

# Utilizing a Simplified User Experience

# Agenda

- What is the difference between UX and UI?
- How has Crestron has built a great user experience into the DNA of our products
- The range of UX solutions Crestron provides
- The basics of UX/UI development for custom solutions
  - Principles of UX Design
  - Psychology of UX
  - User Centered Analysis and Testing
  - Evidence-based UX



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# Introduction: The Difference Between UX and UI

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## UX makes interfaces useful

- Information architecture
- User research
- Scenarios
- Wireframes
- Task flow
- Sketching
- **Prototyping**
- **User testing**

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## UI makes interfaces beautiful

- Typefaces
- Layout
- Visual design
- User controls
- Color
- Action buttons
- **Prototyping**
- **User testing**

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# Introduction

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## The UX benefits of Crestron

What are the building blocks?

- Hardware
  - Built for performance
  - Built for consistency
  - Built for versatility
- Software
  - Multitudes of Crestron and 3rd party user interface types
  - Custom software design tools if you need them
  - Powerful and consistent commissioning tools
- Integration
  - Everything works together in smoothest possible fashion

# Introduction

## Who is the “user” anyway?

Depending on the project there could be many “users” to consider

- End users of different:
  - Age
  - Technical proficiency
  - Job role
- Aesthetic decision makers
  - Executives
  - Architects
- System administrators
  - Technicians
  - Help Desk



# Introduction

Many complete hardware, software, and integration solutions are ready for you to use



 AirMedia<sup>2</sup>

 XiO CLOUD

CRESTRON HOME<sup>TM</sup>

 .AV Framework<sup>™</sup>

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## Utilizing a Simplified User Experience



Crestron Flex

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# Crestron Flex: Simple. Secure. Scalable. Consistent.

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## Native support for most popular third-party UC applications



 Microsoft Teams



 Skype for Business



 ZOOM

## Open UC

- De-couples applications from hardware – switch instantly
- No penalty of expensive hardware changes or additional charges
- Run applications that best support your business needs, today and tomorrow





# Crestron Flex: Simple. Secure. Scalable. Consistent.



**Crestron Flex  
P100 Series**

Voice-over-IP desk phone



**Crestron Flex  
M100 Series**

Tabletop conferencing system



**Crestron Flex  
B100 Series**

Wall-mount smart soundbar



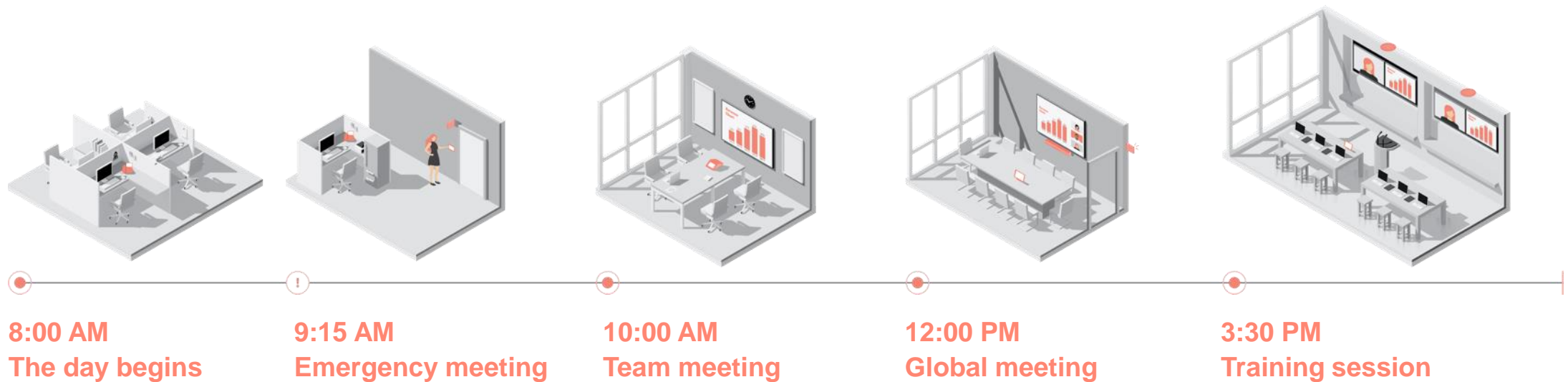
**Crestron Flex  
C100 Series**

Flexible, integrated UC kit

# Crestron Flex: Simple. Secure. Scalable. Consistent.

## Several different forms, one consistent user experience

- Less strain on support resources



# Utilizing a Simplified User Experience



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## .AV Framework

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### Deploy simple, scalable room solutions

- Web-based configuration and deployment
- Add a TSW-X60 Series touch screen and automatically generate the GUI for single or multiple display systems
- UI guide explains how easy touch screen pages are to use



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## Utilizing a Simplified User Experience



AirMedia® 2.0 wireless presentation technology

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## Why wireless presentation?

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- Frees people to sit or stand anywhere in the room or space and easily connect their laptops and smart devices to room display, regardless of OS
- No more wires or dongles cluttering table – in fact, you don't even need a table
- Enable collaboration in flexible spaces – e.g., cafeterias, hallways, private offices



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## Utilizing a Simplified User Experience



TSS and TSW Room Scheduling

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# One enterprise platform

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## Enterprise-grade hardware for any scheduling workflow

Crestron scheduling touch screens provide a full range of scheduling providers all from one unified hardware platform, including direct connection to popular calendar providers, Crestron Fusion® software, and a variety of partner applications





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# Customizability

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## Custom branding for the enterprise

Crestron scheduling is built on web standard technologies. It offers levels of customizability that match any customer's need, including:

- Four built-in layouts that include support for custom image or video backgrounds and logos
- Editing via CSS to change UI component sizes, color, and positioning
- Full HTML5 UI for creating completely custom experiences which can be edited by anybody with experience in web design

