

# Prominence of User Interface Design

## Contents

---

### Module\_1 - Prominence of User Interface Design

1.1 - Introduction and Background . . . . .	1
1.2 - Interaction and Interface Design . . . . .	2
1.3 - Virtuous User Interface Design . . . . .	4
1.4 - User Experience . . . . .	7
1.5 - Process of Interaction and Interface Design . . . . .	10
1.6 - Guidelines in Interaction and Interface Design . . . . .	12
1.7 - Concise Summary . . . . .	13
1.8 - Extended Resources . . . . .	14
1.9 - References . . . . .	15
1.10 - PowerPoint Presentation–Refer to D2L	

### PROMINENCE OF USER INTERFACE DESIGN

User interface design is an essential concept to be understood when trying to creating a successful application. User interface design is defined as “the process of making interfaces in software or computerized devices with a focus on looks or style” (User Interface (UI) Design, n.d.). The objective of a good user interface is to minimize the user’s stress and maximize their ability to access all the features of the application at use. User interface design can be further broken down into two sections—interaction and interface design—and, when combined together, designers can make an extraordinary application.

#### 1.1 - Introduction and Background

Even though the constant development and improvement of technology makes devices more complicated each day, we live in an age in which people can effectively use some of the most advanced pieces of technology without needing a complete understanding of how those objects function and complete their goals. We can thank the many developers and researchers in technology and psychology who created the field of design known as user interface design. Before we can talk about user interface design, we must understand user interaction design. According to Helen Sharp, Yvonne Rogers, and Jenny Preece, interaction design is “designing interactive products to support the way people communicate and interact in their everyday and working lives” (Sharp, Rogers, Preece, 2015).

In other words, user interaction design is the design philosophy in which a device is made with the intent to maximize the usability of and user experience with an object. User interface design is a subset of interaction design primarily dealing with the interactions between people and machinery. Usability and user experience are two key pillars of user interaction design; one can have a revolutionary computer application that could change the world, but if it is near unusable or makes the everyday user too irritated to even look at it, then no one will use that product (Hopkins, 2017). User interface design became a prominent design focus because it allowed these advanced products to become *wanted* instead of solely being *needed*. User interface design became an eventual necessity because of the many challenges to making the interactions between people and computers useful and pleasing.

#### 1.2 - Interaction and Interface Design

User interaction and interface design are vital design philosophies that need to be understood in order to keep users happy. While similar, these design philosophies have important differences. Interaction design focuses on how the user interacts with the system globally: for instance, clicking a button on the screen or navigating through menus to access another screen. Interface design, however, focuses on what the users actually see, such as a home or welcome screen. These two philosophies and practices should go hand-in-hand when designing for the best user experience possible.

Humans and computers have a unique relationship because, unlike most machinery, computers can provide constant feedback for each action the user makes, leading to a dynamic device that can be used for multiple situations, whether solving equations or automating machinery.

### 1.2.1 – Interface Design

Good interface design allows the user to complete their set of tasks in the most efficient way possible. Teo Siang breaks down interface design into five dimensions: words, visual representations, physical objects or space, time, and behavior (Siang, 2019). The first dimension, words, covers items like labels and buttons. When using words, it is very important the demographic of the application is known first. One must know who the demographic of the application is and use words that will appeal to them; for example, avoid jargon when designing for the layperson. The words should be simple, concise, and meaningful. Secondly, we have visual representation, which consist of images, typography, graphs, and other graphical elements. Visual representation goes hand-in-hand with words by giving them some additional life; in some cases, visuals can replace words entirely. The third dimension is physical objects or space, which deals with the type of device the user is going to be using when accessing the application or webpage.

The designer needs to know how the application is going to be accessed and create the application accordingly. The user can be on a phone, laptop, or tablet, during night or day; and since every device has its own screen resolution, the images, labels, and buttons need to be designed and placed so they will be visible in each format and properly spaced. Next is time, which deals with sound, animation, media, and user interaction. Sound, animation, and media give users the necessary responses when using the application. However, designers need to be aware of the time it takes for the sound, animation, or media to complete, because if too long or too short, the user could become uninterested and leave the application. Some users might like to see how much time they have spent on the application, and some may like to leave and return to the application in the same spot they left; it is important that the designer consider these features for users that would like them. Lastly, the dimension of behavior is essentially a combination of all previous four dimensions and how they coexist and interact with each other. This the most important dimension for post-launch support, because this dimension allows designers to receive feedback from users on what they liked and disliked and how they can improve their applications.

