



CPSC 100

Computational Thinking

Internet

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University of British Columbia

Agenda

- Usability Heuristics Continued
- Project Milestone 1: Group Formation
- Mid-Course Feedback
- Internet and Dark Patterns



Learning Goals

After this **today's lecture**, you should be able to:

- **Understand** and describe the **last five usability heuristics** proposed by Jakob Nielsen.
- **Explain why** each heuristic is important in designing usable systems.
- **Illustrate** how each heuristic appears (or is violated) in real-world interfaces using provided examples.
- **Compare and contrast** different heuristics using concrete UI examples to determine which are adhered to or violated.



Q: Which heuristic does this interface violate?

- A. Visibility of System Status
- B. Match between System & Real World
- C. User Control and Freedom
- D. Consistency and Standards
- E. Error Prevention

Would you mind answering a few questions to help us learn more about you and improve our service?

Continue



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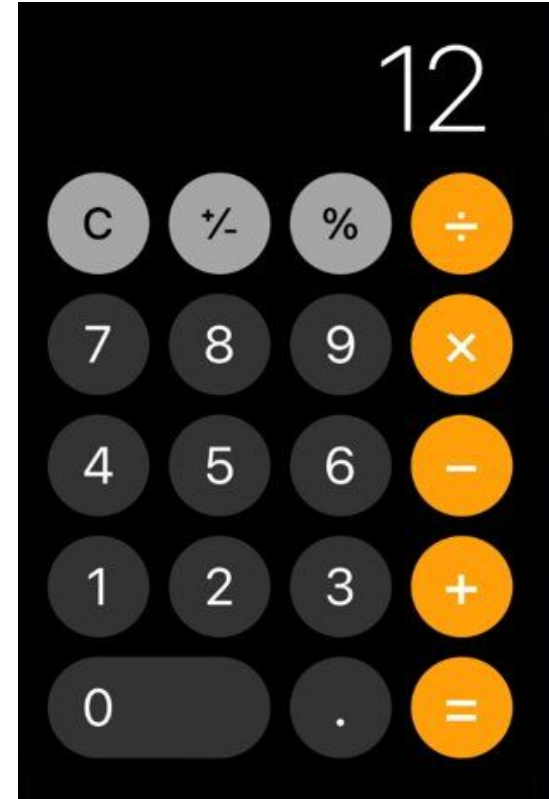




iClicker

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iClicker

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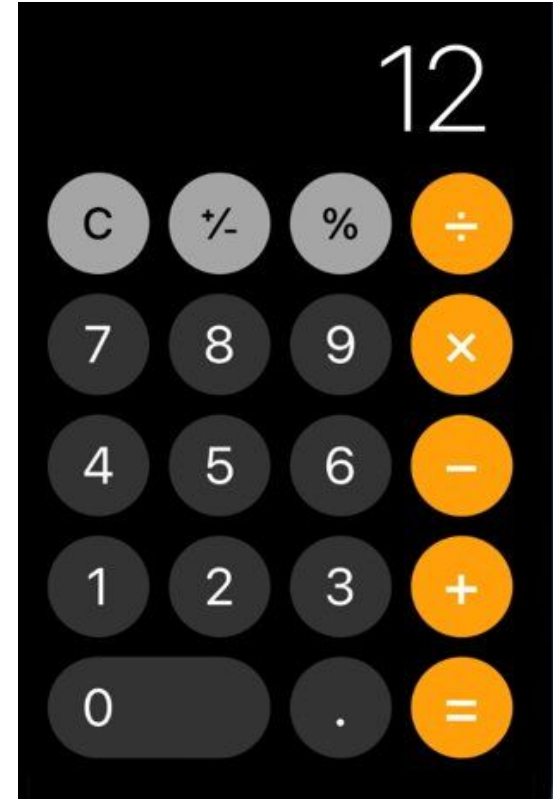
A. Visibility of System Status

