INDIA EDITION

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AV TODAY

TECHNOLOGY . PEOPLE . EXPERIENCES

Insightful Conversations

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Co-founder, Acorp Consultant

John M. Simento
Managing Partner, ALMOE Group

Shylakumar Balu
Business Head, Aastro Tech Electronics

A Retail Renaissance

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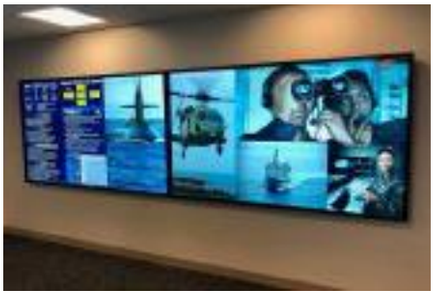

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Founder's Note

K David Paul Sudhakar
Founder & Director

Time sure has flown, and we're already on our fourth edition of AV Today Magazine. In this issue, we are delighted to feature an interesting corporate story from Dubai, spotlighting the Almoe Group's 30-year journey and their vision for India. We're proud to expand our horizons and take this edition to Dubai.

There's a lot in store for tech learners: We have covered AR & VR, Daylight Harvesting, and continued the article on DSP from our third edition. We also delve into India's growing retail industry to bring you valuable insights on trends and the immersive experiences that AV offers shoppers; we also discussed the impact of Nexmosphere sensors and A-Frame Kiosks on shoppers.

In our Women of AV series, we bring you an engaging conversation with Mahua Mukhopadhyay of AVID, where she shares her journey, challenges, and achievements. We are sure you'll find it insightful. In our Podcast series, we we had a dialogue with Shylakumar Balu, who has witnessed the birth and evolution of the AV industry in India over the past three decades. He also talks about some of his team who have transitioned into successful AV startups, while others have become leaders in prominent global manufacturing companies.

We hope you enjoy reading this edition; we certainly had a rewarding time putting it together and are excited to share it with you.

Before I close, on behalf of all of us at AV Today, we hope you have a festive season filled with joy, positivity, and growth.

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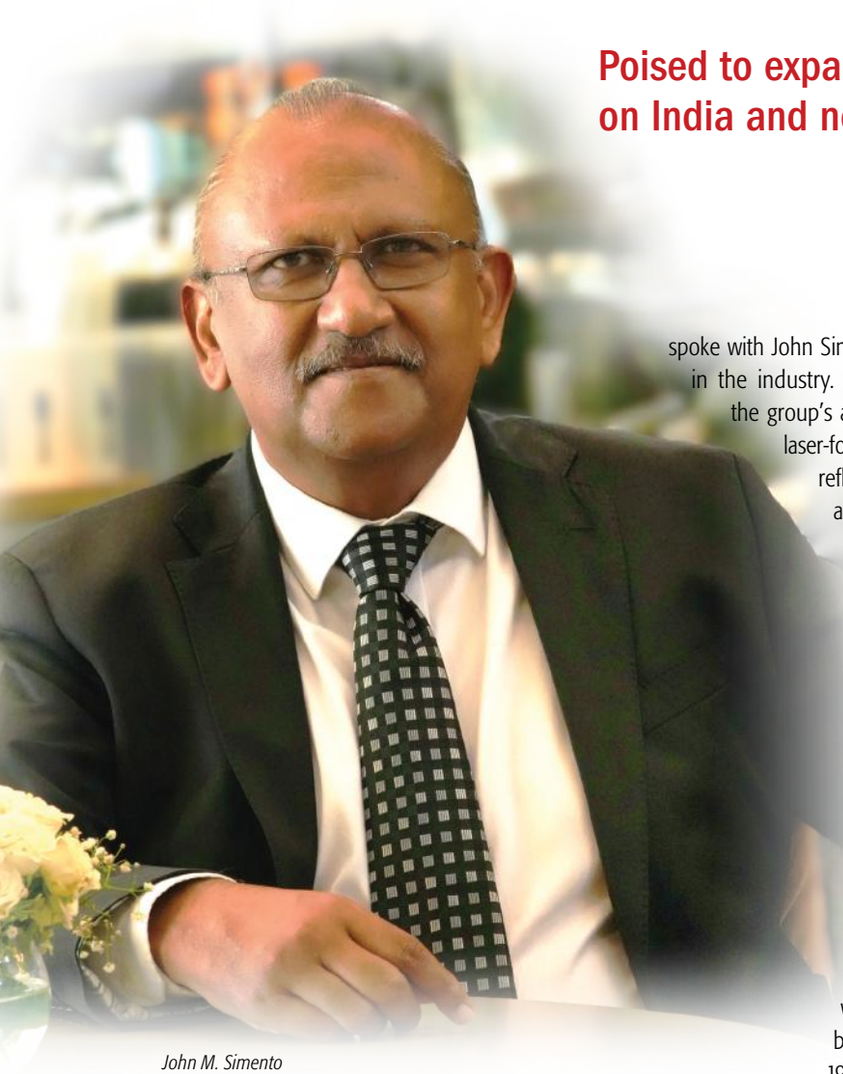
Almoe Group Celebrates 30 Years of Excellence

Poised to expand operations globally, with a focus on India and new markets like Africa and China.



John M. Simento
Managing Partner at ALMOE Group

Success stories often start with a leap of faith and a shared vision. Co-founders John Simento and the late Tyronne Pires took this leap of faith when they came together to start the Almoe Group of companies in Dubai in 1994. Now, three decades later, the Almoe Group with the help of Jamal Sabri (Group CEO) is one of the top AV and IT distribution and solution providers in the Middle East and Asia with a growing global presence.

As the group celebrates its 30th anniversary, we spoke with John Simento, a visionary leader in the industry. Filled with pride about the group's achievements so far and laser-focused on the future, John reflects on his journey from a small town in Karnataka, India, to starting and building a business in the Middle East—a meaningful journey of 42 years and counting.

The start of something big

Hailing from Kolar Gold Fields. Karnataka, India, John spent his early working life in Bangalore before moving to Qatar in 1982 and Dubai in 1984. For the next decade, John worked on office automation, which involved copiers, printers, and, by that time, fax machines and scanners. "I started servicing, repairing, and installing these machines. After about five years in service, I felt the need to gain exposure to sales. I requested to join the team and was then assigned to a specific area where I could handle sales and service for the same clients."

John shares how this experience helped him build a comprehensive understanding of a product and its functionalities, including its flaws and strengths. "It gave me credibility, and when clients saw that I was confident in my knowledge about the products, it made a positive impact. It was that understanding and experience working in sales that I later carried with me throughout my career," he says.

The birth of Almoe

In 1994, John and his partner Tyronne embarked on a journey that would eventually culminate in the establishment of Almoe as it is known today. "In the early days, it used to be called Al-Mahbara Office Equipment and that is how the current name was formed."

