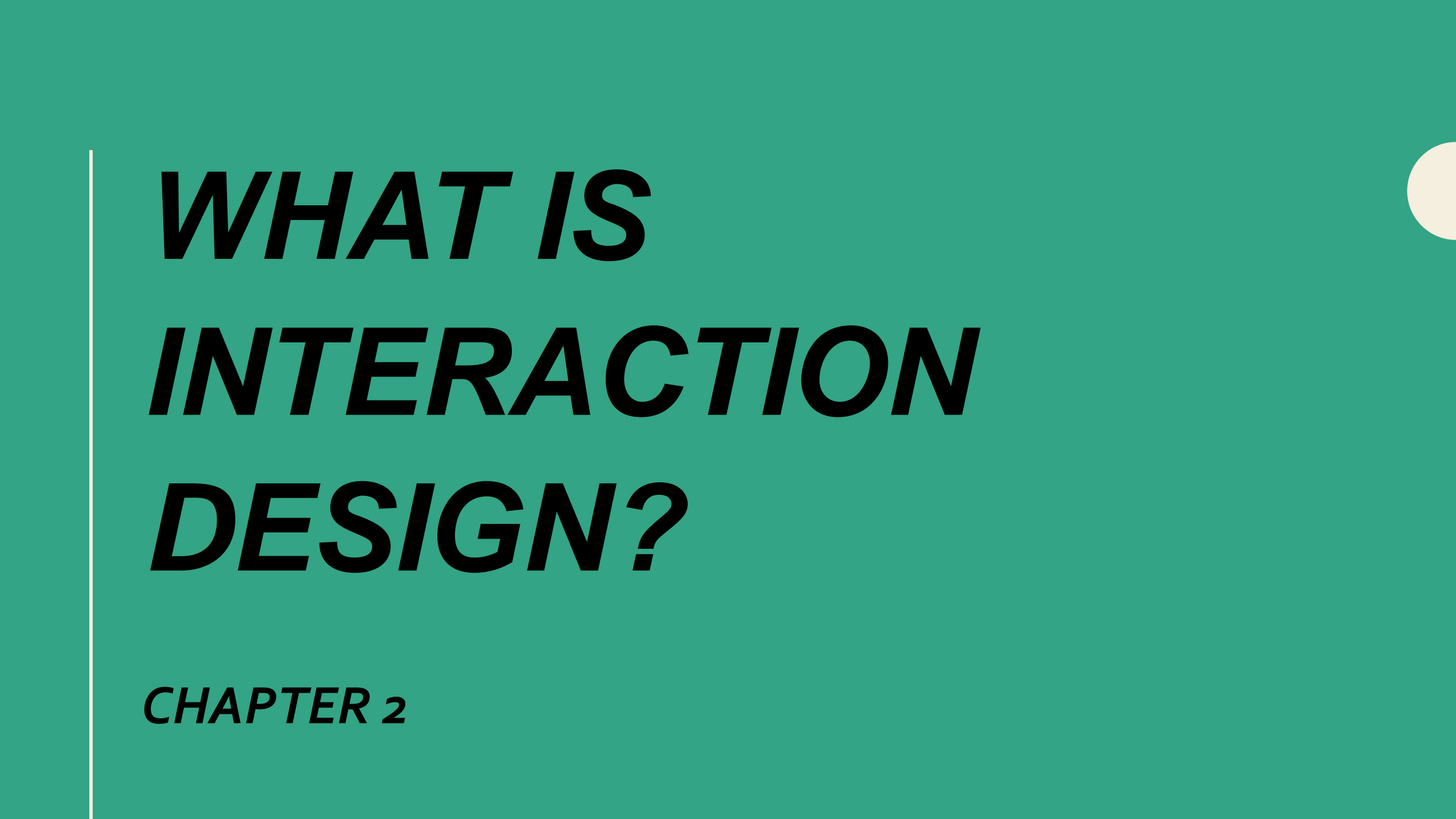# *HUMAN COMPUTER INTERACTION 1*

Ms. Deliza Grace T. Delgado

Central Philippines State University

San Carlos Campus

WHAT IS INTERACTION DESIGN?