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C. User Control and Freedom

D. Consistency and Standards

E. Error Prevention



Usability Heuristics

10 Usability Heuristics (Nielsen, 1993)



Visibility of
System Status

1



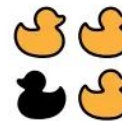
Match Between
System & Real World

2



User Control
And Freedom

3



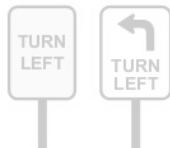
Consistency
And Standards

4



Error
Prevention

5



Recognition
Rather Than Recall

6



Flexibility And
Efficiency of Use

7



Aesthetic And
Minimalistic Design

8



Help Users
With Errors

9



Help And
Documentation

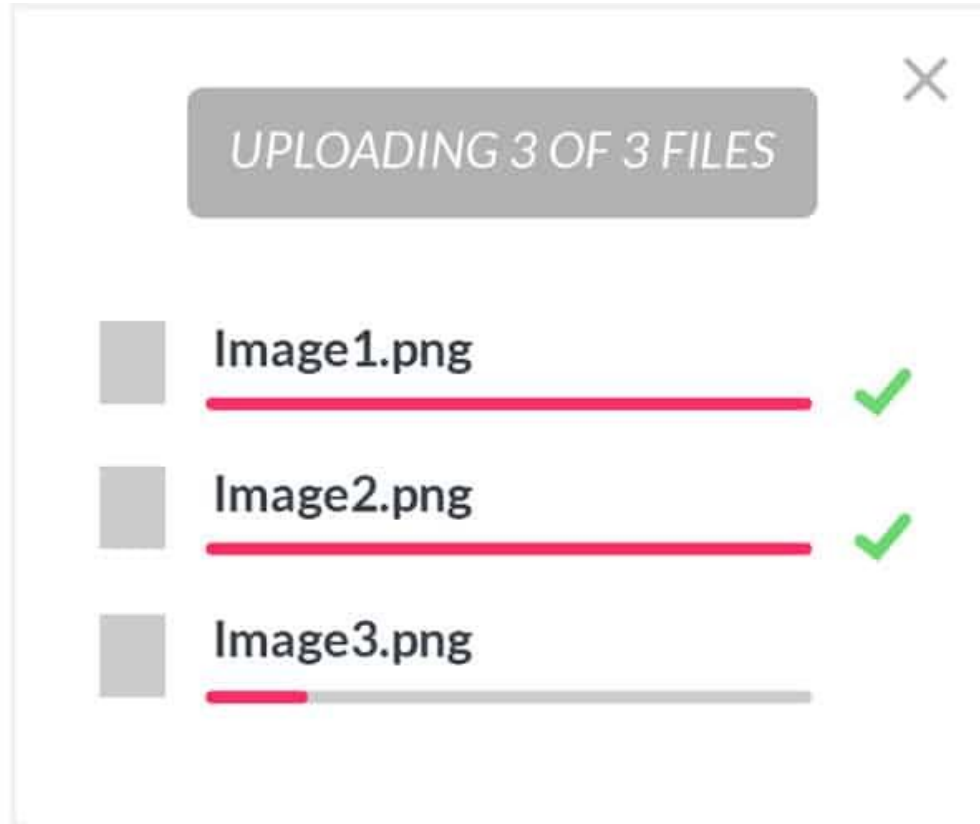
10

1. Visibility of system status



Visibility of
System Status

1



2. Match System + Real world



Match Between
System & Real World

2



2. Match System + Real world



Match Between
System & Real World

2

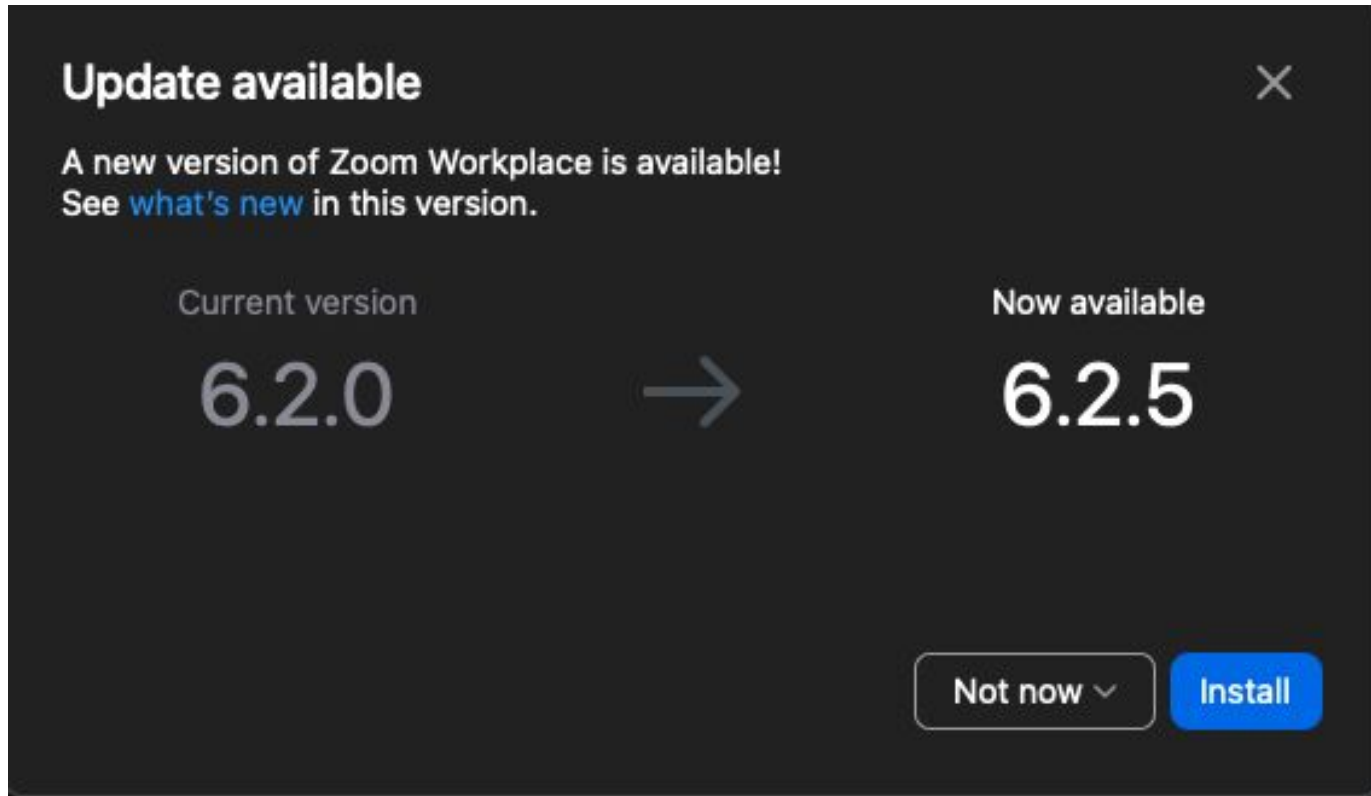


3. User control + Freedom



