is the outer boundaries of a design. Format also refers to the physical form a design would take. A format will adjust to the implementation of the design in the practical world. Elements of the design are placed according to the boundaries of a format (pg. 29-30).

### 2.1.2.2 Balance

Balance refers to the equilibrium of a visual design. A balanced composition contributes to a more harmonious interaction between the design elements. Balance related to the visual weight of design elements. Landa defines visual weight as how attractive, important and emphasized is an element. Elements of design should

be organized in a way that has equal visual weight on each side of the y and x axis to promote balance, achieving harmony and cohesiveness (pg. 30-33).

### 1) Symmetry Balance

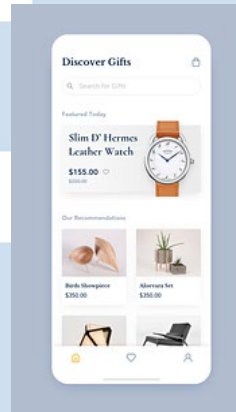


Image 2.14 Example of Symmetry  
Source: Shirish Shikhrakar (2019)

Symmetry requires equal amounts of design elements with similar visual weights on either side of the central axis. Outright symmetry means mirrored design elements on either side of the central axis, while approximate symmetry refers to a general reflection of visual weight using different but similar design elements.

### 2) Asymmetry Balance

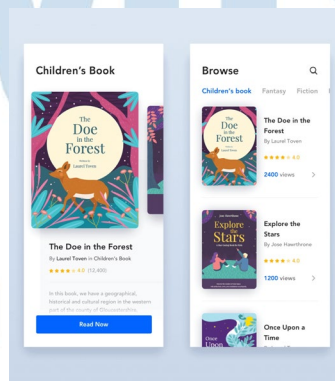


Image 2.15 Example of Asymmetry  
Source: Shirish Shikhrakar (2019)

Asymmetry balances design through visual weight and counterweights without mirroring design elements directly. Each element is assigned a weight based on how they appear in the design, and each weight should be countered with a different element of similar visual weight.

### 3) Radial Balance



Image 2.16 Example of Radial Balance  
Source: Iaroslav Iasegodobli (2023)

Radial balance utilizes both x and y central axes to create a circular illusion. Design elements are positioned as such that they radiate out from the center of the format.

#### 2.1.2.3 Visual Hierarchy

A visual hierarchy is an arrangement from the most to the least emphasized design element. This creates a visual guide that leads the observer's eyes through the design. The most emphasized element is the focal point of the design, after which a designer should guide the audience to other components of the design through lower emphasis, creating a harmonious look (pg. 33-35). Emphasis is created using several means:

## 1) Isolation



Image 2.17 Example of Isolation  
Source: Maja Glinicka (2020)

The main subject of the design is isolated. This is so it acts as a focal point to draw the viewer's attention to it.

## 2) Placement

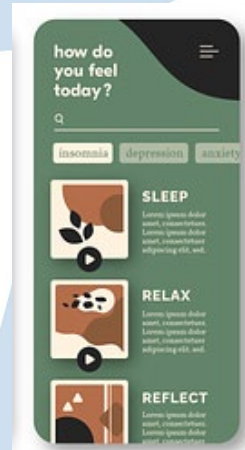


Image 2.18 Example of Placement  
Source: Maja Glinicka (2020)

Placing the focal points at specific positions that the eye naturally draws to allows greater priority towards the element, drawing attention to it.

### 3) Scale



Image 2.19 Example of Scale  
Source: Maja Glinicka (2020)

Differentiating the size of the focal point in contrast to the other elements around it will draw attention towards the element.

### 4) Contrast

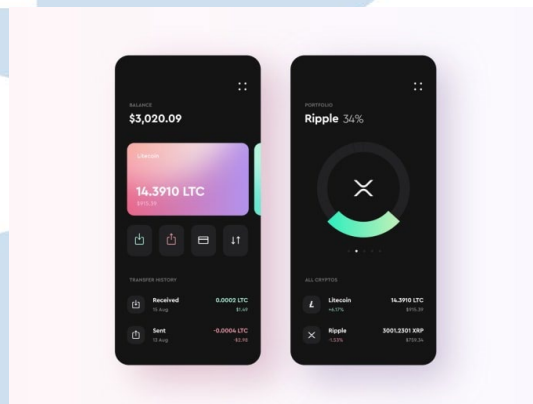


Image 2.20 Example of Contrast  
Source: Alexi (2022)

Differentiating the focal point through contrast is achieved through the play of light and darkness, texture, and saturation. Contrast is best aided by scale and position to better achieve clarity and prioritization.

