

# Week 2-2 UX and Usability

SFWRENG 4HC3/6HC3 Human Computer Interfaces

*\* Slides adapted from previous instructors of COMPSCI/SFWRENG  
4HC3/6HC3*

# Review Question

## **Scenario:**

Imagine a user is shopping on an e-commerce website (e.g., Amazon). They add several items to their shopping cart and proceed to the checkout process. However, when they attempt to complete the purchase, they encounter an error message that says, "Transaction failed due to an issue."

**Is this a scenario of Gulf of Execution or Gulf of Evaluation?**

# Gulf of Execution & Evaluation

A **Gulf of Execution** arises when the **user** has difficulties **providing instructions** that are executable **by the system**

A **Gulf of Evaluation** arises when the **user** has trouble **interpreting system output** in light of their goals

# Review Question

## Scenario:

Imagine a user is shopping on an e-commerce website (e.g., Amazon). They add several items to their shopping cart and proceed to the checkout process. However, when they attempt to complete the purchase, they encounter an error message that says, "Transaction failed due to **an issue**."

The goal is **not** achieved

But can user **evaluate** how much progress they made?

# Practice: Computer Desktop Design

Assume a MacOS user who has never used Windows before, and wants to clean up their Desktop in Windows

1. Use Stages of Action to analyze the user's interaction with the system
2. With the stages of action, think about how does the current design of the desktop interface minimize the gulfs?



# Week 2 Goals

- Monday
  - ~~Interface and Interaction~~
- Wednesday
  - **Usability and UX**
    - **Usability Goals**
    - **UX Goals**
- Friday
  - Design Principles: Part 1

# Usability Goals

## Example:

Designing a drawing tool for creatives that promotes **efficiency** and **creativity**.

# Usability Goals

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Designing a drawing tool for creatives that promotes **efficiency** and **creativity**.

These primary objectives are referred as **usability goals** and **user experience goals**

A **user experience goal** is concerned with the quality of the user's experience with the system

A **usability goal** addresses the issue of meeting a specific usability criteria

# Usability Goals

Designing user interactions requires **identifying important usability goals** for the system

Common usability goals:

- Effectiveness
- Efficiency
- Safety
- Utility
- Learnability
- Memorability

# Usability Goals

Designing user interactions requires **identifying important usability goals** for the system

Parts of a system may have different goals:

- Accounting routines (efficient, safe)
- Scheduling routine (memorable)

Common usability goals:

- Effectiveness
- Efficiency
- Safety
- Utility
- Learnability
- Memorability

# Usability Goals

Each **usability goal** is typically **operationalized** as a question

**Usability criteria** refers to something that can be measured to determine if **the goal** is being met

e.g., Efficiency - task completion time

A more concrete way for a designer to tell if they are meeting the goal

# Usability Goals

**Common goals:** Effectiveness, Efficiency, Safety, Utility, Learnability, Memorability

They are not necessarily **obvious** in the design process:

- Needs explicit consideration, or it gets glossed over
- How do you measure it? Don't rely on "common sense"
- You often need to make trade-offs

# Usability Goals: Effectiveness

Most general goal,  
Concerned with **whether the system is doing** what it generally says it will do

