Heuristic Evaluation, Part 2

First: Finishing Up the Risks Lecture

Awareness–Understanding Matrix

Oh, the data we collected last week could be used for the present task!

	Aware	**Not aware**
Understand	**Known knowns**: Things we are aware of and understand	**Unknown knowns:** Things we know but whose relevance we don't realize.
Don't understand	**Known unknowns:** Things we are aware of but don't understand	**Unknown unknowns:** Things we are neither aware of nor understand

I know flights CAN be canceled, but will THIS flight be canceled?

https://en.wikipedia.org/wiki/There_are_unknown_unknowns

Inherent Vs. Accidental Complexity

- Some problems bring *inherent complexity*
  - Tax software is inherently complex because it has to be at least as complex as the tax code (law)
  - Automated driving software has to handle the complexities of physics *and* driving laws *and* human behavior
- But some software systems make problems *even harder*
  - You've seen these systems too

Conway's Law

- "[O]rganizations which design systems…are constrained to produce designs which are copies of the communication structures of these organizations."
- Therefore, organizational structure poses architectural risks!

https://en.wikipedia.org/wiki/Conway's_law

Surfacing Risk

- Ask team members: what might go wrong?
  - A diverse team is more likely to identify more risks
- Then you can make mitigation plans.

Scenario #3: Cut or Press Forward?

- One month until you promised your investors the app would launch.
- Two key features have five weeks of estimated work left:
  - AI-based tutor screening (otherwise will have to interview prospective tutors; very expensive)
  - Algorithm-based tutor matching (e.g., need a calculus expert to do calculus tutoring)

- Ideas:
  - Move engineers from A to B (or vice versa); defer the other feature
  - Ask engineers to work evenings and weekends
  - Hire engineers from elsewhere
  - Something else?

Submit plan on Gradescope

Conclusion

- Surfacing risks in many categories enables you to mitigate them
- Mitigating risks often requires tradeoffs
- Know:
  - *Second system effect*
  - *Mythical man month: Adding new people to a late software project makes it later*

On to Heuristics

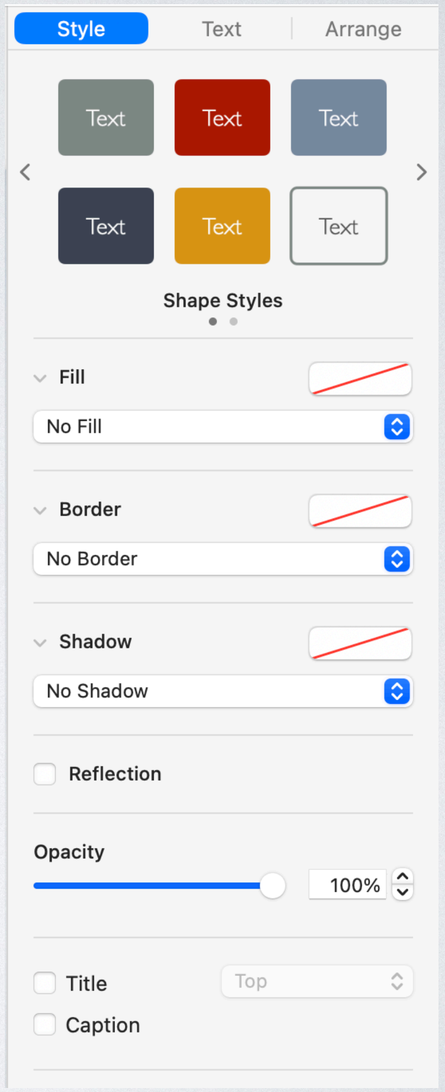
#3: User Control and Freedom

- Users often perform actions by mistake. They need a clearly marked "emergency exit" to leave the unwanted action without having to go through an extended process.
- Support Undo and Redo.
- Show a clear way to exit the current interaction, like a Cancel button.
- Make sure the exit is clearly labeled and discoverable.



Let Users Pick the Order

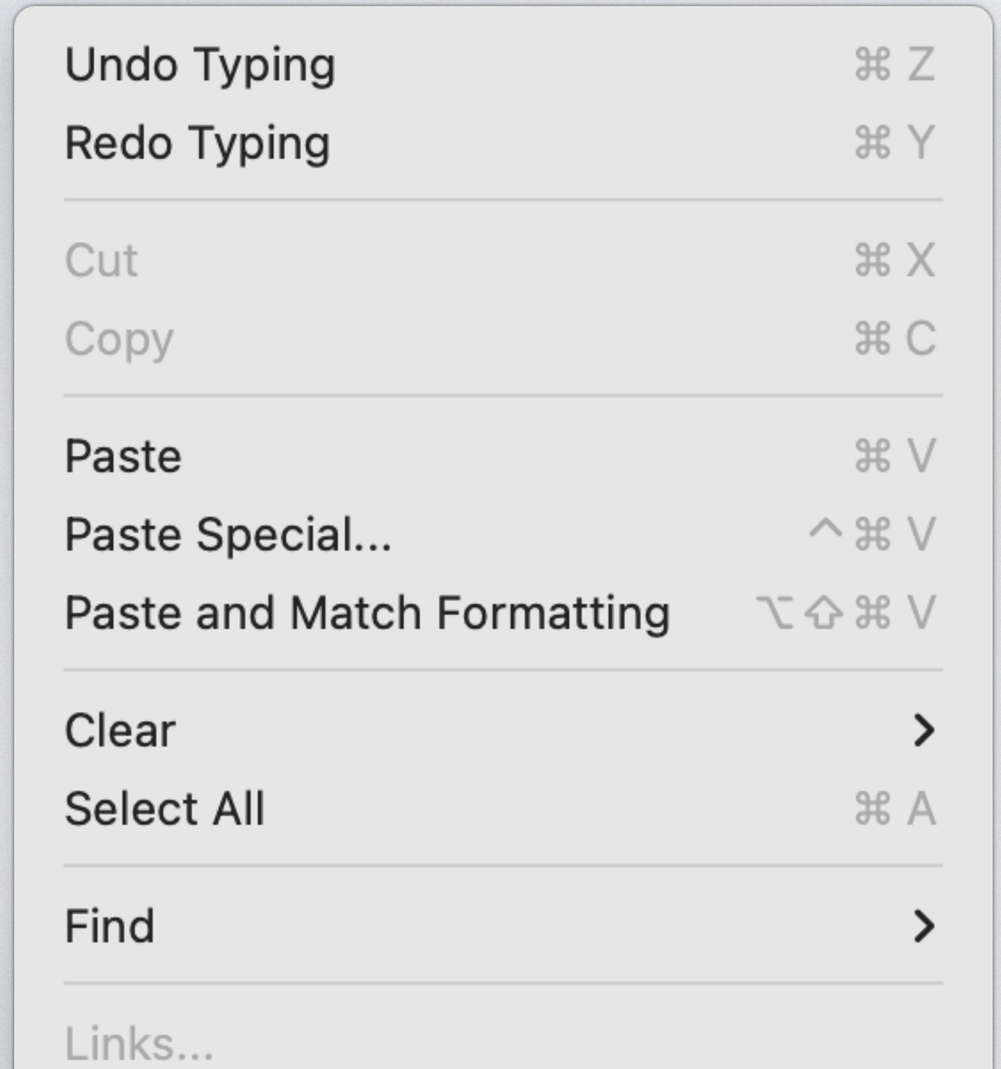
- "Wizards" force users to make choices in an order the developer chose
- Inspectors let users choose in any order