CHAPTER 2

Learning Outcomes:

This chapter aims to:

    A. *Describe what Interaction Design is.*

    B. *Identify the people involved in the process.*

    C. *Identify the different dimensions and principles of design.*

    D. *Describe and identify the design thinking.*

    E. *Identify the difference between user interface and user experience.*

INTRODUCTION

Most of the technology products requires to interact with the users, starting from a smartphone, social networking sites to the high-end machineries. They had been designed primarily with the users in mind. One aim of these interaction design is to reduce negative aspects, such as frustrations and annoyance of the users' experiences on the certain products and to improve the positive aspects, such as enjoyment and satisfaction. In this chapter, you will be able to identify how a developer must think in order to enhance those interactive products based on the users' perspective.

PRE-TEST
Complete the definitions of the following acronyms. Choose the correct words below.

Centered **Computer** **Interaction** **Information** **Experience** **User**

Customed **Enhancement** **Designer** **Unit** **Development** **Interface**

1. HCI Human _____ Interaction

2. IxD _____ Design

3. UI _____ Interface

4. UX User _____

5. UXD User Experience _____

6. IA _____ Architect

7. UCD User _____ Design

8. UID User _____ Designer

PRE-TEST
Check (✓) the following which describe a good Design Thinking, put X if not.

_____1. Based on user experience

_____2. Based on events

_____3. Revolutionary

_____4. Think outside the box

_____5. More talk

_____6. More listen

_____7. Repeatable process

_____8. Soloed

_____9. Collaborative

_____10. Intuitive

Lesson 2.1 INTERACTION DESIGN

Interaction Design (IxD)

- is the design of interactive products and services in which the focus of the designer goes beyond the item in development on how the way users will interact with it.

- *"Interaction Design is the creation of a dialogue between a person and a product, system, or service. This dialogue is both physical and emotional in nature and is manifested in the interplay between form, function, and technology as experienced over time."* according to John Kolko.

-**is the design of the interaction between users and products.**

Who are involve in the Interaction Design?

➢ **Designers**
- ✓ They should know many different things about users, technologies, and interactions between them.
- ✓ They need to understand how people act and react to events.
- ✓ How people communicate and interact with each other
- ✓ Create engaging user experiences.
- ✓ Understand how emotions work, what is meant by aesthetics, desirability, and the role of narrative in human experience.

➢ **Developers**
- ✓ Understand the business side, the technical side, the manufacturing side, and the marketing side.

What do professionals do in the Interaction Design business?

> ➤ **Interaction Designers**
- These are people involved in the design of all the interactive aspects of a product

> ➤ **Usability Engineers**
- These are people who focus on evaluating products, using usability methods and principles

> ➤ **Web Designers**
- These are people who develop and create the visual design of websites, such as layouts

> ➤ **Information Architects (IA)**
- People who come up with ideas of how to plan and structure interactive products

> ➤ **User Experience Designers (UX)**
- These are people who do all the above but who may also carry out field studies to inform the design of products

Five Dimensions of Interactive Design

1D: Words

Words, especially those used in interactions, like button labels should be meaningful and simple to understand. They should communicate information to users, but not too much information to overwhelm the user.

2D: Visual representations

This concerns graphical elements like images, typography and icons that users interact with. These usually supplement the words used to communicate information to users.

3D: Physical objects or space

Through what physical objects do users interact with the product? A laptop, with a mouse or touchpad? Or a smartphone, with the user's fingers? And within what kind of physical space does the user do so? For instance, is the user standing in a crowded train while using the app on a smartphone, or sitting on a desk in the office surfing the website? These all affect the interaction between the user and the product

Five Dimensions of Interactive Design

4D: Time

　　While this dimension sounds a little abstract, it mostly refers to media that changes with time (animation, videos, sounds). Motion and sounds play a crucial role in giving visual and audio feedback to users' interactions. Also of concern is the amount of time a user spends interacting with the product: can users track their progress, or resume their interaction some time later?

5D: Behaviour

　　This includes the mechanism of a product: how do users perform actions on the website? How do users operate the product? In other words, it's how the previous dimensions define the interactions of a product. It also includes the reactions—for instance emotional responses or feedback—of users and the product.