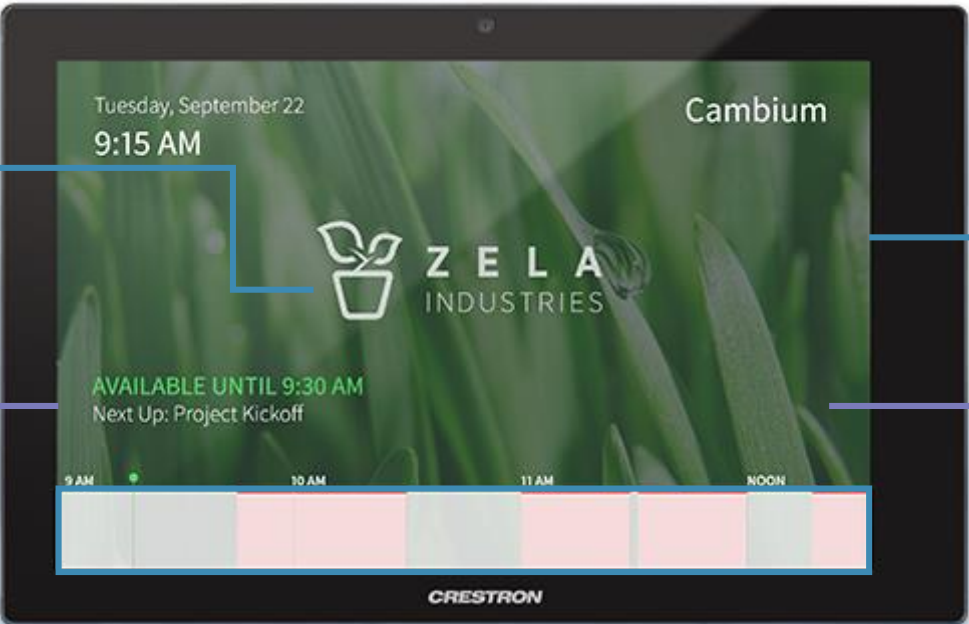
The support for video backgrounds is unmatched in the industry and provides immediate visual pop in common spaces.



# Custom GUI

Logos can be placed on the touch screen to reinforce branding

Change colors and positions using just a few lines of standard CSS



Static backgrounds and video loops can be set while in-use or as a screensaver

HTML5 support makes it easy to customize UI to promote branding



RESERVE



LOCATE



OPTIMIZE

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## LED accessories

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### LED accessories for TSW touch screens give visibility to room availability

LEDs come in two forms:

- SSW/SSC Status Signs: LED illuminated signs that can be engraved with room name and mounted to wall or ceiling
- Light Bar: Adds LED indicator strips to the side of a TSW touch screen
- SIW: Low-profile wall indicator

LED accessories are powered and controlled via connection to TSW USB port, no config necessary.



## Utilizing a Simplified User Experience

Crestron XiO Cloud™ service

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# Manage remotely

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## Crestron XiO Cloud™ provisioning for mass configuration and firmware upgrades

- Deploy – devices power on and connect up to the cloud
- Manage – push firmware updates
- Monitor – know about system outages before your users do
- Evolve – understand how spaces are being used to drive future design decisions



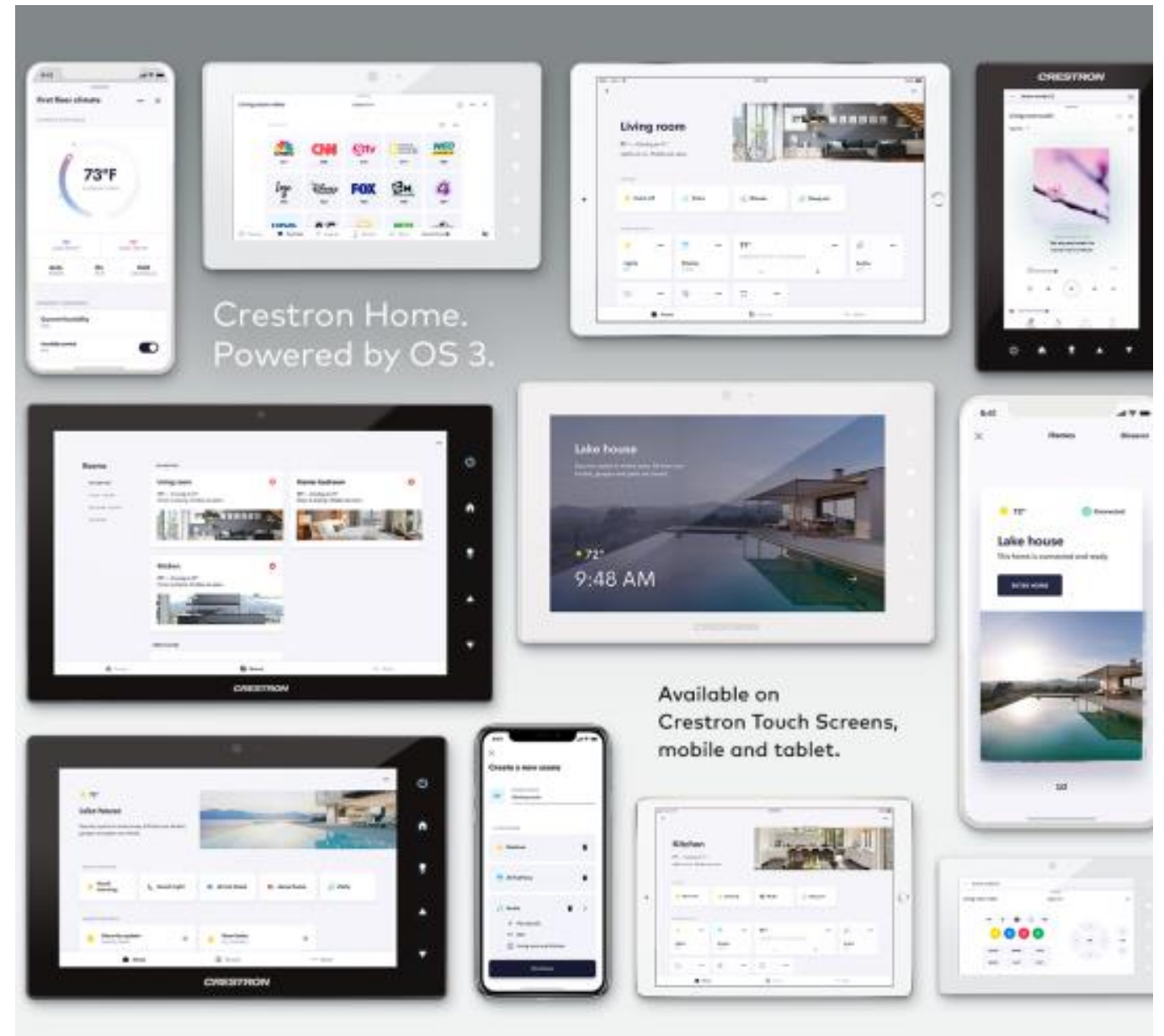
# Utilizing a Simplified User Experience



# Crestron Home™

All native. Stylish, responsive, smooth performance.