He continues, "Over time, we gradually transitioned from dealing solely with office equipment to diversifying into projectors, marking our first foray into the AV industry. We started with overhead projectors, mainly Kindermann from Germany, and then added various brands like Davis and Boxlight."

"Our biggest breakthrough came when we started selling Epson projectors, that was when we got a foothold in the market because Epson was a key player in the industry. We decided to approach them to which they challenged us to sell a targeted number of projectors to earn the distributorship. We accepted this challenge and were proud to exceed expectations."

John shares how they quickly expanded into Qatar, Bahrain, Oman, and Saudi Arabia through a reseller network, supplying projectors from Dubai to these regions. "Once we proved our reliability and ability to drive revenue, we attracted other leading brands such Sony, LG, NEC and more.

This helped us grow into a significant distributor in the region."

Sadly, in 2020 Tyronne passed away causing an immense loss to the company and personally. His passion and energy were one of the driving forces behind the Almoe group of companies' success and John and Jamal were determined to honor Tyronne's memory by continuing the work they had started together. "His legacy is our constant reminder to push the boundaries and to strive for greatness," – they say.

Diversifying for growth

John explains how the company expanded from being a distribution-focused business to offering AV equipment rentals for events. "At the time, product prices were high and therefore seeing this gap in the market, we started Almoe Rentals in 2003." This shift allowed us to leverage our existing expertise in AV technology and provide clients with more flexible, tailored services due to a growing demand for short-term, high-end equipment solutions in the event industry."

In terms of the integration division of Almoe Group, John explains that no one in Dubai at that time was installing projectors and a friend had suggested it. "I was hesitant at first because I had no prior experience, but he offered to help. For our very first project, we didn't even have a VGA cable, so we used five regular video cables taped together as a substitute. The quality was great, but it was costly. Eventually, VGA cables became more accessible, making things easier. This is how our integration division started," reminisces John.

Speaking about some of their projects, John recalls the AV installations done at Madinat Jumeirah, Meydan Racecourse, Dubai Parks & Resorts, and several premium hotels such as the Intercontinental and the Grand Hyatt in Dubai. "Apart from this, we have worked on smaller projects in various sectors and locations across the UAE. Delivering projects on time and to the client's satisfaction helped build our reputation and opened the doors to more opportunities."

Additionally, John mentions a significant time in 2004 when Jamal Sabri joined the Almoe Group of Companies as the Chief Financial Officer (CFO). His deep understanding of the company's financial landscape, combined with his strategic insight, made him a standout leader within the organization. However, it wasn't just Jamal's knowledge that drove his rise; it was his exceptional leadership qualities and his ability to connect with people across all levels of the business. His collaborative approach, clear communication, and visionary thinking enabled him to influence key decisions that shaped the company's growth trajectory.

As the business expanded, it became clear that Jamal's capabilities extended far beyond financial management. His broad understanding of the company's operations and markets, coupled with his proactive approach to problem-solving, made him indispensable. Recognizing his talent, he was entrusted with role of the Group CEO. Under his leadership, the Almoe Group has continued to innovate and grow. "With a dedicated focus and responsibility towards our partners, clients and employees, we aim to further diversify our portfolio and mark footprints globally." says Jamal.

Specktron: An In-house Brand, Redefining AV and ICT Products

John and Jamal explained that around 2011, restrictions on the scope of distributorship, prompted them and Tyronne to start their own in-house brand, Specktron, in 2012. "This was a pivotal moment because it allowed us to offer high-quality products under our own brand. We focus on interactive panels, professional displays, AIO LED products, and commercial LEDs. Specktron is now sold in over 50 countries, giving us incredible reach and flexibility; it has strengthened our market position, helping us provide even more value to clients across multiple channels worldwide."

Making inroads in the Indian market

Since opening its first Almoe office in Bangalore in 2007, Almoe Digital Solutions has expanded to four offices across the country. "Currently, we have about 50 employees in India, and as part of the "Make in India" initiative, we have started assembling some of our products locally." Furthermore, we plan to open Specktron offices to cater to the Indian market specifically. This reflects our commitment to providing local-made, high-quality solutions tailored to the needs of Indian customers. Our goal is to become a leading supplier of AV equipment in the country."

Speaking of goals and opportunities ahead, John and Jamal say, "The education market in India is growing significantly, and we foresee a promising future. The need for interactive panels is rising as the Indian Government has plans of upgrading several schools with this product. Therefore, with this demand and now with our assembly being done in India, it gives us a lot more room for growth and a lot more reason to be here."

Jamal Sarwar Sabri
Group CEO at ALMOE Group

Almoe Group: 30 Years of Innovation, Excellence & Collaboration

The Almoe Group has undoubtedly played an integral role in the growth of the AV industry in the UAE and beyond. "Over the last three decades, we have built a strong foundation, overcome numerous challenges, and evolved to meet the changing needs of the industry." "Throughout this journey, we have consistently delivered top-tier solutions to our clients, and this milestone is a testament to our team's dedication and our clients' trust."

John proceeds to speak on the Almoe Group management team, "The success of the company is a testament to the dedication and leadership

of the incredible general managers and staff who have guided each division, both past and present. Many of them have been with us for over 15-20 years, contributing their extensive knowledge and expertise through various industry challenges and market shifts. Additionally, "it is amazing to witness their commitment and the impact they have had on the company. We believe the longevity of their careers within the company reflects their passion and belief in our shared mission."

When asked how the market for AV has changed in these three decades, John explains, "The AV industry has dramatically transformed. We've moved from analog solutions to fully digital systems, with personalized, interactive, and on-demand media taking center stage. Significant advancements in technology, particularly in immersive and interactive technology, artificial intelligence (AI), robotics, machine learning, and the advent of 5G, have revolutionized content creation, delivery, and engagement."

John points out that AV technology has been adopted by every major industry, becoming integral to their growth and adaptability. "In the advertising industry, traditional static billboards have given way to dynamic digital billboards with real-time updates, interactive content, and multiple rotating ads. Similarly, the education sector has transitioned from blackboards to whiteboards, interactive projectors, and smart screens of all sizes, completely revolutionizing how education is delivered."

Passionate about making an impact in the community, John explains how Corporate Social Responsibility (CSR) and sustainability are a central focus. "We focus on contributing to the UAE Government's initiatives and the United Nations' Sustainable Development Goals. Our CSR efforts align with these goals by promoting good health and well-being, gender equality, economic growth, environmental conservation and much more."

Meeting challenges with resilience and innovation

John discusses some of the challenges faced on their journey. Initially, gaining the trust of vendors and customers was difficult, but they were able to establish long-term relationships by consistently delivering quality. Additionally, in the early stages securing funding was another obstacle, but this was overcome by pitching banks to invest in their growth by demonstrating their commitment and strong track record.

