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Welcome!

Create/Join a group of 4 and discuss this question:

What challenges are you currently facing that you would like to help with today?

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John Campanella

- 43 Years in the industry (1981)
- Manufacturing through integration
- Co-Author of CTS-D Course
- 2006 InfoComm Educator of the year
- AVIXA Facilitator since 1992

Trevor Flynn

- 14 Years in the AV industry (2010)
- Audio Engineering MSc from The University of Hertfordshire (UK)
- Audio Engineering instructor at Nexus ICA in Coventry, UK (3 years)
- Passed John's CTS-D exam

Learning Objectives

- Recognize why certain designs need more attention to detail in order to be as complete as the customer is expecting.

Learning Objectives

- Understand how to fully critique your designs prior to installation or submission.

Learning Objectives

- Collaborate with others to discover new solutions to problems with system design.

Learning Objectives

- ==Learn problem solving processes==
  - determining your objectives and constraints
  - Prototyping
  - Testing
  - evaluation.

Common Design Error Issues

- Infrastructure
- Facility
- AV System Design
- User Wish List vs Actual need

Infrastructure

- Probable Errors:
  - Power
  - Rack Space (MDF/IDF)
  - Connections (BMS)
  - Location of Devices
  - Other Trades Pathways
  - What Else?

Facility

- Probable Errors
  - Furniture
  - Room Configuration
  - ADA Requirements
  - What Else?

AV System Design

- Probable Issues or Errors
  - Equipment Specification
  - Wiring Topology
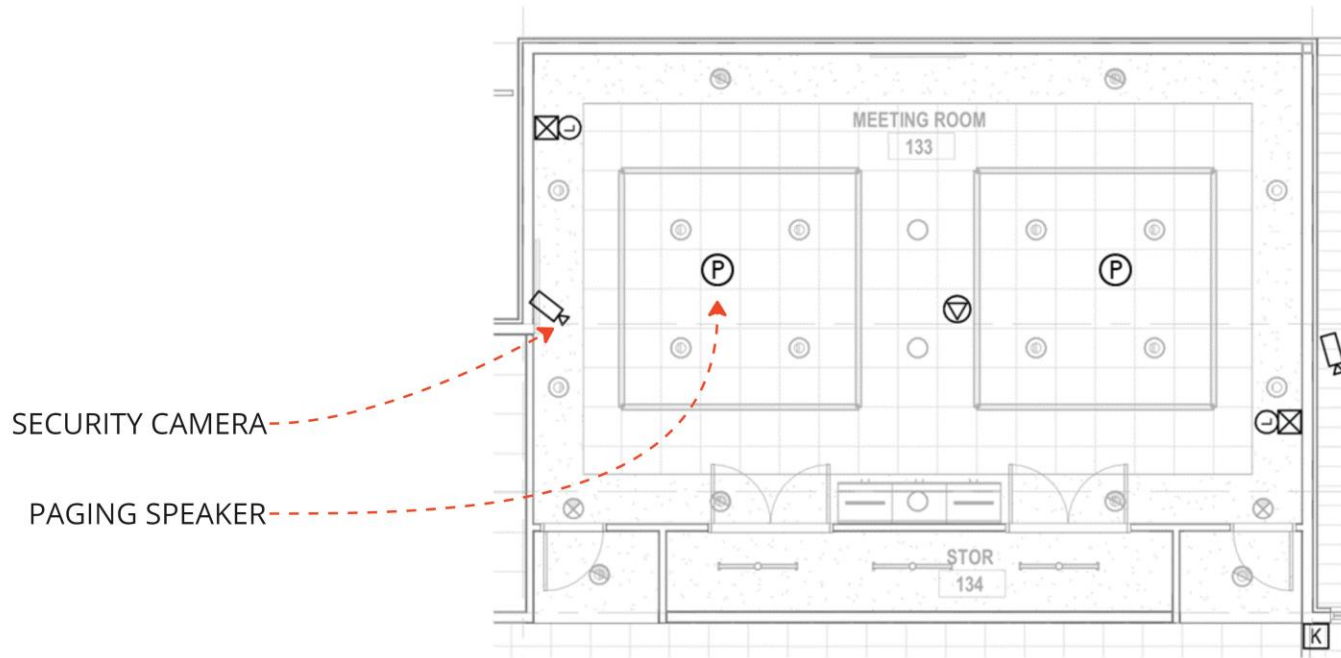 - "Bandwidth" Availability
  - Supply Chain
  - What Else?

User Wish List vs Actual

- Probable Issues or Errors
  - User Polling
  - Existing Systems
  - Ease of Functionality
  - Change of the Guard
  - What Else?