According to Alan Smith, there are three important laws that every designer must follow when practicing interaction design: Hick's Law, Fitts' Law, and Tesler's Law (Smith, 2018). Hick's Law was created by Edmund Hick and states that the more options users have, the longer it takes to make a decision. Designers have to take this law into account and try to limit the number of options displayed to only the most immediate options necessary to the user. Fitts' Law was created by a psychologist, and when applied to interaction design, it states that interactive buttons should be much more noticeable to the user for an easier navigation experience. Tesler's Law was created by Larry Tesler and states that as applications continuously get updated, their complexity will increase as well. The designer will need to move complexity to the background to simplify the user experience. Applying the principles of the five dimensions and three laws into interface design, the designer will be able to create a superb application design.

### 1.3 - Virtuous User Interface Design

After the many developments of user interface design, we are in an age in which some of the most complicated activities can be accomplished just with a couple presses on the screen of a phone, including filing your taxes, controlling your home security, and even monitoring your health. As we develop new user interfaces to accompany these applications, not only do we have to ask, “what is the best way to develop the UI”, but we also have to ask, “How will the user react to the UI?” This is where we introduce Virtuous User Interface Design, in which the design is based around the user’s culture and how much freedom they will have with the final UI (Marcus A., n.d). To make an effective Virtuous User Interface, we must determine if the user should have full freedom, what information is given to them, and how the user interface is presented. If we follow these principles, the user will be able to have a positive user experience.

The amount of freedom and choices a user has will have a major impact on the user experience. These choices can range from every single button on a keyboard to the number of buttons on an elevator. To understand the right amount of freedom the user should have, designers’ first need to understand what the user wants from the device. For example, a traditional soda machine and the Coke Freestyle® both serve the same purpose of dispensing ice and soda; the only fundamental difference to the user is the amount of choices they have (Tiger, A. A., Nance, W., Roach, C., & Emery, B. G., 2017). If we compare the amount of wait time these machines have, the traditional soda fountain was on average nine seconds faster than the Freestyle, but the Freestyle gave increased revenue for the quick service industry of 11 percent when it was introduced (Tiger, A. A., Nance, W., Roach, C., & Emery, B. G., 2017). When it came to profit, the Freestyle outdid the traditional soda fountain machine because users welcomed the amount of choices, even though it didn’t mean that the traditional machine was made obsolete. The traditional machine is simpler for more elderly people and is more likely used for people who like the standard flavors only. Limited choices excel in machines with short interactions and with users who have little to no experience with the product, while a large pool of choices excels in machines with long interactions and users who are highly experienced with the product (Sharp H., Rogers Y., Preece J., 2015). If the amount of choices is not properly balanced for the expected user, then the user experience may be impacted; a common example often cited is the elderly becoming frustrated with computers and smartphones.

The main purpose of virtuous user interface design is to help the user, but if information presented is handled poorly, it will merely cause more harm than good. In this day of age, we use UIs to make efficient life-critical systems and if we do not give enough information in the UI, it can lead to faulty decision-making processes.

One example of this failure is the APACHE Medical system, a disease-classification protocol used in hospitals that determines whether the patient is too ill for treatment (Weber M., 2019). This user interface design fails to give important information such as the immediate countermeasures to improve a patient’s chances to live and can lead to the immediate loss of life. If the presentation of information too simplified or too comfortable, the UI will apply to fewer people that can actually use it effectively, which defeats the purpose of the system (Weber M., 2019). The opposite is also true: having too much information can have the same effect. Having too much information on screen makes the screen look confusing and makes each part of the interface demand too much of the user’s attention (Galitz, W. O., 2007). To help optimize the information, user interface designs can categorize and use multiple screens to help share and parse information as it is needed by the user. Once the information is ready, the designer has to find the best way to present the information.

To effectively send a message, we have to choose our words wisely. This same principle is also used for virtuous user interface design, but instead of only focusing on what words are used, we also have to organize and design the layout in which the information is delivered. If this is done improperly, then the application the user interface is a part of will not work as intended. When dealing with applications such as military software, we can see how dangerous this could be. An example of a poor virtuous interface design can be seen with a missile-strike planner software that the United States military had created that contained a cute, nonaggressive dog as the help feature avatar (Cummings M.L, 2004). With millions of dollars spent on development of the missile-strike system, the dog made this software seem like a simple excel sheet instead of the life-taking weapon it is. If this was the final version of that software, then it would lessen the gravity of sending an explosive to destroy people's livelihoods and lessen the proper emotional response of using this weapon (Cummings M.L, 2004). Some ways to fix that problem would be to have multiple checks to confirm the user's actions or to use a tame color palette to make this interface look serious instead of fun.

