# HUMAN INTERFACE OBJECTS

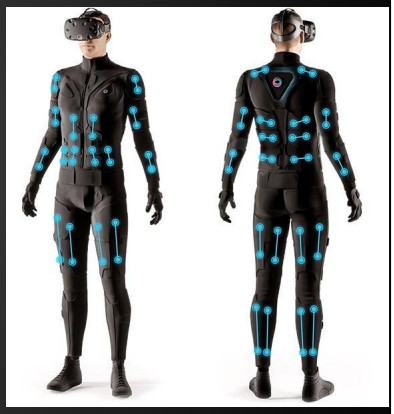
**EXPLORED AND IMPROVED**

# BASED ON TOG'S PRINCIPLES OF

## Human Interaction Objects

Hello, this is Kevin. My project partner David and I are sharing our research on Bruce Tognazzini's 5 Principles of Human Interface Objects. Bruce worked at Apple for 14 years, and now is a principal at Nielson and Norman group for the past 20+ years. He holds 56 patents.

# 1. Should be seen, heard, felt, or perceived.



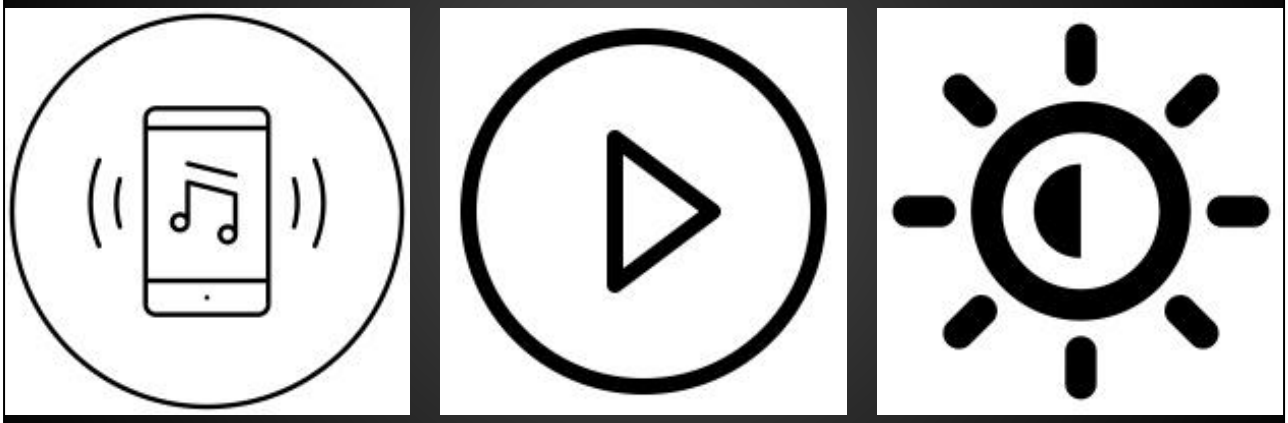
Tognazzini's 1st principle states that objects **should be seen, heard, felt, or perceived** like screens, alerts, or VR haptic suits.

# 2. Should have a standard way of being used.



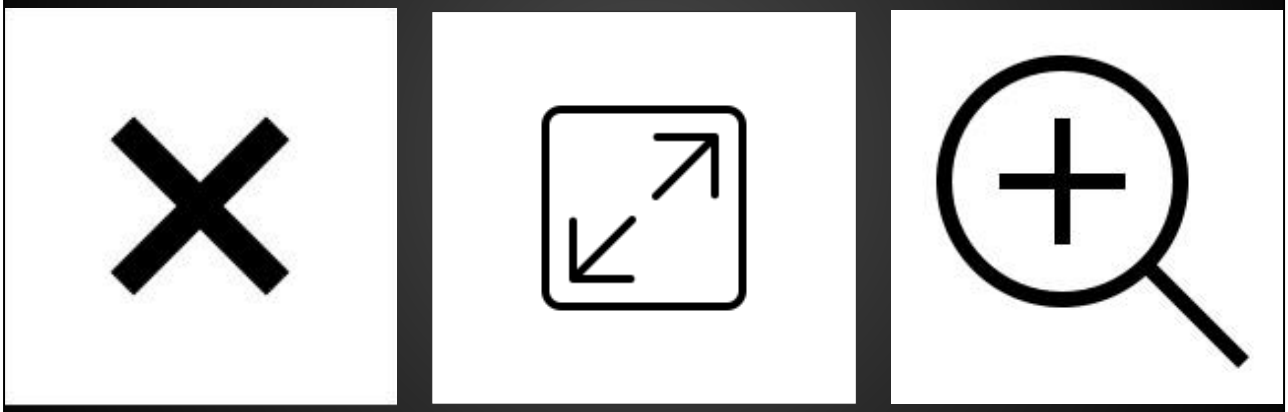
Objects should be **operated in a standard way like keypads, joysticks or light switches.**