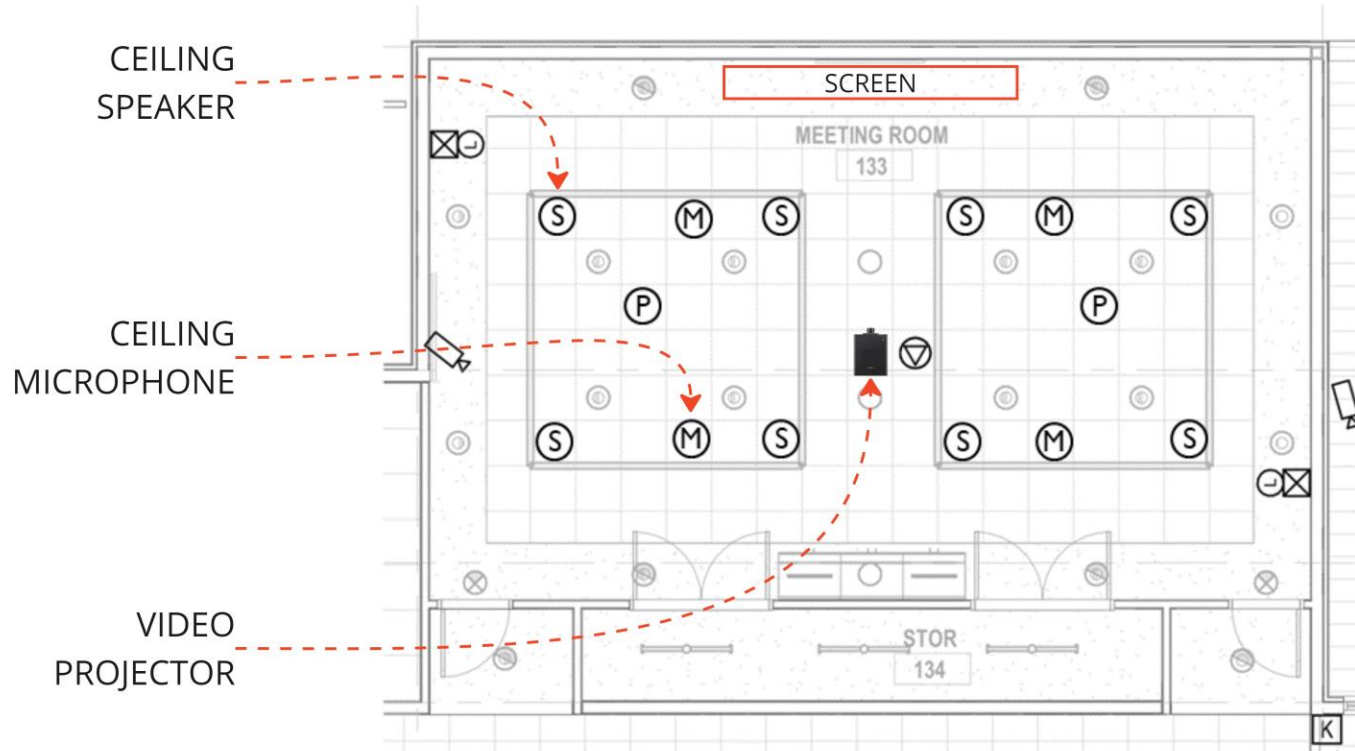# Example #1

- Client Provided Reflected Ceiling Plan

Example #1

- Meeting Room Design
  - Client Needs/Wants
    - Projector
    - Projection Screen
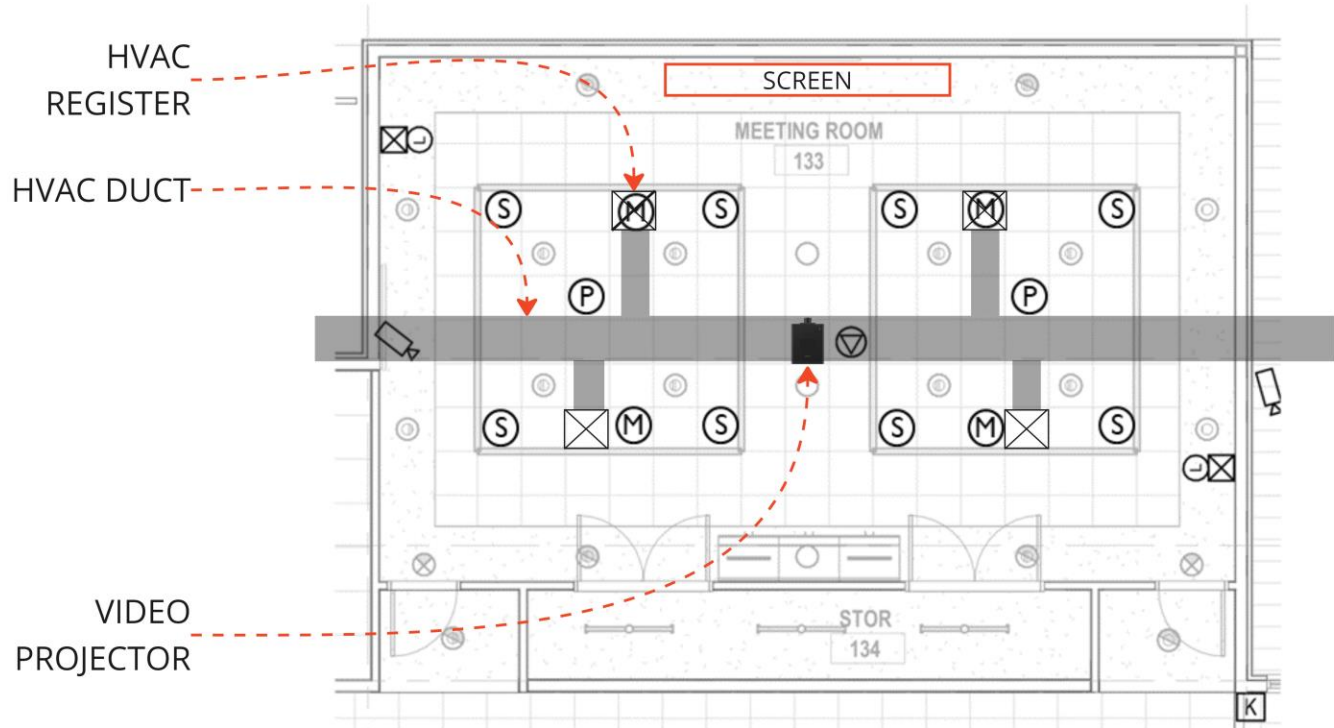   - Camera
    - Ceiling Speakers
    - Ceiling Microphones