Visibility of
System Status

1

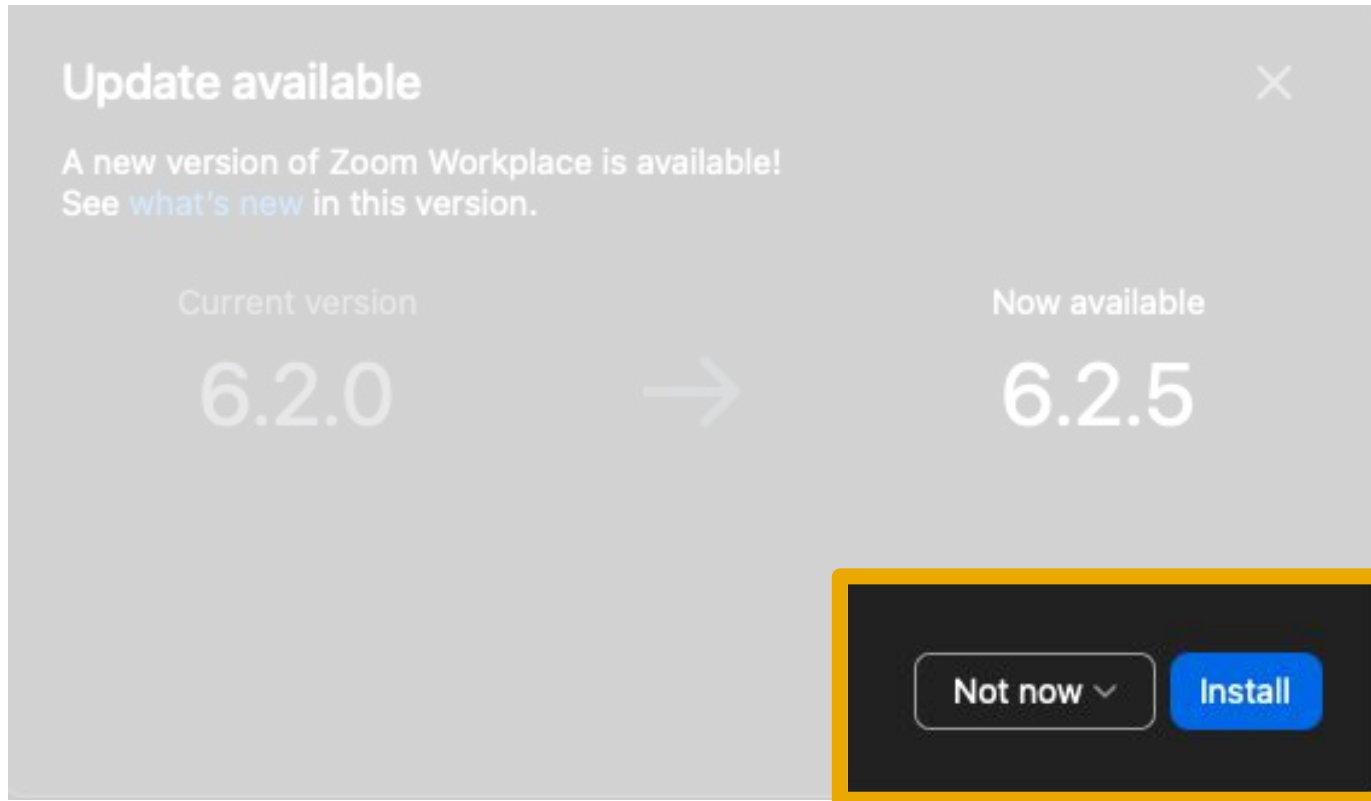


3. User control + Freedom



Visibility of
System Status

1

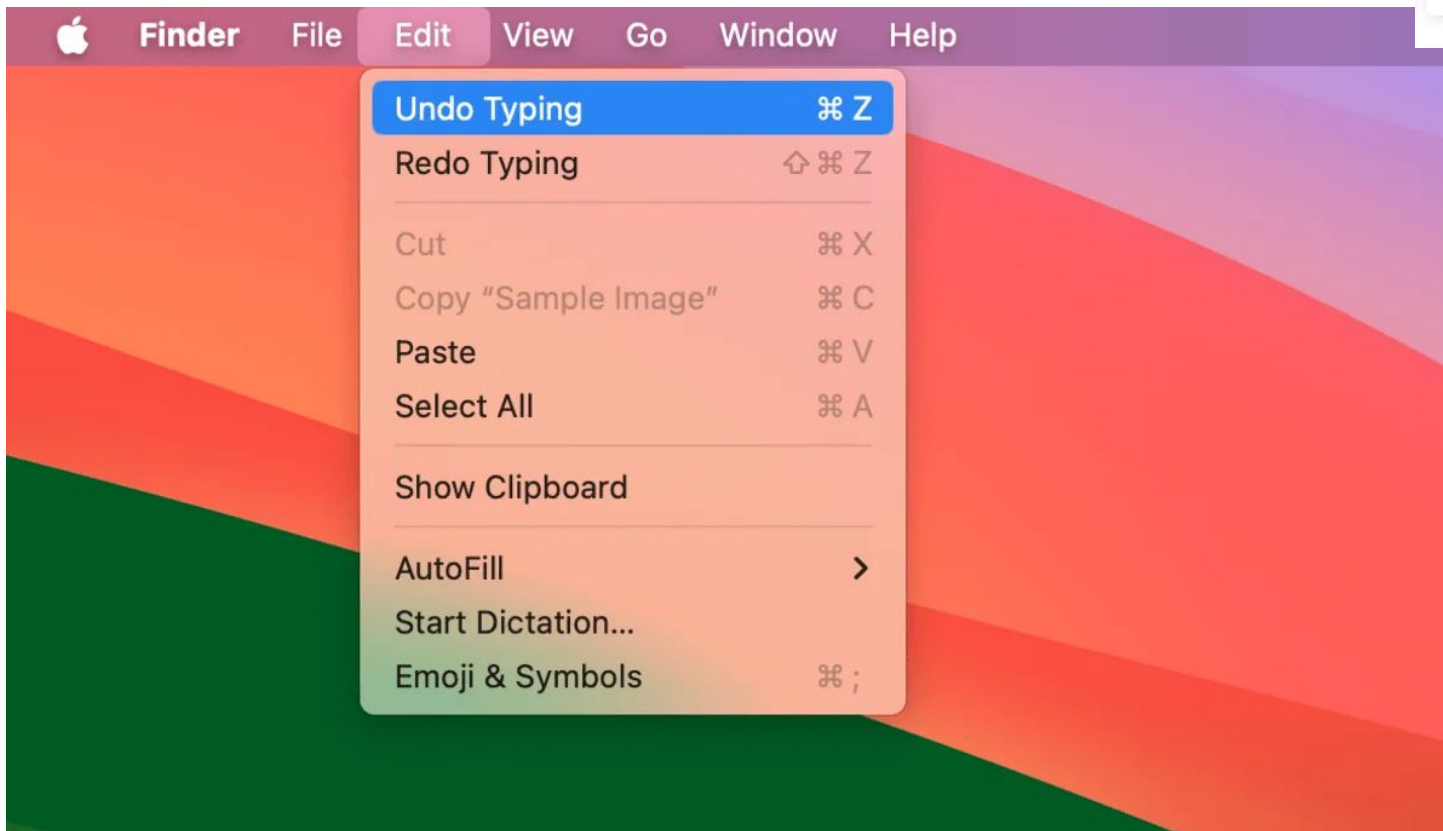


3. User control + Freedom



User Control
And Freedom

3



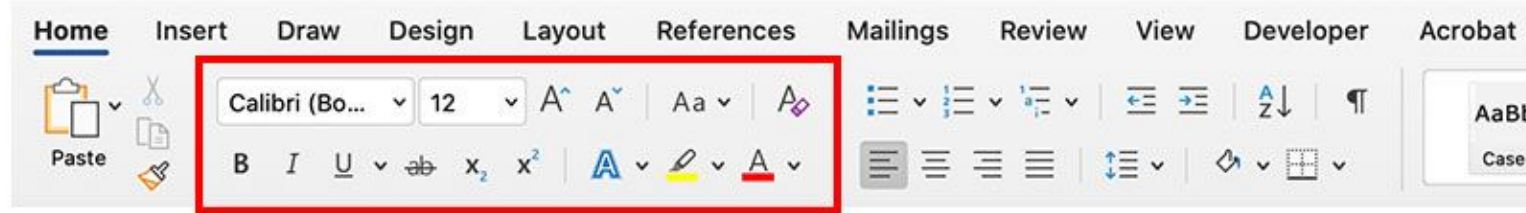
4. Consistency + Standards



Consistency
And Standards

4

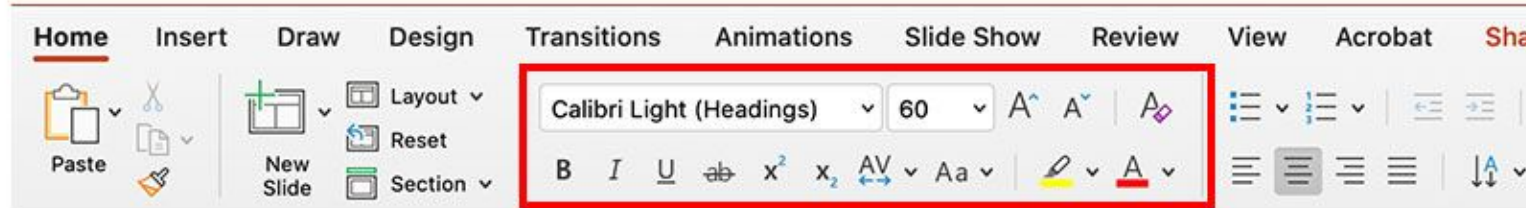
Word



Excel



PP



5. Error Prevention



Error
Prevention

5

Quit Opera?