However, by far the COVID-19 pandemic presented the most unique and biggest challenge yet. This led the company to pivot to virtual and hybrid events and to embrace new technology and platforms. With this, Almoe Group expanded its services, becoming more resilient and diverse in an ever-evolving industry.

"We overcame challenges through strategic innovation, adaptability, and nurturing a strong team. Our commitment to high-quality service and continuous improvement helped us build lasting client relationships which helped us navigate difficult periods. The support and trust of our clients and partners was critical to strengthen and grow our market position at these times" explains John.

Setting Sights on Future Expansion

Looking to the future, John highlights, "We are now focused on further expanding our operations globally and our first step is to establish offices in Africa, particularly in Kenya and Ghana to take advantage of the emerging markets. Additionally, we aim to open an office in China to support our brand and expand our presence in Asia. We are considering strategic acquisitions and investments to speed up our growth and ensure we remain at the forefront of the industry."

"Together with Jamal Sabri, partner and CEO of Almoe Group of Companies we are all set to expand our reach and embrace new opportunities. We hope to propel the company forward into new markets and service offerings" he adds.

As a multi-million dollar group with global presence, and over 350 employees strides into the future, we wish John, Jamal and the team enduring success in the years ahead.

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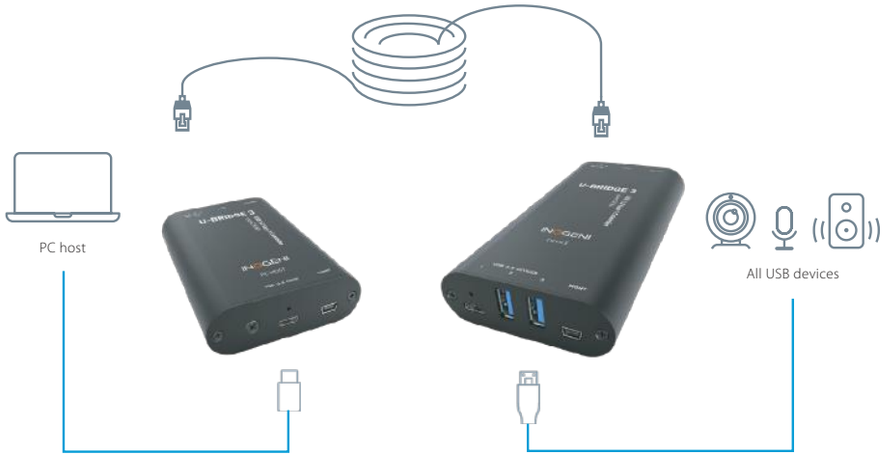

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AV in Retail
Fueling Immersive Experiences In-store and Beyond

How is AV enhancing customer journeys in India's retail sector? Nishita H Kalita speaks to industry experts for valuable insights into the evolving trends in the Indian retail industry.

From the evergreen Indian bazaars and street markets in every city, town, and village to the new digital-first hubs of experience in larger cities, the great Indian shopping experience is evolving in fascinating ways. The way Indians shop is also seeing a visible shift. As brick-and-mortar retail takes back its place in this post-pandemic era, we examine how AV technologies are disrupting retail and crafting immersive experiences that go a long way in captivating the Indian shopper.

The state of retail in India

The fourth largest in the world, the Indian retail market is expected to grow at 9–10% to reach $2 trillion in the next decade, according to a report by the Retailers Association of India (RAI) and the Boston Consulting Group (BCG), presenting a significant opportunity for retailers.

A lot of new developments are driving growth in retail, according to Sangya Gupta, CEO of ASK Consultants India. "People in this post-COVID era are tired of shopping online and want a change. So, after COVID, brick-and-mortar retail is making a comeback in a more transformative way. There is now a blended approach where physical stores complement online platforms. Some e-commerce retailers do not always list all their products online, meaning customers must visit the store for maximum benefit. Retailers also offer an immersive in-store experience that can't be replicated online."

Prashant Govindan, Director of Generation AV India Pvt. Ltd., emphasizes that despite the growing popularity of e-commerce, brick-and-mortar retail remains essential. "While online shopping offers convenience, people are increasingly seeking unique experiences. As a result, physical stores are experiencing a resurgence in traffic, particularly in high-end fashion, gourmet foods, lifestyle brands, and premium electronics." He notes that luxury retail is rapidly expanding into tier-1 and tier-2 Indian cities as a new category within organized retail.

Mustafa Rampurawala, Business Head of Solutions India Systems (P) Ltd., highlights that we are seeing a post-pandemic revival of brick-and-mortar retail. "In the post-pandemic era, people are frustrated staying at home; they want to visit stores, touch and feel the products, and then purchase. In addition to the larger cities, we are seeing a steady emergence of high-end fashion stores and malls in smaller towns where one least expects them. Retail in India has already reached a level that we were expecting to come up in the next 10 or 20 years." he says.

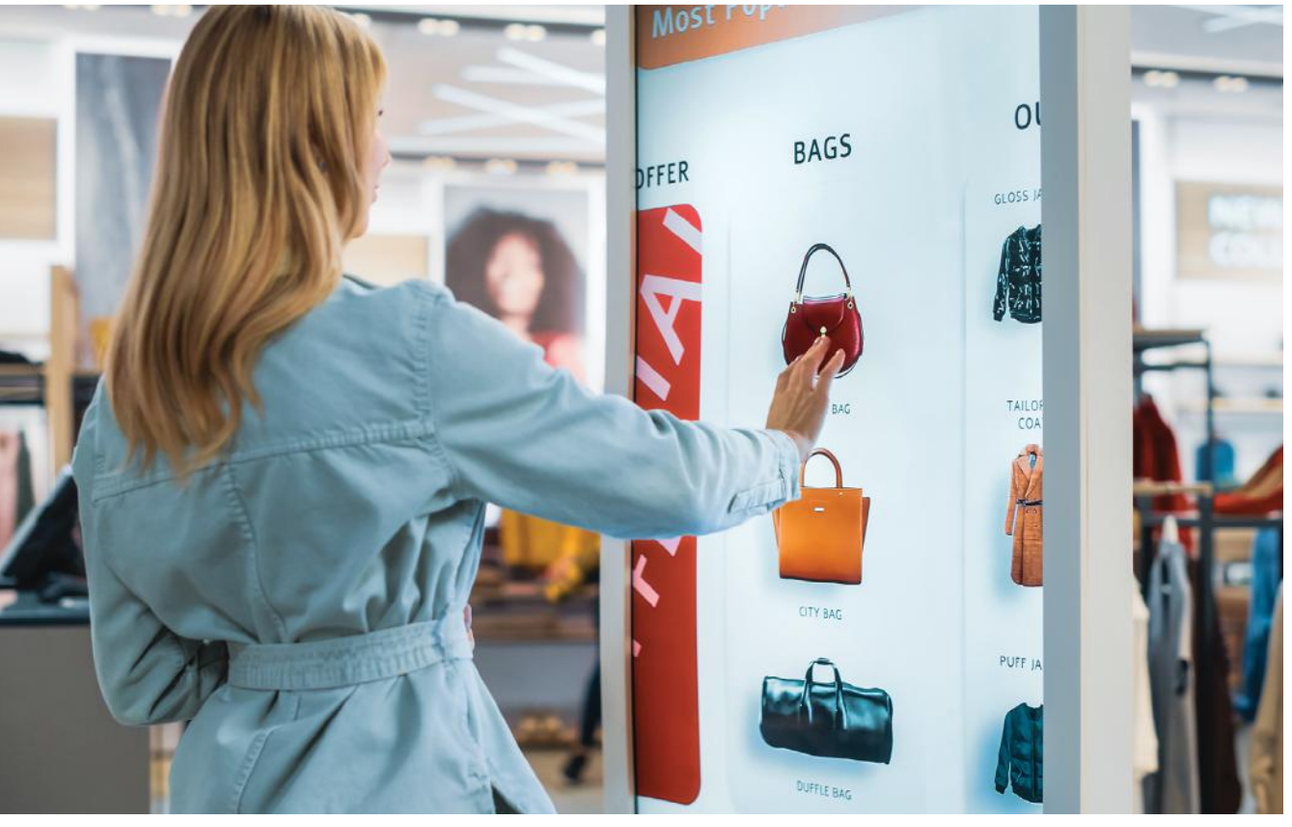
Elevating experiences from high street retail to Chandni Chowk