Example #1

- Design Engineering Phase

Example #1

- Onsite Discovery

Example #1

- How would you approach this?
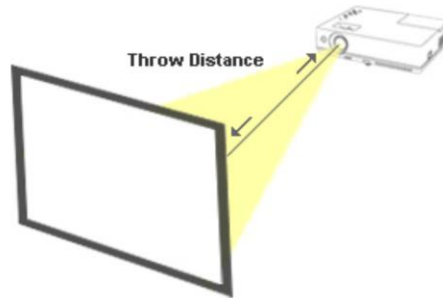 - Break it down.

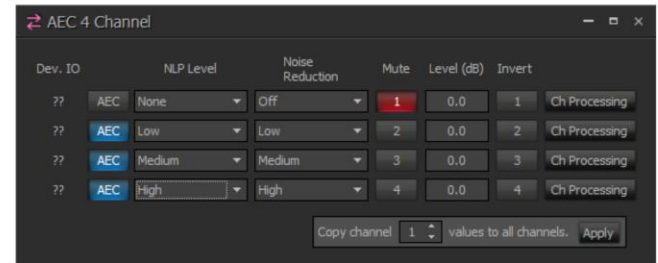- Get in groups of 4 and brainstorm.

Example #1

- Did you consider:

Tile bridge mount allows projector location to remain

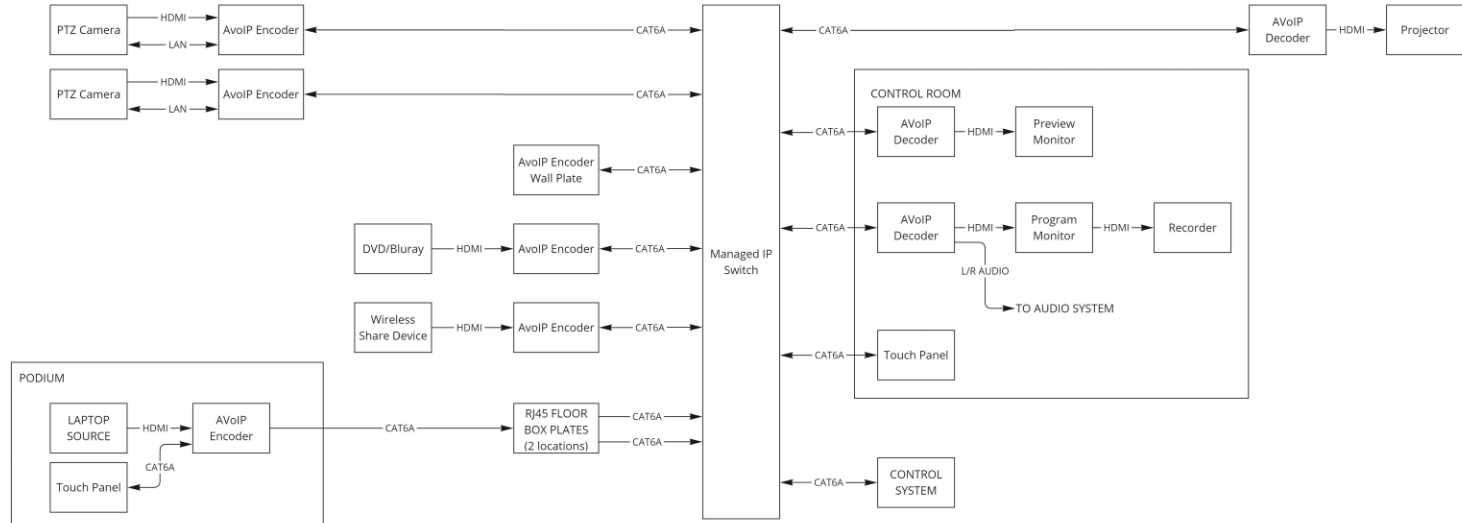Lens throw may allow for single tile adjustment of location

Throw Distance

Verify non-linear processing of microphones to ensure register noise is minimized at the mics

AEC 4 Channel

Dev. IO		NLP Level	Noise Reduction	Mute	Level (dB)	Invert	
??	AEC	None	Off	1	0.0	1	Ch Processing
??	AEC	Low	Low	2	0.0	2	Ch Processing
??	AEC	Medium	Medium	3	0.0	3	Ch Processing
??	AEC	High	High	4	0.0	4	Ch Processing