Quit Opera?

You are about to quit Opera, closing 38 tabs. Don't worry, they'll be restored when you start Opera again. Are you sure?

Don't warn me again

Quit Opera

Cancel

10 Usability Heuristics (Nielsen, 1993)



Visibility of
System Status

1



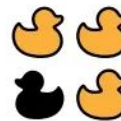
Match Between
System & Real World

2



User Control
And Freedom

3



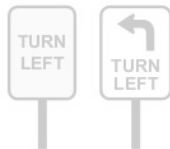
Consistency
And Standards

4



Error
Prevention

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Recognition
Rather Than Recall

6



Flexibility And
Efficiency of Use

7



Aesthetic And
Minimalistic Design

8



Help Users
With Errors

9



Help And
Documentation

10

10 Usability Heuristics (Nielsen, 1993)



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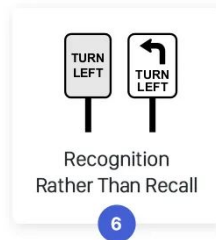


Help And
Documentation

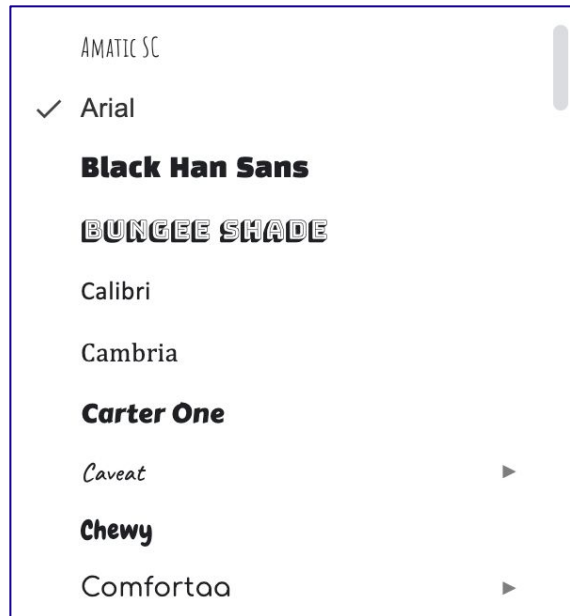
10



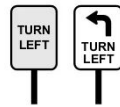
6. Recognition > Recall



- Make objects, actions, options visible
 - Reduce reliance memory
 - Door handle activity
- Short-term memory= 7 ± 2 items
 - 30 sec to 2 min unless interrupted
- Menus rather than type-in
 - But short enough



MS Word Control Bar



Recognition
Rather Than Recall

6





7. Flexibility + Efficiency



Flexibility And
Efficiency of Use

7

- Provide shortcuts
 - Expert/power users love it!
- Jump directly to desired location
 - CMD/Control + Tab
- Reuse previously entered information
 - Avoid introducing typos
- Good default values
 - Are your users usually from Canada? Pre-select it.



Flexibility And
Efficiency of Use

7

Flexibility to Choose Options



888-L16-17.pptx

1 member



To: Email or name

Can view

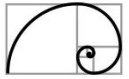


Anyone with the link can **view** this file

[Link settings](#) • [Copy link](#)



8. Aesthetic + Minimalism



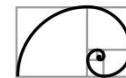
Aesthetic And
Minimalistic Design

8

- Good graphic design + colour choice
 - Appropriately direct attention
- Is your design too complex to explain or document?
 - → Redesign it
- Group related objects
 - Alignment, decorations, etc.
- Balance and blank space
 - Use all the space you have, but wisely