To create the most effective medium through which to deliver information, we have to understand that humans have a tendency to anthropomorphize computers (Weber M., 2019). We can use this to our advantage to make aesthetics that play on those feelings. Video games excel at making user interfaces that relay good aesthetics, like in the game "The Sims," in which the humanization of the computer makes the player want to interact with other characters, even though all you can do is give commands to the player character (Weber M., 2019). If we build around people's expectations and design an interface that gives information in a proper way, then we can make a virtuous user interface that optimally aids the user.

When making a UI, following the principles of virtuous user interface design makes a safe and welcoming platform that will maximize utility for the user. By providing the proper amount of choices, presenting the right level of information, and displaying the data properly, the UI will be simple and understandable, encouraging proper, repeated usage. If these ideas are not followed, usability engineers may still be able to make an efficient system, but not one that will be entirely beneficial for the users (Weber M., 2019). As development of user interface design continues, proper measures must be made to keep these new designs virtuously good for everyone involved.

## **Intuitive and steady structure**

For an interface to be effectively useable and traversable, the controls and data must be spread out in a natural and reliable manner. Users are most likely all around familiar with numerous different interfaces, and designers ought to be as well, in the event that they need to accomplish multiple goals with their applications. Turning out with a completely new design for an interface may sound like a very fulfilling, potentially worldview-breaking venture; however, for every single change, a designer must consider that users need to feel comfortable. The rationale of convenience should have a major impact in the structure of any UI: the focus should be for the most-utilized controls to be predictable.

### **1.3.1 Clarity**

In the event that a user can't properly navigate an interface, all the time spent designing the product is wasted. In the visual chain of importance and substance, there ought to be no equivocation over the manner in which an interface works. One of the troubles in endeavoring towards a distinct or unique UI that stands out is balancing when to expound and when to be brief. When in doubt, the snappier and simpler, the better, so long as the UI doesn't lose any of its semantic significance. While a UI

ought to be structured so users can confidently perform actions without the assistance of a manual, it doesn't hurt to execute some assistance documentation in the event of some unforeseen issue.

### **1.3.2 High responsivity**

For a user to appreciate an interface, it can't feel as though the interface is struggling to keep up with mouse clicks and console tapping. On the off chance that the interface falls flat, designers should stay aware of user requests; failing to do so will essentially reduce a user's experience and can result in dissatisfaction, especially when attempting to perform fundamental undertakings. At every possible opportunity, the interface should move quickly in pace with the user, and where this is not feasible, a loading sign or some other effectively refreshed data ought to be exhibited to the user to prevent them from feeling "separated" from the interface. A slow-running interface can give the impression of poor or defective programming.

### **1.3.3 Maintainability**

A UI ought to have a limit to the number of updates introduced, and changes should be coordinated without causing serious interference to the user experience. For example, a designer may need to add an extra element to the product; if the interface is convoluted to the point that there is no space to add it without compromising clarity or aesthetics, this implies a defect in design.

### **1.3.4 Attractiveness**

Style is in no way, shape or form the most significant piece of an interface, and a pretty look cannot make up for a poor structure. In any case, insofar as style isn't mistaken for substance, some stylishly satisfying typography and a lovely shading plan can go far in making the user feel more at home when utilizing an interface. Once more, the style for an interface must be proper for the specific user. One may go so far as to perform some statistical surveying to decide precisely what users are searching for.

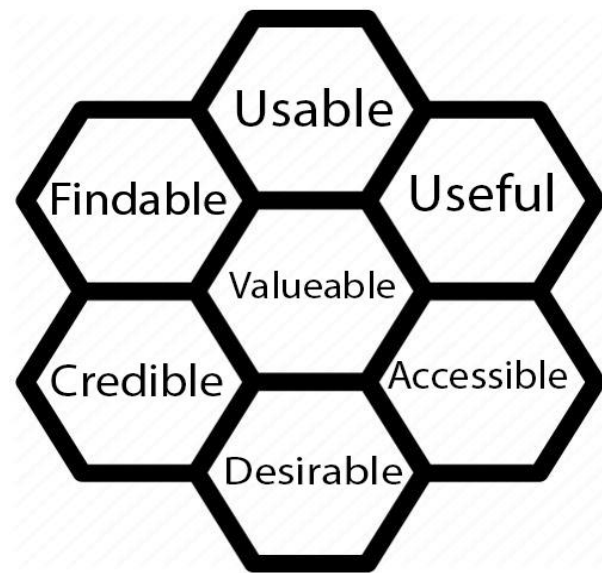
## **1.4 - User Experience**

User Experience (UX) alludes to an individual's feelings about utilizing a specific product. It incorporates the commonsense, experiential, and emotional associations that come with product ownership and use. UX incorporates an individual's impression of the entirety of the product, including utility, usability and proficiency. User experience centers on having a profound comprehension of users, what they need, what they esteem, their capacities, and their constraints. It additionally considers the business objectives of the product. UX best practices advance improving the nature of the user's collaboration with and impression of a product and its use.