Copy channel 1 values to all channels. Apply

Credit: Biamp Cornerstorne
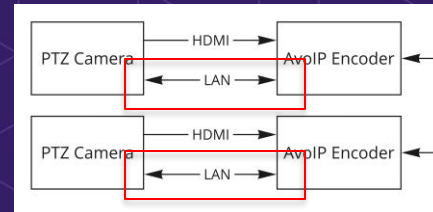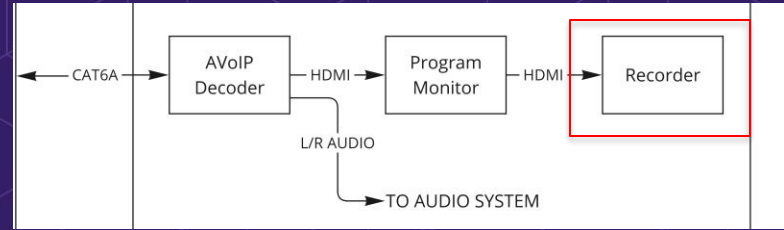
Example #2

- AVoIP Distribution

Example #2

- There are multiple distinct problems with this design.
  - Errors in engineering design concept
  - Problems discovered during audio commissioning
- Break into groups and discuss
  - Identify errors and problems
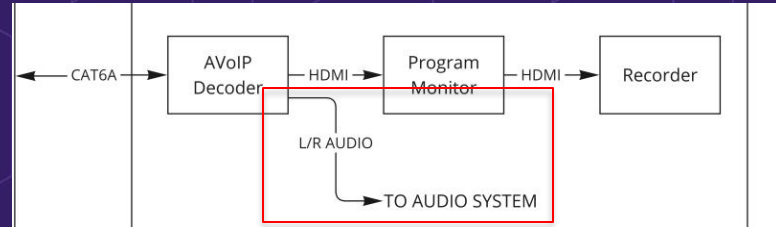 - Brainstorm solutions

Example #2

- Design errors
  - HDCP encryption was causing the blu-ray to shut down any time the program monitor was in the signal chain.
    - Solution?
  - PoE requirements were not being met for cameras or touch panel.
    - Solution?

Example #2

- Audio Commissioning discovery
  - Audio Lip Sync/Lap issues discovered with the breakout of analog audio to the DSP from the AVoIP system.
    - Solution?

Example #2

- Audio Commissioning discovery
  - Dante direct to DSP can keep all audio digitally synced and routed from source to DSP.
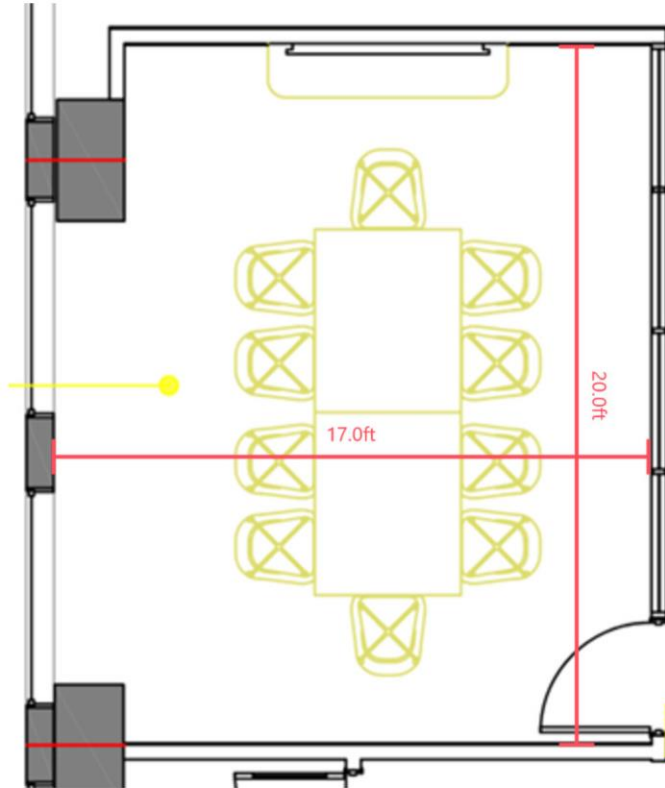 - What if?
    - Encoders don't have Dante available.

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Example #2

- What else did you discover / uncover?