Questions to Consider When Designing Interactions

Define How Users Can Interact with the Interface	• ***What can a user do with their mouse, finger, or stylus to directly interact with the interface?*** This includes pushing buttons, dragging and dropping across the interface, etc. • ***What commands can a user give, that aren't directly a part of the product, to interact with it?*** An example of an "indirect manipulation" is when a user hits "Ctrl+C", they expect to be able to copy a piece of content.
Give Users Clues about Behavior before Actions are Taken	• ***What about the appearance (color, shape, size, etc) gives the user a clue about how it may function?*** These help the user understand how it can be used. • ***What information do you provide to let a user know what will happen before they perform an action?*** These tell users what will happen if they decide to move forward with their action. This can include meaningful label on a button, instructions before a final submission, etc.
Anticipate and Mitigate Errors	• ***Are there constraints put in place to help prevent errors?*** The Poka-Yoke Principle says that placing these constraints forces the user to adjust behavior in order to move forward with their intended action. • ***Do error messages provide a way for the user to correct the problem or explain why the error occurred?*** Helpful error messages provide solutions and context.

Questions to Consider When Designing Interactions

Consider System Feedback and Response Time	• ***What feedback does a user get once an action is performed?*** When a user engages and performs an action, the system needs to respond to acknowledge the action and to let the user know what it is doing. • ***How long between an action and a product's response time?*** Responsiveness (latency) can be characterized at four levels: immediate (less than 0.1 second), stammer (0.1-1 second), interruption (1-10 seconds), and disruption (more than 10 seconds).
Strategically Think about Each Elements	• ***Are the interface elements a reasonable size to interact with?*** Fitts' Law says that elements, such as buttons, need to be big enough for a user to be able to click it. This is particularly important in a mobile context that likely includes a touch component. • ***Are edges and corners strategically being used to locate interactive elements like menus?*** Fitts' Law also states that since the edge provides a boundary that the mouse or finger cannot go beyond, it tends to be a good location for menus and buttons. • ***Are you following standards?*** Users have an understanding of how interface elements are supposed to function. You should only depart from the standards if a new way improves upon the old.

Questions to Consider When Designing Interactions

Simplify for Learnability	• ***Is information chunked into seven (plus or minus two) items at a time?*** George Miller found that people are only able to keep five to nine items in the short-term memory before they forgot or had errors. • ***Is the user's end simplified as much as possible?*** Tesler's Law of Conservation notes that you need to try to remove complexity as much as possible from the user and instead build the system to take it into account. With that said, he also notes to keep in mind that things can only be simplified to a certain point before they no longer function. • ***Are familiar formats used?*** Hick's Law states that decision time is affected by how familiar a format is for a user to follow, how familiar they are with the choices, and the number of choice they need to decide between.

Design Principles

Design principles

- are used by interaction designers to aid their thinking when designing for the user experience**.** These are generalizable abstractions intended to orient designers towards thinking about different aspects of their designs. A well-known example is **feedback: products should be designed to provide adequate feedback to the users to ensure they know what to do next in their tasks**. Another one that has become increasingly important is **findability which refers to the degree to which a particular object is easy to discover or locate – be it navigating a website, moving through a building, or finding the delete image option on a digital camera.**

- are derived from a mix of theory-based knowledge, experience, and common sense

COMMON DESIGN PRINCIPLES

- **Visibility**

    - is the basic principle that the more visible an element is, the more likely users will know about them and how to use them. Equally important is the opposite: when something is out of sight, it's difficult to know about and use.

    The skill in applying this principle is realizing that you can't make everything visible, because it'll ultimately clutter the interface but instead need to prioritize what interface elements are by far the most important for the user experience and prioritize their visibility.

COMMON DESIGN PRINCIPLES

- **Feedback**

Feedback provides acknowledgment of our interactions and information about their outcomes. We use feedback to understand where we are, our current condition or status, what we can do next, and even to know when we are finished.

Feedback should complement the experience, not complicate it. Provide feedback when people need it. It should be noticeable and meaningful. Failure to acknowledge an interaction, or provide feedback that is not noticed, can lead to unnecessary repetition of actions, mistakes, and errors.