## **Example:**

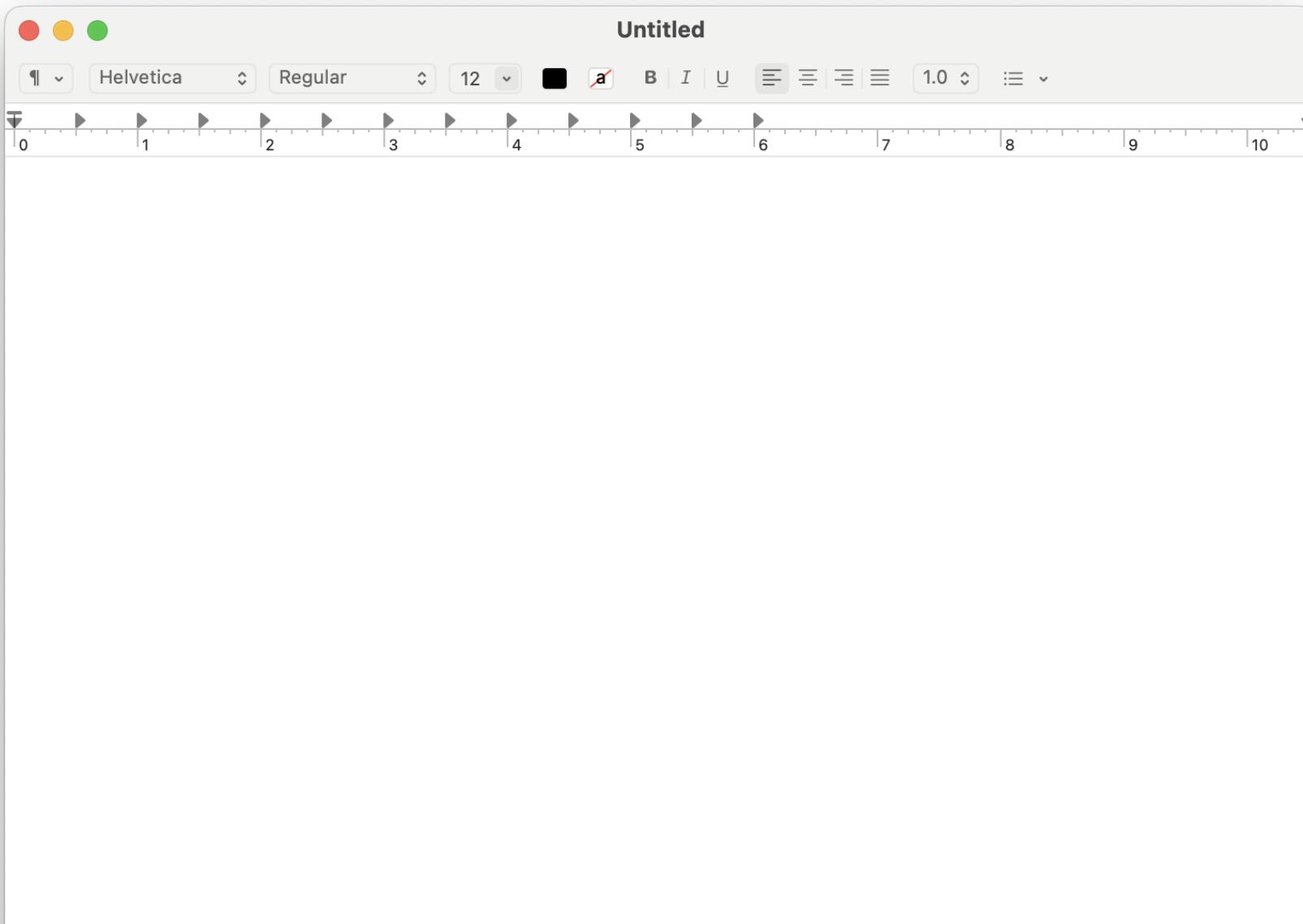
- Word processor
- E-commerce system

**Question:**  
is the system doing what it is supposed to do?

## **Criteria:**

degree to which user's goals were met successfully by the system

# Effectiveness: Example #1



# Usability Goal: Efficiency



Considers **how much time** it will take users to perform their tasks

Generally the **more steps** it takes to carry out a task, the less efficient a system is

## Example:

- Visual Voice mail
- Amazon e-commerce

## Question:

is the user saving time/being productive with the system?

## Criteria:

time to complete a task; # of operations to complete a task

# Efficiency: Example #2

The screenshot shows the McMaster University Mosaic Home page with a dark grey background and a red header bar. The header bar includes the McMaster University logo, a dropdown menu labeled 'Mosaic Home', and several icons for navigation and notifications.