#4: Consistency and Standards

- People spend more time using *other products* than *your* product
- Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform and industry conventions.
- Your "clever" solution can cause confusion

I'm Looking at YOU, Microsoft

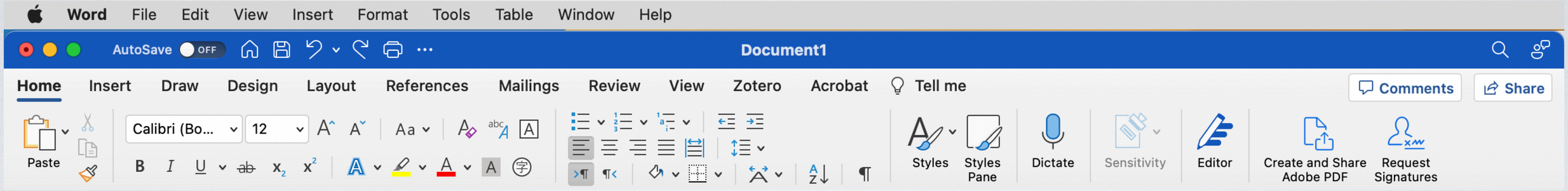


Mac standard for Redo is ⇧⌘Z

I'm STILL Looking at You, Microsoft

- ^A should move cursor to beginning of line (broken in Microsoft apps)
- Likewise ^E (end of line)

Not Just Shortcuts



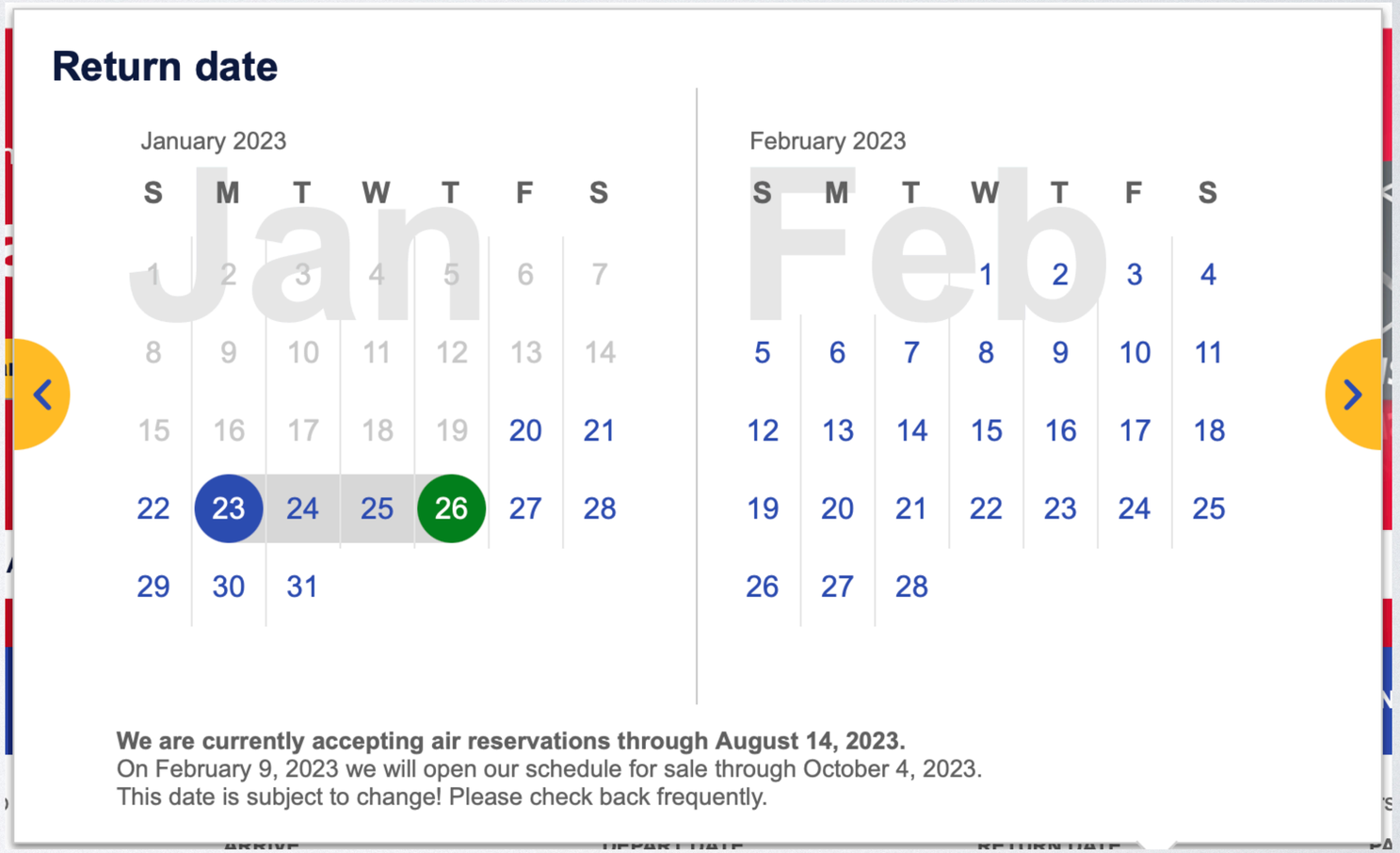
- Two (!??) menu bars, THREE different sections of buttons