# 3. Should have standard resulting behaviors.



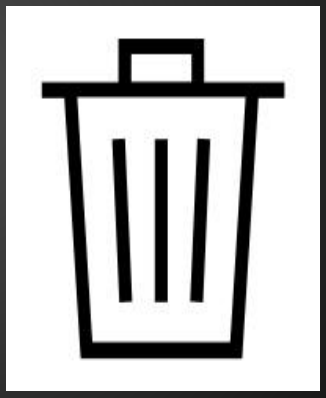
Objects should have **standard resulting behavior like ringtones, play buttons, or brightness adjusters.**

# 4. Should be understandable, self-consistent, and stable.



Objects should be **understandable**, **self-consistent** and **stable** like these icons for close program, full screen, or zoom-in features.

## 5. Should use a new object when people need to interact with it in a different way, or it results in a different behavior.

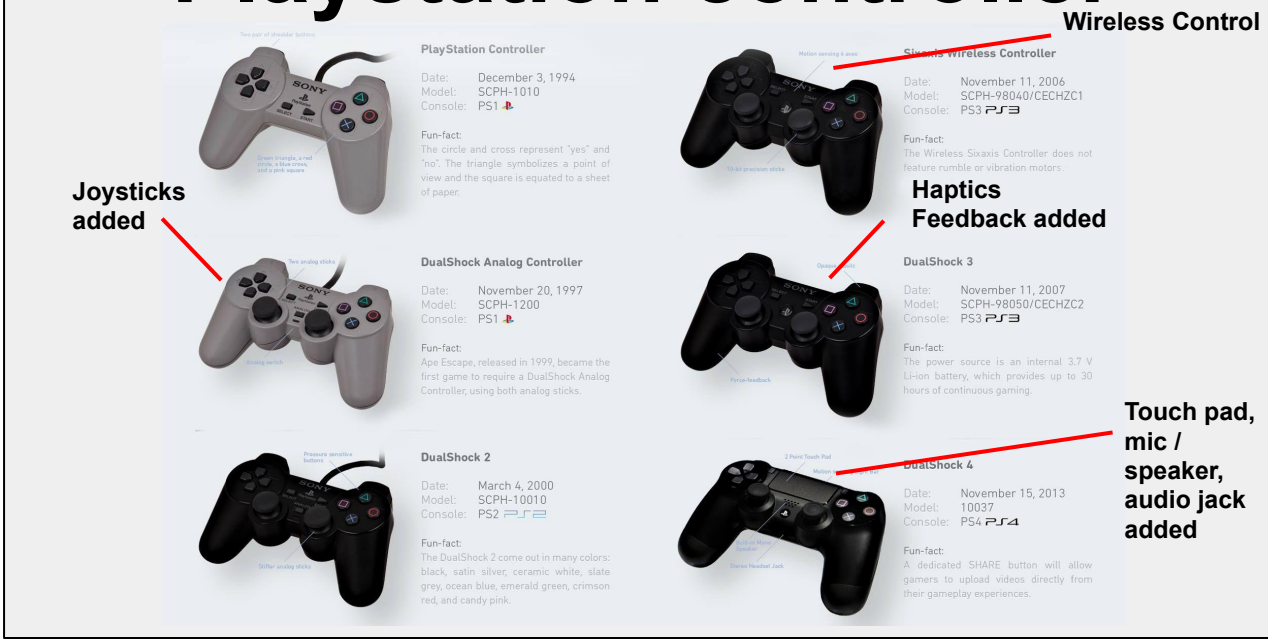


Number 5 states that we should use **new objects** when people need to interact with it **differently**, or if it results in a different **behavior**. For example, we might use a shredder icon instead of a trash can if the feature immediately deleted files.