UX design considers every single component that shapes this experience: how it makes the user feel and how simple it is for the user to achieve their tasks. This could be anything from how a physical item feels in the hand to how clear the checkout procedure is when purchasing something on the web. The objective of UX design is to make simple, effective, pertinent and all-around pleasant encounters for the user.

The main reason why user experience is so critical is because it is one of the key factors that can make the user hate or love the product. No matter how useful or how many features a product has, if it leaves the user frustrated, the user may prefer to use other similar software with a better user experience.

Peter Morville argues that the 7 most important key factors related to a user's experience can be shaped into a honeycomb (Figure 1.1). These traits can be described as usable, findable, useful, valuable, accessible, credible, and desirable (Moreville, 2016).



**Fig 1.1 Honey Comb UX (Kabir, 2019)**

---

## Useful

If a product, system or service isn't useful to anyone, what is the point of bringing it to the market? There would be no audience for that specific product, and it would be impossible for the product to compete in the market. Because humans by nature all think differently and prefer different things, a product by its nature can be useful to one person while being completely useless to another. A good example of this would be a product meant for entertainment. A new completely new genre of video game might be loved by some people while completely being hated by the rest.

---

## Usable

Usability is one of the most important of these factors, mainly because it allows users to work efficiently and effectively. Peter describes usability as a necessity for users but still not enough by itself for a great user experience. Usability applies to both hardware and software. A great example of this would be a Nintendo 64 controller, with buttons on both ends and a joystick in the middle; this frustrated some users when compared with recent console controllers, which are far more ergonomic with buttons and joysticks on both sides. In general, the first generation of any product may not be that usable. We can see this with MP3 players, which weren't that popular, but once the iPod came out, every household soon had a one.

---

## Findable

How easy or hard is it to find a specific product? If the product is a software then it should have content such as toolbars and menu items which are easy to find as well. If a website such as CNN has all its news on the front page instead of being divided into sections, people won't prefer going to CNN's website.

---

## Desirability

When it comes to desirability, one might wonder what it means in user experience. Simply put, desirability in user experience is conveyed through branding, image, identity, aesthetics and emotional design. Simply put, the more desirable the product is the more a user will brag about it and create a desire in other people, thus making it more popular.

---

## Accessibility

The software should be accessible by all so that people with disabilities can also use the product. To some it might come as a shock that almost 20% percent of people in the US have disabilities according to the US census. That's 20% of the people that could be your potential users. Also, it is worth nothing that in the EU, it is a legal obligation for the design to be accessible, and that not doing so can result in a hefty fine.

---

## Valuable

The product must be beneficial to its user. A product that costs \$500 and solves a \$10,000 issue will succeed, but on the other hand if a \$10,000 product solves a \$500 issue, people won't be that inclined to buy.

---

## Credible

Credibility relates to how much the user will trust the product. It can depend on a lot of things such as how long a product lasts, how long it will be supported and updated, and on whether the information provided is accurate.

### 1.4 UX Design Disciplines: The Quadrant Model

UX is a broad umbrella term that can be divided up into four main disciplines: Experience Strategy, (ExS), Interaction Design (IxD), User Research (UR) and Information Architecture (IA).

#### 1.4.1 Experience Strategy (ExS)

UX configuration isn't just about the end user; it likewise carries tremendous incentives to the business providing the product or service. UX design is tied in with conceiving an all-encompassing business process, consolidating both the user's needs and those of the organization.

#### 1.4.2 Interaction Design (IxD)

Interaction design concerns how the user operates within a framework, considering every intelligent component; for example, page changes and activities. Interaction designers look to make natural plans that enable the user to easily finish core assignments and activities.

#### 1.4.3 User Research (UR)

UX configuration is tied in with recognizing an issue and structuring the arrangement. This requires broad research and criticism from existing or potential users. During the exploration stage, UX designers will dispatch studies, lead meetings and ease of use testing, and make user personas so as to comprehend the end user's needs and goals. They assemble both subjective and quantitative information and utilize this to settle on great plan choices.