Error Prevention

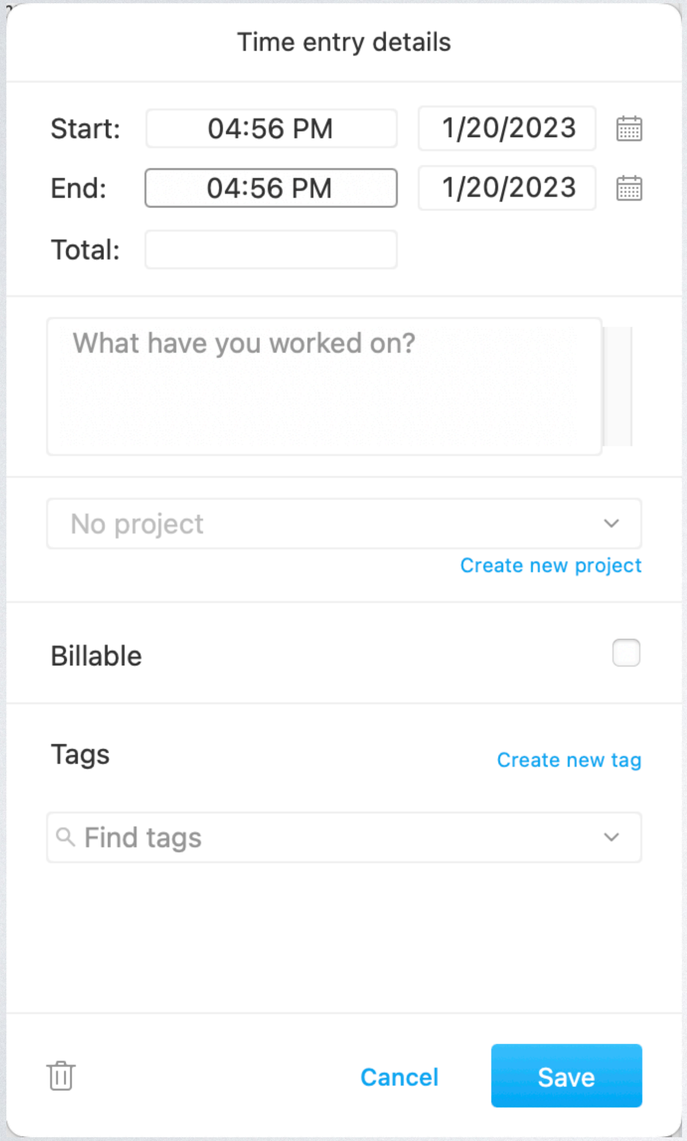
- Good error messages are important, but the best designs carefully prevent problems from occurring in the first place. Either eliminate error-prone conditions, or check for them and present users with a confirmation option before they commit to the action.

Southwest

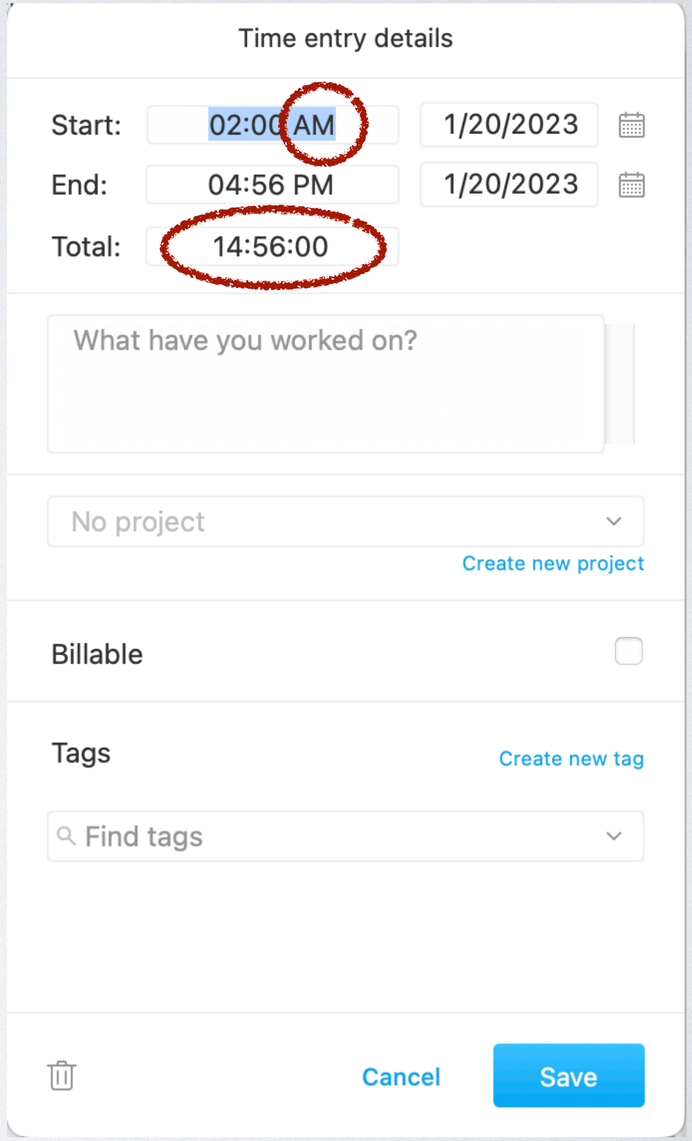
- Can't set return date before departure date



Clockify Desktop



Change start time: "2:00"



#6: Recognition Rather Than Recall

- Minimize the user's memory load by making elements, actions, and options visible. The user should not have to remember information from one part of the interface to another. Information required to use the design (e.g. field labels or menu items) should be visible or easily retrievable when needed.

Command Line vs. GUI

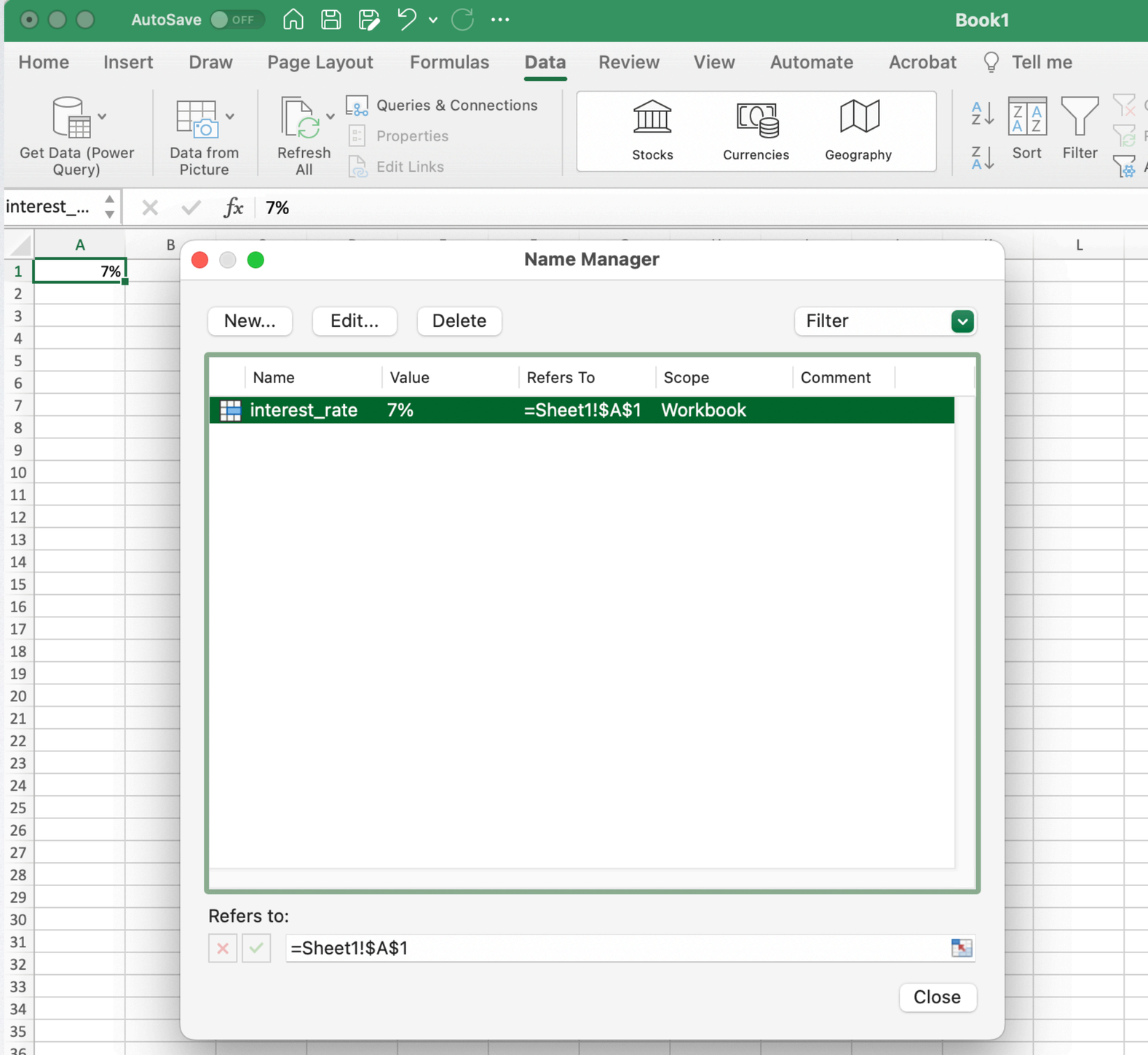
- Command line requires you to remember command names
- GUI gives you lists of possible commands in menus