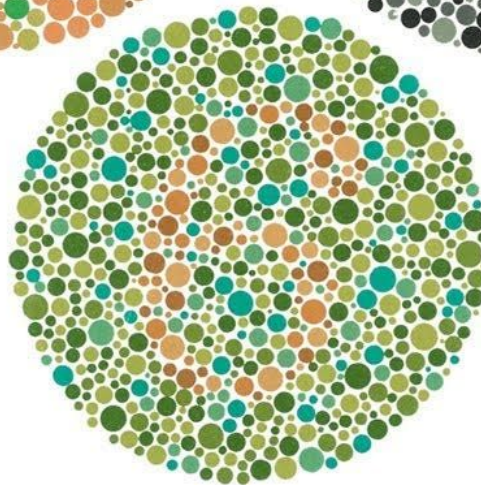
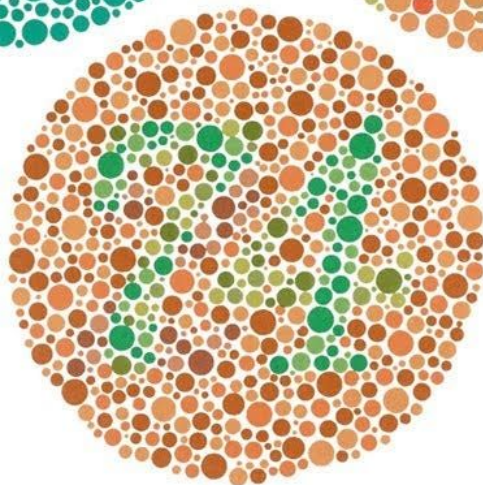
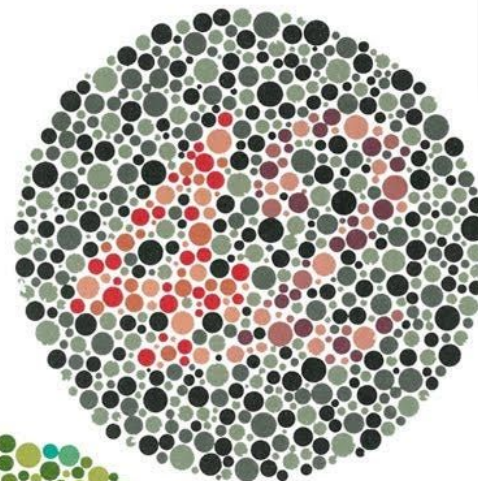
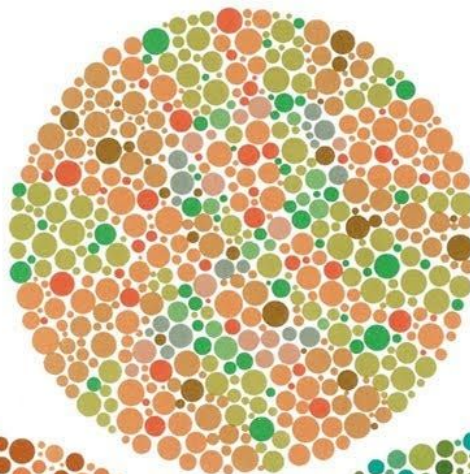
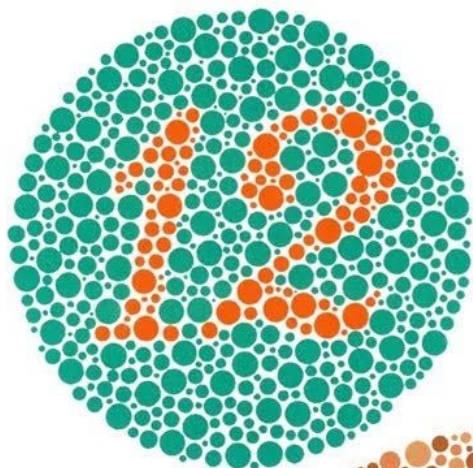
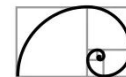
8. Aesthetic + Minimalism



Aesthetic And
Minimalistic Design

8

- Few fonts and colors (5 to 7 colors)
- Appropriate contrast
 - [Check your contrast ratio](#)
- "Less is more"
- Colour blindness (Red / Green / Blue / Yellow)
 - Don't rely on colours for improving readability



9. Help Users with Errors



Help Users
With Errors

9




- **Recognize, diagnose, and recover from errors**
- Help users when they are in trouble
- Opportunities for users to learn about the system
- Clear language; no codes
- Unclear:
 - **✗ Error 404... good luck!**
- Clear:
 - **✓ Oops! The page you're looking for doesn't exist, because the link has changed. To recover, you can contact the system admin via (system@help.ca)**

9. Help Users with Errors



Help Users
With Errors

9

- Be precise
 -  "Syntax error"
- Constructively help the user solve the problem
 - Say **why** the error happened
 - Provide info on how to fix it
- Be polite and not accusing; positive wording:
 -  "Fatal error."
 -  "Something went wrong; let's get you back..."

✗ Bad Warning Messages

Home Store How to Buy News About Us Products Services Support

View Cart My Account Dow

Tablets

Buy online or call 1-800-FUJITSU Fujitsu recommends Microsoft® Windows® XP Tablet PC Edition for Mobile Com

Tablets

- Tablet Overview
- LifeBook T Series
 - T3000
 - T3000D
- ST5000 Series
 - Stylistic ST5000
 - Stylistic ST5000D
 - Stylistic ST4000

Products

- Notebooks
- Tablets
- Servers
- Desktops
- Accessories
- Outlet Store

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Friendly Error Message



Error #49371A8QMV67.
Have a nice day!

OK

Are you sure?

Yes

No



Good Warning Message



Secure Empty Trash permanently erases the items in the Trash. Are you sure you want to permanently erase them?

If you choose Secure Empty Trash, you can't recover the items unless you've backed them up using Time Machine or another backup program.

Cancel

Secure Empty Trash



10. Help + Documentation



Help And
Documentation

10

- Most people will not read documentation
- If do, then
 - First time product is used, or else
 - In a panic, need information right away
- Iterative design of documentation needed
- Peer review, pilot instructions
 - Does it make sense?



