

ELEVATING EDUCATION WITH SMART CLASSROOMS



***A Conference Session
by Kairav Adhvaryu,
Product Manager &
Tech Head, Nanta
Tech Private Limited
on 'Education - Smart
Class'***

In this conference session, held during the PALM + AV-ICN Expo 2023, Kairav Adhvaryu, Product Manager & Tech Head, Nanta Tech Private Limited, discusses the concept of smart classrooms, its benefits, components, and what trends are emerging in the smart classrooms. The session further explores how smart classes facilitate virtual, interactive, and immersive teaching experiences in the classrooms with the help of innovative technology solutions, which will revolutionize the future of education.

Kairav Adhvaryu, Product Manager & Tech Head, Nanta Tech Private Limited - a company covering some of the main technological segments like Audio Visual Solutions, Cyber Security, Robotics solutions, IT networking, and infrastructure solutions, thoughtfully builds curiosity in the audience's minds about smart technologies that are allowing students to learn and engage more effectively. He starts the session by

stating, "Smart classrooms help engage with the students more effectively, provide better teaching experiences, help in sharing and collaborating easily, record lectures for future references, allow self-paced learning, and so much more."

But are smart classrooms limited to the education industry only?

With the thought to make the audience

understand the limitations of smart classrooms, Kairav explains, "Smart classrooms are not only limited to the education segment. They can be used in multiple fields like the medical industry for live streaming of the OT room operations including a two-way communication for the doctors. Furthermore, smart classrooms also help improve the quality of education by recording high-quality videos with complete information.

Why Smart Classrooms are Needed -

- To Engage with students more effectively
- Provide better Teaching experience
- Share and Collaborate easily
- To record the lecture for future reference & Self-paced learning
- And many more such applications...

beyond traditional activities within the smart classrooms."

Smart classroom references

Kairav presents some images of smart classrooms where the audience gets to see the location of boundary microphones in the setup and how to use those. He shares, "There's a preview display for the lecturer so that the lecturer can view in front whatever they are presenting on back of them. Furthermore, there are smart podiums that consist of in-built windows systems, interactive monitor microphones, and a document scanner through which users can share or perform multiple functions. For the live streaming applications, we focus on cameras that record everything in the classroom. These cameras come with multiple functions, for instance, a speaker tracking function. So, whenever a speaker is speaking, it can directly focus on that section of the room. To record what a lecturer is speaking, there's also a camera installed in the front, which tracks the lecturer & its movement." He adds, "Interactive Flat Panels are the most commonly used components in smart classrooms. Earlier there were projectors, that were used, however, nowadays, we need

Kairav Adhvaryu, Product Manager & Tech Head, Nanta Tech Private Limited shares a brief on the need for smart classroom environments for advanced learning experiences

This can also be used in corporate rooms and many other segments."

AV Components in the smart classrooms

Taking the interaction further, Kairav states, "To make learning more interactive and engaging, smart classrooms include

components like interactive whiteboards, projectors, document cameras, smart podiums, collaborative devices, videoconferencing equipment, microphones, amplifiers, speakers, control system to control every component using Tab. By using all these applications, we offer our students a hands-on learning experience, which goes

OPTOCORE

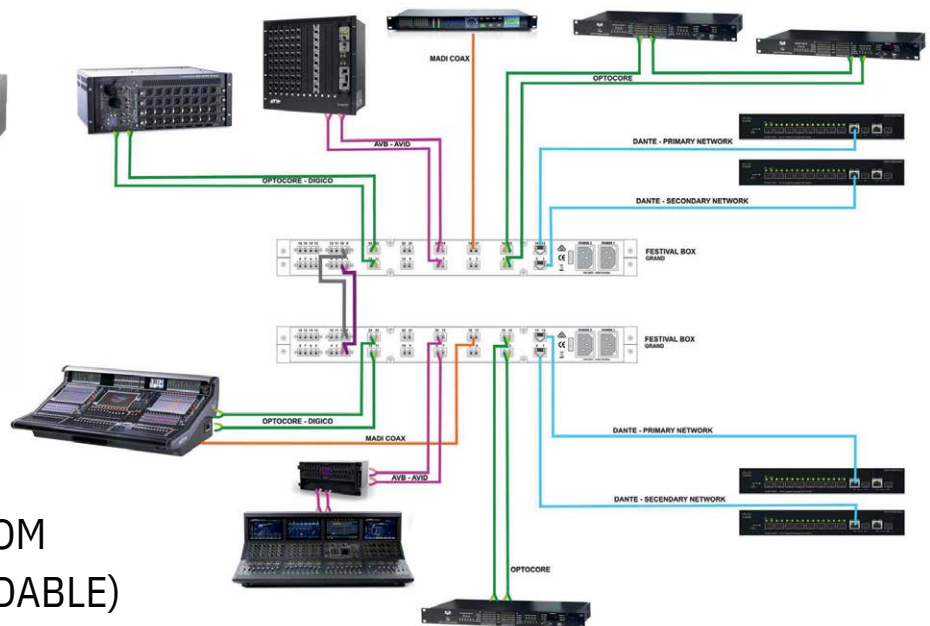
SMART FIBER SOLUTIONS FOR LIVE EVENTS AND INSTALLED AV

NO MORE BULKY SNAKE CABLES... AND NO MORE LIMIT TO SOUND MIX CREATIVITY



FESTIVAL BOX

SIGNAL TRANSPORT OVER FIBER - FROM STAGE TO MIXING CONSOLES (EXPANDABLE)