Capitals

- What's the capital of Portugal?
- Is Lisbon the capital of Portugal?

Excel Name Manager

- Can't see the list of named ranges in the formula editor or in the table
- Instead, use the "Name Manager": a modal dialog box!
- Close the box. What were the names, again?



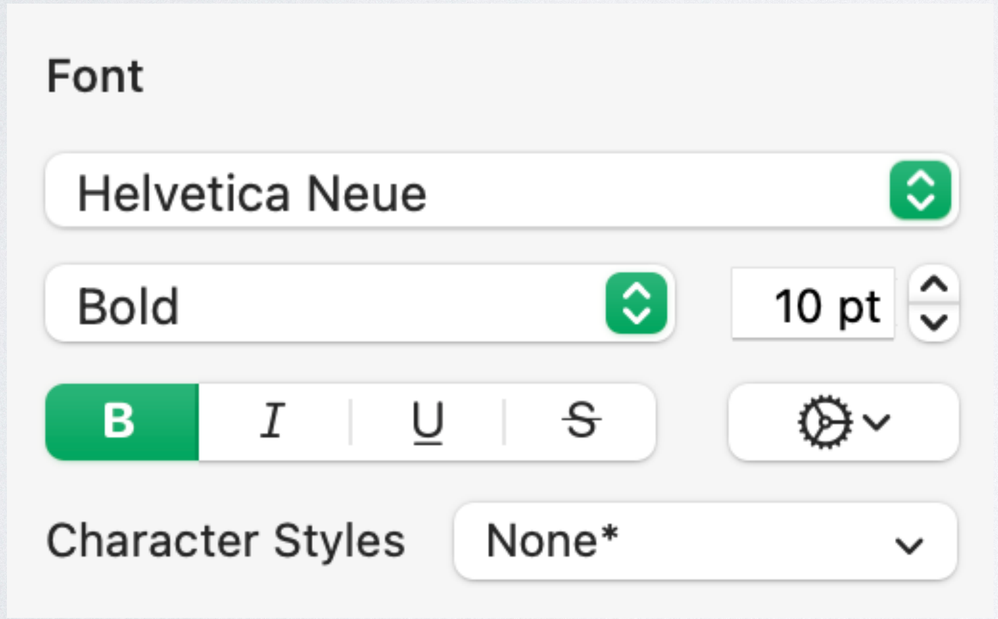
#7: Flexibility and Efficiency of Use

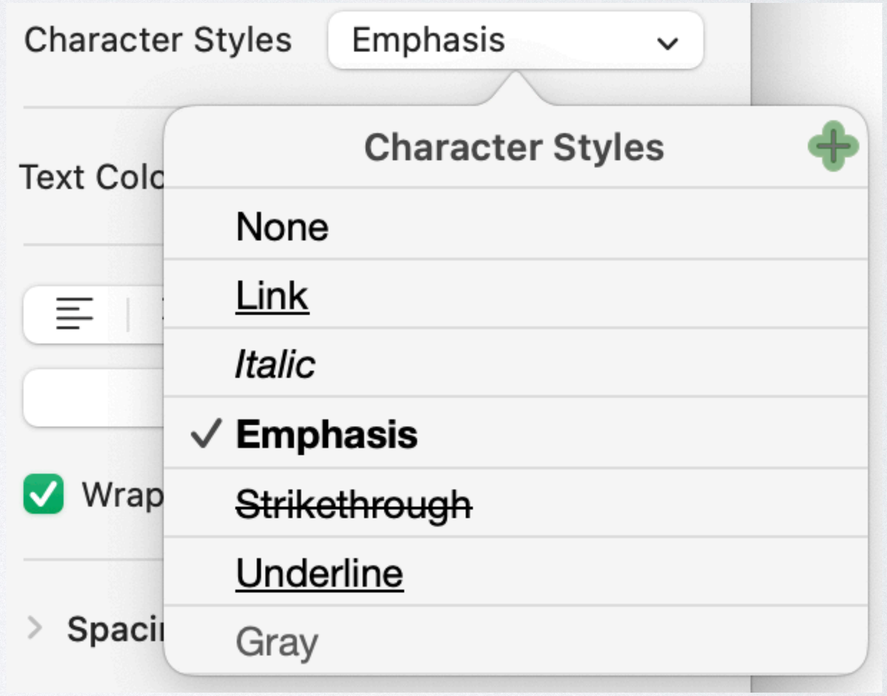
- "Shortcuts — hidden from novice users — may speed up the interaction for the expert user so that the design can cater to both inexperienced and experienced users. Allow users to tailor frequent actions."
- Novices and experts have different needs
  - Novices need *discoverability*
  - Experts need *efficiency*

Sending Lots of Similar Emails

- Retype?
- Copy/paste, modify?
- Standardize, use CC/BCC?
- Mail merge
- Fancy CRM tool

Multiple Methods for One Task

- **To make text bold:**
  - 

  - ⌘B
  - 

Is More Better?