"AV is intrinsic to the retail experience, be it large format LED displays or interactive panels or even immersive audio and VR experiences that elevate the shopping experience from the mundane to extraordinary," says Prashant. He adds that traditionally, in-store displays and signage have been the core of AV in retail, but what is changing is the scale and the technology at play, with many malls and departmental stores employing in-store advertising and offers through captivating displays.

Sangya emphasizes the growing prevalence of digital signage, video walls, self-service kiosks, and interactive product displays in malls. She also mentions the emergence of malls in new locations, such as Chandni Chowk, one of the oldest and busiest markets in Old Delhi. "The market is completely different. In narrow alleys, there are tiny lanes that are congested. When a mall comes up in such an area, it greatly benefits both the retailers and the consumers, creating a win-win situation for both parties." she adds that AV is also playing a critical role in supermarkets and hypermarkets to transform their service delivery by

incorporating audio systems, background music, and digital displays to provide information and offers to customers.

Mustafa shares flagship stores are incorporating AV technologies like video walls and interactive displays to provide an immersive brand experience. "In department stores and shopping centers, AV technology is used aggressively. This includes digital signage, self-service kiosks, interactive kiosks, information kiosks, wayfinding solutions, background music announcements, and channelized announcements for promotions on the brands sold in the stores or malls." Mustafa also points out that luxury boutiques provide features like LED walls, cashless checkout counters, and immersive soundscaping technology to provide a luxurious experience for customers, especially those looking to relax in the lounge area for a few minutes.



A retail revolution in the making

Prashant highlights how high-end retail brands bring luxury shopping experiences closer to affluent clientele who would otherwise travel to International destinations. "By setting up flagship stores in major cities and smaller format stores in Tier 2 locations, brands cater to the well-heeled clientele and make luxury shopping more accessible. Based on demographic studies, they identify potential locations for their flagship stores and target high-income areas within these cities." Luxury Gourmet retail is also on the rise, he notes.

The emerging trend of lifestyle-based retail in smaller towns is notable, explains Prashant. "In tier 2 and tier 3 cities, there are pockets of affluence where many people have settled post-pandemic. They have chosen to live in smaller towns and cities to be closer to their hometowns and families, but these individuals have international exposure, and as a result, there is a growing demand for better experiences in these cities."

We are also seeing a personalized consultative selling approach in high-end luxury retail. "Customers make an appointment to visit, and it's more of a consultation than a simple shopping trip. The store is designed with great attention to detail, and even the music and scent are carefully curated to enhance the overall experience," he says. He adds that offering customers the opportunity to experience and buy pieces from local artisans in a retail setting is another trend.

Mustafa emphasizes the significance of high-quality audio in flagship stores. "Retailers realize the importance of pairing proper audio with video to create an immersive experience. Brands like Bose, Bang & Olufsen, and international luxury brands such as Martin Audio and Harman are now focusing on the retail sector. The combination of audio and video offers an entirely different experience for customers visiting these stores," he says.

It's an exciting time for Indian retail, especially on the high-end and experiential side of the business, says Prashant. "It's now experiences over products," he says, citing the example of India's vibrant soul coffee culture. "Brands host coffee-tasting workshops, comedy shows, and music performances to build a deeper connection with consumers, and AV plays a vital role in enabling these experiences. This shift in coffee and food culture is part of the retail revolution."

Brands are also increasingly supporting communities to build brand loyalty and connect with their target customer at an emotional level. Prashant highlights examples such as the Harley Davidson, Royal Enfield, and Mahindra Thar clubs, where brands organize events to tap into the demographic of well-heeled individuals seeking meaning and a higher purpose.

Subcultures are thriving, and Gen Z finds like-minded tribes even in the most niche interests. For example, Prashant cites the Sneakerverse, where limited-edition sneakers sell for thousands of dollars. "Some people buy them just to showcase them as collectible works of art. It's fascinating to see how consumer culture is evolving. Audiovisual technology will play a huge role in shaping this new trend," he says.

Mustafa explains that the demand for global brands is increasing due to the growing awareness and purchasing power of Indian consumers. "The younger generation now has higher disposable

income, which has boosted their buying power. Additionally, the entry of foreign brands into the Indian market has made local sellers more competitive.

He also highlights that Indian brands have stepped up their game to compete with each other, focusing on visibility and personalization services to meet the increasing competition in the market. "Indian companies hosting international brands have become increasingly focused on technology. Previously, premium Indian stores rarely had advanced technology; now they invest crores in technology to provide shoppers a holistic and immersive experience."

AV innovations and next-level shopping experiences

Weaving a brand story and product placement without being overly obtrusive is an art, highlights Prashant. "Retail store designers work with visual artists, architects, ergonomists, musicians, and acoustic and sound engineers to create a unified and subtle ambiance. Everything is carefully curated, from lighting to music. Innovative use of technologies, such as "whispering windows," "heat mapping," and AI-based store assistants, is upping the ante in high-street retail," he says.

"In the world of large-format display technology, with every shrinking pixel pitch, the focus is on delivering a natural, immersive experience. Innovation is the key to captivating customers through semi-transparent or flexible, curved displays," he adds.