Example #3

- Simple Conference Room
  - Display mounted on the wall
  - Camera on credenza below display
  - Equipment in credenza below
    - UC Appliance
    - Network switch & USB Switch
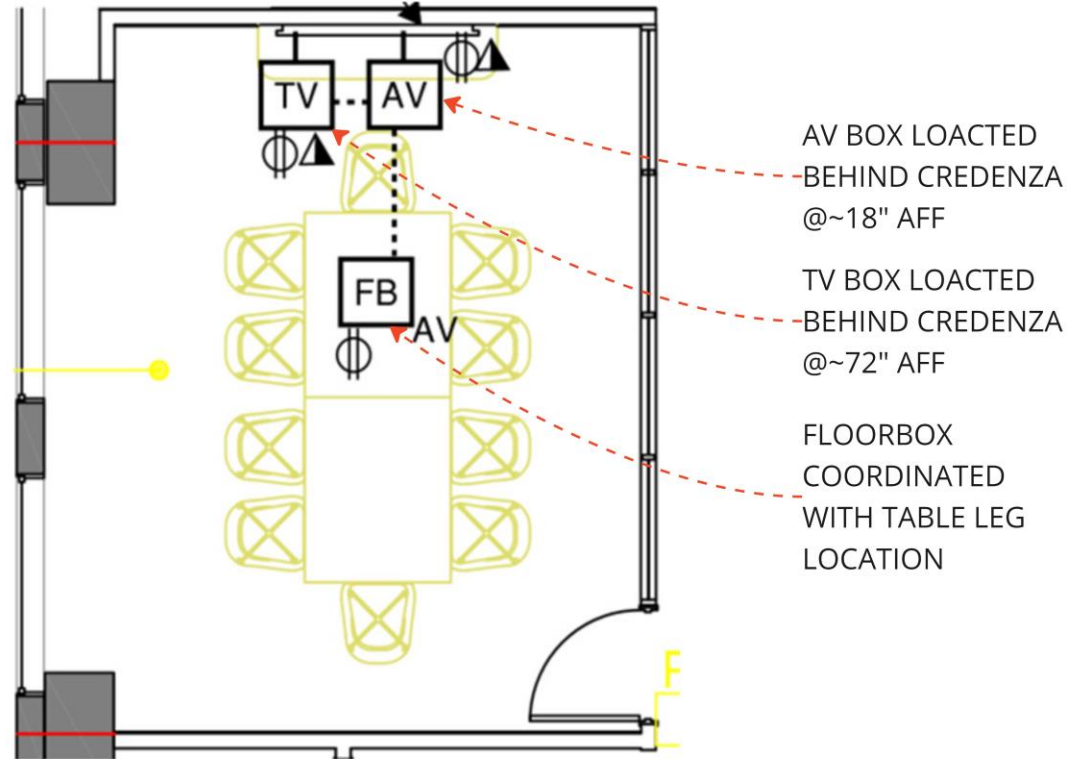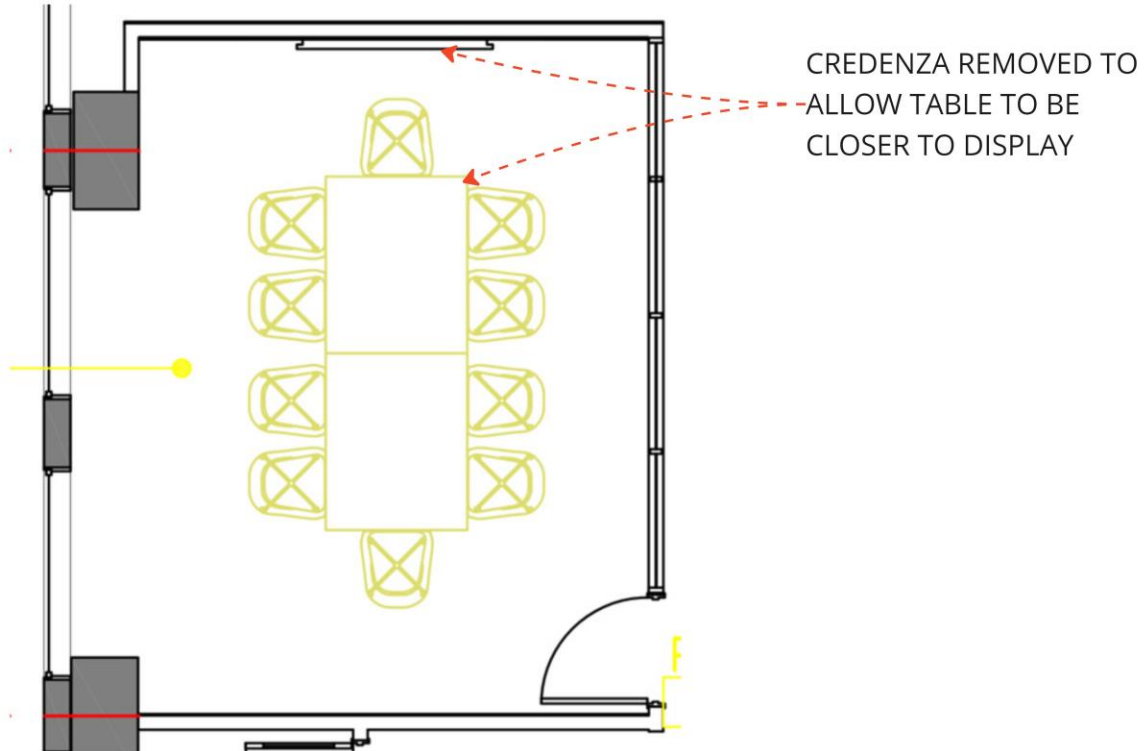   - Wireless sharing device

Example #3

- AV Room

Example #3

- Planned design

AV BOX LOACTED BEHIND CREDENZA @~18" AFF

TV BOX LOACTED BEHIND CREDENZA @~72" AFF

FLOORBOX COORDINATED WITH TABLE LEG LOCATION

Example #3

- What If?

CREDENZA REMOVED TO ALLOW TABLE TO BE CLOSER TO DISPLAY
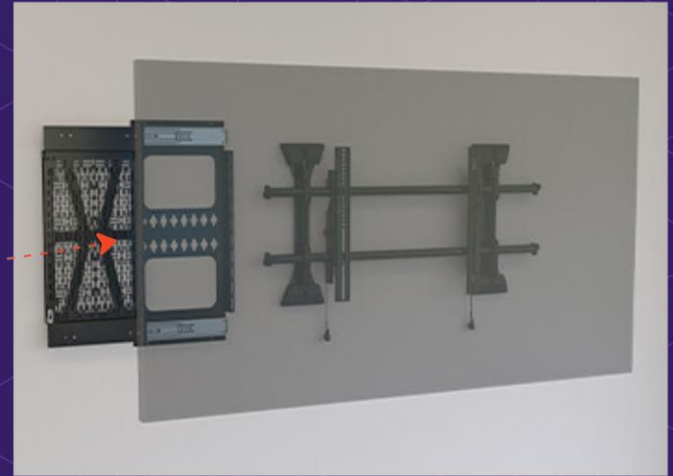
Example #3

- What are the issues?