10. Help + Documentation



Help And
Documentation

10

- Help system is an extra feature to learn
 - If need to add help, maybe fix the feature?
- Use documentation writers to help refine system
 - How to improve flow / increase productivity
- Simple & clear quality writing
 - What if users do not speak English?
 - Leave no room for assumptions
 - Screenshots, GIFs, videos are great!

Example: Help + Documentation



Help Users
With Errors

9

Google Chrome Help

Help Center

Community

Google Chrome

Sign in

Passkeys are the simplest and most secure way to sign in to your account. To sign in with just your fingerprint, face scan, or screen lock, [create a passkey](#).

How can we help you?

Describe your issue

Browse help topics

Get started with Chrome

Download and install Google Chrome
Create or manage your Google Account in Chrome
Sign in and sync in Chrome
Make Chrome your default browser
Use Chrome at home
Sign out of Chrome
Check location info & directions in Chrome

10 Usability Heuristics (Nielsen, 1993)



Visibility of
System Status

1



Match Between
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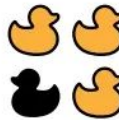
Match Between
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User Control
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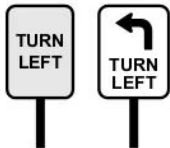
Consistency
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Error
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Flexibility And
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Minimalistic Design

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Help Users
With Errors

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Help And
Documentation

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Q: Which heuristic does this interface violate?



Payment Error

Your payment didn't process. Please check the details you entered and try again.

- A. Recognition Rather Than Recall
- B. Flexibility and Efficiency of Use
- C. Aesthetic And Minimalist Design
- D. Help User with Errors
- E. Help and Documentation



Q: Which heuristic does this interface violate?



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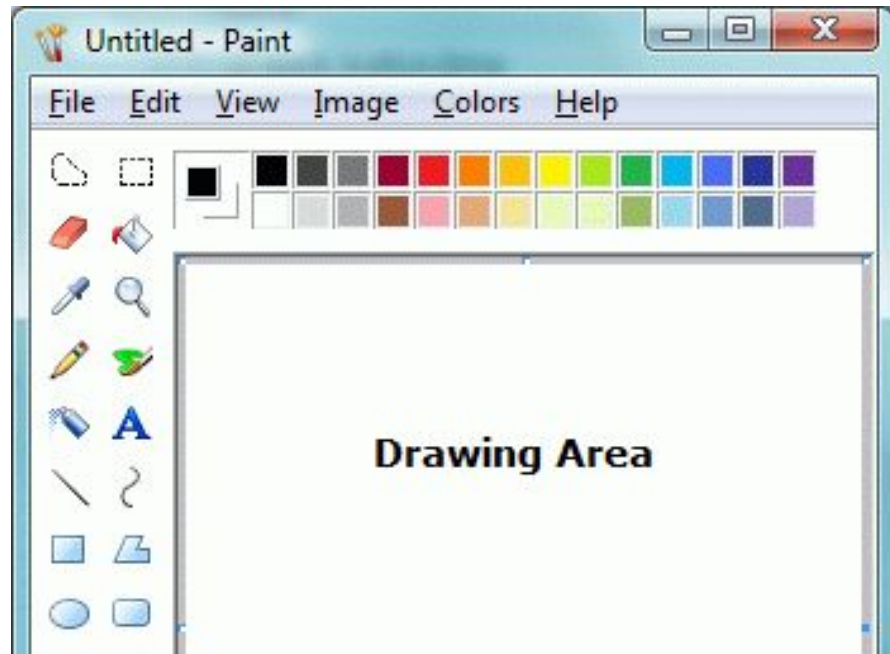
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iClicker

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Course Admin



Project Milestone 1: Group Formation

- **If you don't yet have a full group of 3 or 4, come to the front! I will help you find some groups**
- **Once you have a group, start the PrairieLearn group assignment for Milestone 1!**



Mid Course Feedback

- I'd like to get some ANONYMOUS feedback from you on how things are going!
- I plan to spend some time next week to try and improve things that you think are broken in the course... be honest!

Link: bit.ly/cpsc100_2025W1

Internet



Dark Patterns

ARTICLE

PRODUCT DESIGN

UPDATED ON: 21 AUG , 2025

18 Dark Patterns Examples That Manipulate Users (and How to Avoid Them)

11 MIN TO READ





Dark Patterns

Why do companies use them? *ll*

Increase
engagement

Obtain
personal
Information

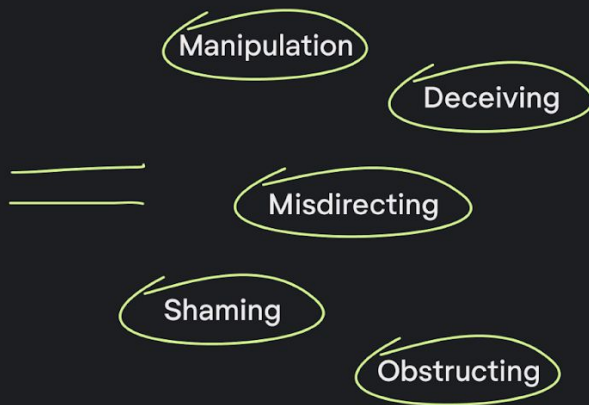
Generate more
revenue

These practices disrespect users' privacy and freedom of choice.