Sangya shares that in some stores, customers are given vision gadgets to design their living rooms virtually. "Customers can use these gadgets to visualize different furniture, interiors, showpieces, and even the size of the TV without making any actual investments. This kind of virtual experience is becoming popular in India." She also discusses a new technology for smart trial rooms. "Stores have smart board displays and utilize RFID tags attached to the products you're carrying. This means you don't even have to try on the clothes. When you stand at a certain distance, the system recognizes the RFID of the product you're interested in and shows you how it will look on you," she says.

"Besides brand promotion, when we talk about comfort and other aspects, another thing to consider is that even in retail, places like hypermarkets and malls are introducing concepts like projection mapping. For example, during festivals like Janmashtami, a lot of content is displayed using projection mapping, providing an enjoyable experience for the visitors beyond just shopping and dining," says Sangya.

Sangya discusses the use of 360-degree product displays and holographic technology in the luxury segment, which is now also used in malls to attract customers with new technology. "I believe this shift will significantly change people's perspectives on the shopping experience because they can see and even feel the products, even if they can't physically touch them," she says.

Mustafa explains how, in some boutiques in the UK and Europe, customers can use VR headsets to virtually experience products unavailable on the shelf before making a purchase decision. "Additionally, human-like robots are entering stores to provide customers with information about products and services through an attached iPad and a video call feature." Mustafa also shares an experience about a car showroom where the salesperson explains the car variants on a smart table. "The salesperson uses the smart table to show the customization options available to the customer and help them experience the product.

"I recently saw an interactive mirror display, which made me think about the mirror TVs we used to see in high-end rooms. This new display felt like a regular mirror until I touched it, and it turned into a screen. Interestingly, this technology has been around for years but continues to evolve, which piqued my interest," notes Mustafa.

Experiences will fuel organized retail in India

Ultimately, according to Sangya, the Indian shopper is unique. "The thought process is different from the global perspective; how we save and spend money is very different from the rest of the world, but things are changing."

Highlighting the role of AV in the shopping experience, Mustafa explains that humans are curious to explore whenever we see something. "The psychology behind why displays are significant is that you may go with a mindset of doing window shopping, but if you see something exciting, it compels you to check it out and maybe make an immediate purchase."

Prashant concludes, "The retail landscape is about offering customers a complete 360-degree experience. This holistic approach will drive the future of organized retail in India. From being an enabler in the retail space, AV will be the driver of demand, opening up possibilities of collaboration and interactive and innovative ways to engage with customers, be it in-store experience or as a larger engaged community."

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A New Reality in AV Technology
The Impact of AR and VR Integration in Retail Space

As the world becomes increasingly digital, the integration of Augmented Reality (AR) and Virtual Reality (VR) into Audio-Visual (AV) technology is reshaping how we experience media and interact with our environments. From immersive training sessions to interactive retail experiences, AR and VR are not just trends; they represent a paradigm shift in how we perceive and engage with content.

This article explores the transformative impact of AR and VR integration within the AV landscape, focusing on their applications, technological advancements, challenges, and future potential.

What Are AR and VR?

Augmented Reality (AR) enhances our real-world environment by overlaying digital information such as images, sounds, and other sensory stimuli onto the physical world. Popular examples include mobile applications like Pokémon GO and Snapchat filters, which allow users to interact with virtual elements in their real surroundings.

Virtual Reality (VR), on the other hand, immerses users in a fully digital environment, usually experienced through VR headsets. These devices transport users to entirely different worlds, offering experiences that can be both entertaining and educational.

Key Trends Driving Adoption

The adoption of AR and VR technologies has accelerated due to several key factors. First, advancements in hardware, such as high-resolution displays, improved processing power, and the miniaturization of components, have made VR headsets more accessible and comfortable for extended use. Additionally, software development platforms like Unity and Unreal Engine have simplified the creation of immersive experiences, democratizing content creation for developers.

Consumer demand is also a driving force, as the proliferation of smartphones and gaming consoles has led users to seek interactive experiences that go beyond passive consumption. Lastly, significant investments from tech giants like Facebook, Google, and Apple demonstrate confidence in the future of AR and VR technologies, further propelling innovation and development in this space.

Technological Advancements

Hardware Innovations

The evolution of AR and VR hardware has greatly facilitated their integration into AV technology. Modern VR headsets, such as the Meta Quest 3, are now lighter, more affordable, and more comfortable, featuring higher refresh rates and resolutions. These advancements significantly reduce motion sickness and enhance realism, especially with competitive products like the Apple Vision Pro entering the market.

Additionally, companies like Meta, Amazon, Snap, and Viture are pioneering AR smart glasses that offer hands-free access to information while allowing users to interact with their physical environment. Furthermore, advanced sensors and cameras improve motion tracking and environmental recognition, enabling more realistic and interactive experiences for users.

Software Ecosystem

The software that powers AR and VR experiences is equally crucial to their effectiveness. Development tools like Unity and ARKit streamline the development process, allowing creators to produce high-quality content without needing extensive programming skills. Additionally, the availability of content libraries filled with pre-made AR and VR assets enables businesses to deploy interactive experiences quickly and efficiently. Moreover, the integration of Artificial Intelligence enhances these experiences by facilitating more personalized interactions and enabling dynamic content adjustments based on user behavior.

Challenges to Integration

Despite the significant potential of AR and VR in AV technology, several challenges must be addressed for wider adoption. Cost and accessibility remain key issues; while prices for AR and VR hardware are decreasing, high-quality equipment can still represent a substantial investment for many businesses, and disparities in technology access can create barriers for smaller companies, particularly in developing regions.

User experience and comfort are also critical concerns, as issues like motion sickness and discomfort during extended use continue to affect VR experiences. Although developers are working to address these challenges, ensuring user comfort is still a significant hurdle. Additionally, creating compelling AR and VR content requires specialized skills and resources, which can hinder many organizations. However, as the technology matures, we can anticipate the emergence of more user-friendly tools that will democratize content creation.

Finally, integrating AR and VR technologies with existing AV systems poses difficulties for many organizations, as the need for interoperability between various devices and platforms complicates deployment.

Applications of AR and VR in AV Technology in the Indian Retail Space

As India embraces digital transformation, the retail landscape is experiencing a profound shift with the integration of AR and VR technologies. These immersive solutions are enhancing customer engagement, improving operational efficiency, and delivering unique shopping experiences tailored to the evolving preferences of Indian consumers. This article explores how AR and VR technologies are transforming the shopping experience and positioning retailers for long-term success in an increasingly competitive marketplace.

The Indian Retail Landscape

India's retail sector is among the fastest-growing globally, fuelled by rising disposable incomes, a young demographic, and rapid urbanization. According to a report by the Indian Brand Equity Foundation (IBEF), the retail market is projected to reach $1.1 trillion by 2025.