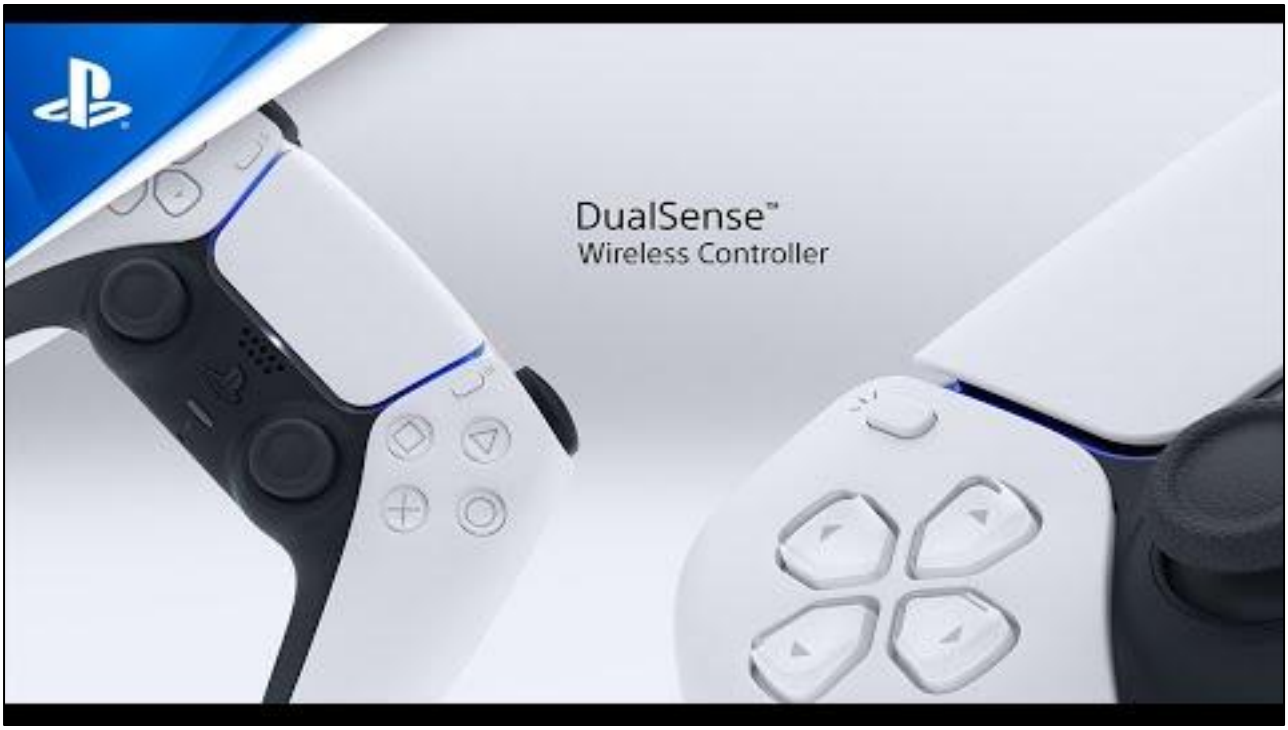
# Good Examples

Let’s dive into some good examples.

# Playstation controller



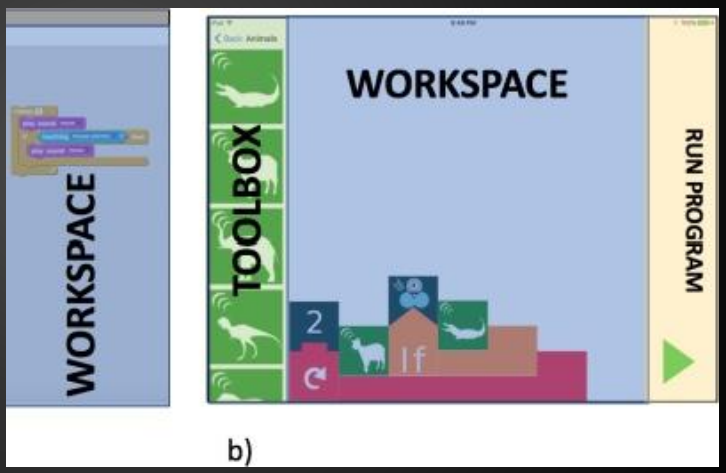

The Playstation controller has endured 25 years of road tested scrutiny and multiple interface upgrades. The first upgrade to the UI was joysticks, then wireless control, haptic feedback, mic/speakers, and then touchpad.