- Break into groups and discuss

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Example #3

- Did you consider:
  - Equipment Location

Slide out accessory provides a new home for equipment and aids in serviceability.

Example #3
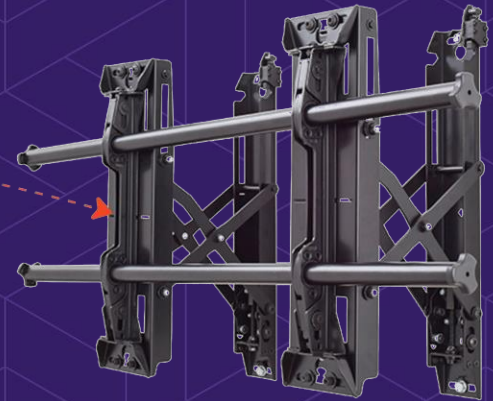
- Did you consider:
  – Serviceability

Pull Out accessory allows for access to rear components.

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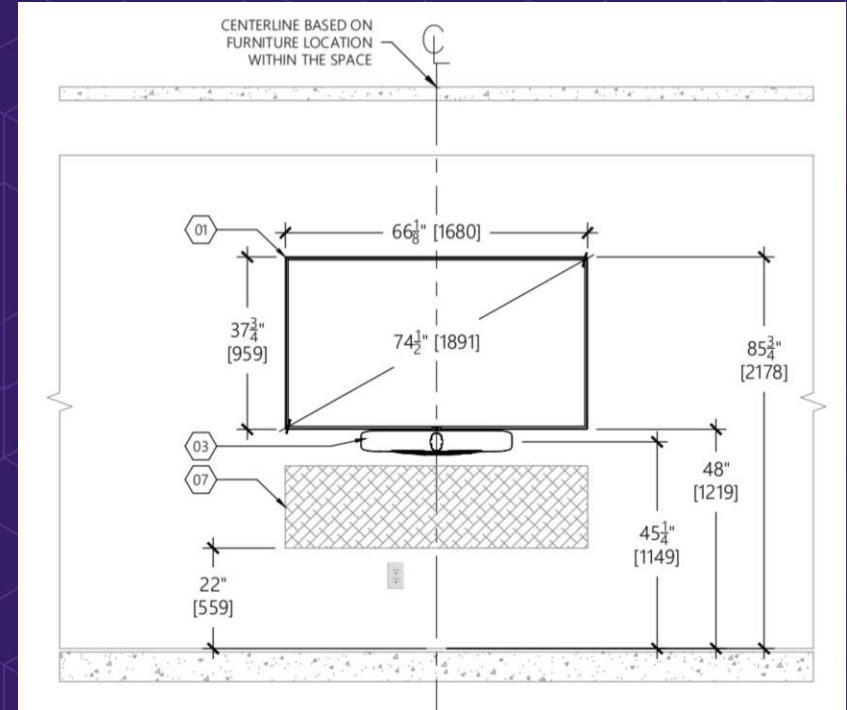# Example #3

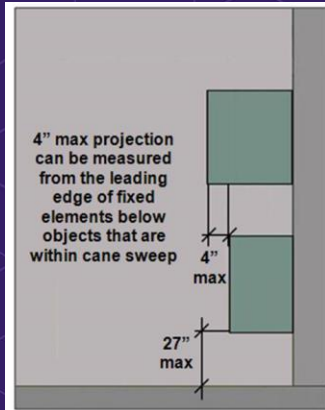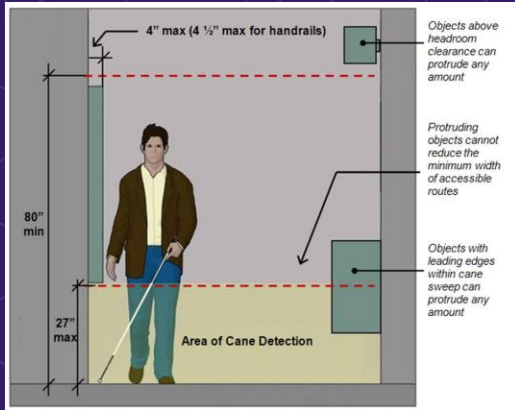- Did you consider:
  - Camera Mounting

Mounting accessory allows for Camera mounting above/below display without additional back box requirements.