## 5) Directions and pointers



Image 2.21 Example of Direction  
Source: Eddie Lobanovskiy (2018)

Arrows and diagonals used to point towards an element help draw the eye to the focal point of the design and create hierarchy.

## 6) Diagrammatic structures

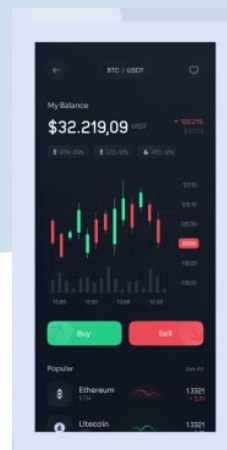


Image 2.22 Example of Diagrams  
Source: Barhim Azzoug (2021)

The positioning of the elements through diagrams aids in prioritization and hierarchy. A tree structure puts the biggest emphasis on the first element, while a star structure puts the emphasis in the center instead. A nest structure creates a hierarchical relationship between the first and the nested layers, putting different emphasis in multiple elements.

#### 2.1.2.4 Unity

Every design element should work together to create a unity to convey the bigger message. The flow of design elements are intertwined to one another so as to create a coherent and harmonious experience for the audience (pg. 36).

#### 2.1.2.5 Law of Perceptual Organization

Law of Perceptual Organization are rules that dictates how an element interacts within one another through correspondence and structure (pg. 36-39). Landa states the 6 factors as the following:

##### 1) Similarity

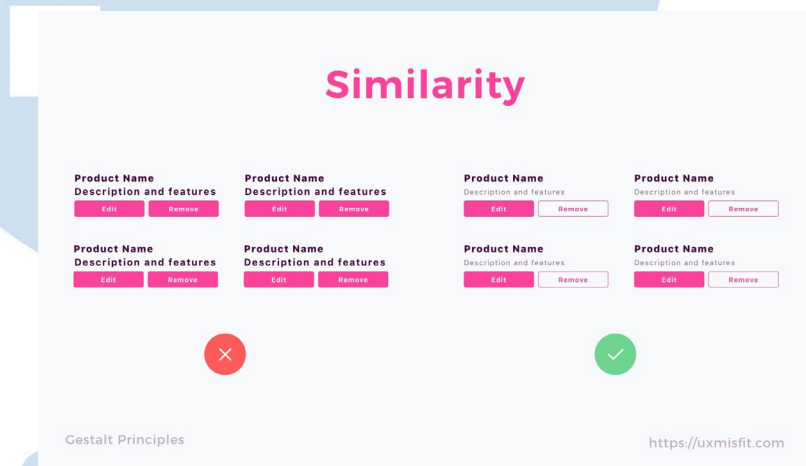


Image 2.23 Example of Similarity in UI Design  
Source: <https://uxmisfit.com/2019/04/23/ui-design-in-practice-gestalt-principles/>

Elements that are similar in multiple aspects are perceived into groups based on the similarities they possess.

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N U S A N T A R A

## 2) Proximity

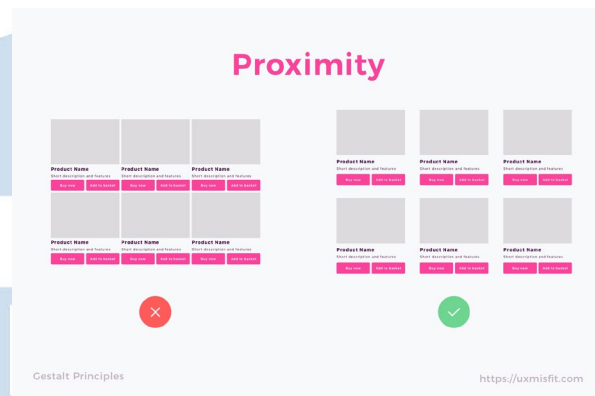


Image 2.24 Example of Proximity in UI Design  
Source: <https://uxmisfit.com/2019/04/23/ui-design-in-practice-gestalt-principles/>

Elements close to one another implies that the elements are in one group.