With the unreleased Playstation 5 controller, we will have motion sensors, adaptive triggering, and changeable joysticks.

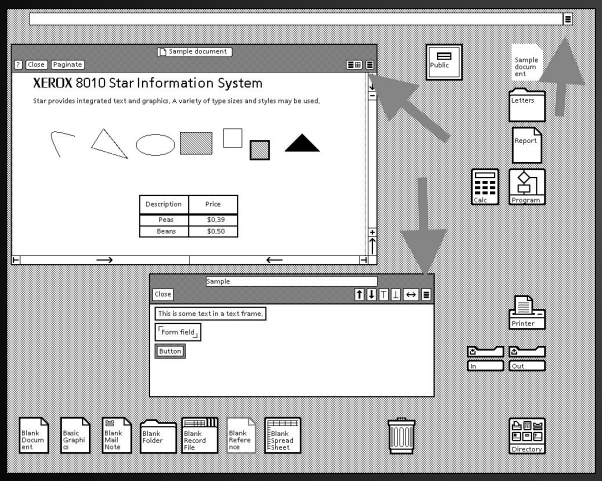

This is the Sphero educational Robot. In the middle image, we see a UI with a joystick driving feature. It's paired with an adjuster for speed, sound, and color. Sphero is good for sighted people, but for people with visual impairments who use **screen readers, there is a struggle** with the operation of a joystick control, or code block programming; seen on the right. Based on Tog's principles, a **new interface object** would be needed to empower new results and behaviors.