- Support for multiple homes
- Room image customization – use your own home's images for your rooms
- Runs on CP4-R, iOS devices, TSW-x60s, then Android™ OS phones/tablets later



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# Utilizing a Simplified User Experience



Programming and UI Design Tools



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## Custom design tools

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Design technologies are available for the full custom solution when you need it



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# Creating the Optimal User Experience



## Principles of UX Design

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# Principles of UX Design



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## User experience honeycomb

At the core of UX is ensuring that users find value in what you're providing to them

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# Principles of UX Design

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## The VIMM model to reduce end user work

### VISUAL: *Optimizing visual comprehension*

- Match screen flows and task flows
- Useful grouping and labeling
- Avoid gratuitous use of color

### INTELLECT: *Simplifying decision making*

- Offer previews and easy escapes
- Provide controls consistently
- Provide reliable system feedback

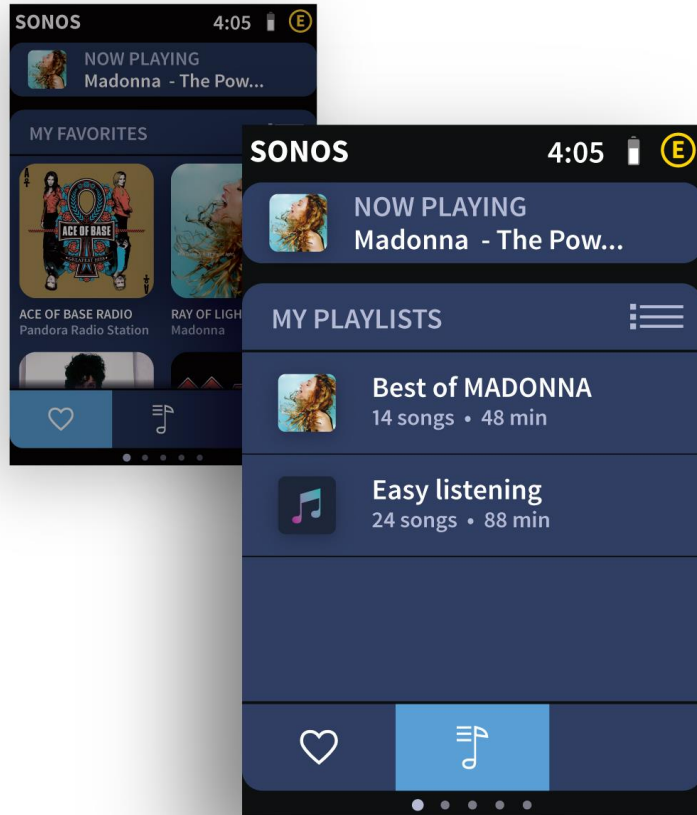
### MEMORY: *Minimizing memory load*

- Recognition over recall
- Provide defaults
- Display visible options

### MOTOR: *Minimizing movement and interaction time*

- Use short distances and large targets
- Optimize for the input device
- Reduce windows and steps

# Principles of UX Design



Crestron TSR-310 Remote screen flow

## The VIMM model to reduce end user work

VISUAL: *Optimizing visual comprehension*

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# Principles of UX Design



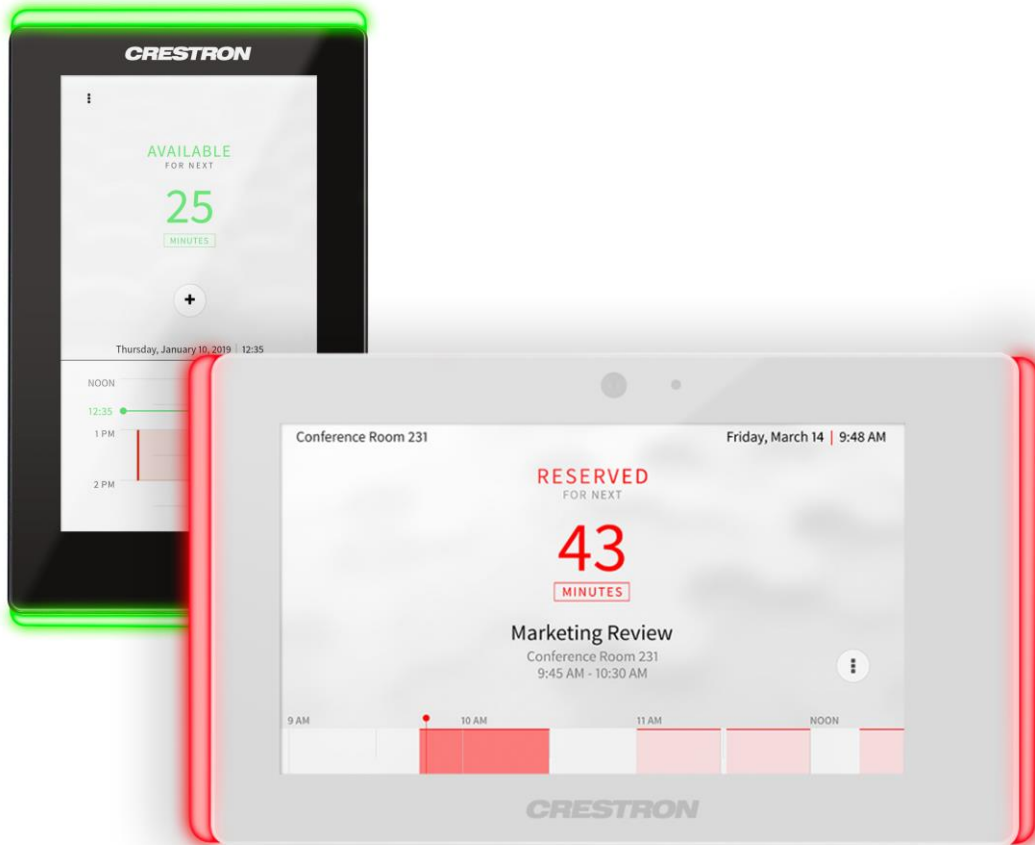
Crestron TSW-1060 with Sonos Media Player