## 3) Continuity

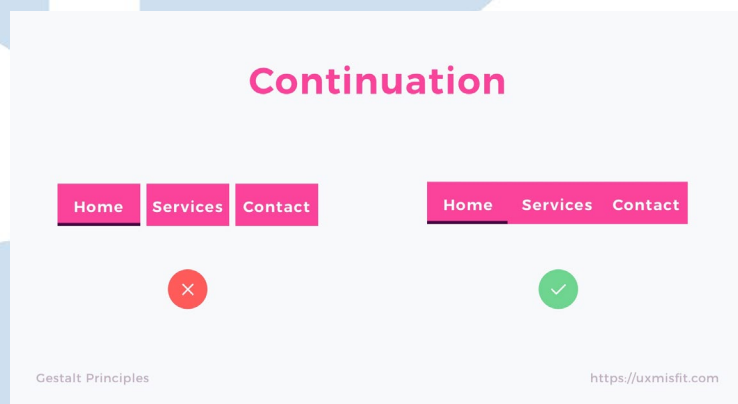


Image 2.25 Example of Continuity in UI Design  
Source: <https://uxmisfit.com/2019/04/23/ui-design-in-practice-gestalt-principles/>

Elements that appear to be connected will be perceived as moving in one direction. The continuity could be real or implied.



#### 4) Closure

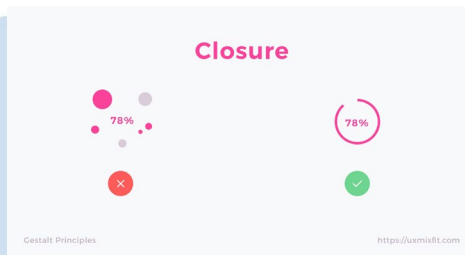


Image 2.26 Example of Closure in UI Design  
Source: <https://uxmisfit.com/2019/04/23/ui-design-in-practice-gestalt-principles/>

Elements that appear to be interconnected is perceived as a single object.

#### 5) Common Fate

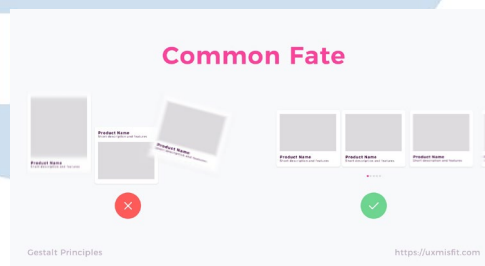


Image 2.27 Example of Common Fate in UI Design  
Source: <https://uxmisfit.com/2019/04/23/ui-design-in-practice-gestalt-principles/>

Elements that are grouped facing the same direction or towards a certain object is implied to be moving towards a certain direction.

#### 2.1.2.6 Scale

Scale is the size of an element in relation to the other elements in a design. The proportions of an element is important for the audience to be able to visualize the elements in a three dimensional space. Scale is also used for emphasis or variety in design, in relation to rhythm and hierarchy (pg. 39).

### 2.1.3 Layout

Landa, (2013) defined layout as a structure build on design elements in order to create unity in design. Layout is often used on both physical print and digital medias (pg. 378). A grid is a static guide which functions as a structure for organizing design elements. Grids divide the space within a format into columns and margins in which the design elements are then placed. This simplifies the visual weight distribution throughout the design. A structural grid provides unity and cohesiveness in the design. (p. 174-179).

#### 1) Columns

Columns are created when a grid creates a vertical space. Meanwhile, a column interval is defined as the space between columns. Single column grids only utilize one column per format, with column intervals acting as margins. Multicolumn grids have multiple columns in one format, with column intervals acting as spacers and margins between design element groups.

#### 2) Flowlines

Flowlines draw additional alignments within columns to aid the positioning of a design element. The alignments can be drawn in regular or irregular intervals, depending on need.

