Audio Visual Professional – Training Agenda for 5 days

PART: 1: Introduction of AVIXA & AV Basics

1. Introduction of Training attendees,
2. Introduction of Trainer,
3. Training session – Ground rules
4. Brief training Objectives
5. Brief Introduction of AVIXA
6. AVIXA AV Certifications – CTS, CTS-D, CTS-I - Overview
7. AVIXA AV Industry Standards – Overview
8. Ohm's Law, Series & Parallel Circuits
9. Balanced & Unbalanced Audio signals
10. Loudspeaker Distribution systems – Low Impedance & High Impedance systems
11. Loudspeaker distribution systems
12. Sound systems – Applications
13. Sound systems – Types based on applications. (Home Audio entertainment systems detailed in separate section)
14. Q&A Session
15. AV Quiz_1: General AV Basics

PART: 2: AV Technology – Essentials

16. Analogue & Digital Signals
17. What is an AV System
18. AV System Goals
19. Analogue & Digital waveforms
20. Digital signal Basics
21. Digital signal Processing & Sampling
22. Bit Depth of a digital signal
23. Bit Rate
24. Signal Compression
25. Digital media formats
26. Noise In Sound systems
27. Audio Signal Transmission
28. Analogue & Digital signal Considerations
29. Q&A Session
30. AV Quiz_2 – session learnings

PART 3: Audio Systems

1. Sound waves
2. Wavelength
3. Frequency
4. Bands & Octaves
5. Harmonics
6. Logarithms
7. Decibels
8. Decibel measurements
9. Using the decibels
10. The inverse square Law & Sound
11. Digital Audio
12. Digitising Analogue Audio
13. Sample Rate & Bit Depth
14. Digital audio Compression
15. Lossless Audio Compression & Lossy Audio Compression
16. Digital Audio Network protocols
17. Cobranet/ AVB/Dante/Q-Sys/AES 67
18. Audio Data streaming
19. Q&A Session
20. Quiz_3 - Session learnings

PART 4: Acoustics & Audio Equipment

21. Acoustics - Basics
22. Sound Energy - Reflections
23. Reverberation
24. Absorption
25. Transmission
26. Ambient Noise
27. Sound Capture
28. Audio Microphone & Microphone Types & Phantom power
29. Microphone polar Patterns
30. Microphone sensitivity, Frequency response & Impedance
31. Wireless Microphone & Frequency spectrum management
32. Microphone cables & types of Audio connectors
33. Audio Signal levels & Compatibility
34. Audio Signal adjustments
35. Audio Mixers
36. Audio processors
37. Audio equalizers & Delays
38. Digital signal processing
39. Power Amplifiers
40. Loudspeakers, Sensitivity, Polar Patterns, Impedance & crossovers
41. Feedback in Audio Systems
42. Sound Masking – brief information
43. Q&A session
44. AV Quiz_4 - Session learnings

Audio Visual Professional – Training Agenda for 5 days

PART 5: Video Systems

1. Basics of Light, Units of Light Measure
2. Direct Light Measurements & Reflected light measurement,
3. Colour Vision & Colour temperature
4. Colour rendering index
5. Ambient light & Image capture
6. Camera Focus, Focal Length
7. Back focus, Aperture, Depth of field
8. Imagers, prism, Video Shutter
9. Colour Signals, Horizontal & Vertical Signals, Scan Rates
10. Video formats & Resolutions
11. Video signal Connectors
12. Display & Projection technology – Transmissive, Reflective, Emissive
13. Q&A session
14. AV Quiz_5 – Session learnings

PART 6: Video Systems

15. Flat panel display technologies – LCD/ LED/ OLED
16. Display aspect ratio
17. Projector optics – Lamp Based light sources.
18. Video projection technologies – LCD/ DLP/ 3DLP/ Single chip laser/ Direct Laser
19. Front & Rear Screens & Screen gain,
20. Perceived Quality – BDM/ ADM
21. Viewing Angles – BDM/ADM
22. Throw distance
23. Image Key stone Error & Correction
24. Digital Display Alignment
25. Projection system Brightness
26. Brightness & Contrast adjustments
27. Q&A session
28. AV Quiz_6 – Session learnings