Key Applications of AR and VR in Indian Retail

1. Virtual Try-Ons

One of the most popular applications of AR in retail is the virtual try-on feature, which enables customers to see how products will look on them without the need for physical fitting. Leading companies in the fashion and retail sectors are at the forefront of this technology.

For example, some platforms allow users to visualize how outfits would look on virtual models that resemble their body type, while others enable users to virtually try on eyewear using their smartphone cameras, creating a seamless and interactive shopping experience. This technology enhances the shopping experience by providing convenience and reducing return rates, as customers can make more informed purchasing decisions.

2. Interactive In-Store Experiences

AR and VR are revolutionizing physical retail spaces by transforming them into interactive environments that engage customers more deeply. Retailers are utilizing AR technology to improve store navigation in large spaces; shoppers can scan a QR code to access interactive maps and detailed product information directly on their smartphones, streamlining the shopping experience.

Additionally, some retailers are implementing AR apps to help customers visualize how furniture will fit in their homes. By pointing their devices at a specific area, users can see a 3D model of the furniture overlaid in real-time, assisting them in making informed purchase decisions.

3. Immersive Product Demonstrations

VR offers a powerful platform for immersive product demonstrations, allowing consumers to experience products before making a purchase. Retailers can create virtual showrooms where customers can explore products in a 3D environment. For example, leading automobile companies are utilizing VR to showcase their vehicles, enabling customers to take virtual test drives and experience the car's features and performance from the comfort of their homes.

In the grocery sector, companies are also leveraging VR for immersive demonstrations, allowing customers to see how fresh produce is sourced and processed. This technology enhances transparency, builds trust, and provides a unique behind-the-scenes look at the journey of their food.

4. Personalized Marketing Campaigns

AR and VR technologies empower retailers to create personalized marketing campaigns that deeply resonate with consumers. Retailers can use AR to offer targeted promotions, such as personalized discounts and offers based on a customer's previous purchases or preferences, fostering customer loyalty.

Additionally, experiential marketing through AR

has been embraced by some beverage companies, enabling customers to unlock interactive experiences like games, discounts, or exclusive content by scanning products. This not only boosts consumer engagement but also strengthens brand loyalty and interaction.

5. Training and Development

AR and VR are also playing a vital role in employee training and development within the retail sector. Retailers can utilize VR simulations to train staff in customer service, product knowledge, and operational procedures, all within a risk-free environment. E-commerce platforms, in particular, are adopting VR modules to onboard new employees efficiently. Additionally, AR can be employed to train staff on safety protocols and equipment handling, which is essential for maintaining workplace safety, especially in larger retail environments.

Challenges to Adoption

While AR and VR technologies offer significant potential for the Indian retail sector, several challenges can hinder their widespread adoption. The high costs of development and implementation may deter small to medium-sized retailers from embracing these solutions. Additionally, not all consumers have smartphones capable of supporting advanced AR features, limiting the reach of these technologies.

There's also a considerable knowledge gap among consumers, requiring retailers to invest in educating their customers about AR and VR to maximize engagement. Furthermore, the need for a robust digital infrastructure, including reliable high-speed internet, presents challenges, especially in rural areas.

AV Integrators and Their Role in AR and VR Integration

AV integrators are essential in transforming the retail experience through the integration of AR and VR technologies into audiovisual systems. They provide tailored solutions that align with business goals, optimizing network infrastructure and ensuring seamless hardware and software operations. This expertise enables retailers to craft immersive, interactive experiences that enhance customer engagement and drive business growth.

By seamlessly integrating AR and VR systems into existing setups, AV integrators ensure compatibility and create a unified shopping experience. They collaborate with developers to produce visually appealing 3D content, facilitating features like virtual product placements and store navigation. Additionally, AV integrators set up the necessary hardware, including AR displays and VR headsets, while ensuring smooth integration with software platforms such as ARCore, ARKit, Unity, and Unreal.

Moreover, AV integrators optimize network infrastructure to deliver sufficient bandwidth and low latency for real-time interactions. They offer comprehensive training and ongoing technical support for retail staff, ensuring effective use of AR and VR systems. By designing scalable and adaptable solutions, AV integrators empower retailers to enhance immersive experiences as technology evolves, all without the need for significant infrastructure overhauls.

The Future of AR and VR in Indian Retail

The future of AR and VR in Indian retail looks promising, fueled by ongoing technological advancements and changing consumer preferences. One key trend is the integration of AR and VR with Artificial Intelligence (AI), which will create more personalized experiences by analyzing customer behavior and preferences. Additionally, the rollout of 5G connectivity across India will boost the capabilities of AR and VR applications, offering smoother experiences and richer content. Another trend to watch is cross-industry collaborations between tech companies and retailers, driving innovation and the development of tailored AR and VR applications for the Indian market.

Conclusion

The integration of AR and VR technologies into the Indian retail space is transforming customer experiences and setting new benchmarks for engagement. From virtual try-ons to immersive product demonstrations, these innovations are not only enhancing convenience but also fostering stronger connections between brands and consumers. As the retail landscape evolves, embracing AR and VR will be vital for retailers aiming to succeed in a competitive market. By addressing challenges and harnessing technological advancements, the future of retail in India promises to be an exciting journey of innovation and deeper customer engagement.

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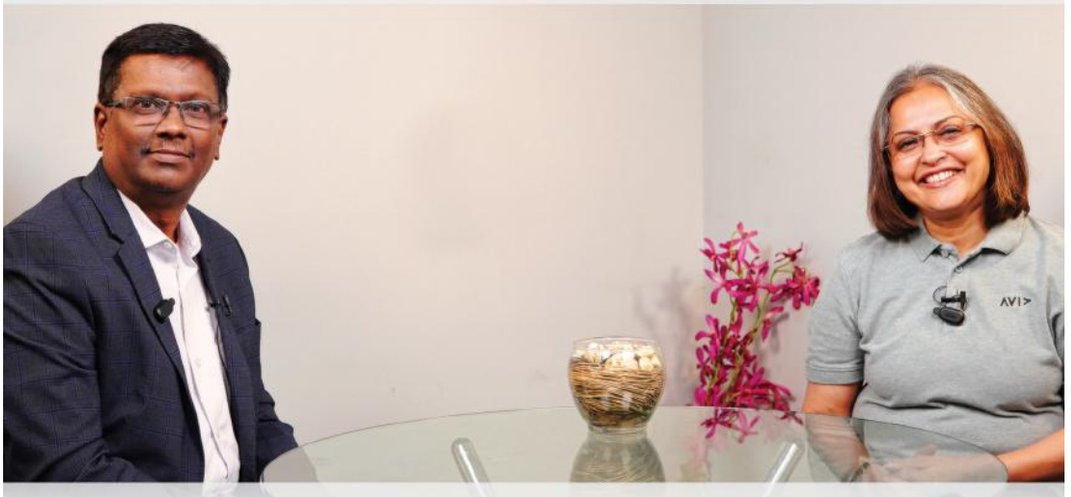
Women of AV



Women Leaders and Champions of Process Excellence

As more women enter the AV industry, they are bringing a wealth of diverse insights and talents, creating a foundation for the next generation of pioneers and trailblazers.