Dark Patterns

Definition

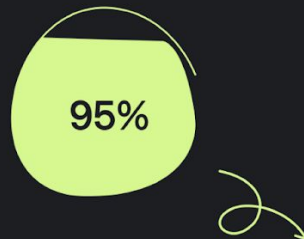
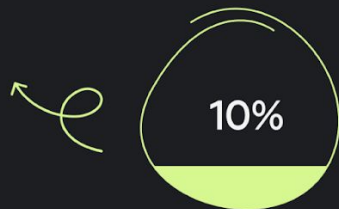
Dark patterns (deceptive patterns) are tricks designed to mislead users into doing things they don't want to do.



Dark Patterns

Dark patterns were present on over **10%** of a sample of **11,000** popular ecommerce sites

(Princeton University & the University of Chicago, 2019)



Deceptive patterns were present in **95%** of **240** free, trending apps (avg. at least **7 dark patterns** in each)

(the University of Zurich, 2019)



Dark Patterns

Why did dark patterns become so widespread? ^{1/2}

A/B testing and
the focus on
driving
conversions

Anastasiia Soroka

Copypat designs

Anastasiia Soroka

NN/g Nielsen Norman Group

Dark Patterns

Dark patterns are more likely to be successful with vulnerable users:

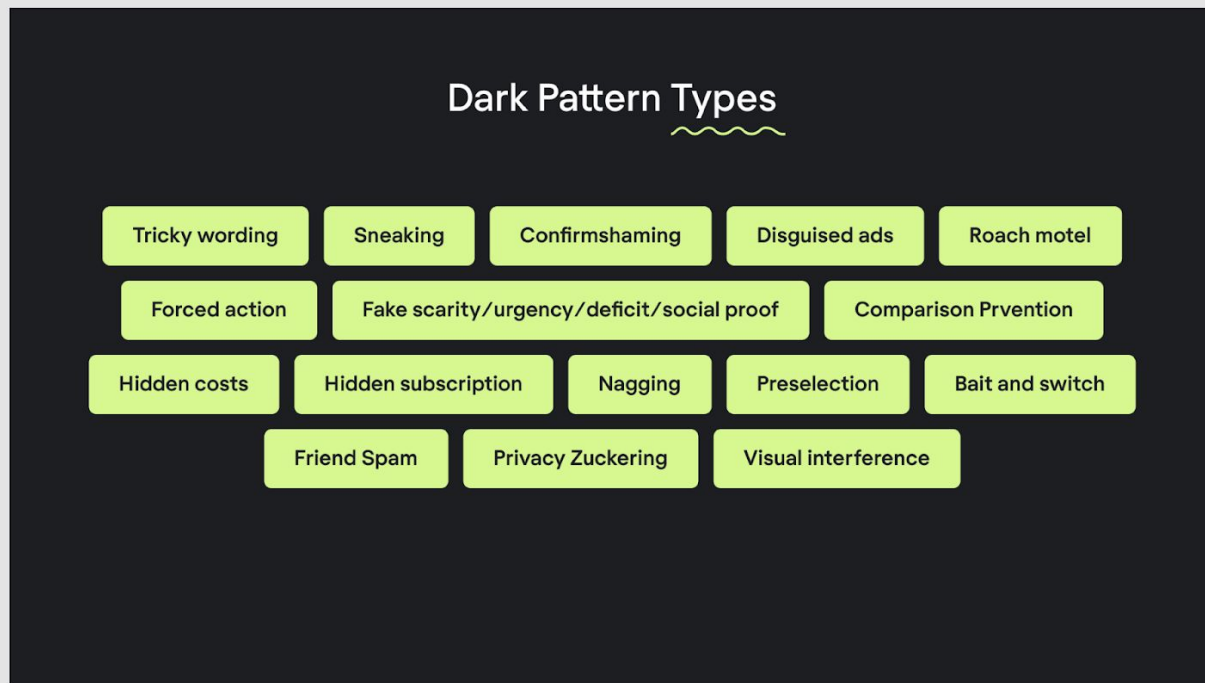
Time-poor users

Lower digital literacy users

People with cognitive and visual impairments

Eldery users

Dark Patterns



Dark Patterns

Dark Patterns

The Basic Idea

Imagine this: you're scrolling on an app when an ad interrupts your browsing. You automatically click the "X" button, but it still redirects you to the ad's website. You close out of it, feeling quite annoyed, then find the tiny button that says "close" in the corner that finally removes the ad. We can explain this all too common experience using dark patterns.

Dark, or deceptive patterns, are misleading design techniques used in websites and apps to trick users into making unintended decisions. They usually guide users down a path that they never intended to take. These manipulative strategies can range from hidden costs to misleading navigation, all crafted to benefit the service provider at the user's expense.

Wrap up