End of the session: 5 PM

Audio Visual Professional – Training Agenda for 5 days

PART 7: Networking Technology for AV

1. AV over IP – Network protocol's – Cobranet/AVB/Dante/Q-Sys
2. Comparison of the AV over IP Protocols – Advantages & Disadvantages
3. Overview of HD Base T System Topology
4. Overview of SDvOE system topology – Software based Video over Ethernet
5. Types of Networks - LAN/WLAN/CAN/MAN/WAN/SAN/VLAN/PAN,
6. Category cables – Types & bandwidth
7. Network topology - Star/BUS/Ring/Mesh
8. Ethernet & Ethernet connections
9. Fibre Optics cables - Types & Connectors
10. Wireless connections – Standard Revisions
11. The OSI Reference Model – 7 Layers
12. The TCP/IP Networking model
13. Q&A Session
14. Networks Quiz_7

PART 8: Networking Technology for AV

15. Network Interface Cards & MAC Addresses
16. Internet protocol Addressing – IPv4 & IPv6
17. Q&A Session
18. Subnet Masks
19. Static IP Addressing & Dynamic IP Addressing
20. The domain name Systems
21. The Network Switches,
22. Routers, Gateways, Bridges
23. Network security
24. Network access control & Access control lists
25. 802.1x
26. Firewalls
27. Navigating Firewalls
28. Next Generation Technologies – Moving to Cloud platforms.
29. Q&A Session
30. Networks Quiz_8

Audio Visual Professional – Training Agenda for 5 days

PART 9 – Section A: Home Entertainment Systems – AV Systems

01. Multiroom Home audio systems – Wired & Wireless system.
02. Music streaming solutions from Apps – Spotify/ deezer/ gobuz/ ora stream/ tunify / tunein/ radio.com/ Napster/ nugs.net/ amazon music
03. Music Streaming and Smart Home systems – Brief overview
04. Dolby Digital 5.1 & Dolby ATMOS Home entertainment systems – Home Theatre systems

PART 9 – Section B: Project Management for AV

05. What is a project – Definition as per PMI,
06. What is project management – Definition as per PMI,
07. Project Management – Projects/ Program/ Portfolio
08. Project management – Knowledge areas (10)
09. Predictive & Adaptive Project management (Waterfall & Agile)
10. Project management for AV systems
11. Q&A Session
12. PM_Quiz_9

PART 10: AV Systems – Solution Design Workshops for Training Attendants.

13. **Assignment: 01 – Venue – A Restaurant**

    Design a Background Music system & a Digital signage solution for a restaurant as per details below.: Provide AV proposal BOQ & Explain your proposed solution for the Restaurant application. Restaurant has a small stage for a live singer. Singer uses Tie Clip Microphone with Dante microphone audio interface.

    a. Room Dimensions are width 10 meters, Length 20 Meters. Separated by partition wall at the middle. Suspended ceiling height is 3.5 meters.
    b. Tips: Use Ceiling Loudspeakers, having a dispersion angle of 90 degrees, Uniformity fo sound shall be within +/- 3 dB
    c. UHD Smart 65-inch Digital displays with SoC features – 8 units on wall mount

    Provide solution BOQ & Explain & qualify your solution to the IT Manger of the facility

    Assignment Duration: 1 hour

14. **Assignment: 02 – House of Worship – A Church**

    Design an Audio system for a House of worship. (A Church) The Worship Hall is having a dimensions of 15 Meters in width, 30 meters in Length. Ceiling height is 12 meters with high reverberation.

    User requirements: The Hall produces a high reverberation and hence the end user is looking for DSP based Audio beam steering column loudspeakers on a Dante network protocol. The Presenter uses a gooseneck wireless microphone on a podium and plays an audio prior to the ceremony from an MP3 streaming device.

    Provide solution BOQ & Explain & qualify your solution to the IT Manger of the facility.

    Assignment Duration: 1 hour

Prasad Rao, MBA, PMP, AVIXA CTS, CTS-Design, CTS-Installation - Certified

15. **Assignment:3 – A Multipurpose Hall @ A Convention Centre facility**

Design an Audio & Video solution for a Multipurpose Hall with front Video projection and audio system. Hall size: Width: 12 meters, Length: 25 Meters. Ceiling height: 5 Meters.

Client needs: 10,000 Lumens UHD Projector on a scissor lift, Large front projection ceiling mounted motorised screen, Presenter's to be provided with Livelier tie clip Wireless microphones.
Solution 1: HD Base T solution with Video projection system.
Solution 2: Alternative with Network based SDvOE based Solution with LED Video wall solution,

Provide Proposed solution BOQ for both solutions. Describe your solution to the End user being an IT Director.

Assignment Duration: 1 hour

Q&A Session