Example #3
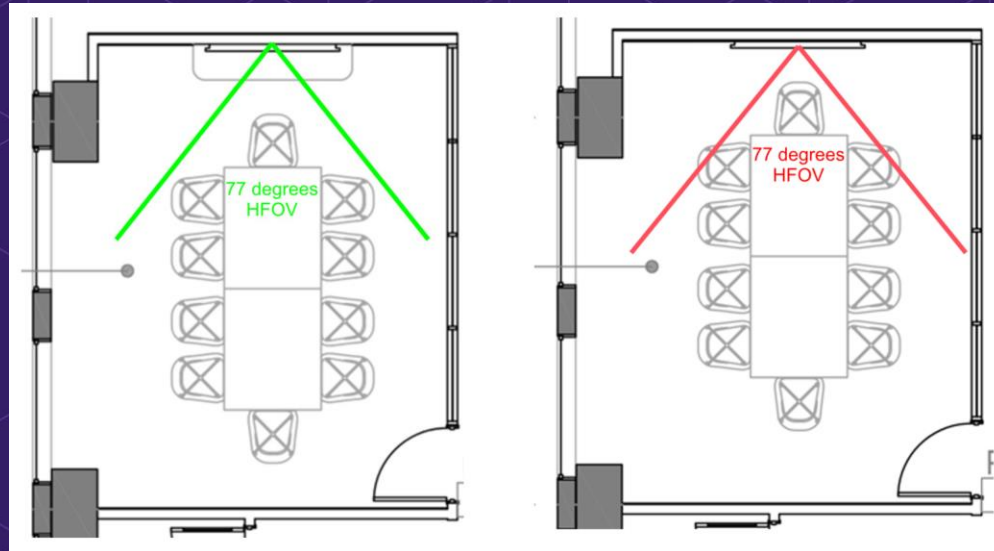
- Did you consider:
  - ADA Ramifications

Example #3

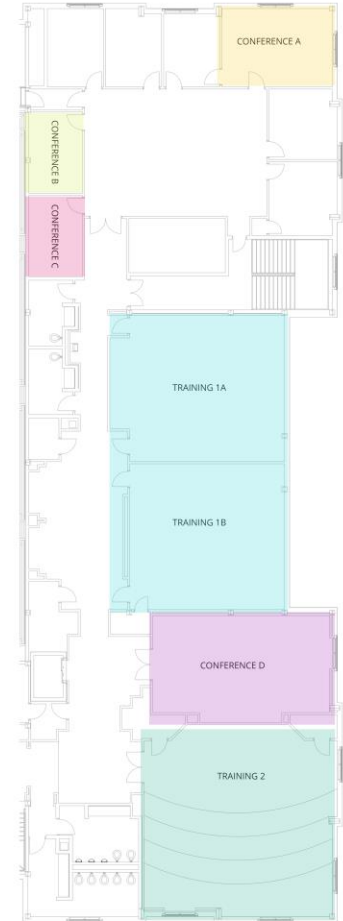- Did you consider:
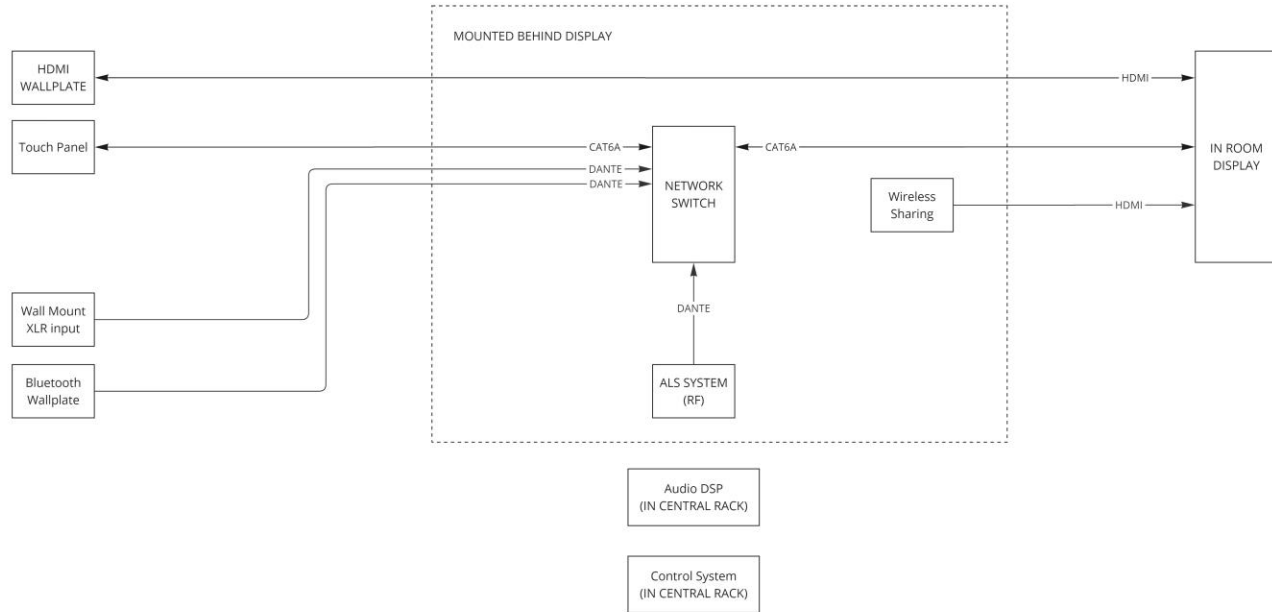 - Camera field of view

Example #3

- What else did you discover / uncover?

Example #4

- Public Conference Center
  - Single display for presentation in each space
  - HDMI input and wireless sharing for each space.
  - Microphone inputs for each space
  - Ceiling speakers for local reinforcement
  - Wall mount touch panel control
  - Assistive listening system provided in each space.