#### 1.4.4 Information Architecture (IA)

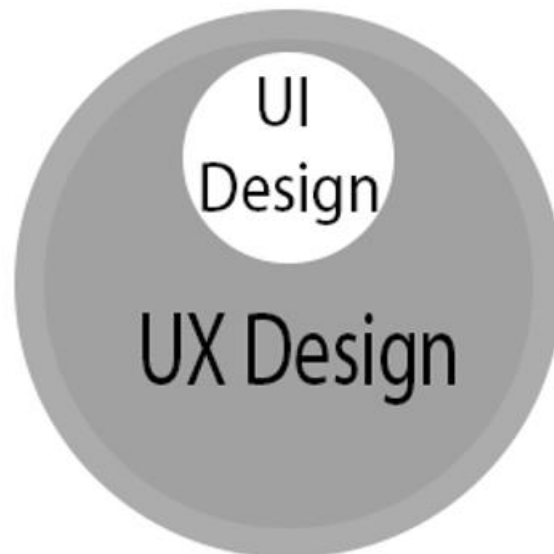
Data engineering is the act of sorting out data and substance in an important and open way. This is pivotal in helping the user to explore their way around a product. To determine the IA of some random item, data planners think about the connection between various arrangements. They likewise give close consideration to the language utilized and guarantee that it is both persuading and reliable.

#### 1.5 - Process of Interaction and Interface Design

The “Process” of Interaction and Interface design relies on the developer’s ability to understand what a user or customer needs from a UI. Simplicity is key for a successful UI. The process requires that designers maintain consistency and use common practice UI elements. Typography, color, and texture are also all essential to a proper UI to make sure the user gets the correct format: “For instance, Microsoft Windows promotes the convention that each file’s type is indicated by its extension (the part of the filename after the last period) and that an icon associated with the file type visually represents each file. The file type determines how the file will be opened when the icon is double-clicked” (Yee).

Security and usability are major qualities to consider. The three main steps are an analysis of needs, a designing phase, and then a testing phase. According to Yee, “every piece of software ultimately has a human user, even if that user is sometimes a system administrator or a programmer. Therefore, attention to usability concerns is always necessary to achieve true security.” This is where designers need to ask whether or not the UI is truly secure. The process and guidelines of interactive design go hand-in-hand. They both rely on each other in order to accomplish a proper task or inclusion within a design.

User interface design is only a component *part* of user experience design and is more towards the side of “surface and overall feel of a design.” According to the website Interaction-Design.org, one analogy is to picture UX design as a vehicle with UI design at the steering wheel.



**Fig 1.2 UI Design part of UX Design ((Kabir, 2019))**

In Figure 1.2, we show that UI design is a part of user experience design. User experience design has a lot of sub categories that all add up to become UX design, the biggest and most prominent of which is user interface design.

Interaction design, on the other hand, includes more than just software anything that is materialistic or in computer that has some sort of design is related to interaction design. There are 5 dimensions of IxD.

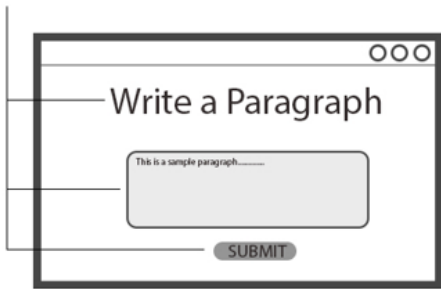
Those five dimensions of designs include

- i. (1d) Words,
- ii. (2d) Visual representations,
- iii. (3d) Physical objects space,
- iv. (4d) Time, and
- v. (5d) Behavior

These 5 dimensions were defined by Gillian Crampton Smith and Kevin Silver. (IDF, 2016).

- (1D) **Words** are text; basically, whatever the user can read without needing any interaction, such as a label. Its only purpose is to provide the user with the right amount of text.

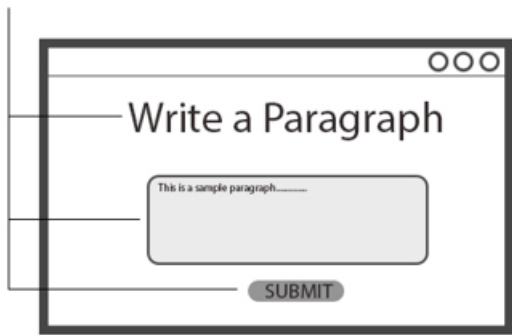
1D: Text



**Fig 1.3 UI Design 1D** ((Kabir, 2019))

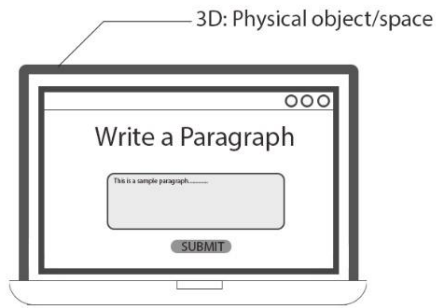
- (2D) **Visual representations** are items that include graphical elements such as images, typography and icons which help the users.