COMCON
www.comcon.co.in

Authorized Distribution & Support Partner

Contact Us : +91 (0)11 26384606, 46181078 Email : sales@comcon.co.in

collaboration devices. Interactive flat panels have 30,000 - 50,000 hours of operating life. So, if you run the equipment 8 hours a day, the lifespan goes above 10 years. It has 4k resolution with Android/Windows system built-in and provides the users with more collaborative outcomes. In terms of collaboration, you can wirelessly share any content using a smartphone, tablet, laptop, or any device."

During the conference session, Kairav also shared some technical briefs including concepts like wireless collaboration and wired medium in smart classrooms. He stated, "There are some simple boxes made by the brands like Kramer Via or Crestron AirMedia. Such devices help in wirelessly sharing the content on the screen and chat or collaborate in the same media of the classroom. Furthermore, there are two technologies that are generally used for extended ranges. First one is SDVoE – generally means AV-over-IP that stands for Software Defined Video over Ethernet. And the second is HDBaseT Technology, which has a limitation to go up to 150 m only. Initially, we had this topology where we simply connected our projectors to the laptops – that was our smart classrooms. However, there was a limitation in this concept too that the HDMI cable could only go up to 10 m or 15 m. To eliminate this limitation, HDBaseT Technology was used. HDBaseT's features include – 4k video with high quality audio, simplified cabling, long-distance transmission, flexible control, and anti-jamming design."

Learning different components of smart classrooms

New types of technologies are emerging such as ceiling microphones, which do not require users to have wired connectivity. Kairav expresses, "We faced one such situation when we were designing a project where female lecturers faced concerns about pinning microphone receivers on their sarees or dresses. Therefore, ceiling microphones are helpful as there are no such issues. Furthermore, ceiling microphones also create a beam. Let's say, there's a noise coming from one side; ceiling microphones create a beam to capture that voice, creating an immersive listening experience for the students or audience. These devices also have a good covering range. An area of up to 10 m x 10 m can be easily covered by a single ceiling microphone." Kairav further, shares a reference video by Sennheiser that clarifies the use of ceiling microphones with very basic concepts of how the applications of ceiling



The session informs the audience about ceiling microphones with a perfect video by Sennheiser that clarifies the use of ceiling microphones in training rooms

microphones can be used in the training rooms environment.

Adding to the audience's technical knowledge, Kairav explains the use of smart podiums and video conferencing technologies. He shares, "Smart podiums can be used as collaborative tools also because they have every essential feature like a touch interactive display where you can write, or annotate on it, microphone systems, in-built or integrated speakers, wirelessly share content, and portable. For an institute that doesn't have regular sessions, single smart podiums work and can easily be transported to a different room." To share a brief idea of how smart podiums work, Kairav plays a video by Maxhub that elucidates on the functioning, features, and latest advancement of smart podiums. He later adds to the interaction, "Most of the smart classrooms have been converted into hybrid classrooms where some student members are sitting within the room and some maybe outside and that's where lecturers convey their messages through video conferencing. It helps connect with experts around the world, welcome guest speakers in the classroom environments, and collaborate with students from different institutes. Moreover, Speaker Tracking Cameras are set to directly focus on the speakers without manually adjusting the settings like the presets. Nowadays, cameras are also coming with the picture-in-picture (PIP) mode that don't require any third-party switchers or controllers for this application."

New & upcoming technologies in smart classrooms

Kairav continues the session providing essential details about upcoming technolo-

gies in the education sector. He also presents relevant examples like the Hologram used in 2014 elections to clarify the concept of holograms for different applications in India.

Hologram in Education – Hologram technologies have the potential to revolutionize how the world learns. Students can view the concept and visualize what's taught to them in the classrooms. The technology provides a feeling like the lecturer is standing in the same room while giving the presentation. Nowadays, holograms are becoming more popular but due to many technicalities involved with it, the technology is taking time to enter the education segment.

Robots in Education – Using a robot can be helpful in smart classroom applications because it has in-built AI assistance like Alexa or Google along with the in-built speaker and microphone systems that help with video calls. While explaining AI robots' functioning within the classrooms, Kairav shares the specifications of the AI robot in detail. He remarks, "It can be used for multiple functions like facial recognition, taking attendance of the students, helping guest lectures take the classes, and more. Currently, the Temis (AI robots) are installed in airports like the Kuchi Airport and Bangalore airport to be used as a way-finder application."

Kairav shared multiple videos and presentations by the end of the conference for reference on the innovative technologies that are catering to the educational segment and are set to advance the way students learn.

To watch full conference from AV-ICN Expo, visit our Youtube channel.