COMMON DESIGN PRINCIPLES

- **Constraint**

     - Constraints is about limiting the range of interaction possibilities for the user to simplify the interface and guide the user to the appropriate next action. This is a case where constraints are clarifying, since they make it clear what can be done. Limitless possibilities often leave the user confused.

COMMON DESIGN PRINCIPLES

- **Consistency**

    - Consistency refers to having similar operations and similar elements for achieving similar tasks. By leveraging consistent elements throughout your entire experience, you make your experience far easier to use. This consistency is important not only within your interface, but across the many interfaces users are using across their devices.

COMMON DESIGN PRINCIPLES

- **Affordance**

    - Affordance refers to an attribute of an object that allows people to know how to use it. Essentially to afford means to give a clue. The physical button on a mouse gives a clue that it can be clicked to perform an action. When an object has strong affordances, it's very clear how to use it.

Lesson 2.2 DESIGN THINKING

Design Thinking

- is a non-linear, iterative process that teams use to understand users, challenge assumptions, redefine problems and create innovative solutions to prototype and test. It is a method that based on what people need and want, and what people like or dislike in regards to production, packaging, marketing, retailing, support and or all of them.

- is a skill that allows a designer to align what people want with what can be done, and produce a viable business strategy that creates customer value and market opportunity.

How Design Thinking Similar and Different

TRADITIONAL

- What is the right answer?

- Repeatable, proven processes

- Design For

- Think for insight

- More talk

- Stuck inside

- Data

- Events

- Talk about facts

- Soloed

- Evolutionary (bored)

DESIGN THINKING

- What is the right question?

- Intuitive, responsive practice

- Design With

- Build for insight

- More listen

- Get outside

- Stories

- Experiences

- Talk about feelings

- Collaborative

- Revolutionary (inspired)

How Design Thinking Similar and Different
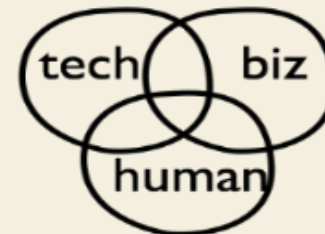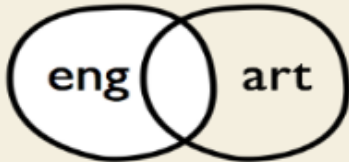
DESIGN ⟶ design thinking

individuals

products

eng art

teams

experiences

tech biz human

Design Thinking Mindset

A mindset is a person's way of thinking and opinions. A designer should have these mindsets to reach the depth of each problem. These are the following suggested mindsets and methods.

- **Human-Centered**
- **Show Don't Tell**
- **Embrace Experimentation**
- **Be Mindful of Process**
- **Craft Clarity**
- **Radical Collaboration**
- **Bias Towards Action**

Design Thinking Mindset

- **Human-Centered**
- designers must have the empathy towards people they design and getting feedback from them is fundamental to a good design. They must observe users for inspiration and testing that involves users can result to good design.

- **Show Don't Tell**
- they must communicate what they are thinking through visuals because it is more effective than words. This can be done by creating experiences using illustrative visuals and telling good stories.

- **Embrace Experimentation**
- prototyping is the integral part of the innovative process. They must think outside the box, prototype and iterate in which they think, make and learn from it.

Design Thinking Mindset

- **Be Mindful of Process**
- they must have the knowledge of the design process, where they are right now in the process, what methods to use in which phase and how to apply it to reach the goals.
  -

- **Craft Clarity**
- out of many problems found, create a clear vision about the design. Frame the vision and put it in a way to fuel ideation and to inspire other designers or developers.

- **Radical Collaboration**
- collaborate with other designers and innovators from different backgrounds, varied interests, and viewpoints. Breakthrough insights can come up when people from different fields come together.

- **Bias Towards Action**
- good design is achieved when it's actually made. Many times designers spend so much time thinking and create only one output. They should strive more towards doing and making more, iterating again and again after thinking. Doing so can also result in innovations.