#### 3) Modular grid

Grid Modules draw flowlines in regular intervals to create equal spaces across the vertical and horizontal alignment of the format. A single space within the horizontal and vertical guidelines is called a module. Design elements may take up more than one module at a time in a process is called zoning. Zoning is when individual modules are grouped together to better deliver information, with the goal of unity and harmony.

In digital media, responsive grid is a grid system that is characterized by its flexibility to adjust towards different formats it is opened in (Tang, 2019). Responsive grid is found in User Interfaces on both

websites and applications to keep the consistency in design despite the changing format. According to Tang, (2020) responsive grid has 4 main elements:

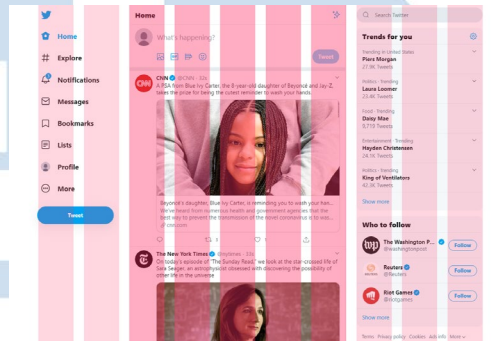


Image 2.28 Responsive grid in Twitter

Source:

[https://miro.medium.com/v2/resize:fit:2800/1\\*TukkXAeHSoZqKp7PnvC8Q.png](https://miro.medium.com/v2/resize:fit:2800/1*TukkXAeHSoZqKp7PnvC8Q.png)

### 1) Field of elements

Field of elements is the area where the design elements are placed in the grid system. The elements placement depends on the columns in the design.

### 2) Columns

Columns are the main pivot of design elements in an interface. The column in a responsive grid system are flexible and the size can change with the format. Every media has different columns, and the elements placement may shift depending on the columns. A mobile application tend to have 4 columns for smart phones and 8 columns for a tablet.

### 3) Gutters

Gutters are the gap between columns. They are consistent in size and does not change with the format. They serve as the constant in a responsive grid in order to keep the design elements from crashing into each other.

### 4) Side Margins

Side margins are the outer gap of a grid system. It has a consistent size and does not change with the format. It is designed to keep the

elements from going off-grid. In an application, the size margin tend to be about 20-30px.

#### **2.1.4 Typography**

Typography is the practice of using elements of type in design. A typeface refers to a set of characters with similar visual properties. The visual properties and style of a typeface is so unique from one to another that when modified, a typeface is still recognizable. A typeface generally contain letters, numbers, symbols, signs, punctuation marks, and accent marks(Landa, 2013).

##### **2.1.4.1 Classification**

Type is classified based on their style, history, and markings. Landa, (2013) notes that classification vary from a historian to another, but he classified type into 8 categories:

- 1) Old Style

Old Style, also called humanist typefaces, started in 15th century Rome. It is stylized with angled and bracketed serifs due to the letters drawn with a broad-edged pen.

- 2) Transitional

Transitional serif typefaces come from the 18th century, and incorporate both characteristics from Old Style and Modern typeface.

- 3) Modern

Modern serif typefaces originate from late 18th to 19th century. The typeface is characterized with thin horizontal strokes contrasted to thick vertical strokes. The typeface is the most symmetrical among all typefaces.

U N I V E R S I T A S  
M U L T I M E D I A  
N U S A N T A R A

#### 4) Slab Serif

Slab serif is derived from the Egyptian in the early 19th century. They are characterized by flat and heavy serifs.

#### 5) Sans Serif

Sans serif is introduced in early 19th century. They do not have serifs, although the strokes within the letter can be varied or uniform according to stylistic choice.

#### 6) Blackletter

Blackletter is also called gothic, and takes reference from manuscript letterforms. It is characterized by heavy strokes, condensed letters, and minimal curves.

#### 7) Script

Script is a decorative typeface that resemble handwritings. Letters are slanted and sometimes written in cursive. Script tend to emulate brush strokes and calligraphy.

#### 8) Display

Display typefaces are any typeface that is used for decorative purposes in headlines and titles. They tend to be more elaborate, decorative, and sometimes difficult to read without context.

