Enhance Your Virtual Meeting Experience · Innovation case study

The virtual meeting market space has broadened significantly over the last few years. The Covid 19 pandemic brought a lot of changes to the way organisations and working professionals functioned, primarily - the increase of remote workforces.

This led to the integration of virtual meetings as a part of the daily routine. With the number of employees working from home and teams, increasing daily remote collaboration, the usage of virtual meetings has more than doubled in the last year alone.

Familiar?

With the convenience afforded by virtual meetings, some new ways of working and learning came about. I collaborate with people around the globe in virtual mode when I attend 4 to 5 hours of virtual meetings every day.

A virtual meeting is convenient, but it also presents challenges. In almost all the meetings that I attend, I hear or say "You are speaking on mute", and so many other instances that establish the fact that this is a challenging environment. Have you ever experienced a virtual meeting where everyone was at their best behavior? Do you recall extraordinary intrusions whether they be pets,

toddlers or other elements? And did the mic and camera settings work as desired at all times without fail?

Armed with passion and seeking innovation in this area, I have been analysing these challenges since early 2020. In this case study, I provide some background, and explain how my solution addresses these issues.

Structure of this case study:

- Challenges with virtual meetings
- The psychology behind
- Usability challenges
- Solution - The innovation
- How it works
- Advantages

Challenges with virtual meetings

In a virtual meeting, these situations are not atypical -
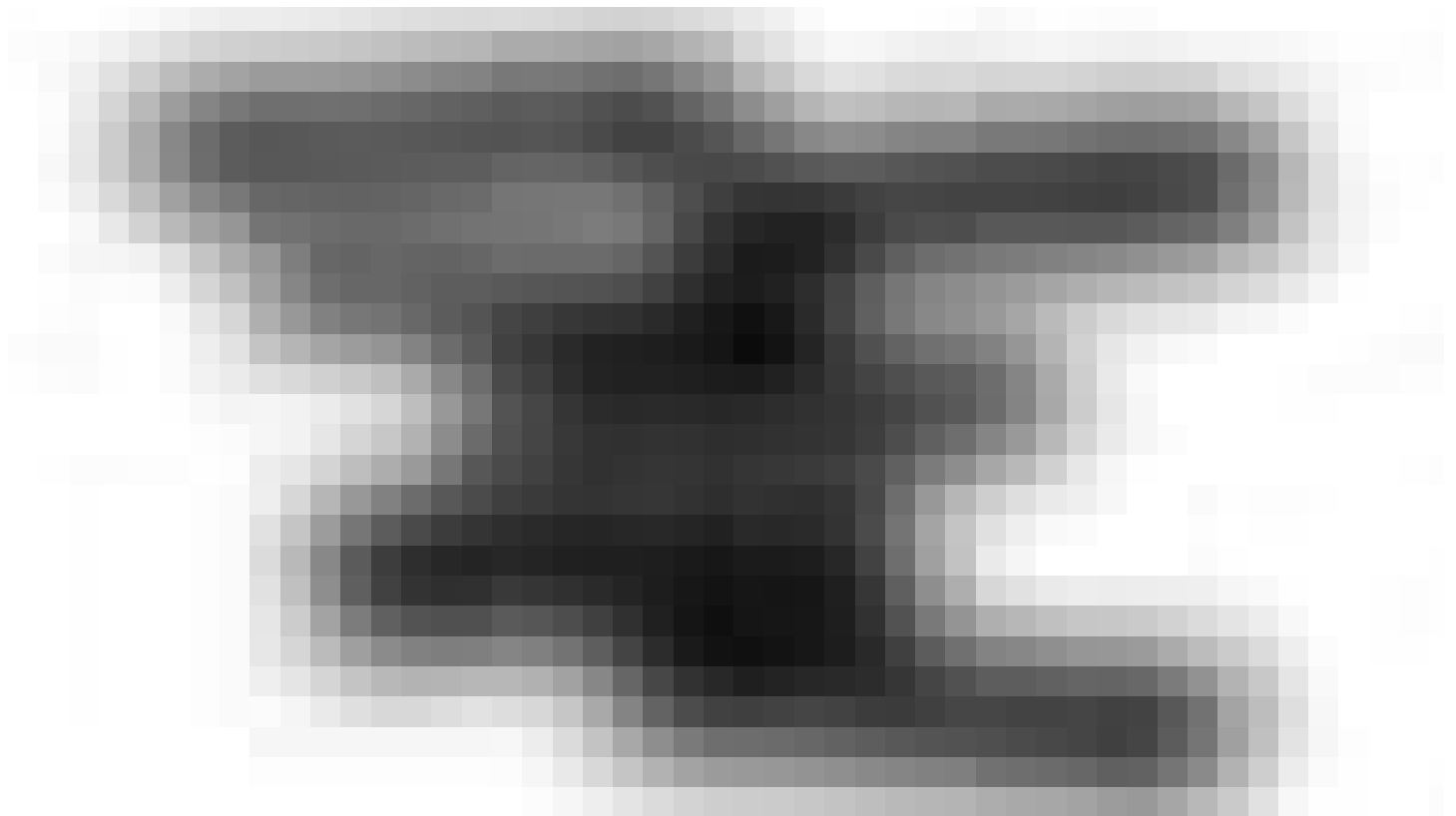
Some common problems that are observed for virtual meetings are:

- **Meeting bloopers**
  From forgetting to unmute yourself to realising that a toddler or a pet has walked into the frame before you can turn off the camera to saying inappropriate things , bloopers happen constantly causing embarrassment.

- **Fatigue and anxiety**
  "Zoom fatigue (aka virtual fatigue) is when the constant use of video conference calls and meetings leads to burnout. This can make it hard to concentrate on tasks and can bring on feelings of anxiety, stress, and depression." - greatist.com

  One reason for anxiety is to feel out of control and constantly worry that everything is not fine. A lot of people keep checking that they remain on mute regularly.

The psychology behind

- **Rewards-cost tradeoff**
  As stated in **Psychiatric Times**, the core psychological component of fatigue is a rewards-cost tradeoff that happens in our minds unconsciously. At every level of behavior, a tradeoff is made between the likely rewards and the costs of engaging in a certain activity. Even minor decisions, such as pressing the "Delete" versus "Backspace" button to erase a typed word, are made on the basis of these unconscious estimates to maximize reward (eg, time) over cost (eg, effort). A lack of perceived reward relative to cost during video conferencing is a primary psychological mechanism of Zoom fatigue. For eg. speaking on mute, being prone to meeting bloopers, audio delays, etc. there is likely decreased reward perceived when those people are videoconferencing.

- **Obligation to one's own physical environment**
  In a virtual meeting, not being in the same physical environment, you are always conscious of your own environment and its impact on other members of the virtual meeting.

People don't completely trust the system, and hence feel like they do not have enough control over their virtual meetings.

Reason for feeling the lack of control – Usability challenges

1. Representation of status vs action

The status is vaguely represented. In the following example (zoom) controls, It is difficult for a user to decipher whether he/she is on mute or unmute. The icon represents the status, and the label 'unmute' represents the action. This conflicting representation can delay the user's understanding of the status.


Representation of status vs action

In this article **State-Switch Controls: The Infamous Case of the "Mute" Button**, the problem of clearly communicating the status versus the action is very well explained.

2. Inconvenient to access

A significant amount of people multitask while attending virtual meetings. And when you multitask (a task that also involves your computer) during a meeting, you have multiple windows open. When your meeting window is hidden behind another window(s), it's inconvenient to access the meeting controls.