Five Stages of Design Thinking
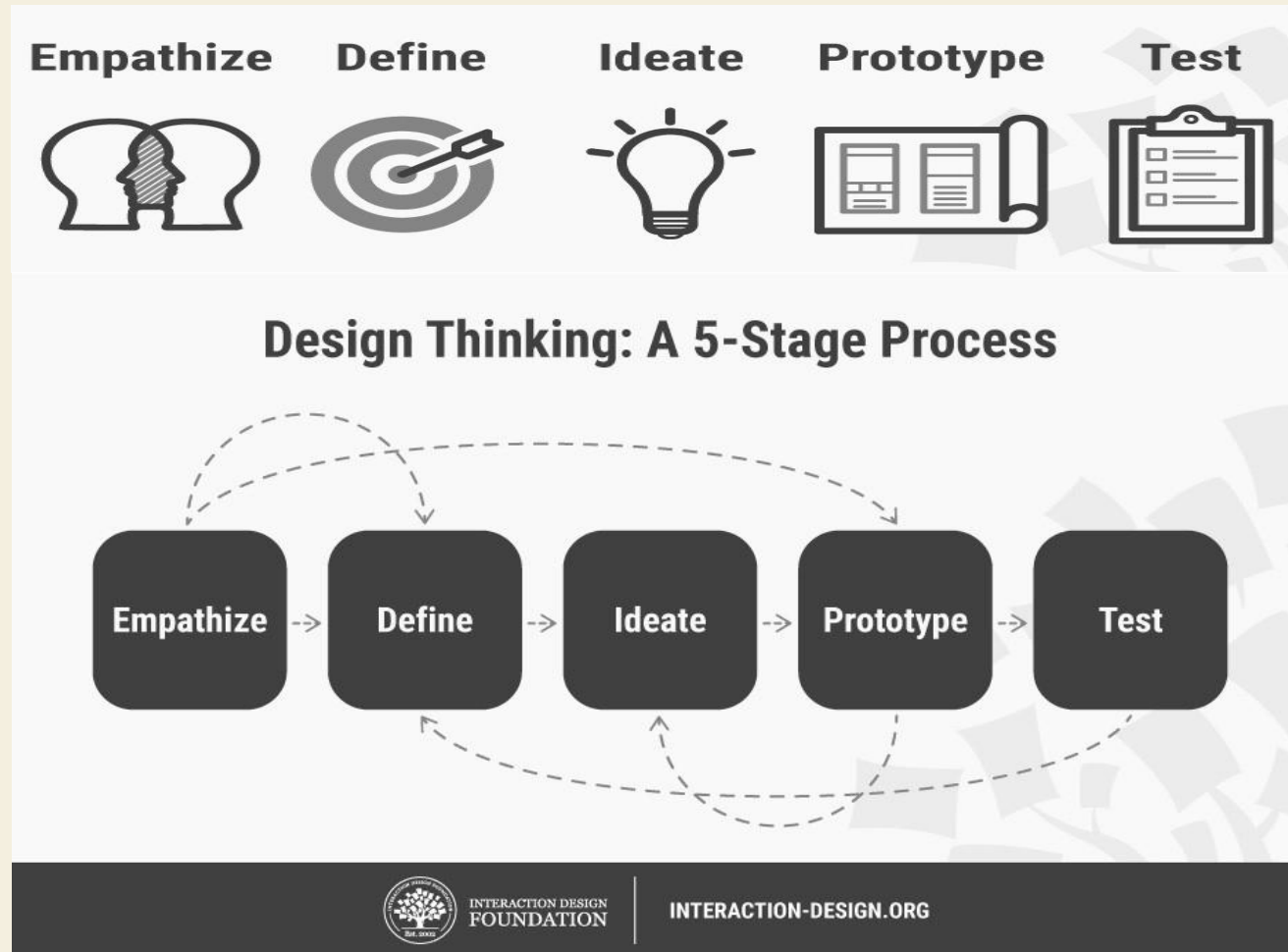
Five Stages of Design Thinking

- Stage 1: **Empathize** *– Research The Users' Needs*

- The designer should gain an empathetic understanding of the solving a problem, typically through user research. Empathy is crucial to a human-centered design process such as design thinking because it allows you to set aside the designers assumptions about the world and gain real insight into users and their needs.