Join us as we move on talking to the iconic women leaders in our AV industry. In this edition, we had the opportunity to speak to Mrs. Mahua Mukhopadhyay, Executive Director at AV Integration Distribution India Pvt Ltd (AVID), a distinguished company recognized globally for its achievements in AV systems integration across India and Asia. As the India Lead of the AVIXA Women's Council and the esteemed recipient of the AVIXA (formerly InfoComm) Global AV Woman of the Year 2017 and the Woman AV Professional of the Year 2023 award, Mahua Mukhopadhyay exemplifies leadership and innovation in the field.

She began her professional journey as a Programmer in the IT industry and her transition to IT Sales handling key roles in DSQ software and Oracle where she handled the channel sales for North America. Her chance of entering the AV industry came as an opportunity as she wanted to support her husband to handle the operations side of his business. This unexpected turn of events has since led her to become a prominent leader in AV systems integration.

During our discussion, Mahua highlighted the rapid technological advancements in the AV industry since her entry, noting that innovations appear almost every quarter. She also expressed excitement about the increasing participation of women across all AV job roles, emphasizing how their involvement enhances diversity and brings fresh perspectives, driving the industry's growth and evolution.

Her IT background has been crucial in her role, allowing her to implement effective process strategies. She established a 24/7 ticket handling system with clear Service Level Agreements (SLAs), ensuring efficient support and responsiveness to client needs. This expertise has streamlined operations and greatly enhanced the support system's effectiveness.

While discussing the challenge of bringing more women leaders into the AV industry, Mahua pointed out that lack of awareness is the main barrier. Despite the abundance of opportunities available, many women remain unaware of the potential career paths in this field. Raising awareness could unlock these opportunities and encourage more women to pursue leadership roles in the AV sector. She also highlighted several initiatives undertaken by her organization and the AVIXA Women's Council to attract more women into the industry. Despite these efforts, she pointed out a significant barrier: a lack of awareness that continues to hinder women's entry into the field. This observation underscores the need for more proactive measures and programs to raise awareness and encourage women to pursue careers in the AV industry.

When discussing the balance between personal and professional life, Mahua emphasized that achieving work-life balance is a common challenge faced across all industries. She believes that it is essential for individuals to take the initiative in finding this balance by carefully planning their strategies to accommodate both family and work commitments. Her perspective highlights the importance of personal responsibility in creating a harmonious integration of professional obligations and personal life, ensuring that neither aspect is compromised.

She was instrumental in keeping the team intact with her relationship building skills and she groomed them to be a committed and loyal employees. She led the organisation from a 100 member team to the present strength of 225 employees spread across India.

To access the full interview, scan the QR code.

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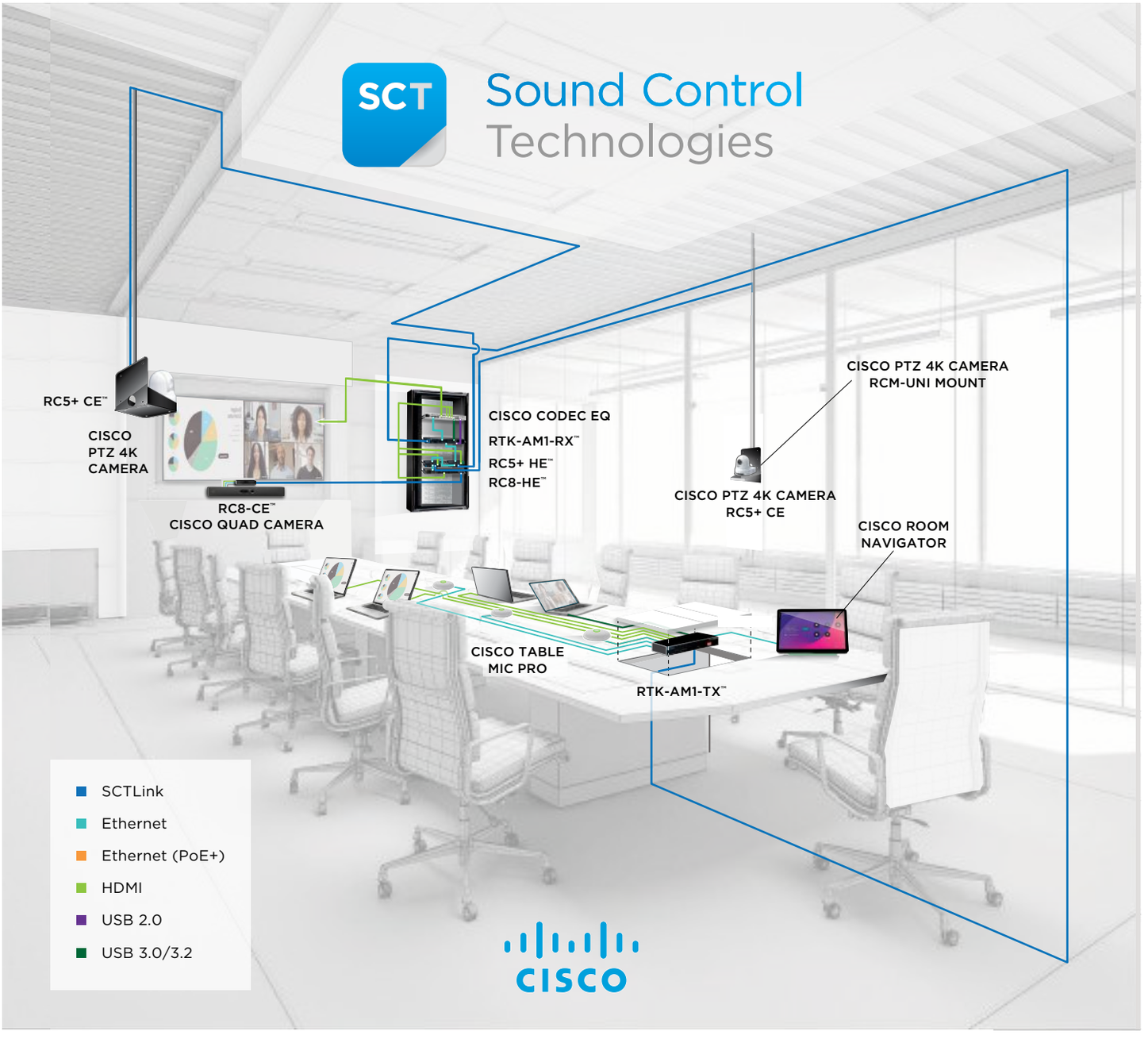
Cisco's new Cross-view setup uses AI-directed switching to deliver the best view of participants from multiple angles, providing a high-quality, immersive video conferencing experience. RoomOS's integration of multi-camera technology and software intelligence ensures everyone feels present in the discussion.