Users may not have their cursor close to the meeting controls. Some users may be screen sharing and moving the cursor around, or for some users, the cursor would be idle and their hands may not be on the mouse or trackpad. The travel time to reach the UI meeting controls provided by the meeting software is not fast. You need good reaction times to traverse across the display screen to the UI-buttons.
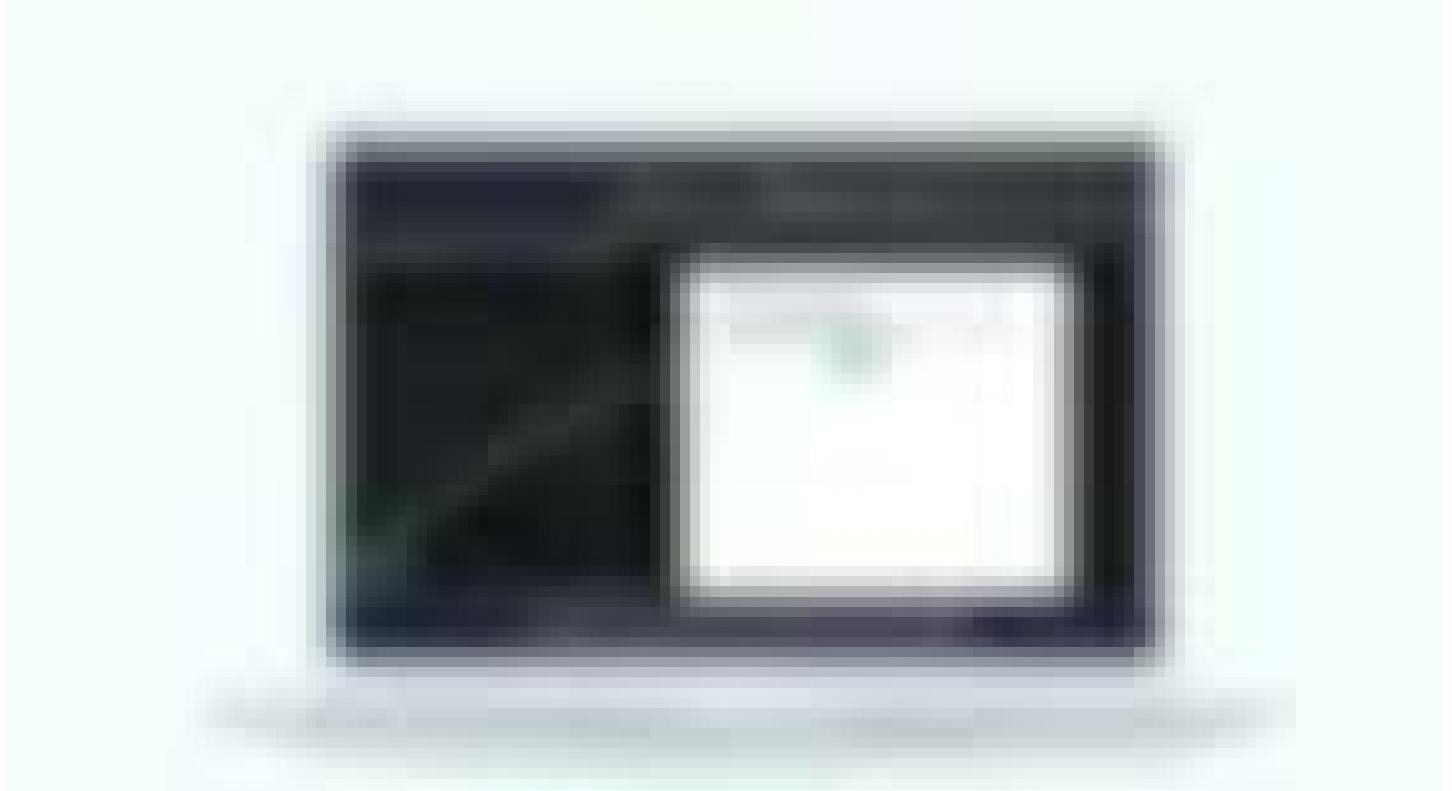
Inconvenient to access

3. Lack of constant visibility of system status

A lot of people said that they keep checking every minute to make sure that they are on mute. The underlying problem here is that the feedback, for example, you are on mute - is not explicitly available to the users. It may be that meeting controls bar hides when not in focus or the meeting app window could be hidden behind multiple windows.

Visibility of system status is a crucial **heuristics principle**. In the documentation of NN group, they said "Communicating the current state allows users to feel in control of the system, take appropriate actions to reach their goal, and ultimately trust the brand."