## The VIMM model to reduce end user work

INTELLECT: *Simplifying decision making*

- Offer previews and easy escapes
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# Principles of UX Design



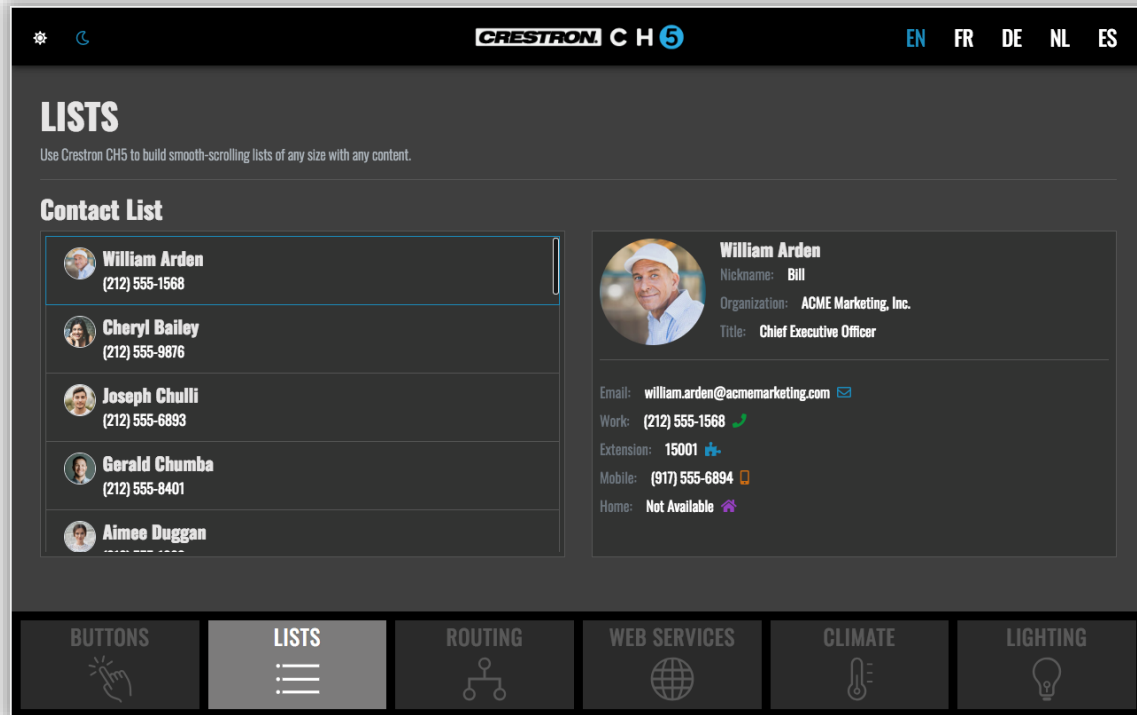
Crestron TSW-560 scheduling touch screen

## The VIMM model to reduce end user work

MEMORY: *Minimizing memory load*

- Display visible options
- Recognition over recall
- Provide defaults

# Principles of UX Design



Crestron CH5 Development Project

## The VIMM model to reduce end user work

MOTOR: *Minimizing movement and interaction time*

- Use short distances and large targets
- Optimize for the input device
- Reduce windows and steps



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# Creating the Optimal User Experience



Psychology of UX

# Psychology of UX



## Von Restorff Effect

The Von Restorff Effect, also known as The Isolation Effect, states that when multiple similar objects are present, the one that differs from the rest is most likely to be remembered.

Such distinctiveness can be generated from changing the meaningfulness or physical nature of the stimulus in ways such as:

- Size
- Shape
- Color
- Underlining
- Highlighting

# Psychology of UX



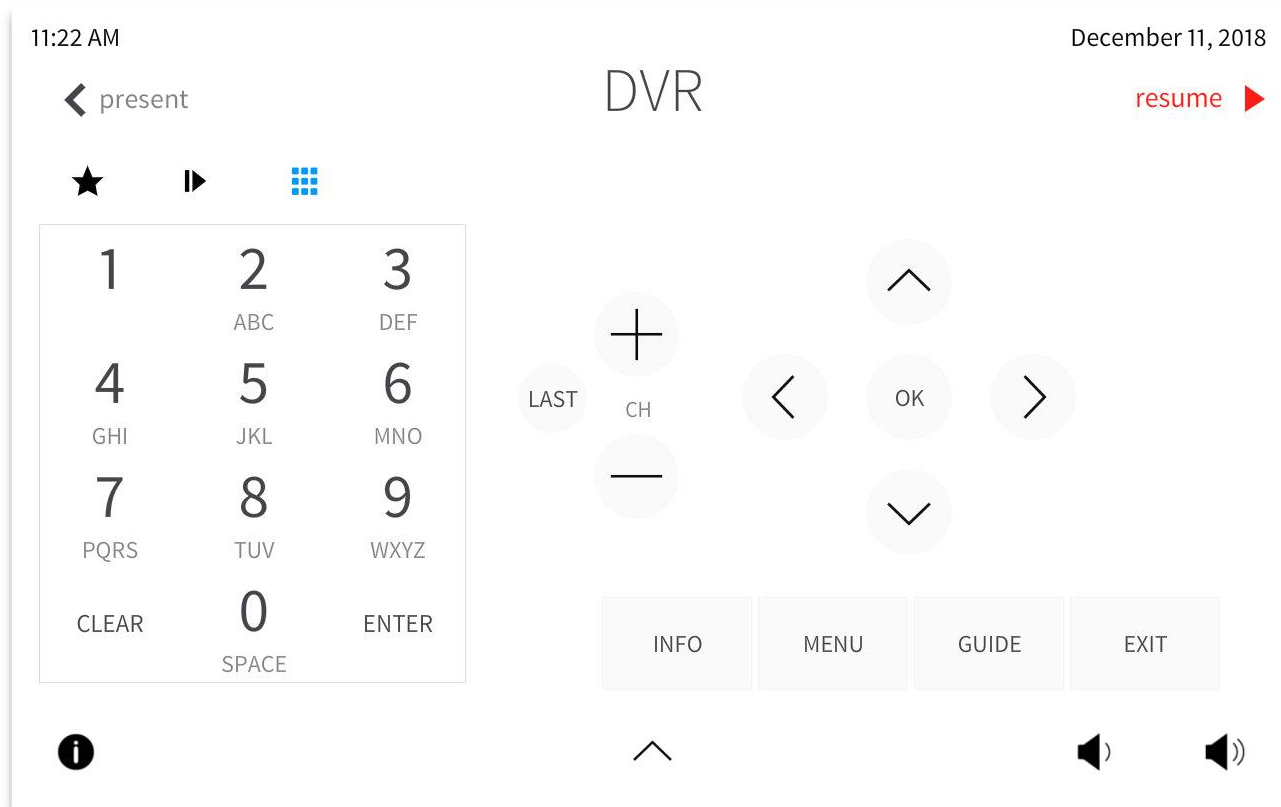
## Serial Position Effect

Serial Position Effect is a person's propensity to recall the first and last items in a series best, while easily forgetting the points in between.

Positioning key actions on the far left and right within elements such as navigation can increase memorization.

Placing the least important items in the middle of lists can be helpful because these items tend to be stored less frequently in the user's memory.

# Psychology of UX



## Law of Proximity

The Law of Proximity states that objects close to each other or grouped together are related.

The law of proximity is useful by allowing users to group different clusters of content at a glance.

# Psychology of UX



## Hick-Hyman Law

The Hick-Hyman Law states that the time it takes to make a decision increases with the number and complexity of choices.

More choices increase the time to consider options and make a decision, resulting in user frustration.

- Simplify UI for users by limiting the number of choices and breaking complex tasks into smaller steps
- Categorize choices / controls into main navigation and sub-navigation to help users quickly find the options they need
- Avoid overwhelming users by highlighting too many recommended options.

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# Creating the Optimal User Experience



User Centered Analysis and User Testing

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# User Centered Analysis and User Testing: The Difference

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## User centered analysis

*Gathering / analyzing* user data to design a *new* product

- Who are the users and how do they think and work?
- What factors affect user tasks?
- What do users expect from the design?
- What are the user's pain points and motivations?

Techniques:

- Interviews
- Surveys
- Focus groups
- Workshops

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## User testing

*Evaluating an existing* design with real users

- Is the design usable?
- Does the UI match how users think and work?
- Is the design, effective, efficient, and satisfactory to users?
- Are users able to complete tasks?

Techniques:

- Expectancy test
- Task walkthrough
- Performance test
- A-B testing

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# User Centered Analysis

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## User's mental model

The representation that a person has in their mind of how something works in the real world.



*User's mental model  
using a mobile device to call somebody*

## Conceptual model

The actual interface that users interact with.



*Conceptual model - Crestron Flex products*

*Intuitive user experience results from interface's conceptual model matching  
user's mental model – not merely reflect underlying system.*

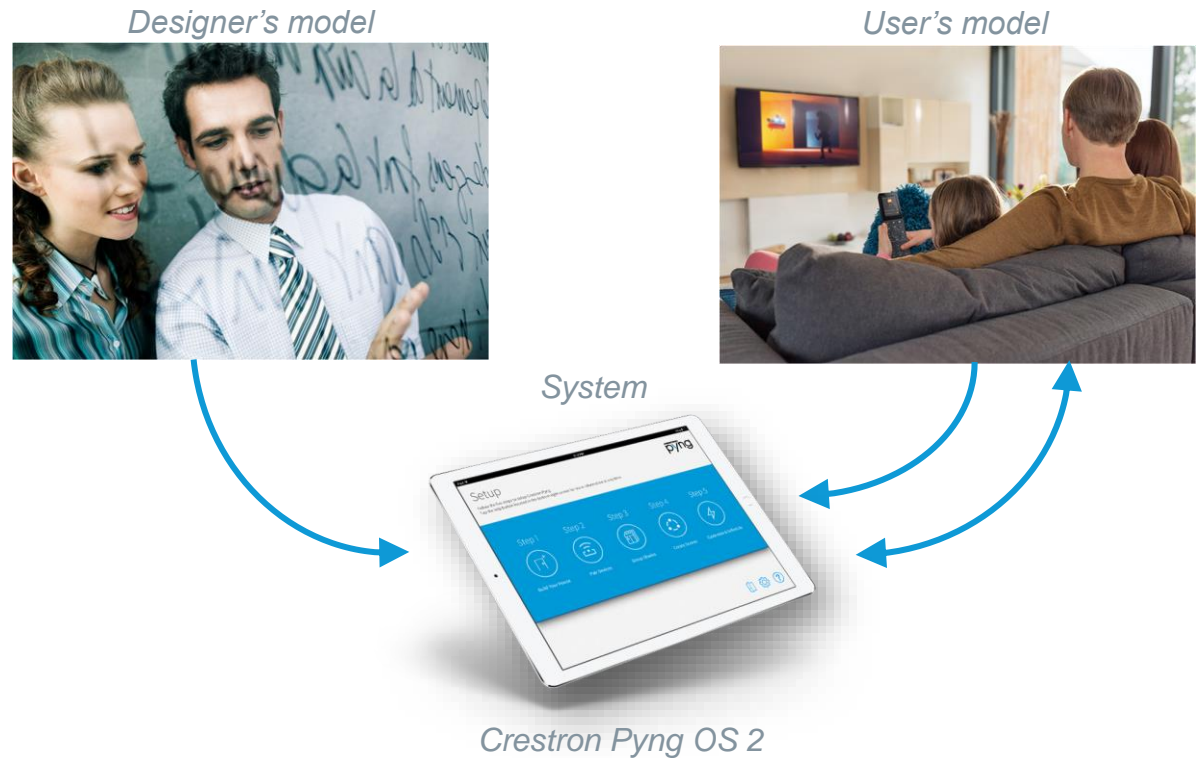


# User Centered Analysis

## Designing for user's mental models

It's essential to close the gap between business goals and how users think in order to design intuitive interfaces.