Five Stages of Design Thinking

- Stage 2: **Define** – *State The Users' Needs and Problems*

- In this stage, they must accumulate the information gathered during the Empathize stage. Then they will analyze the observations and synthesize them to define the core problems the designer team have identified. These definitions are called problem statements. They can create personas to help keep their efforts human-centered before proceeding to ideation.

Five Stages of Design Thinking

- Stage 3: **Ideate** *– Challenge Assumptions And Create Ideas*

- Brainstorming is particularly useful in this stage for they will generate ideas. The solid background of knowledge from the first two phases means they can start to "think outside the box", look for alternative ways to view the problem and identify innovative solutions to the problem statement they have created.

Five Stages of Design Thinking

- Stage 4: **Prototype** – *Start To Create Solutions*

- This is an experimental phase. It aims to identify the best possible solution for each problem gathered. The designer team will produce some inexpensive, scaled-down versions of the product (or specific features found within those product) to investigate the ideas they have generated. This could involve simply paper prototyping.

Five Stages of Design Thinking

- Stage 5: **Test** – *Try The Solutions Out*

- In this stage, evaluators rigorously test the prototypes. Although this is the final stage, design thinking is iterative: designer teams often use the results to redefine one or more further problems that will exist. So, they can return to previous stages to make further iterations, alterations and refinements – to find or rule out alternative solutions

Lesson 2.3 USER INTERFACE

User Interface

"The way that you accomplish tasks with a product – what you do and how it responds –that's the interface" — *Jef Raskin*

A good interaction design is always learnable. According to a research, most users will search for another website to complete their task if content is not optimized and also site users are less likely to return to a website after a negative experiences. A User Interface (UI) in a modern application is not about how it looks but how it works. Interface itself is the product and its primary aim to the user it to communicate. The main goal of UI design is simple and elegant, clear and consistent

What Makes A Great User Interface?

1. **CLARITY**: The interface avoids ambiguity by making everything clear through language, flow, visual elements. Clear interfaces don't need manuals. They also ensure users make less mistakes while using them.

2. **CONCISION**: Crowded Screen. The real challenge in making a great interface is to make it concise and clear at the same time.

3. **FAMILIARITY**: Something is familiar when you recall a previous encounter you've had with it. Even if someone uses an interface for the first time, certain elements can still be familiar.

4. **RESPONSIVENESS**: Responsiveness means **speed**: a good interface should not feel sluggish. Secondly, the interface should provide **good feedback** to the user about what's happening and whether the user's input is being successfully processed.

What Makes A Great User Interface?

5. **CONSISTENCY**: It allows users to recognize usage patterns. Once your users learn how certain parts of the interface work, they can apply this knowledge to new areas and features, provided that the user interface there is consistent with what they already know.

6. **AESTHETICS**: Making something look good will make the time your users spend using your application more **enjoyable**; and **happier users** can only be a good thing.

7. **EFFICIENCY**: Time is money, and a great interface should make **the user more productive** through **shortcuts** and good design. The core benefits of technology: **it allows us to perform tasks with less time** and effort by doing most of the work for us.

8. **FORGIVENESS**: Everyone makes mistakes, and how your **application handles those mistakes will be a test of its overall quality.** Is it easy to undo actions? Is it easy to recover deleted files? A good interface **should not punish users** for their mistakes but should instead provide the **means to remedy them.**

Visual Interface Design

Visual Interface Design is the process of designing the physical representation of your interface as your users would see it on the screen of their electronic device.

The objective of visual interface design is to **communicate meaning**, which is done by **crafting appropriate visuals** that best represent what the application does and how it can be operated

Main Building Blocks of Visual Interface Design

- **Layout And Positioning**
- **Shape And Size**
- **Color**
- **Contrast**
- **Texture**

Main Building Blocks of Visual Interface Design

- **Layout And Positioning**

  - Layout provides structure.

  - It also defines hierarchy and relationships through the spacing between elements.

  - Bringing elements closer together indicates a relationship between them; for example, labels under icons.

  - Positioning can improve flow, too. For example, positioning labels in forms above text fields, rather than to the left, allows us to move our eyes down them easily, rather than have to keep looking left to check which label applies to which field.

Main Building Blocks of Visual Interface Design

- ## **Shape And Size**

- **Shape** can be used to differentiate elements; for example, by varying the silhouettes of icons to make them easier and quicker to recognize.