- Perl motto: "There's more than one way to do it."
- Using a language feature forces maintainers of the code to understand that feature
- But no one cares whether you clicked or used ⌘B to make text bold



Close Boxes

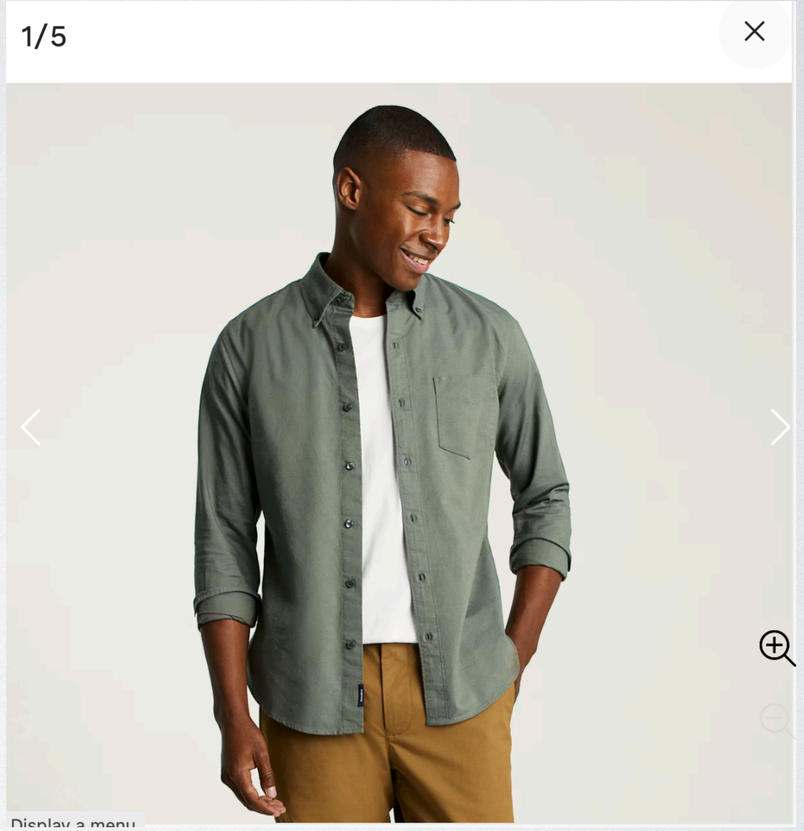
- macOS has close boxes on the *left*. Windows has close boxes on the *right*.
- Bonobos puts all close boxes on the right. Which heuristic does this violate?

A. Consistency and standards

B. Error prevention

C. Recognition rather than recall

D. Reliability and Efficiency of use



#8: Aesthetic and Minimalist Design

- "Interfaces should not contain information that is irrelevant or rarely needed. Every extra unit of information in an interface competes with the relevant units of information and diminishes their relative visibility."



Google Search I'm Feeling Lucky

Carbon neutral since 2007



Southwest learns the cost of canceling 16,700 flights

Southwest Airlines reported a loss for the fourth quarter, as the company took an $800 million pretax hit to earnings due to the airline's holiday travel meltdown.

CEO Bob Jordan issues statement »



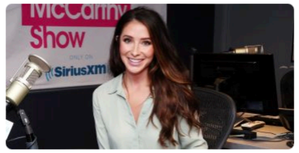
Why did San Diego waves suddenly turn bright pink?



'Cheers' favorite makes rare TV appearance in series



Store chain bars employees with 'missing, broken' teeth



Bristol Palin has 9th surgery after breast reduction



Former NFL linebacker Jessie Lemonier dies at 25

Stories for you



Celebrity People

Alicia Keys Rocks a Purple Bikini While on Tropical Birthday Getaway: 'Aquarius Energy'

The Grammy winner soaked up the sun in style for her 42nd birthday



Ad SmartAsset

Average Retirement Savings By Age: Are You Normal?

The shocking amount some people have saved, and why speaking with a financial advisor could help increase your returns and alleviate stress.

Trending Now

1. Tyre Nichols
2. Patrick Mahomes Injury
3. Donald Trump
4. Alex Murdaugh Trial
5. Russia-Ukraine War
6. Paul Pelosi
7. Madison Brooks
8. Poker Face
9. Stéphane Rolland
10. Sean Payton



4 Signs Of Dying Liver (Write These Down)

Ad Liver Renew

Weather

San Diego

Today	Fri	Sat	Sun
68° 41°	68° 44°	60° 50°	55° 46°

See More »

AccuWeather

Scoreboard

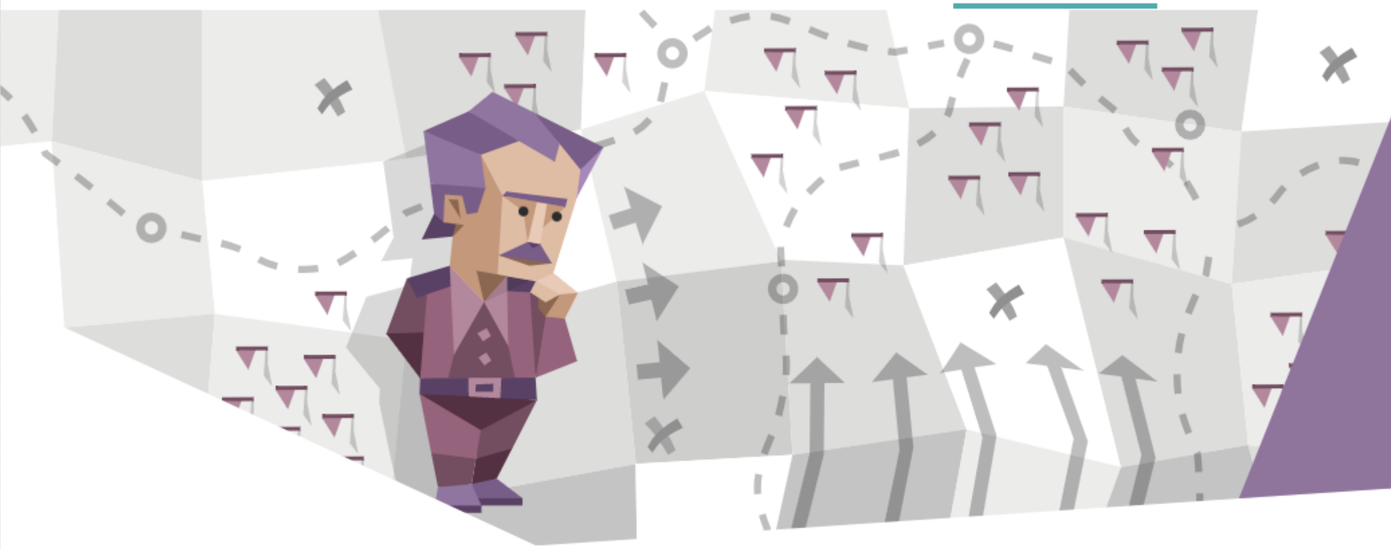
Trending

Yesterday Today Tomorrow

St. Francis (NY) 22

Half

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Architect

Personality

INTJ-A / INTJ-T

(WHAT'S THE DIFFERENCE?)

Explore This Type

- Introduction
- Strengths & Weaknesses
- Romantic Relationships
- Friendships
- Parenthood
- Career Paths
- Workplace Habits

Introduction

WHO IS AN ARCHITECT (INTJ)?

