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
Introduction: The Difference Between UX and UI

**UX makes interfaces useful**
- Information architecture
- User research
- Scenarios
- Wireframes
- Task flow
- Sketching
- Prototyping
- User testing

**UI makes interfaces beautiful**
- Typefaces
- Layout
- Visual design
- User controls
- Color
- Action buttons
- Prototyping
- User testing
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
Utilizing a Simplified User Experience

Crestron Flex

Native support for most popular third-party UC applications

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
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

Several different forms, one consistent user experience

- Less strain on support resources

8:00 AM
The day begins

9:15 AM
Emergency meeting

10:00 AM
Team meeting

12:00 PM
Global meeting

3:30 PM
Training session
Utilizing a Simplified User Experience

.AV Framework™ technology
AV Framework

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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AirMedia® 2.0 wireless presentation technology
Why wireless presentation?

- 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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TSS and TSW Room Scheduling
One enterprise platform

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.
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.

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

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

HTML5 support makes it easy to customize UI to promote branding.
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.
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Crestron XiO Cloud™ service
Manage remotely

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
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Crestron Home™
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
Utilizing a Simplified User Experience

Programming and UI Design Tools
Custom design tools

Design technologies are available for the full custom solution when you need it
Creating the Optimal User Experience

Principles of UX Design
Principles of UX Design

User experience honeycomb
At the core of UX is ensuring that users find value in what you’re providing to them.
Principles of UX Design

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

**MEMORY:** Minimizing memory load
- Recognition over recall
- Provide defaults
- Display visible options

**INTELLECT:** Simplifying decision making
- Offer previews and easy escapes
- Provide controls consistently
- Provide reliable system feedback

**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

The VIMM model to reduce end user work

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Crestron TSR-310 Remote screen flow
Principles of UX Design

The VIMM model to reduce end user work

**INTELLECT: Simplifying decision making**

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

*Crestron TSW-1060 with Sonos Media Player*
Principles of UX Design

The VIMM model to reduce end user work

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Principles of UX Design

The VIMM model to reduce end user work

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Crestron CH5 Development Project
Creating the Optimal User Experience

Psychology of UX
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
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.
Creating the Optimal User Experience

User Centered Analysis and User Testing
User Centered Analysis and User Testing: The Difference

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

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
User Centered Analysis

User’s mental model
The representation that a person has in their mind of how something works in the real world.

Conceptual model
The actual interface that users interact with.

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
Creating the Optimal User Experience

User Testing
User Testing

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
User Testing

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.
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
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.
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.
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