1D: Text



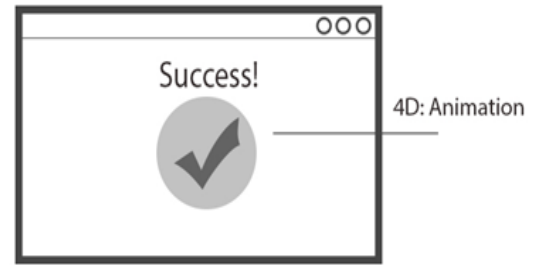
**Fig 1.4 UI Design 2D** ((Kabir, 2019))

- (3D) **Physical Objects** involve the medium through which the user interacts with the product; some examples of this would include laptops, computers, mobile phones, tablets, etc.



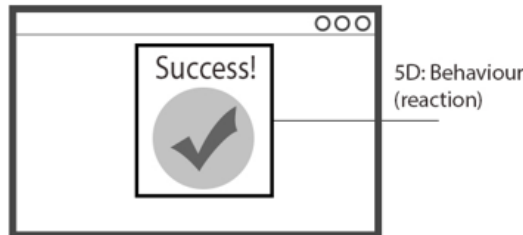
**Fig 1.5 UI Design 3D** ((Kabir, 2019))

- (4D) **Time** relates to things that change with time, such as media. This would include any animation, videos, and sound.



**Fig 1.6 UI Design 4D** ((Kabir, 2019))

- (5D) **Behavior** is how all of the previous dimensions come together and interact with each other. This also includes users' inputs and outputs based on that interaction.



**Fig 1.7 UI Design 5D** ((Kabir, 2019))

## 1.6 - Guidelines in Interaction and Interface Design

The “Guidelines” in Interaction and Interface design rely on the users’ tasks. It concerns how to minimize certain “undesired” events of what a user can do while streamlining the correct tasks accordingly: “Minimizing the risk of undesired events is a matter of controlling authorization. Accomplishing the user’s intended tasks correctly depends on good communication between the user and the system” (Yee). The user must be granted a sense of authority in order to allow them to complete their tasks within a manageable time. Accurate awareness is critical to both the user and the developer because this allows the developer to develop authority for the user when interacting with the product, while maintaining their own control over the user for appropriate interaction. Communication is critical because that allows the user to use security policies within their own tasks, while maintaining boundaries. All in all, the guidelines provide the developer necessary uses that they need to implement for users. This allows for a safe and secure interactive design for small or large scale uses (Yee).

As the development of interaction and interface design advances, developers experiment with design choices; there is no true universal set of rules on what makes good user interface designs. Instead, we have guidelines that help paint a picture on what proper interface and interaction design should look like. For example, we can compare the Shneiderman-Plaisant rules to the Nielsen-Molich rules. These two set of rules share many guidelines, including for consistency and error preventions, but some guidelines are unique to each set of rules, such as the Shneiderman-Plaisant rule of having a minimal short-term memory load or the

Nielsen-Molich rule of having a minimalist design (Johnson J., 2014). Most of these guidelines all are similar to each other, because these rules have one very common factor: psychology. All of these guidelines are based off of the human psyche, or, in other words, these guidelines are optimized based on how people perceive, learn and reason with the user interface (Johnson J., 2014). Since these guidelines are made with the user's psyche in mind, they allow the user to have the most comfort and usability. By focusing on the structure of the UI, the control that the user has, and how understandable the UI can be, these guidelines can be a tool to make design decisions that lead to the best user experience.

If a user interface is difficult to control, then the main reason to give a user interface was likely ignored in the design phase. Most of the major printed guidelines all cover how the user control should be one of the largest priorities. Consider Shneiderman and Plaisant's direction to "permit easy reversal of actions" or Stone's statement that "(The UI should be) usable by all intended users, despite handicap, access device, or environmental conditions" (Johnson J., 2014). To start looking at user control, consider the hardware involved in the user interface. Before we had the mouse, every computer user would have to use the keyboard alone to issue commands; the main problem with this is that it requires the user to memorize or constantly search commands to interact with the computer. To help solve this problem, developers made new hardware for the computer in the 1960s, including the computer mouse and the touchscreen (Hopkins, 2017). These new pieces of technology allowed the user to select a command with only one press instead of typing every single word for each command. As the hardware improved to help support more usability, the virtual side of the user interface also improved to help achieve that same goal. Since computers were advancing to accomplish even more task, the computer needed more commands to help support the new power of the device such as the ability to revert to a previous state. In fact, people such as Nielson and Mack have made specific guidelines to focus on going back on to previous states (Johnson J., 2014). The ability to go back to a previous state saved time and effort because the user did not need to restart their chain of commands to the user interface. And as time progressed, even more commands were developed, such as the ability to debug errors and have customizability on the user interface. With all of these new control guidelines made, people can learn from their interactions through continued experiences with the user interface.