The page is organized into a grid of service tiles:

- Manage Exams**: Icon of a blue square with an arrow pointing up-right.
- Mosaic News**:
  - Icon of a red folder.
  - Text: July Month End is Closed  
Financial Affairs. 08/05/2022
  - Icon of a blue credit card.
  - Text: July 2022 PCard transactions available  
Financial Affairs 08/04/2022
- MacID and Email**: Icon of an orange key.
- Faculty Center**: Icon of an open book.
- My Research**: Icon of three stacked books.
- COVID Positive Case Reporting**: Icon of a red square with a white cross.
- Regulatory Training**: Icon of a clipboard with a green checkmark.
  - Text: Health and Safety, AODA, Privacy, and Regulatory training
- To Employee Self Service**: Icon of green dollar bills.
  - Text: Employee access to Benefits, Payroll, Tax Slips and more
- Career Opportunities**: Icon of a resume and a blue grid.
- Support and Documentation**: Icon of a blue circle with a white question mark.

A navigation bar at the bottom contains five small circular dots.

# Usability Goal: Safety

Does the system...

- **prevent** you from making serious/unrecoverable errors?
- **provide** means of recovering from errors?
  - e.g., undo options, confirmation dialogs
- **protect** users from dangerous and undesirable conditions?

## Example:

Sending and recall a message

## Question:

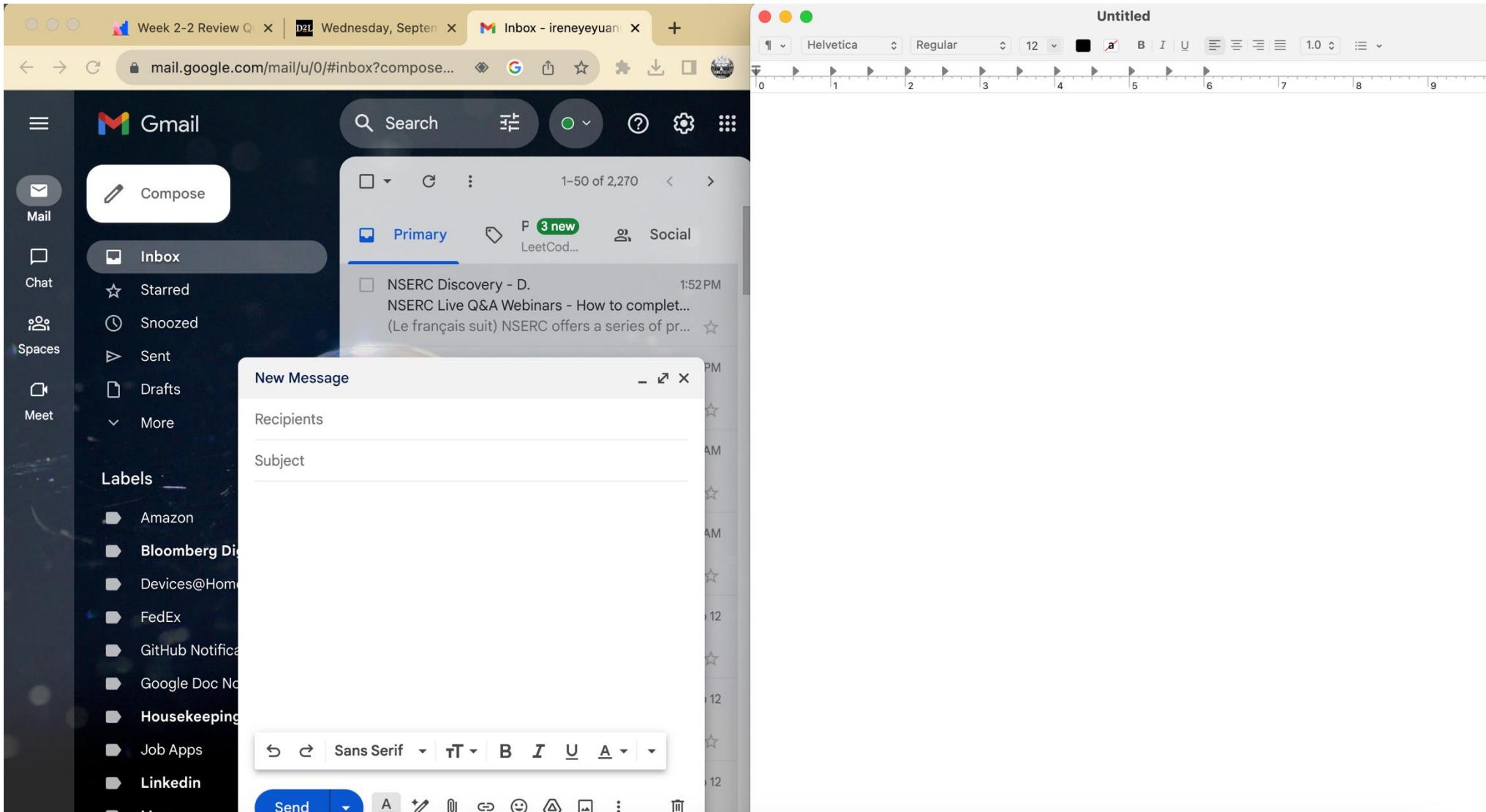
Does it prevent users from making/recovering from serious errors?