# Blocks4All



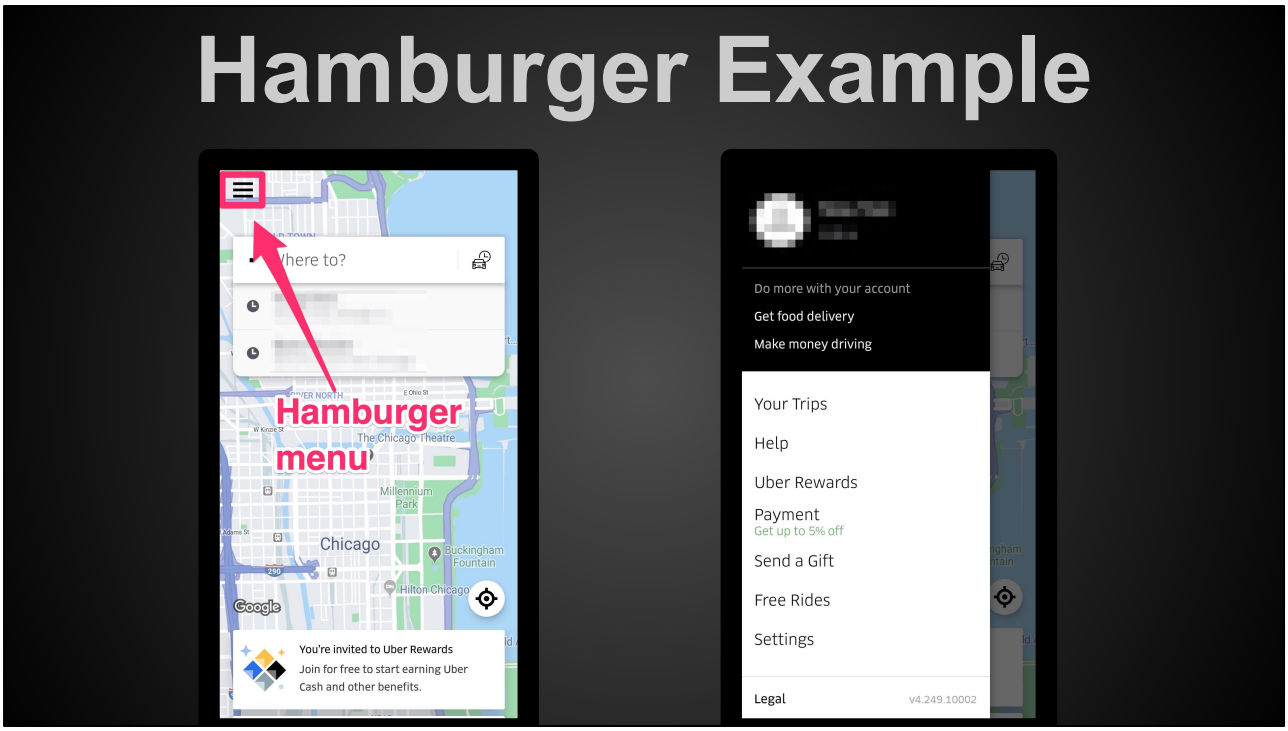

Fortunately, researchers at University of Washington saw these challenges and developed new interface objects in the Blocks4All prototype to **remove three barriers of block coding** for people with visual impairments. The barriers they removed are the **drag and drop** challenge, the awareness of **coding structure**, and the **order of code** operations. David will take over from here to share the remaining good and bad examples.

# Hamburger Icon





Instead of forcing users to go through the content in serial order, the hamburger menu allows users **to access their preferred content directly**. With only a few clicks, billions of users **can quickly get to where they are going**.

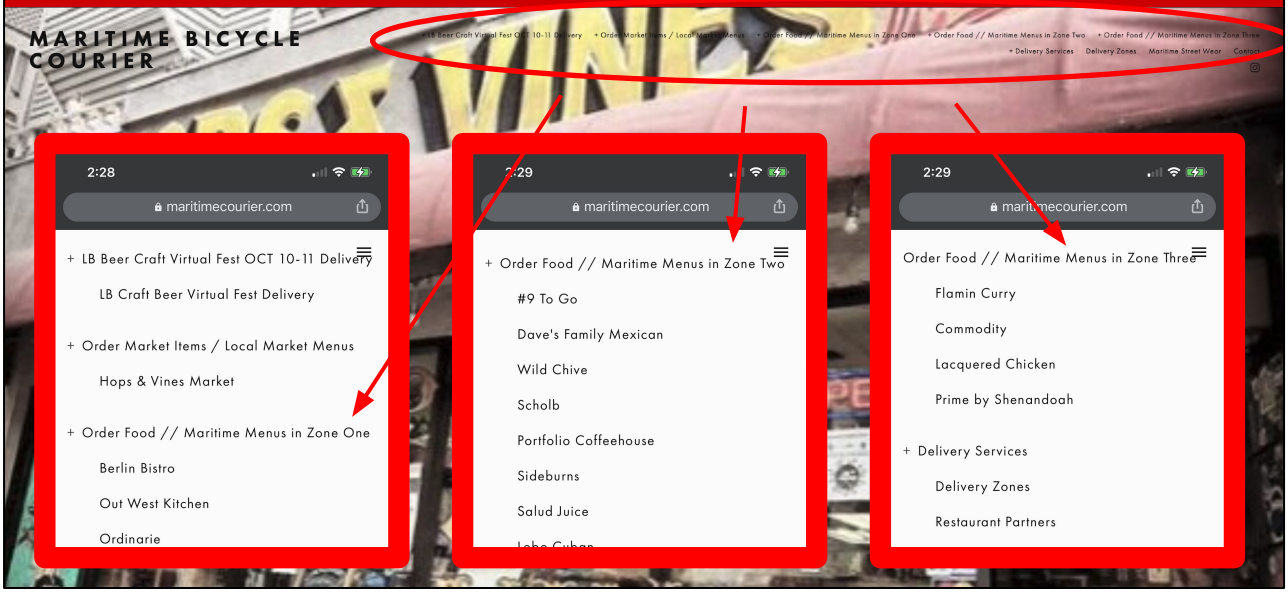



With Uber, the **main goal of this app is to order a car**. For this reason, the majority of the screen's real estate is dedicated to booking a vehicle. Uber uses a hamburger menu in a passive way by hiding content that is not crucial to the primary goal. For things like records of past trips, receipts, and payment settings, users will have to click the hamburger menu to access these non essential buttons.The hamburger menu **obeys the principle that objects should have resulting standard behaviors**. It is also good example of consistency, visibility, and stability in understanding how it works.  Either by **providing crucial navigation** or **getting out of the users way**.