### 2.1.4.2 Alignment

Alignment is the arranging of type. It is used to promote readability and create hierarchy within text type. Landa mentions that there are 6 types of alignments:

#### 1) Left-aligned

The texts are aligned to the left margin.

#### 2) Right-aligned

The texts aligned to the right margin.

#### 3) Justified

The texts are aligned equally between left and right margins.

4) Centered

The text are aligned to an imaginary y axis in the center of the text.

5) Runaround

The text wraps around a graphic element of design.

6) Asymmetrical

The text do not conform to any arrangement.

### 2.1.4.3 Spacing

Spacing are intervals between characters of type. It is useful to enhance readability and legibility, thus conveying the message of design more effectively to the observer.

1) Letterspacing

The spatial interval between characters of a word. Adjusting letterspacing is also called kerning.

2) Word spacing

The spatial interval between words of a sentence.

3) Line Spacing

The spatial interval between lines of type that is measured from one baseline to the other. Adjustments to a line spacing is also called leading.

## 2.2 Interactive Media

Griffey, (2019) defined interactive digital media as a media that is utilizes a computer or a machine to support its interactivity. Interactive media differ from other medias due to its ability to interact with their users. Examples include website, mobile applications, and video games.

### 2.2.1 Mobile Application

Griffey, (2019) defined mobile applications as a form of interactive digital media that is created to be utilized using a tablet or a smartphone. In

designing an interactive digital media, Griffey mentioned the importance of using layout principles.

#### **2.2.1.1 Unity**

Griffey states that unity is the coordination of color and visual to keep the design elements appear connected towards one another. Design elements that are visually connected to one another create a more cohesive visual identity.

#### **2.2.1.2 Differentiation**

Differentiation is the practice of making elements differ from one another. Using differentiation is important to communicate the different functions of the elements within the design. Differentiation is important as a distinction for viewers when they see elements, so that they don't assume all elements do the same thing.

#### **2.2.1.3 Emphasis**

Emphasis is placing priority towards the most important elements. The viewer should be able to look at a screen and find the most important elements to pay attention to, hence the function of emphasis within design.

#### **2.2.1.4 Whitespace**

Whitespace is also called negative space. Griffey states that whitespace refer to any empty space between elements. Whitespace functions as a clarification and distinction between different design elements to improve visual communication and user comprehension.

#### **2.2.1.5 Alignment**

Alignment is the arrangement of elements, and the positions they line up in. Certain design elements can line up to the top, bottom, sides, or middle of other elements to create invisible lines for a more organized appearance. Consistent alignment aids in

viewers comprehension of the elements and visual comparisons between elements.

## **2.3 Interaction Design**

Rogers et al., (2023) define interactive design as the process of designing a media that interacts with the people to support how people communicate and interact with their everyday life (pg. 8). Interaction design aims to reduce negative aspects of a user experience while enhancing the positive aspects (pg. 1).

### **2.3.1 MicroInteraction**

According to Saffer, (2013), microinteractions are details in the product that are interactive and functional. Microinteractions serve to make the product easier and gratifying to engage with. Microinteractions have 4 parts:

#### **2.3.1.1 Trigger**

The trigger is the initiation action that starts the microinteraction through controls. The control should have a clear visual affordance in order to avoid misunderstandings on user intent. Interacting with the control will start a sequence of behaviour from the product, adhering to the rules set by the designer. Triggers are divided into manual triggers and system-initiated triggers. Manual triggers are user initiated, while system-initiated triggers are automatically initiated when certain conditions are met.

#### **2.3.1.2 Rules**

Rules are the perimeters of circumstances in a sequence. Rules depend on the goal of the microinteraction. Objects that a user can trigger has 3 states.

- 1) Default state  
The state a user first finds the object in.
- 2) Activated state  
The state the object is in after being interacted with.



### 3) Updated state

The state of the object after a user is finished interacting with it

Rules dictate how the microinteraction behaves in each state, ensuring clarity for the user and streamlining the sequence to promote a positive user experience

#### **2.3.1.3 Feedback**

Feedback is communication from product to user as the result of a microinteraction process. Feedback should not overburden users nor be arbitrary. It is designed to help the user understand rules of how said microinteraction works through user's pre-assumed knowledge. There are 3 feedback methods that Schaffer lists in his book:

##### 1) Visual

Feedback is provided through the sense of sight. A visual feedback shows the workings of a microinteraction towards the user. It takes the form of animations and messages a user can view. Animation serve as an illusion of a virtual space that helps illustrate how the microinteraction works. Messages provide feedback to make the rules and purpose of a microinteraction clearer to the user.