Does it jeopardize the well-being of the user or others?

## Criteria:

number of errors/time to recover from errors

# Safety: Example #3



# Usability Goal: Utility

Provide sufficient functionality to accommodate range of users' tasks, without complex workarounds or hacks

Will the system provide sufficient fluidity to cover tasks as performed?

## **Example:**

- Accounting packages
- Drawing tools

## **Question:**

Does it provide sufficient functionality for users to carry out tasks as naturally as possible?

## **Criteria:**

availability of core tasks

# Utility: Example #4

A screenshot of Microsoft Word's ribbon interface titled "Document1 - Microsoft Word (Trial)". The "Home" tab is selected. In the center of the screen, there is a large, semi-transparent color palette dropdown menu. The menu has several sections: "Theme Colors" with a grid of 12 colors, "Standard Colors" with a grid of 12 colors, "More Colors...", and "Gradient". The background of the Word window shows some text in orange and black, and the status bar at the bottom indicates "Font: Arial, Size: 20, Color: Black".

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# Usability Goal: Learnability

How easy is the system to learn?

Need to identify how much time users are willing to spend to learn the system

## Example:

- iPhone
- AutoCAD

## Question:

can primary (core) and secondary tasks be learned quickly and easily?

## Criteria:

time to learn a task, errors made in learning a task

# Learnability: Example #5

The image shows the Amazon.com homepage. At the top, there is a dark navigation bar with the Amazon logo, a search bar, and links for "Departments", "Go", "Your Account", "Help", and "Cart". The main content area has a light blue background. In the center, there is a promotional image for "Alexa" featuring a tablet displaying a video call with a family, a blue Echo speaker, and a Fire TV device. Below this central image are four rectangular promotional boxes:

- Extra 30% off select Fashion**: Shows a man and two children standing outdoors.
- Women's fashion**: Shows a variety of women's clothing items like a blue top, a colorful patterned top, white pants, and pink shorts.
- Home store**: Shows a living room interior with a green sofa, a floor lamp, and a window.
- Men's shoes**: Shows several pairs of men's shoes, including loafers and slides.

At the bottom of each promotional box is a link: "See more", "Update your wardrobe", "Explore now", and "Shop the latest styles".

# Usability Goal: Memorability

Once learned, **how easy** is the system to remember?

- Particularly important if system will be used infrequently
- Can users remember how to use the system (with the aids of appropriately designed icons, command groupings, etc.)