For a user interface acceptable to all levels of users, it must be completely understandable to the user. Two major guidelines that are key to make the user interface understandable are the ability to give quality feedback after a command is sent and having the user interface be visually appealing (Johnson J., 2014). Many common forms of feedback are seen through sound, animations, and changes to color. The one thing that all of those three types of feedback have in common is change: either from a new sound from silence or to a new visual to catch the eye of the user.

As we look and compare each variation of guidelines, we see that there is no single, correct version. These guidelines are merely suggestions that help hone a skill instead of a hard rule to follow (Johnson J., 2014). A lot of them have many things in common, but they all are designed for the user. Some people may handle certain aspects of a user interface differently; consider designing for a deaf person not being able to hear any audio feedback. As technology evolves, so will the guidelines of user interaction and interface designs. We see this through history with the changes that many innovations that new graphical user interfaces and devices introduced like the smartphone and the laptop (Hopkins, 2017). With all of these developing guidelines, user interface and interaction designs can have a better guide for the next generation of users.

## 1.7 - Concise Summary

User interface and interaction design are among the most important steps when creating an application. They are a part of what decides whether the application is successful or not. Good interface design allows the user to complete their set of tasks in the most efficient way possible, while interaction design is designing based on how the user will interact with the product. Interface design consists of five important dimensions: words, visual representations, physical objects or space, time, and behavior (Siang, 2019) and three important laws: Hick's Law, Fitts' Law, and Tesler's Law (Smith, 2018).

Combining these dimensions and laws, a user interface design can create a successful user interface. Important principles in interaction design are instructing, conversing, manipulation, and exploring (Preece, Rogers, Sharp, 2015). When creating a design, there are five important guidelines that a designer should always follow: make sure that the design has clarity, that the design is intuitive and easy to use, and that it is highly responsive, easily maintainable, and attractive. If a designer follows these essential guidelines, then their design should come out successfully. An important aspect of interaction and interface design is how the user is going to interact with the application itself. An important model that discusses this topic is the Quadrant Model, which contains four important topics: Experience Strategy (ExS), Interaction Design (IXD), User Research (UR), and Information Architecture (IA). When a designer understands all these topics, then they will be able to create successful applications that will make the users happy and come back repeatedly.

## 1.8 - Extended Resources

### Descriptions & Links

1. Walks through the steps of how to make an application for the iOS platform. The keynote talks about important topics discussed in the paper on how to design a proper, good user interface; including: know who your audience is, try not to make an application for everyone only a specific set of users, why are you making the app and what features do you think that is needed in the app. Also, design the app so it's easy to use for the user, but looks beautiful at the same time.  
<https://developer.apple.com/videos/play/wwdc2016/805/>
2. The video talks about the broad definition of interaction design, differences between interaction design and user experience design, the five dimensions of user interaction design and the questions all designers need to know when designing an application.  
<https://www.interaction-design.org/literature/topics/interaction-design>
3. This introduction talks about the Front-End Framework “Bootstrap” which is widely used within millions of websites today. A true example of Interactive Design and setting the standards for future Interaction & Interface Design projects.  
<https://getbootstrap.com/docs/4.3/getting-started/introduction/>
4. The video talks about bad aspects of user interface design as when a check box menu purposely has certain items in the checkbox already prefilled or how a shopping cart has “recommended items” in it to get you to spend more.  
[Dark Patterns: User Interfaces Designed to Trick People](#)
5. This video shows the user Interaction Design basics of different websites built throughout the years, and compares them to see how they hold up in today’s society.  
[Interaction Design Basics](#)
6. Kabir, M. (2019, June 26). HoneyCombUX. Retrieved June 26, 2019.  
Kabir, M. (2019, July 17). 3 UI Design part of UX Design Retrieved June 26, 2019.
7. An Abridged History of UI  
<https://blog.prototypr.io/an-abridged-history-of-ui-7a1d6ce4a324>
8. User Interface Guidelines for Different Computer Applications  
<https://balsamiq.com/learn/resources/reference/ui-guidelines/>
9. Common Example UI Design Guidelines  
[https://drive.google.com/file/d/1jA7dtre\\_XnDmAvmMA8mtpDILQJoh2EZA/view?usp=sharing](https://drive.google.com/file/d/1jA7dtre_XnDmAvmMA8mtpDILQJoh2EZA/view?usp=sharing)