- Design for patterns that users are accustomed to
- Use natural and intuitive gestures that match real-life actions and expectations



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# Creating the Optimal User Experience



User Testing

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# User Testing

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## Observing *real* users performing *real* tasks on a *real* system to evaluate the existing designs

### Objective is *feedback*:

- Verify design goals were met
- Determine if the design is working or not
- Measure how well the design works
- Diagnose problems
- Compare alternative solutions
- Look for improvement opportunities

### Benefits:

- Provides feedback directly from users
- Provides data for decisions, not opinions
- Saves development time by avoiding extensive rework
- Creates positive ROI
- Helps with “change management” when introducing new systems

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# User Testing

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## Sample size: how many participants do you really need?

### The Law of Diminishing Returns

- Five users will uncover approximately 80% of usability problems in a product
- The amount of new data collected decreases with each test user and flattens out most prominently at 5 test users, making 5 users the right size for the right value



# User Testing

## Prototyping

Testing prototypes is the foundation for the detailed interface design

### The purpose is to support iterative design:

- Easy to change low fidelity quickly
- Focuses on basic page design and task flow
- Users are more willing to critique something in progress

### Evaluate efficiency and usability of:

- Structure and layout
- High level navigation
- Visual presentation
- Primary content



# User Testing

## Crestron Mercury® system user testing



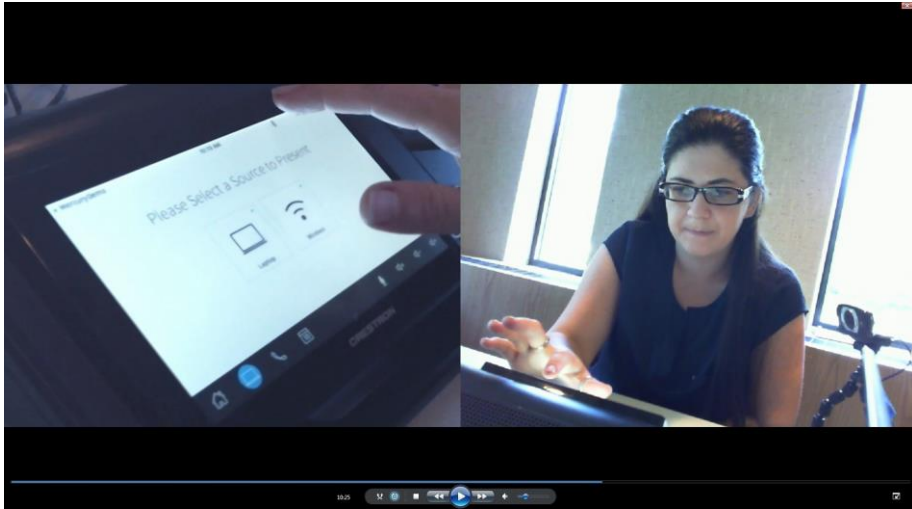
A prototype Crestron Mercury® was built from a collection of Crestron products that emulated the planned capabilities of the device

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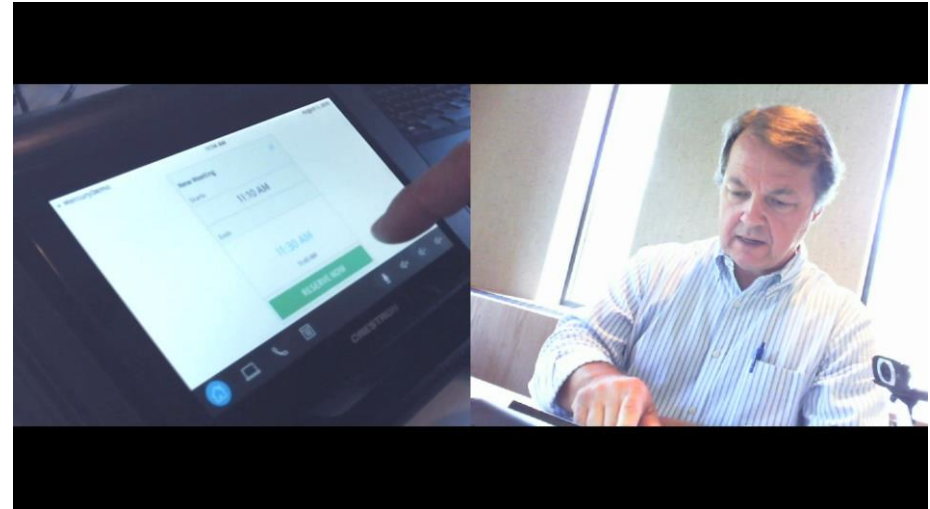
# User Testing

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## Crestron Mercury<sup>®</sup> user testing



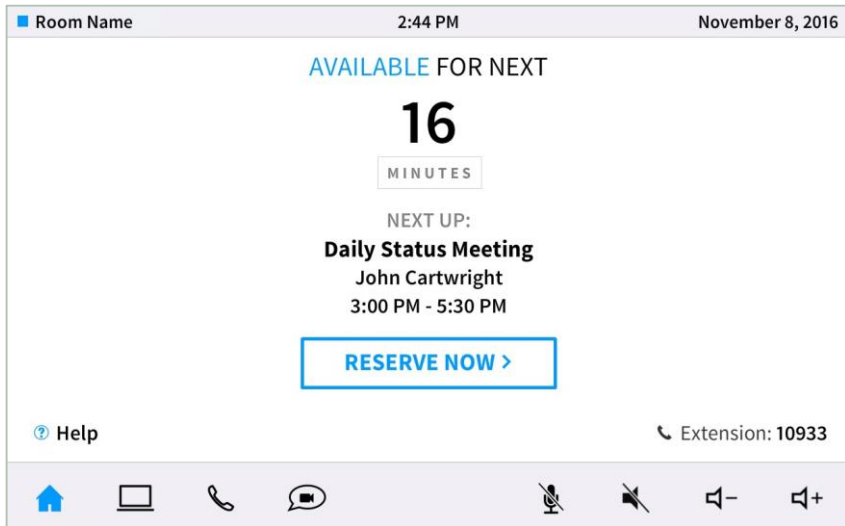
**Study groups were recruited to participate in “Think Aloud,” task-focused usability test sessions on the prototype**