##### 2) Audio

Feedback is provided through hearing. Audible feedback is used for emphasis and alerts. Emphasis is used conjoined with visual to confirm the user's action is recognized and processed, while alerts are indicators of the end or an interruption in the microinteraction. Audio feedback is divided into two types: earcon and speech. Earcon are memorable short jingles that serve to convey a specific information. An example of an earcon would be a

notification alert for a specific app. Speech are spoken words used to convey longer, more specific messages that an earcon is not able to.

### 3) Haptics

Feedback given via tactile vibrations. Haptics are generally used to enhance the message brought through audio and visual feedback. To an extent, haptics can replicate alerts when audio is unavailable. Haptics is also used to simulate artificial texture on the skin.

#### **2.3.1.4 Loops and Modules**

Modes is characterized as a fork road in a microinteraction process. There are two variations to the traditional mode. Spring-loaded modes are modes that are active when a physical action is occurring, ending as soon as the physical action stops. An example is pressing the power button of a smartphone long enough to trigger a reboot. One-off modes are when a user triggers a mode for a set amount of time before ending. An example is when the paste prompt is shown for a brief period upon double tapping the text cursor in the text box of a smartphone.

Loop is a process cycle that repeats for a certain duration of time. Loop automates some of the microinteraction process to promote a smoother experience for the user. An open loop does not respond to feedback and simply executes until the end, while a closed loop has a feedback mechanism and self-adjusts. There are four kinds of loops in microinteraction.

#### 1) Count-controlled loop (For)

Loop that ends after a certain amount of time.

#### 2) Condition-controlled loop (While)

Loop that continues as long as certain conditions are met.

#### 3) Collection-controlled loop

Loop that is activated by a certain trigger automatically.

#### 4) Infinite loop

Perpetually activated loop until a shut down or error occurred to stop the process.

### **2.3.2 Interaction Design Principles**

Design principles aid interaction designers in the user experience design process (Rogers et al., 2023). It is an application of basic design principles into suggestions an interaction designer should consider in their design process. Interaction design principles are concerned on how users see and do tasks using an interactive product (pg. 25-26).

#### **2.3.2.1 Visibility**

Visibility refers to how visible is the interaction aspects. The more visible a function is, the more likely is the user going to understand what to do. The appearance of a function also dictates how a user approaches the function based on past experience. An example of using visibility is a start button in an application being bigger and brighter than the rest of the other buttons to appeal more to the user (pg. 26).

#### **2.3.2.2 Feedback**

Feedback is the process of sending back information on the action and its effects. Feedback is given through audio, tactile, verbal, visual, or a combination of these (pg. 26-27). Feedback is further discussed under the subchapter “Microinteractions”.

#### **2.3.2.3 Constraints**

Constraints are the limits of user interaction that can take place in order to reduce mistakes when users pick the wrong option. An example of constraints is when menu options have lower visibility when unavailable in order to dissuade users from picking them (pg. 27-28).

#### **2.3.2.4 Consistency**

Elements that appear similar should perform similar tasks. Consistent interfaces make the learning curve less steep for users. An example of consistency is when a user presses back on an application, it will always return to the previous page they were on. Inconsistency is when the back button does anything else other than returning to the previous page the user was on (pg. 29).

#### **2.3.2.5 Affordance**

Affordance is a term that refers to previous knowledge a user is presumed to possess to determine how they approach an object. Affordance is the perception of the function as viewed by the user. Norman (199) said that there is real affordance and perceived affordance. Real affordance is tactile and is perceptually obvious as common sense. Perceived affordance is virtual and derived through presumed knowledge. Norman argues that a virtual interface does not have real affordance unless it involves a physical device. An example of affordance is when faced with a slider, users will know to slide the slider instead of double tapping it (pg. 29).