## 1.9 - References:

- Card, S. K., Morgan, T. P., & Newell, A. (n.d.). *The Psychology of Human-Computer Interaction*. Retrieved June 9, 2019, from <https://books.google.com/books?id=iUtaDwAAQBAJ&pg=PP13&lpg=PP13&d#v=onepage&q&f=false>
- Cummings, M.L (2004). Creating moral buffers in weapon control interface design. (2004). IEEE Technology and Society Magazine, Technology and Society Magazine, IEEE, IEEE Technol. Soc. Mag, (3), 28. <https://doi-org.proxy.kennesaw.edu/10.1109/MTAS.2004.1337888>
- Galitz, W. O. (2007). *The Essential Guide to User Interface Design : An Introduction to GUI Design Principles and Techniques* (Vol. 3rd ed). Indianapolis, IN: Wiley. Retrieved from <http://search.ebscohost.com.proxy.kennesaw.edu/login.aspx?direct=true&db=nlebk&AN=191679&site=eds-live&scope=site>
- Holzinger, A. (n.d.). Human-Computer Interaction and Knowledge Discovery (HCI-KDD): What Is the Benefit of Bringing Those Two Fields to Work Together? Retrieved June 9, 2019, from <http://www.bookmetrix.com/detail/chapter/9da25cdf-b32c-46ca-962f-46f9207d84d5#citations>
- Hopkins, A. (2017, February 2). An Abridged History of UI. Retrieved from <https://blog.prototypr.io/an-abridged-history-of-ui-7a1d6ce4a324>
- IDF, I. (n.d.). The Five Languages or Dimensions of Interaction Design. Retrieved from <https://www.interaction-design.org/literature/article/the-five-languages-or-dimensions-of-interaction-design>
- Interaction Design Basics. (2014, February 19). Retrieved June 9, 2019, from <https://www.usability.gov/what-and-why/interaction-design.html> (n.d.). Retrieved from Career Foundry: <https://careerfoundry.com/>
- Johnson, J. (2014). *Designing with the Mind in Mind: Simple Guide to Understanding User Interface Design Guidelines*. Amsterdam: Morgan Kaufmann. Retrieved from <http://search.ebscohost.com.proxy.kennesaw.edu/login.aspx?direct=true&db=e862xna&AN=550422&site=eds-live&scope=site>
- 5 aspects of a good user interface*. (n.d.). Retrieved from Argon Design: <http://www.argondesign.com/news/2014/feb/5/5-aspects-good-user-interface/>
- Fessenden, T. (2018, August 19). *Prominence-Interpretation Theory*. Retrieved from Nielsen Norman Group: <https://www.nngroup.com/articles/prominence-interpretation-theory/>
- MARCUS, A. (n.d.). Crosscurrents cultural Dimensions and Global Web User-Interface Design. Retrieved June 9, 2019, from <http://people.cs.vt.edu/~shaffer/CS6604/Papers/p32-marcus.pdf>
- Morville, P. (2016, October 11). User Experience Design. Retrieved from [http://semanticstudios.com/user\\_experience\\_design/](http://semanticstudios.com/user_experience_design/)

- Sharp H., Rogers Y., & Preece J. (2015). *Interaction design: beyond human-computer Interaction*. Wiley.
- Siang, T. (2019, June). *What is Interaction Design?* . Retrieved from Interaction Design Foundation: <https://www.interaction-design.org/literature/article/what-is-interaction-design>
- Smith, A. (2017, November 27). *What is User Experience? What Makes a Good UX Design?* Retrieved from Prototypr.io: <https://blog.prototypr.io/what-is-user-experience-what-makes-a-good-ux-design-b404bb933bd0?gi=db22876ff8eb>
- Smith, A. (2018, July 24). *A Brief Introduction To Interaction Design*. Retrieved from Usability Geek: <https://usabilitygeek.com/introduction-interaction-design/>
- Tiger, A. A., Nance, W., Roach, C., & Emery, B. G. (2017). Whats All the Fizz About? A Teaching Case Study on the Use of Coca-Cola Freestyle Machines in Quick-Service Restaurants. *Journal of Marketing Development and Competitiveness*, 11(2), 17-26.
- User Interface (UI) Design*. (n.d.). Retrieved from Interaction Design Foundation: <https://www.interaction-design.org/literature/topics/ui-design>
- YEE, K. (2005, August 5). Guidelines and Strategies for Secure Interaction Design. Retrieved, June 8, 2019, from <http://sid.toolness.org/ch13yee.pdf>

*Acknowledgement: The initial preparing of this document was supported by CS 4712*