An **Architect (INTJ)** is a person with the Introverted, Intuitive, Thinking, and Judging personality traits. These thoughtful tacticians love perfecting the details of life, applying creativity and rationality to everything they do. Their inner world is often a private, complex one.

> *"Thought constitutes the greatness of man. Man is a reed, the feeblest thing in nature, but he is a thinking reed."*

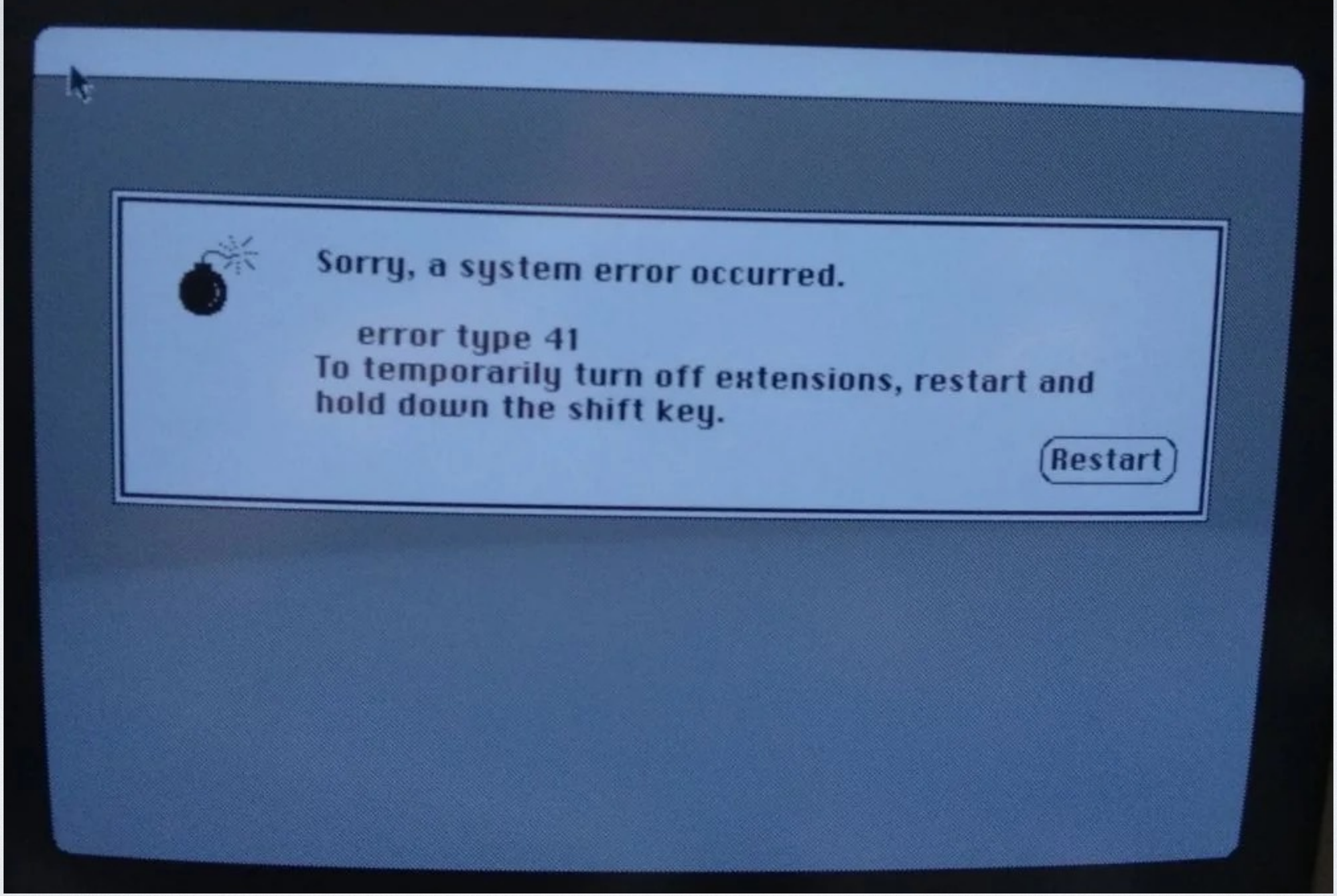
New Here?

Take the Test

Already have your results? Log in.

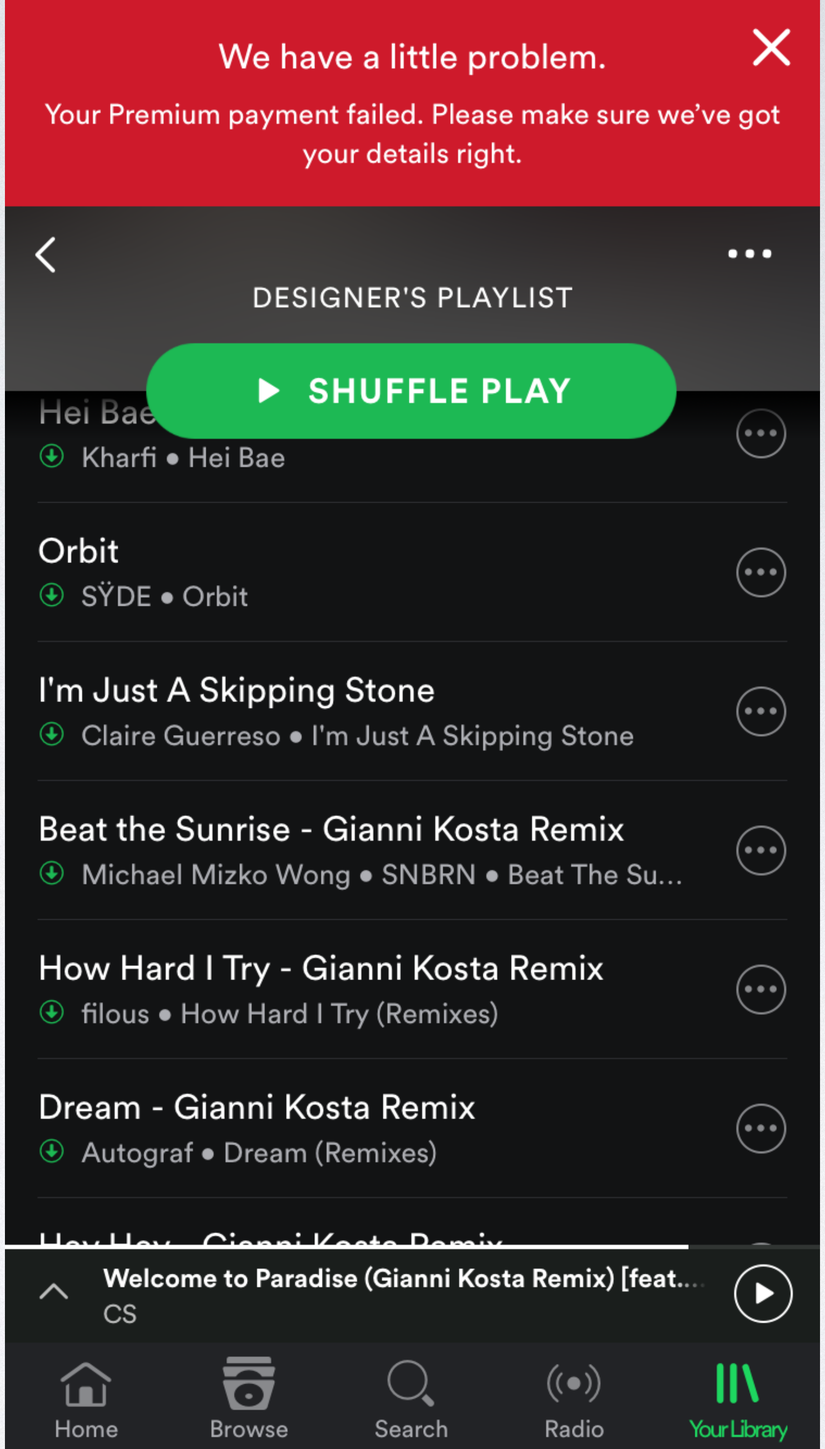
#9: Help Users Recognize, Diagnose, and Recover From Errors