- **Size** can be used to indicate importance, bigger elements being more significant. Size can also make clickable controls more usable;

- **Fitt's law** tells us that the bigger a clickable area is, the quicker users can move their mouse cursor over it. Making the most frequently used controls bigger will make it easier for your users to click on them, and thus improve the efficiency of the interface.

Main Building Blocks of Visual Interface Design

- **Color**

- Color can **attract attention**, provided that it contrasts enough with the background (for example, a bright-yellow notice box on a white background).
- Color can **express meaning.** For example, red usually symbolizes danger or stopping (as at a traffic light) and so is best reserved for error messages; while green generally tends to mean success or an invitation to proceed and so should be used for content of this kind.
- Color can also highlight relationships, such as color coding things like buttons and toolbars to aid the user.

• First, **different cultures** will associate different things with colors, so make sure that any meaning you intend to communicate with your color selection works in your markets.

• Secondly, don't forget about **color-blindness;** take extra care when differentiating items through color, like bars on a chart. If a user is color-blind, they may not be able to distinguish between certain colors, most often red and green, so you may need to use other indicators, such as shape and texture, as well.

Main Building Blocks of Visual Interface Design

- ## **Contrast**

  - **How light or dark something** is in relation to the elements around it will have an effect on the usability of an interface. The key here is contrast. **Black text on a white background has a higher contrast**, and is easier to spot and read, than gray text on a white background. Tuning down the contrast of certain elements allows you to fade them into the background, letting the user differentiate between more important and less important elements.

Main Building Blocks of Visual Interface Design

- ## Texture

  - There is a concept in interactive design called affordance. Affordance is the quality that communicates to the user how something is meant to be used. To indicate that you can click and drag it, a set of ridges usually appears on it, illustrating a rougher texture. Rough textures are often used to add a stronger grip surface to real-life objects to help us pull them with our fingers, and that idea is translated onto the screen, where instead of fingers you would use a mouse cursor.

Lesson 2.3 USER EXPERIENCE

- **User Experience**

- User Experience (UX) is the quality of experience a person has when interacting with a specific design. It is the central focus to the interaction design, how a product behaves and is used by the people in the real world and how people feel about a product and their pleasure and satisfaction when using it, looking at it, holding it, and opening or closing it.

Main Building Blocks of Visual Interface Design

UX Designers consider the Why, What and How of Product Use

As a UX designer, you should consider the **Why, What and How** of product use.

- The *Why* involves the users' motivations for adopting a product, whether they relate to a task they wish to perform with it or to values and views which users associate with the ownership and use of the product.
- The *What* addresses the things people can do with a product—its functionality.
- Finally, the *How* relates to the design of functionality in an accessible and aesthetically pleasant way.

Factors That Influence User Experience

At the core of UX is ensuring that users find value in what you are providing to them. Peter Morville represents this through his **User Experience Honeycomb.**

Useful: Your content should be original and fulfill a need

Usable: Site must be easy to use

Desirable: Image, identity, brand, and other design elements are used to evoke emotion and appreciation

Findable: Content needs to be navigable and locatable onsite and offsite

Accessible: Content needs to be accessible to people with disabilities

Credible: Users must trust and believe what you tell them

User Experience vs User Interface

User Experience vs User Interface

The user interface (UI) is the series of screens, pages, and visual elements—like buttons and icons—that enable a person to interact with a product or service. User experience (UX), on the other hand, is the internal experience that a person has as they interact with every aspect of a company's products and services. UX evolved as a result of the improvements to UI. Once there was something for users to interact with, their experience, whether positive, negative, or neutral, changed how users felt about those interactions.