### **2.3.3 Interaction**

In order to better understand interactions, Rogers et al., (2023) divide interactions into 2 kinds: Social and Emotional Interaction.

#### **2.3.3.1 Social Interaction**

Social interaction is a form of interaction that involves more than one person at a time. Social interaction is a result of the social nature of humans. In interaction design, social interaction takes the form of social media that connect one individual without the space and time barrier (pg. 87).

### 2.3.3.2 Emotional Interaction

Emotional interaction is a form of interaction between an individual and their own emotions as a result of the individual's experience from using the design or the message it conveys. Emotional interaction greatly affects the actions of an individual after using the design.

### 2.3.4 User Experience

User Experience is a term used to describe the behaviour of a product and how its being used by people in the real world. Nielsen and Norman (2014) states it encompasses all aspects of the end-user's interaction with the products, services, and the company behind it. Garret mentions that every product that has been used by someone has user experience(Rogers et al., 2023). User Experience specifically covers satisfaction levels and how people feel about a certain design. A designer cannot create user experience; design is created to evoke a user experience. McCarthy and Wright (2004) came up with four core threads of user experience:

1) The sensual thread

This refers to the sensory experience with the situation; how humans take in technological devices and applications.

2) The emotional thread

This refers to how humans respond emotionally towards the design product. Emotions are also involved in judging the value and how drawn a user is towards the design.

3) The compositional thread

This refers to how humans try to comprehend the design as they interact with it. It provides insight on the usability and ease of a product.

4) The spatio-temporal thread

This refers to when and where the experiences take place, as well as how it affects the experience (pg. 12-15).

### 2.3.5 Interface

Interface is defined as the physical appearance of the design. Interface is adjusted according to the media used to solve the design problems presented. Interface is designed with the user target in mind and take their preferences and needs into consideration to promote a smoother user experience (Rogers et al., 2023). According to Johnson (2010), there are several design rules that ensure good interface design: perception, structure, readability and legibility, color and peripheral vision (fovea), and memory.

#### 2.3.5.1 Perception

Johnson defined perception as how the brain see the world in light of expectation and experiences it has acquired. There are several biases of perception mentioned:

##### 1) Perception biased by experience.

Johnson notes that having prior knowledge of certain things will shape how the brain perceives certain things. When the perceived object differs from the actual object, it can cause ambiguity in design.

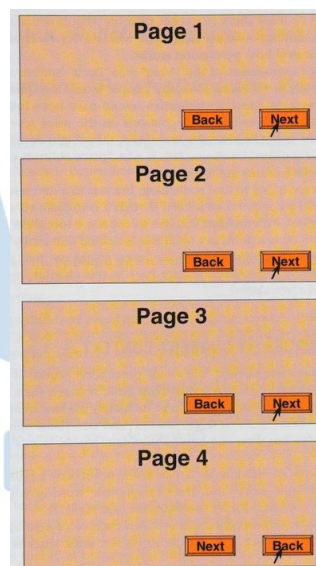


Image 2.29 Example of perceiving by experience in UI Design  
Source: Jeff Johnson (2010)

In the image above, experience from the first three pages taught users that the next button is on the bottom right. Therefore, the user perceives the next button to be on the bottom right, even though it has changed (page 1-4).

2) Perception biased by current context.

Design is influenced by surrounding context. Johnson mentioned that an object is perceived can be influenced by the surrounding design. For example, design elements placed closer together will be perceived as part of a group, while elements placed further away are not perceived as part of the group.

3) Perception biased by goals.

Users with a goal in mind tend to scan for the items they seek and not notice the things they are not looking for. This is to find what they need quickly (page5-8).

### 2.3.5.2 Structure

Structure is related to the Gestalt Principle. It states that information grouped together tend to be understood and perceived by users faster.

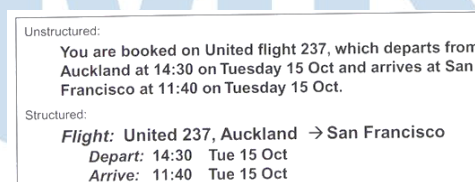


Image 2.30 Example of Structure of Information in UI Design  
Source: Jeff Johnson (2010)

In the example above, the unstructured information provided are jumbled and harder to perceive because it is not structured properly in a way that allows the user to scan for important information. The structured information divides the information into

understandable blocks of information that can be scanned by the user. It is easier to understand what the flight code is as well as find the departure and arrival time (page 11-28).