- Error messages should be expressed in plain language (no error codes), precisely indicate the problem, and constructively suggest a solution.

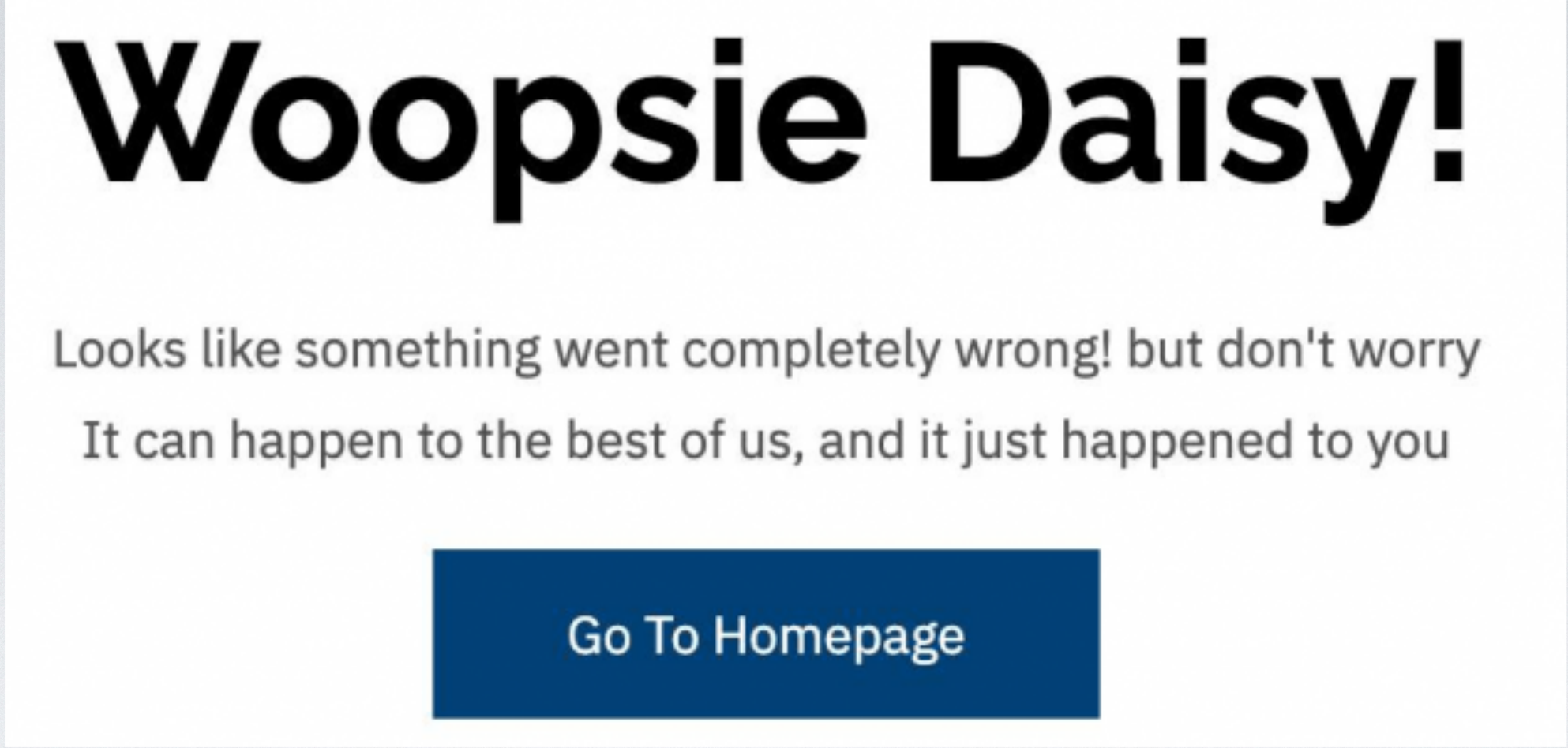


https://www.reddit.com/r/VintageApple/comments/hst2it/macos_system_7_error_41/


WRONG
WAY



https://uxwritinghub.com/error-message-examples/



- Cutesy language is annoying
- Not clear what's wrong or how to fix it
- You probably just lost what you typed (sorry, not sorry)