And now for the Bad Examples.

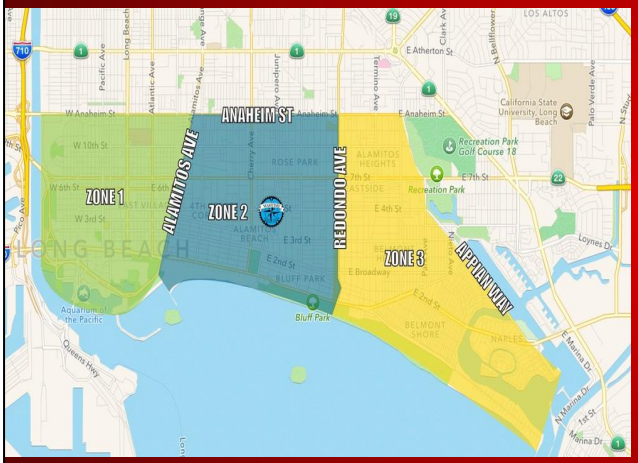

We found a study that showed how screen readers cannot detect a **chat or invite** feature that is nested behind the menu. If Siri could scan the menu source code, she could say **“Click Participants to Invite people to this meeting.”** Zoom could also put the Invite Link and the Chat feature on the dashboards so screen readers can support people with visual impairments.

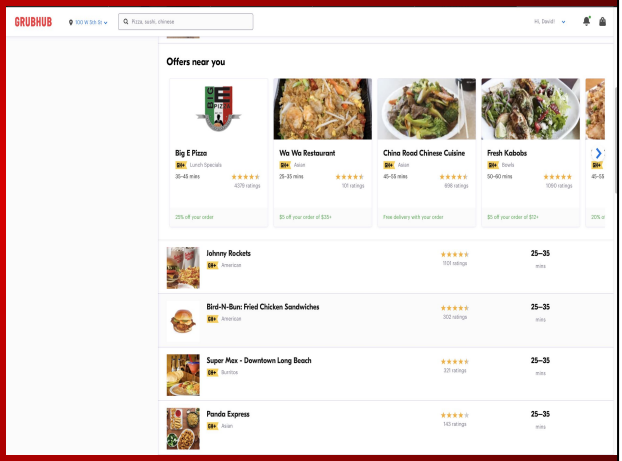
# Bicycle Delivery




This is the food delivery service I use in long beach, however their **site's primary navigation has one huge issue**. This **navigation is challenging** for customers due to **low color contrast** and tricky to **understand their delivery zone**. A customer must know what zone their order is coming from as well as the zone the order is going to. That is why the primary navigation fails the principle that **objects can be seen, heard, felt, or otherwise perceived.**