## Example:

- interface of digital camera



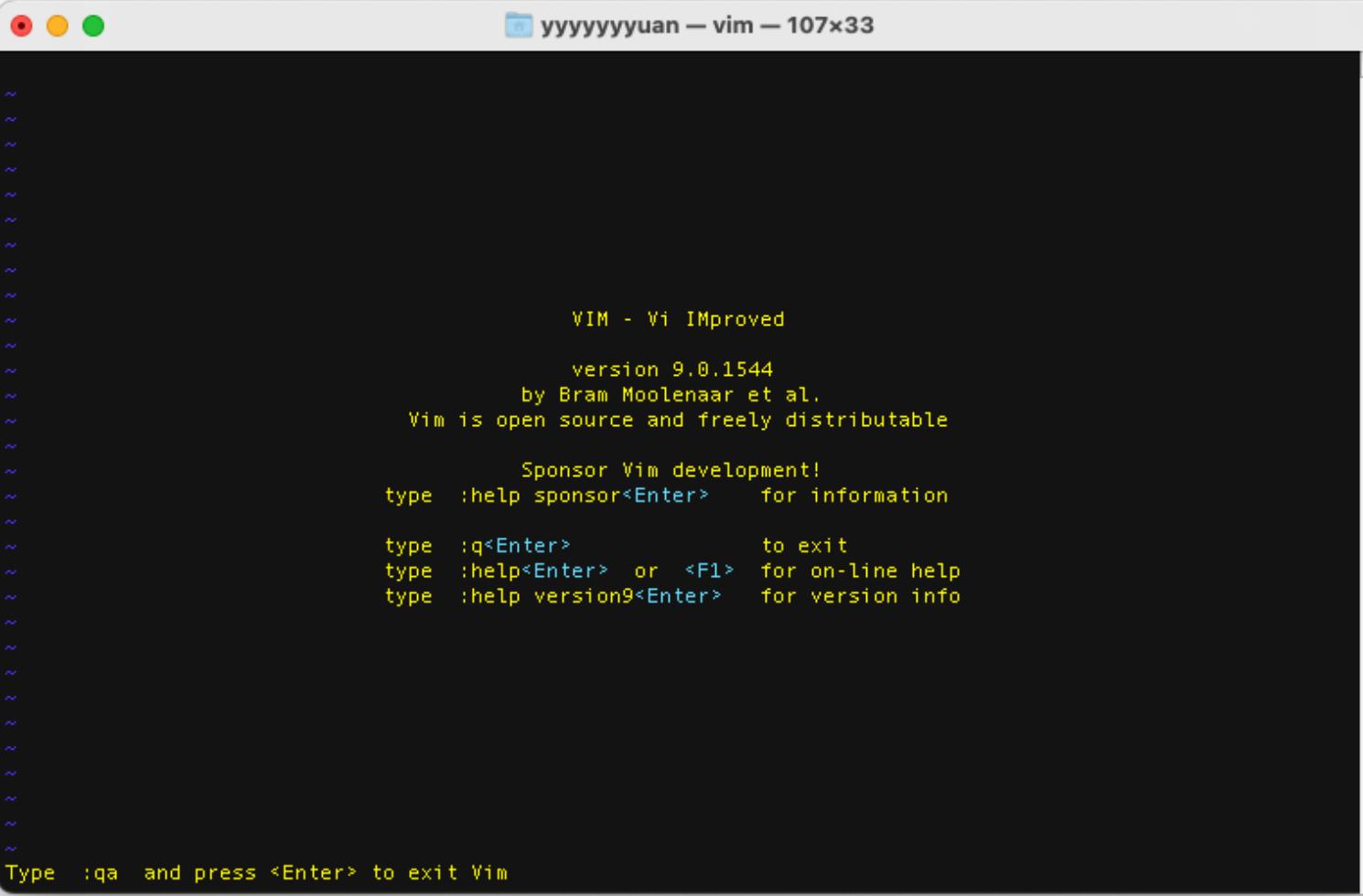
## Question:

will users remember all the steps to carrying out a task?

## Criteria:

errors made in carrying out a task after system is learned

# Memorability: Example #6



VIM - Vi IMproved  
version 9.0.1544  
by Bram Moolenaar et al.  
Vim is open source and freely distributable  
  
Sponsor Vim development!  
type :help sponsor<Enter> for information  
  
type :q<Enter> to exit  
type :help<Enter> or <F1> for on-line help  
type :help version9<Enter> for version info  
  
Type :qa and press <Enter> to exit Vim

# Quick Discussion

**Pair up and take 3 minutes to discuss these examples:**

How long should it take to **learn** to use the following products?  
How long does it actually **take**? How **memorable** are they?