Example #4

MOUNTED BEHIND DISPLAY

HDMI WALLPLATE

Touch Panel

Wall Mount XLR input

Bluetooth Wallplate

NETWORK SWITCH

CAT6A
DANTE
DANTE

Wireless Sharing

IN ROOM DISPLAY

HDMI

CAT6A

HDMI

DANTE

ALS SYSTEM (RF)

Audio DSP (IN CENTRAL RACK)

Control System (IN CENTRAL RACK)

Example #4

- Client states the following:
  - Assistive listening system is cumbersome to use
    - Only provides microphone coverage and BGM.
  - Users have accidentally switched room channels and tune into adjacent spaces.
  - Users have difficulty moving from one room to the next during a large conference and needed to obtain a new ALS receiver to tune into a new channel.
  - Privacy concerns due to the above.

Example #4

- Break into groups and discuss
- What are the pro/cons of the original design?
- What options do you have at your disposal?
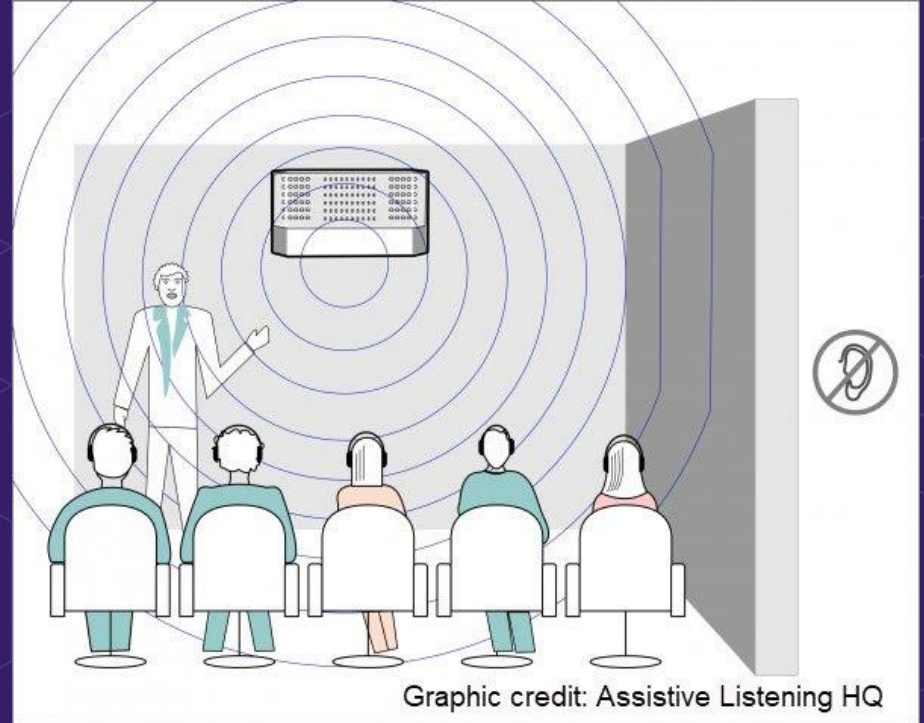 - How does each option affect functionality, budget, and timeline?

Example #4

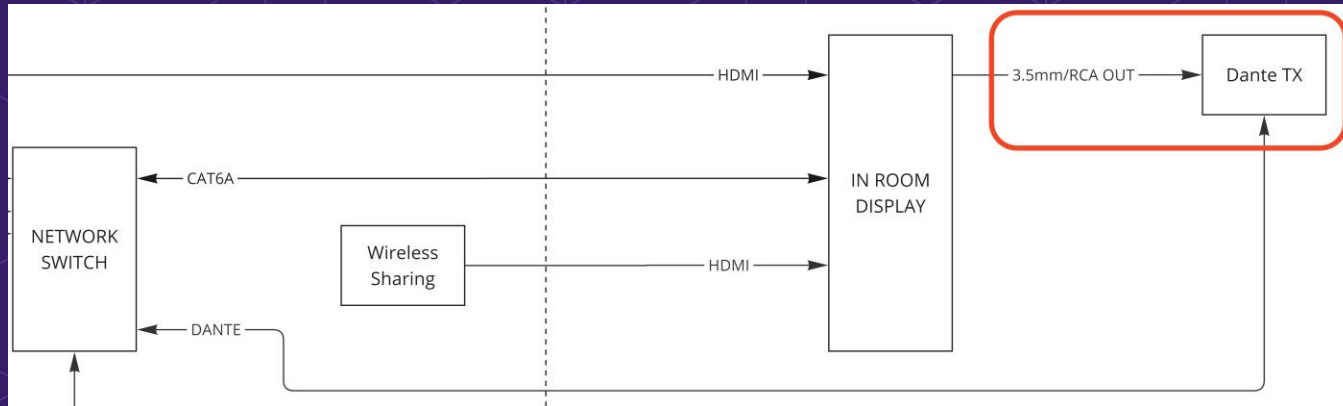- Did you consider:
  - IR based system.

Example #4

- Did you consider:
  - IR based system.

Graphic credit: Assistive Listening HQ

Example #4

- Did you consider:
  - Program audio capture

Example #4

- What else did you discover / uncover?

Q&A Discussion

- Questions
- Examples of YOUR experience
- Steps to Ensure Success!

Think - Reflect - Share

- What strategies from this session will you consider implementing?