### 2.3.5.3 Readability and Legibility

When delivering information via user interface, users tend to gravitate toward familiarity. This means using familiar words, simple and bigger typefaces, and a clean background for better readability and legibility (page 39-45).

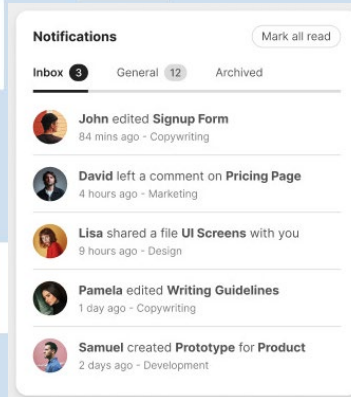


Image 2.31 Example of Readability in UI Design  
Source: <https://uxmovement.substack.com/p/how-to-make-your-ui-text-super-easy>

The example above is an example of legibility in a notifications panel. The background used is clean and contrasts well with text, and the typeface used is simple and big enough to be seen without the user squinting to look. Moreover, the words used are familiar for users that are experienced in editing and commenting on shared files. Overall, the design is easy to understand and perceive by users.

### 2.3.5.4 Color and Peripheral Vision

Johnson stated that a human vision is refined for contrast, not color. This means that it is easier for users to discern between design elements when they are contrasting with each other and the background, as opposed to using brighter colors. The user's ability



to differentiate colors depend on saturation of color, size of element, and separation. The paler, further apart, and thinner the weight of the element, the harder it is to discern between colors.

Peripheral vision, or fovea, is the area around the main vision a user is focusing on. The human eye can still see things around the main object of focus; however, the brain is more focused on the main object, thus the surroundings retain less detail. This translates over to interface design in which important buttons and sentences should always stay in the peripheral of the user's vision to be noticed easily when needed. Johnson also emphasizes using recognizable colors that differs from its surrounding for the interface element to be perceived quickly and correctly (page 53-77).

#### **2.3.5.5 Memory**

Johnson divides memory into short term and long term memory. Short term memory refers to the part of brain that stores information for only a short period of time. The information stored is easily forgotten and are limited in capacity. Thus, interface design should be done as straightforward and as simple as possible for ease of use.

Long term memory refers to the part of the brain that stores information for long periods of time. This area is reserved for information the brain deems important and crucial. However, retrieval from this area of memory takes much longer and sometimes require additional external help (page 79-95).

### **2.4 Collaborative music**

Edgard Varèse defined music as “organized sound” (Levitin, 2019). Levitin breaks down music further into music elements: tone, pitch, rhythm, tempo, contour, timbre, loudness, spatial location, and reverberation. “Tone” or “note” is a discrete musical sound, with the word “tone” referring to the sound itself and “note”

referring to the written form. “Pitch” is the position of frequency relative to the musical scale. “Rhythm” is the duration of a note and how they are grouped. “Tempo” is the overall speed and pace of music. “Contour” shapes the melody and takes account of the pattern where a note goes up or down). “Timbre” is the quality of sound produced by overtones, distinguished between different music instruments. “Loudness” or volume controls the amplitude of a musical tone. “Spatial location” is where the sound originates from. “Reverberation” is how distant sound appears juxtaposed against the size of the room that the sound is from, also known as “echo”.

According to Bruce Elise Benson (McAuley et al., 2020), musical improvisation is defined as a creative process that generate music In real-time. Improvisation include music elements like melody, harmony, rhythm, ant timbre. Benson regards improvisation as some kind of “ethical contract”, in which musicians have mutual respect and understanding on each other’s space in the process of music playing. Musicians take turns in following, leading, and supporting one another through spontaneous music (pg. 437-447).

#### **2.4.1 Musical Community**

Wenger (2015) defines communities of practice as a group of individual that has similar passion and concern for something, in which they learn more about it by interacting with each other regularly”. By proxy, communities of musical practice are a group of people that have similar passion for music that gather to better themselves in music (Kenny, 2016).

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