4. Inconsistent mechanism across meeting apps

Every meeting app has its own way of handling the controls. Some use icons to represent the status (for eg. If you are on mute, the icon will show unmute), and some use icons to show the action (for eg. If you are on mute, the icon will show mute). So if a user is using multiple meeting applications, he/she is expected to change the learning every time.
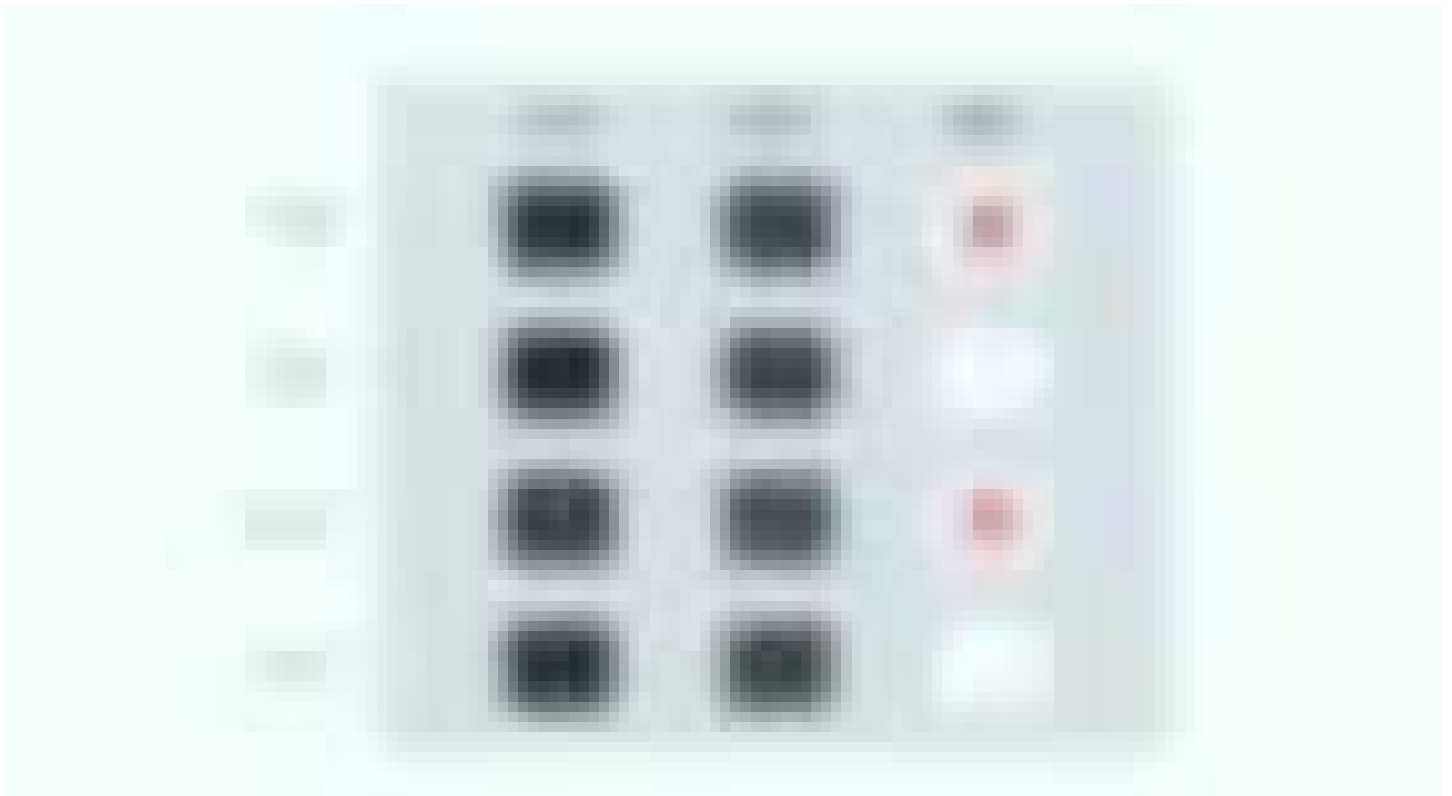
Inconsistent mechanism across meeting apps

Solution - Virtual meeting controller

The solution is a hardware controller with tactile buttons for meeting controls. A patent-pending system where a hardware device is connected with a computer. Through software, a user can use the hardware device to control the provided meeting functions. The software also keeps the hardware and meeting app synchronised to provide a consistent status.

Tactile controls for actions
The meeting controls in the user interface of the meeting application are replaced by tactile controls.