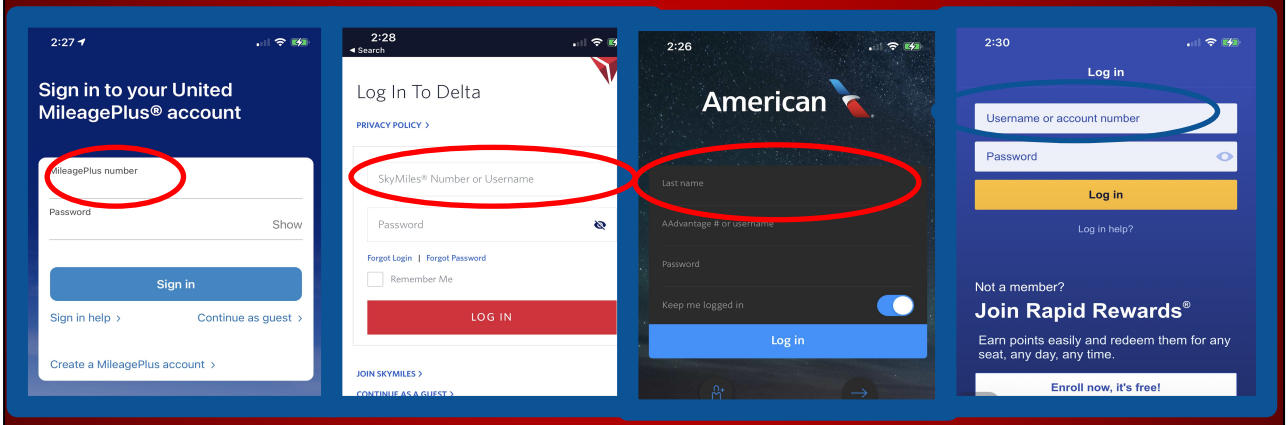
# Courier Solution



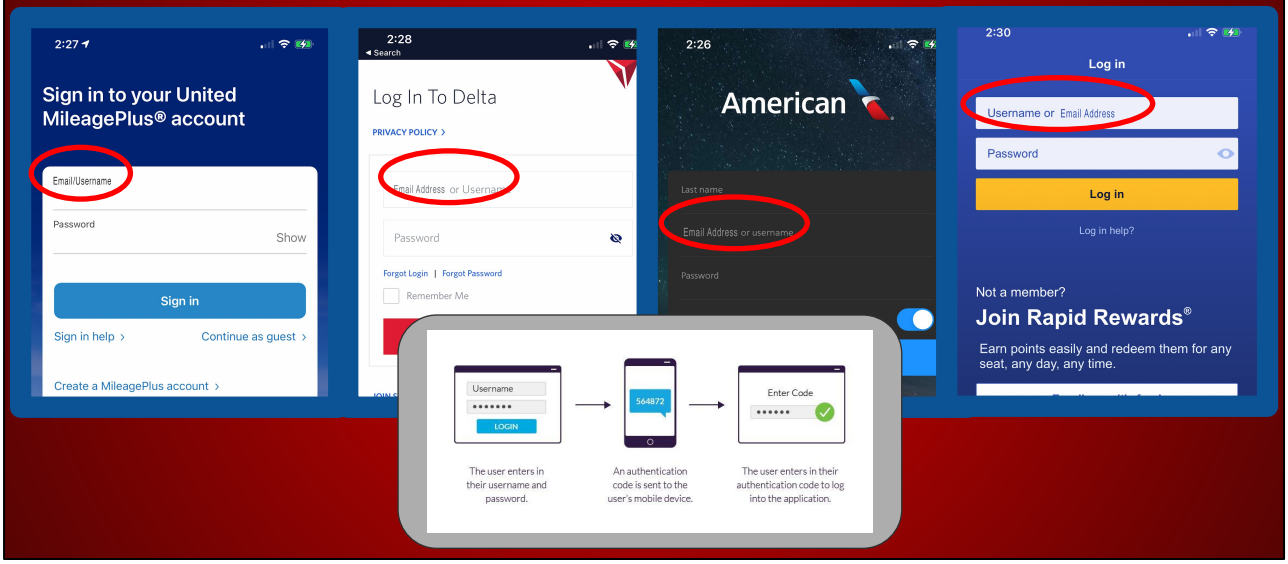

Our solution is a **clear primary navigation,** where delivery zones are **managed internally** on the administrative end. Customers **should only be offered delivery options from restaurants based on their delivery zip code**, much like how GrubHub or DoorDash operates. This updated solution follows the principle that **objects should be understandable, self-consistent, and stable.**

# Airline Login




I always wonder, why can't I login with the email address associated with my airline account? Airline logins have **created a new type of object** unnecessarily; while this is a **new convention** it **is not a unique experience**. I believe these logins have failed the **principle that objects should result in standard behaviors.**

# Airline Solution




Our solution allows customers to sign in to their airline account with their **email address and password**, and for additional security purposes, we would implement **2-factor authentication**. This login would reflect traditonal conventions by following the principle that **objects should have a standard resulting behavior**. Our main takeaway


Thank you all for being with us to learn about Bruce Tognazzini's 5 principles of Human Interface design and our next slide provides sources and the link to our preparation notes.

# Sources

**Icons by the Noun Project**

https://wdww.good.is/articles/using-the-noun-project-s-iconic-design-tools-for-social-change

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**Zoom Accessibility** https://www.smashingmagazine.com/2020/06/accessible-video-conferencing-tools/

**Zoom accessibility tips article** https://mosen.org/zoom/

**Hamburger Icon**
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**Full list of sources and preparation notes**
https://docs.google.com/document/d/1p26yRDsSxtPnI8IartThTB2xCG2T2v9JVWG4O68kXl0/edit?usp=sharing