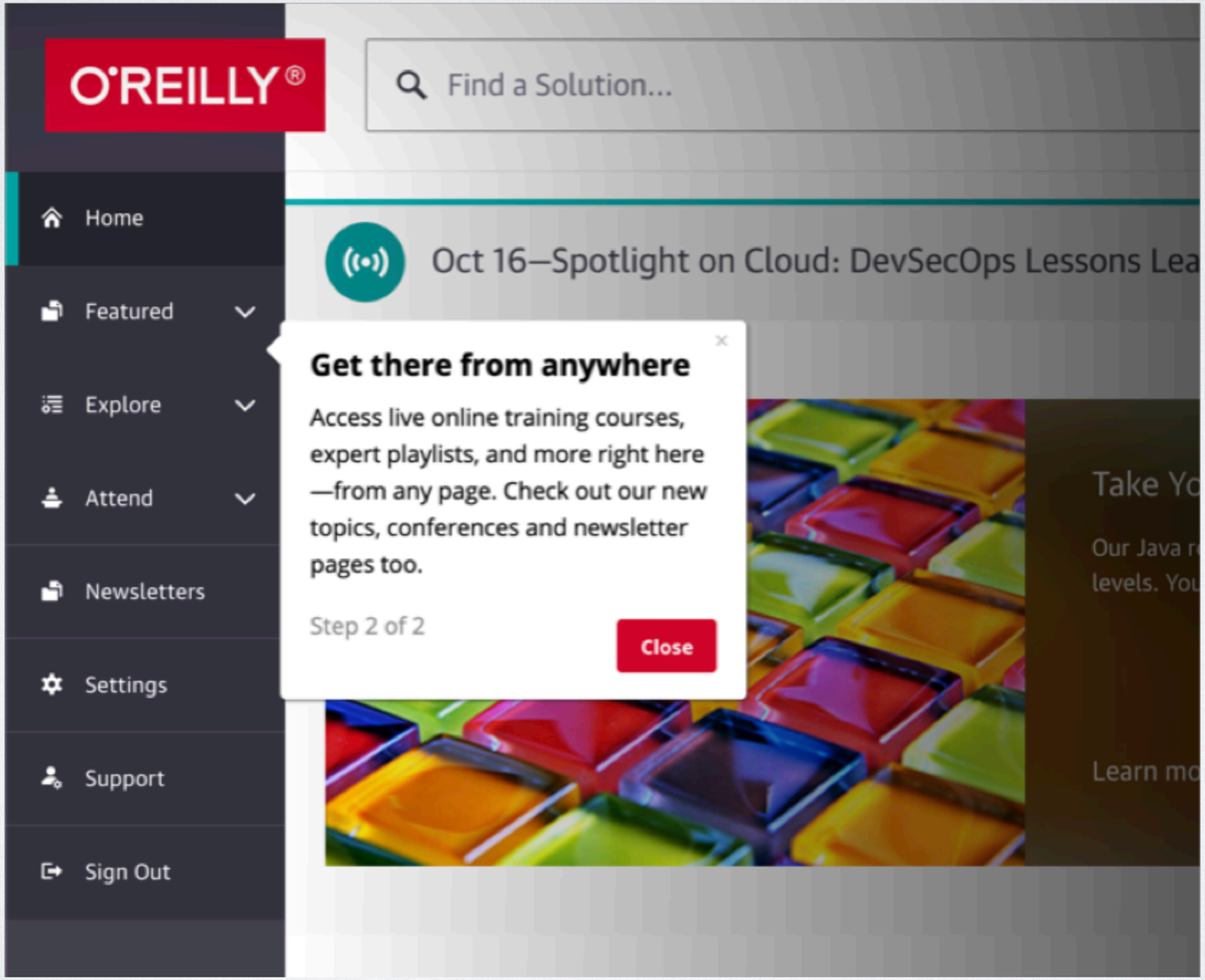
#10: Help and Documentation

- It's best if the system doesn't need any additional explanation. However, it may be necessary to provide documentation to help users understand how to complete their tasks.
- Enable search in documentation
- Present documentation in context

Proactive vs Reactive Help

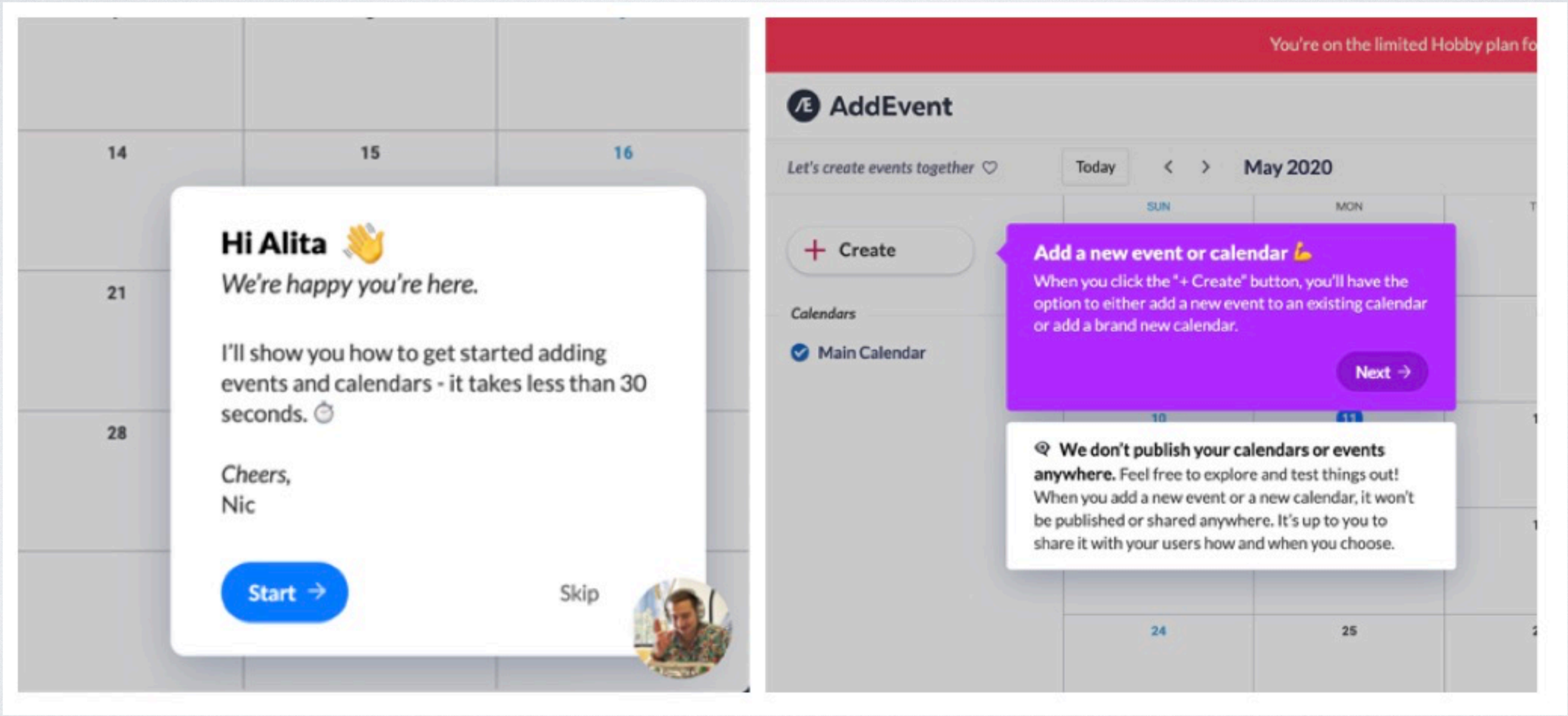
- Proactive: help before people get stuck (e.g., tutorials)
  - Push: not relevant to user's goals
  - Pull: Just in time
- Reactive: answer questions, troubleshoot problems

Push Revelations



https://www.nngroup.com/articles/help-and-documentation/

Pull Revelations



https://www.nngroup.com/articles/help-and-documentation/

Activity

- In small groups, do a heuristic evaluation of an app of your choice.
- Try to find problems that you think might present significant usability challenges to users.

Nielsen's Heuristics

- Visibility of system status
- Match between system and the real world
- User control and freedom
- Consistency and standards
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help users recognize, diagnose, and recover from errors
- Help and documentation