User Experience vs User Interface
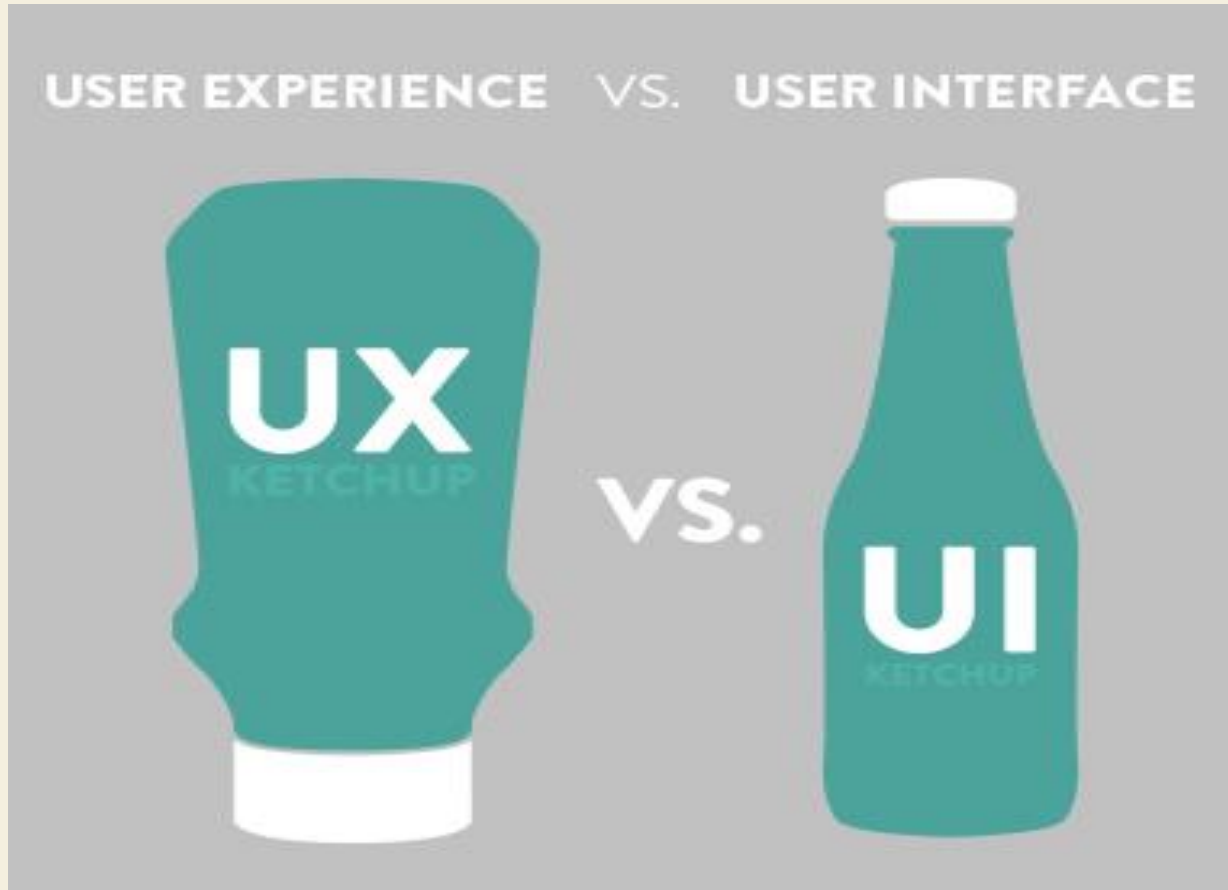
In terms of functionality, **UI is how things look, UX is how things work. UX is a process, while UI is a deliverable**. But people easily confuse the two since they tend to have a symbiotic relationship

Four Core Threads

Four Core Threads

The threads are meant as ideas to help designers think and talk more clearly and concretely about the relationship between technology and experience. By describing an experience in terms of its interconnected aspects, the framework can aid thinking about the whole experience of a technology rather than as fragmented aspects, e.g. its usability, its marketability, or its utility.

Four Core Threads

- **Sensual Thread**

- is concerned with our sensory engagement with situation and is similar to visceral level of Norman's model (2004).

- **Emotional Threads**

- involve common human emotions, such as sorrow, anger, happiness etc. may be influenced during product use.

- **Compositional Thread**

- refers to narrative part of product experience; as it unfolds the way a person make sense of them.

- **Spatio-temporal Thread**

- is concerned with the space and time in which our experiences take place and effect of their influencing factors.

THANK YOU! BE SAFE EVERYONE ☺

Ms. Deliza Grace T. Delgado

Central Philippines State University

San Carlos Campus