According to Finnish neurophysiologist Matti Bergström, quoted in a **lecture of Sofia Svanteson**: "The density of nerve endings in our fingertips is enormous. Their discrimination is almost as good as that of our eyes." Studies show that physical sensorimotor activities create a stronger connection to performed tasks.
By reflecting the meeting controls into the physical world, we are helping users feel more in control by establishing a stronger connection to the tasks.

Tactile controls are also easy to find and access because they have a dedicated space as compared to user interface controls that sit amidst all the other controls that are present on the screen.

Clear communication of status
We are communicating the status to the users using an LED light in the tactile buttons.

As **defined by the NN group**, "The visibility of system status refers to how well the state of the system is conveyed to its users. Ideally, systems should always keep users informed about what is going on, through appropriate feedback within reasonable time." By using the LED light in the buttons, we ensure clear communication and the visibility of the status.
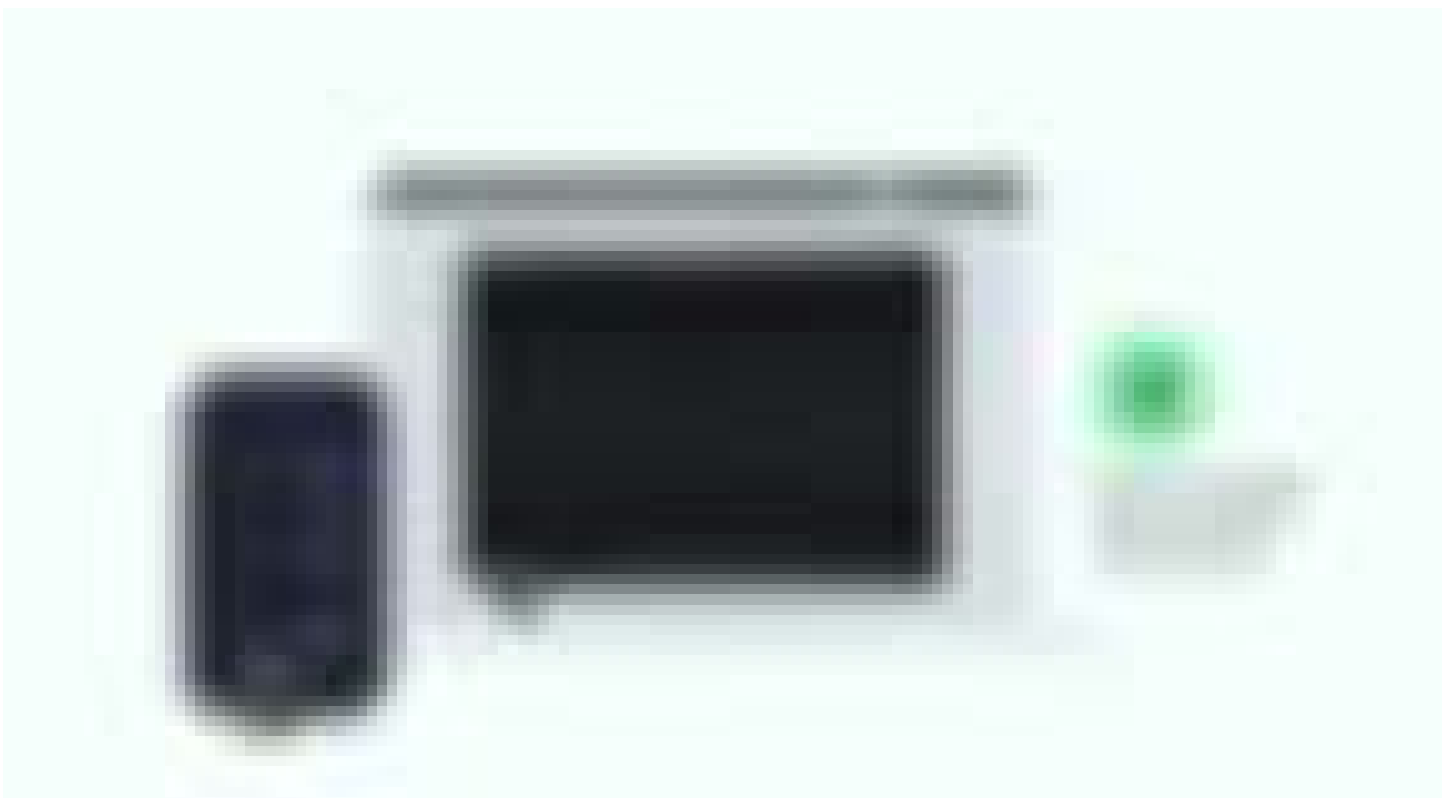
The status is also meant to be in synchronisation with the meeting application status. In case a user chooses to use the meeting app UI controls, the Boop device is designed to reflect the status.
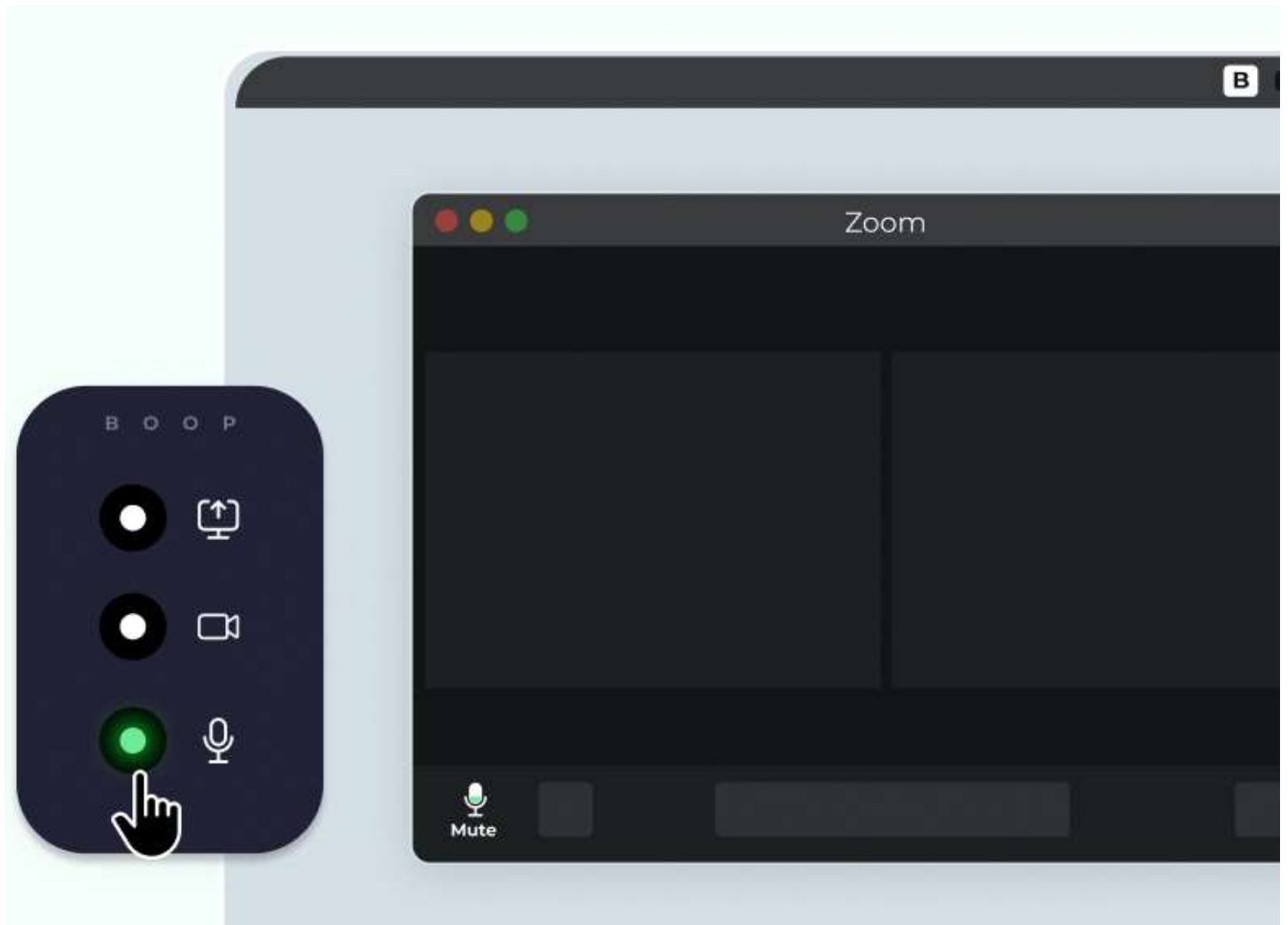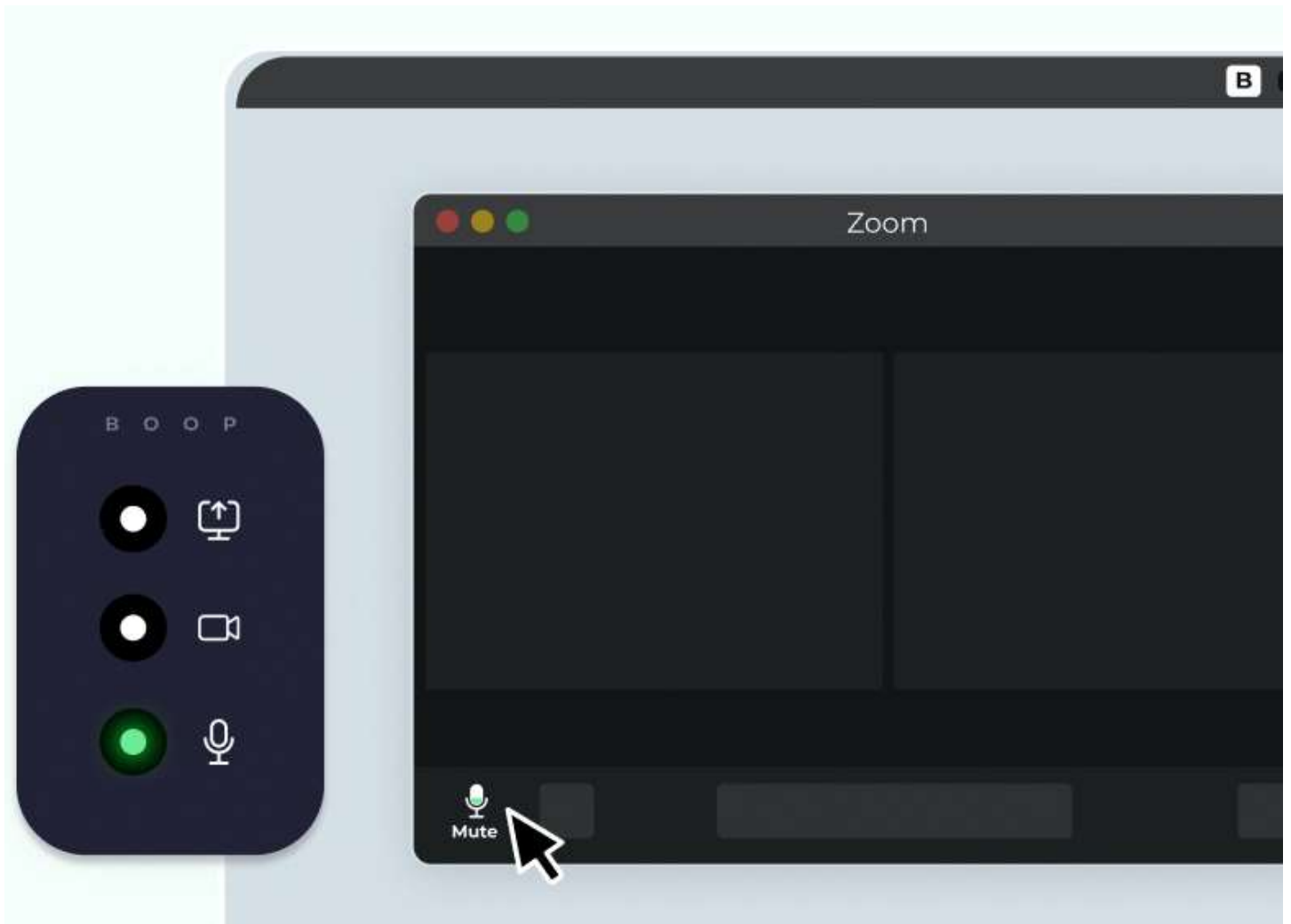
How it works