- a) Using a DVD/Blu-ray to watch a movie
- b) Using an authoring tool to create a simple website
- c) Setting up a wireless router

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# User Experience Goals

One goal could be to build systems that are  
**more than usable**

That also enhance the user's experience

**User experience goals** relate to how the user  
**feels** using the system

# User Experience Goals

While **usability** is mostly about being able to do things

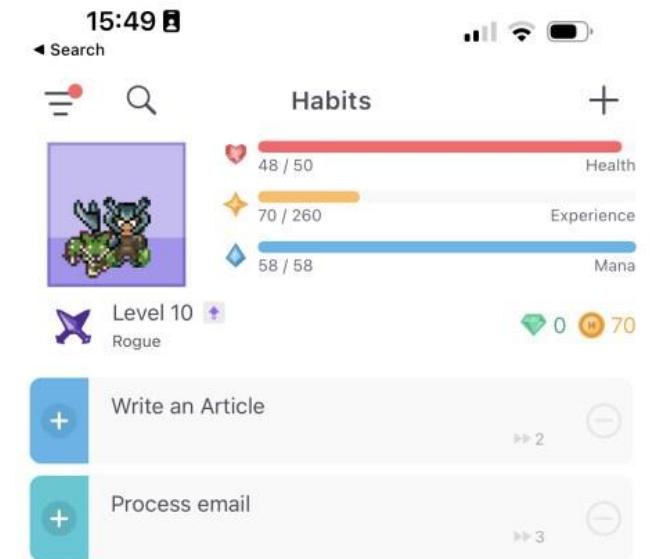
But, humans have emotions and mental states

- boredom
- frustration
- anger
- engagement
- etc

These also impact **how successful** an interface is

# User Experience Goals Examples

- **Satisfying** – feel good using the system
  - e.g., productive
- **Motivating** – did not feel like giving up
  - e.g., gamification
- **Enjoyable** – fun, lack of frustrations
  - e.g., software for boring things like taxes
- **Aesthetically pleasing** – good visual design
  - e.g., nice to look at, design facilitates use
- **Fun**
  - e.g., excited about using it again



# User Experience Goals Examples

- **Supports creativity** – varied ways of doing tasks
- **Entertaining** – keeps your attention
- **Rewarding** – feel better while using it
- **Helpful** – clueless but still made it through
- **Emotionally fulfilling** – evokes positive emotions

# Usability vs. UX Goals

Do these two sets of goals overlap?

YES, they are tightly intertwined:

- Something that is **fun** to use is more **learnable**
- Something that is **frustrating** may lead to more **errors**
- Something that does not **support creativity** may not be **productive**

# Practice Examples

What are the **key usability and user experience goals** of these systems?

1. an **Internet application** that allows the general public to access their medical records
2. a **CAD system** for architects and engineers
3. an **online community to support** people who are facing various long-term health conditions (e.g., cancer treatment)

# Example #1

an Internet application that allows the general public to access their medical records

## Usability

- Effectiveness
- Efficiency
- Safety
- Utility
- Learnability
- Memorability

## User experience

- Satisfying
- Motivating
- Enjoyable
- Aesthetically pleasing
- Fun
- Supportive of creativity
- Entertaining
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# Example #1

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# Example #2

a CAD system for architects and engineers

## Usability

- Effectiveness
- Efficiency
- Safety
- Utility
- Learnability
- Memorability

## User experience

- Satisfying
- Motivating
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# Example #2

a CAD system for architects and engineers

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- Effectiveness
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## User experience

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- **Aesthetically pleasing**
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# Practice

an online community to support people who are facing various long-term health conditions (e.g., cancer treatment)

## Usability

- Effectiveness
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## User experience

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