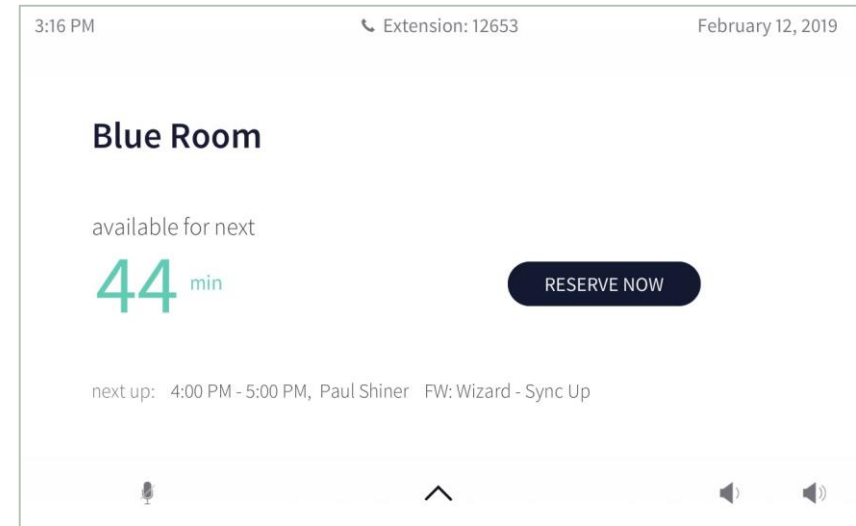
**The sessions were recorded and observed by members of Crestron’s UX team. Several opportunities for improvement were discovered**

# User Testing

## Crestron Mercury® user testing



Based on user feedback, the home screen was refined...

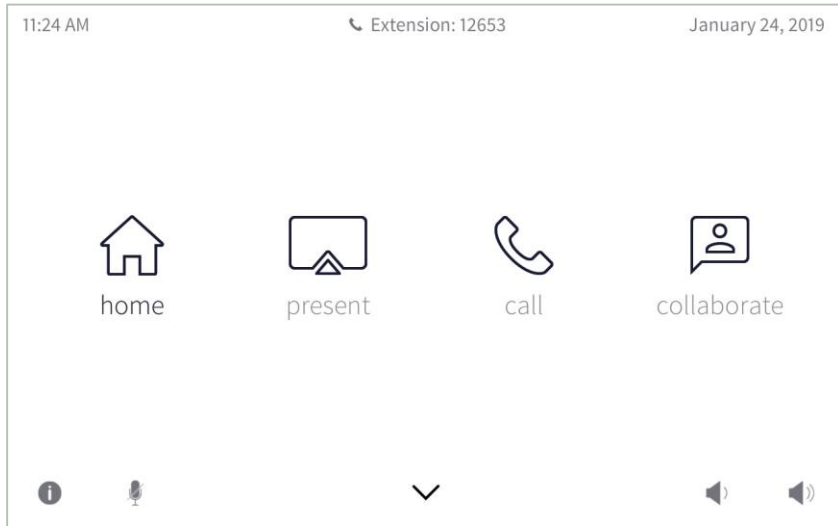


to declutter the user interface and allow for a more focused experience

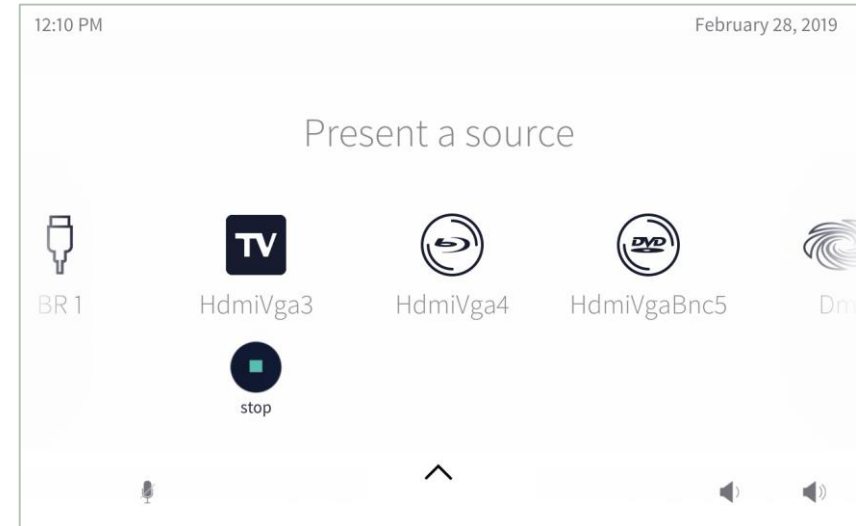


# User Testing

## Crestron Mercury® user testing



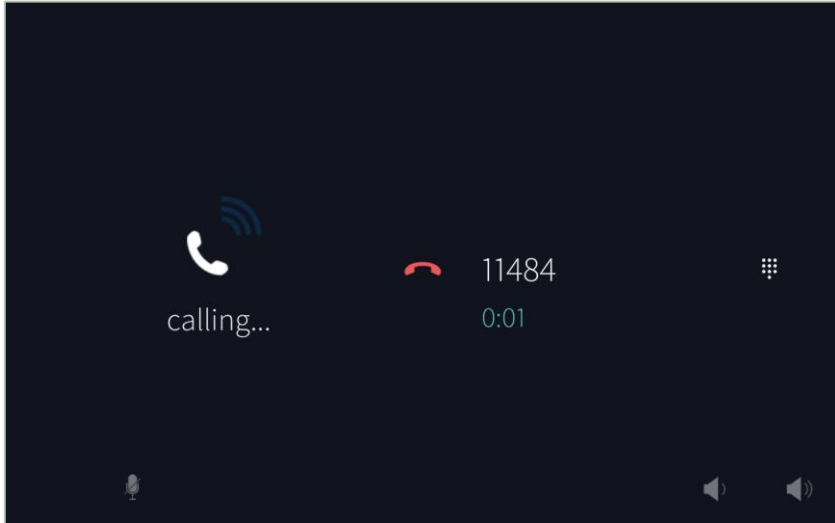
**The new simplified menu design has also proven to be readily scalable...**