Setting up
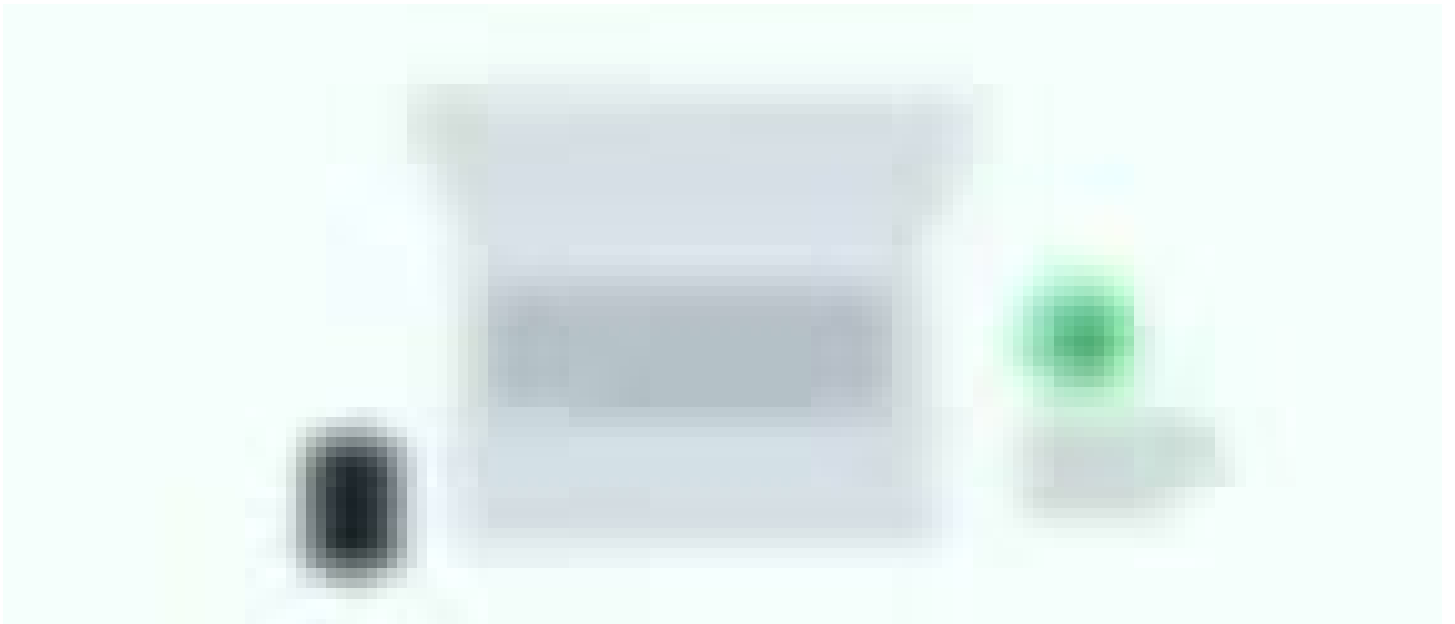
Using it

Here are the two ways that this can be used. A user can use the tactile button as well as the user interface buttons of the meeting application to perform the task.

Using the tactile controls in Boop device

Using the user interface controls in meeting application

Advantages

Backed by psychology and heuristics principles, this product would address these problems faced today with the available solutions:

- **Convenience**
  By taking the keys out of the screen and into the physical world, it will be convenient and efficient to use the functions without having to look for the buttons on the screen or navigate your cursor all the way to the user interface buttons. Tactile controls are easier to access than the ones on the screen.

- **Feedback**
  By providing feedback to the users about their mute and camera status, we are enhancing the visibility of the system status. The constantly available feedback will help give psychological relief to the users.

- **Consistency**
  By providing controls that work the same way across meeting applications, the device helps in injecting consistency to the user experience. And with the normalisation of controls, users do not have to change the mental model per application.

- **Accessibility**
  Tactile controls are inclusive of people with physical challenges that lack dexterity.

Conclusion

We've verified, tested, and have enough evidence to prove that our current remote-work world calls for a handy remote to help you take control over your virtual meetings.

Please feel free to reach with any questions, comments or feedback, all forms of interest will be most appreciated.