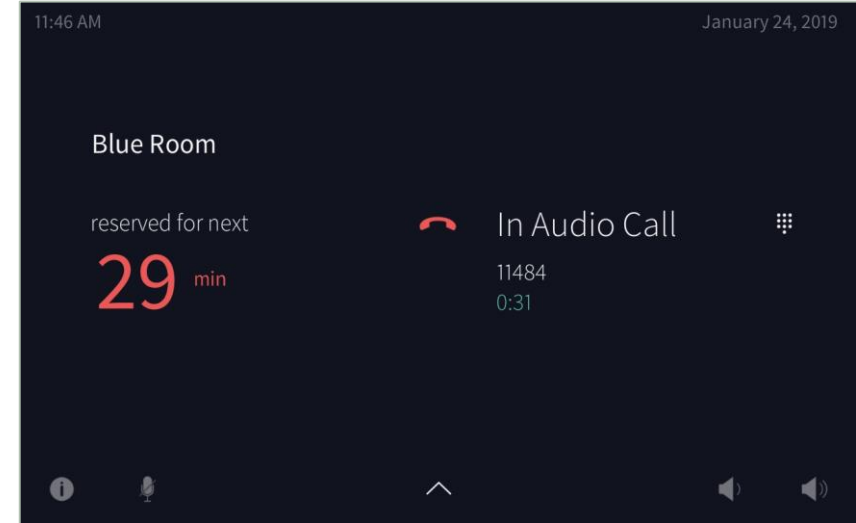
**and more dynamic, allowing for larger or smaller systems without compromising the visual integrity of the page**

# User Testing

## Crestron Mercury<sup>®</sup> user testing



**Inverting the background color signifies to the user that they're on an active call**



**Additionally, the new UI surfaces the most relevant meeting information during an active call**

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# Creating the Optimal User Experience



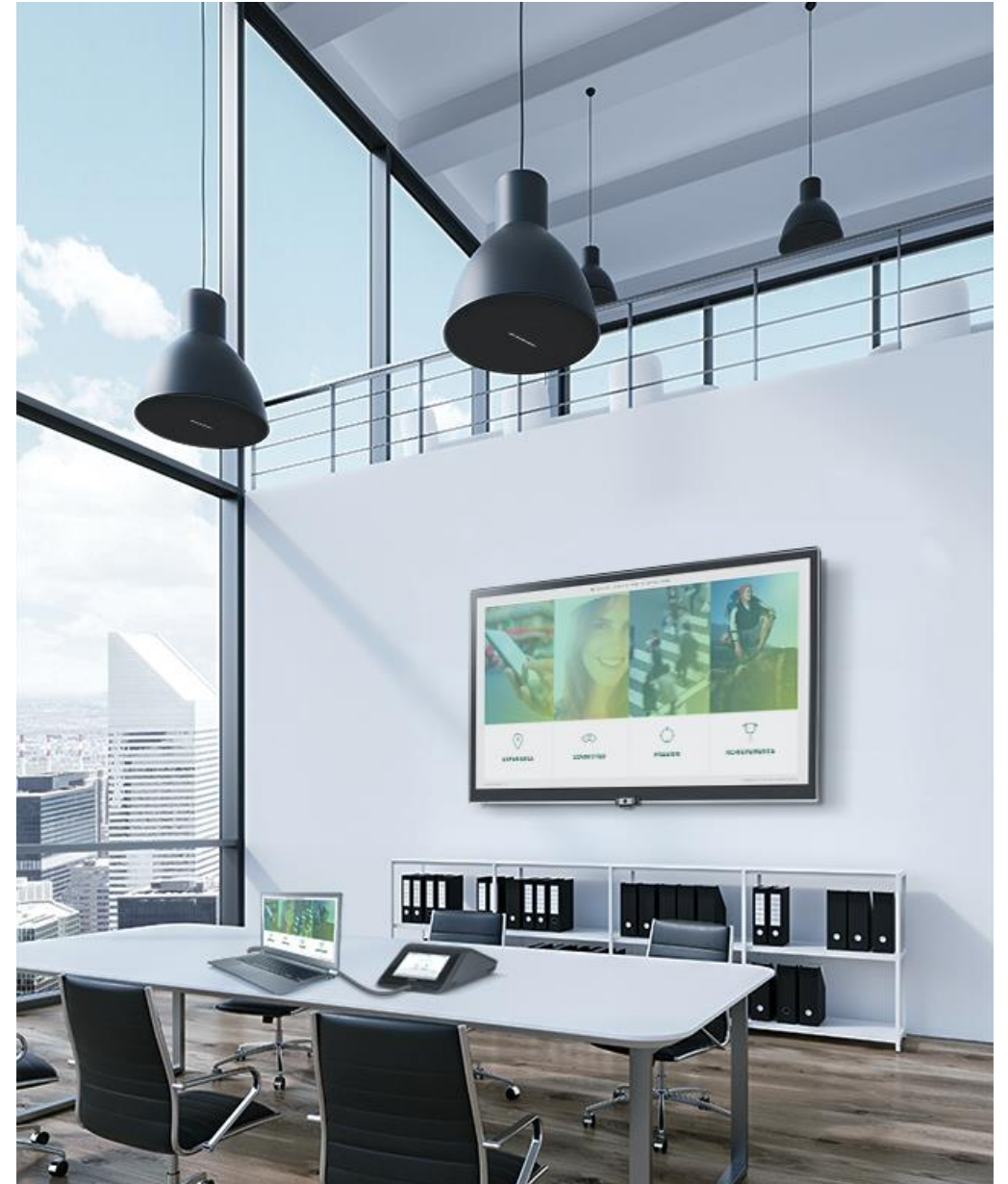
Conclusion

# Conclusions

## Designing user experiences with Crestron

It isn't necessary to start from scratch

- User experience design requires time, careful analysis, iterations, and work
- User experience has to be designed in from the start
- Crestron makes a large investment in:
  - Designing great user experience right into our solutions
  - Providing the tools necessary to craft the user experience from scratch when required
- Utilizing a strong foundation of hardware and software solutions, Crestron offers user experiences that fulfill most needs of the enterprise or home
- Your goal should be to leverage existing user experiences whenever possible, and design from scratch only when the project absolutely requires it
- Hybrid goal: take cues from the Crestron user experience if crafting your own





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