SCT's RTK-AM1 Table Integration Kit enhances the Cross-view experience by supporting one BYOM/BYOD laptop, three Cisco Pro microphones, and the Cisco Room Navigator. The USB-C port delivers audio, video, and 60W power to the laptop, while a single CAT cable seamlessly transmits all signals to the codec, maximizing versatility and simplifying installation. The RC8 and RC5+ Camera Extension Kits, paired with SCT's custom Cisco mounts, deliver a sleek, professional finish for any Cisco Quad Camera or 4K PTZ installation.



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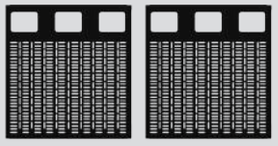

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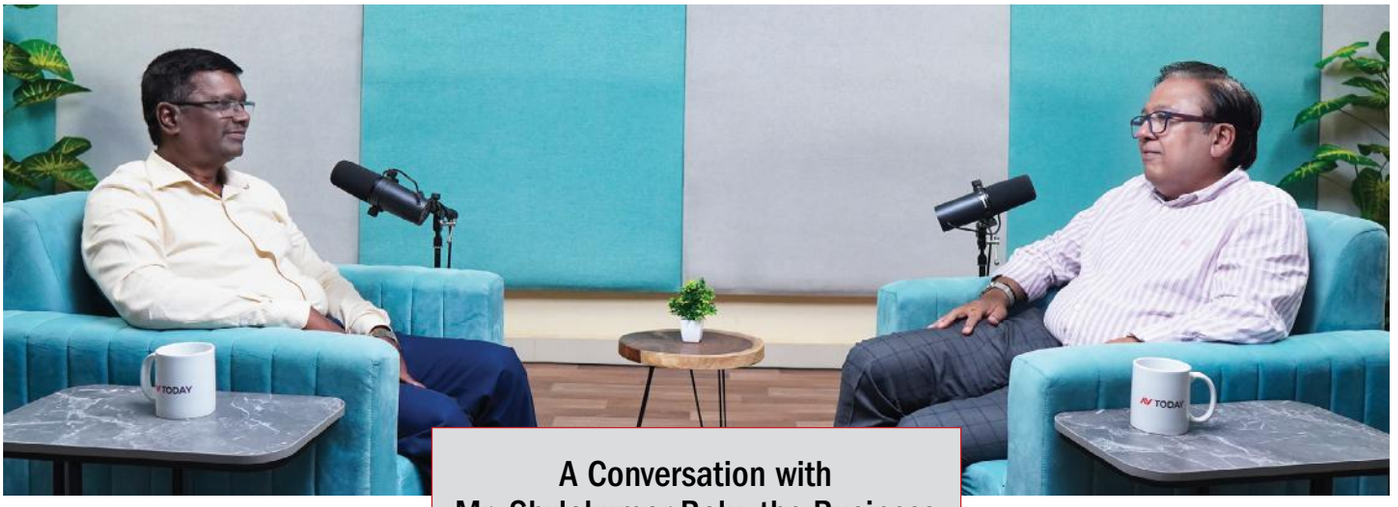

A Conversation with Mr. Shylakumar Balu, the Business Head of Aastro Tech Electronics

Welcome to the second episode of our podcast series, where we explore the remarkable journey of veteran leaders who have been instrumental in shaping the AV industry. In this episode, we are honored to present a captivating conversation with Mr. Shylakumar Balu, the Business Head of Aastro Tech Electronics, a subsidiary of Sigma AVIT. Affectionately known as Genesis Balu or Balu Sir, he is a veteran in AV with over three decades of expertise in the industry. From launching Genesis IT Innovations (GITIL) in the early '90s to leading Aastro Tech today, Balu's journey exemplifies the spirit of innovation, resilience, and dedication that has driven the audio-visual industry forward.

The desire to start something new often stems from a requirement from someone, serving as the spark that ignites the birth of a thriving business. In these pivotal moments, the seeds of innovation and ambition are sown, setting the stage for a remarkable success story that transforms an idea into a powerful and prosperous business.

Balu's entrepreneurial journey began with Genesis IT Innovations, an IT firm that sold 8086 laptops with monochrome displays, a venture met with its fair share of challenges due to the high cost of Laptops then. A unique customer request for larger display projections prompted him to seek a solution. His determination took him to Singapore, where he sourced LCD panels to complement overhead projectors (OHPs). This moment marked the company's shift into the AV market, eventually partnering with InFocus to introduce 170 lumens VGA projectors in India which featured a built-in floppy drive, a revolutionary technology that allowed presentations without a computer.

Building a team of passionate associates, Balu's early team at Genesis embraced a flexible, all-hands-on-deck approach, with everyone taking on multiple responsibilities, from sales to technical installations. This commitment to teamwork and passion became the foundation of their success. Despite having solid references, they invested considerable effort in securing clients, often conducting multiple presentations while carrying six to seven-kilogram projectors and their dedication and persistence led to major breakthroughs with top companies like ITC, Hindustan Lever, and Infosys.

In 1999, Balu recalls a notable project for SG Software, integrating audio and video projectors with AMX control panels—a testament to their capability to deliver comprehensive AV solutions. As they progressed, they built connections with consultants to create tailored AV solutions for multinational companies like KanBay (now Capgemini) and AstraZeneca in India. Additionally, they developed an experience center for IBM in Delhi.

As a first- generation entrepreneur in his family, a role that imparted valuable lessons and demanded significant effort to navigate the ups and downs of business. Shylakumar credits his success mainly to the passionate team he has built, which has enabled them to engage effectively with the AV industry across the Indian Army and government projects. In discussing work-life balance, he emphasized the critical support from his family, especially given his extensive travel for work and time spent away from home on customer sites.

Shylakumar concludes that today's AV industry has evolved, offering robust products and support that reduce failure rates. This shift allows teams to focus more on understanding solutions than merely troubleshooting. While earlier challenges fostered innovation and adaptability, the current landscape empowers professionals to efficiently meet customer needs with confidence.

In this insightful podcast, Balu's journey inspires and reminds us that the path to success is paved with innovation, teamwork, and unwavering dedication.

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The Soundtrack Café
Weaving Unforgettable Experiences Every Day

The Soundtrack Café, located in the vibrant Vishal Nagar area of Pune, has emerged as a premier destination for artists and music enthusiasts. Located at Neco Sky Park Commercial, Vishal Nagar, Pimple Nilakh, New DP Road, Pimpri Chinchwad, Maharashtra, India, this café harmoniously blends culinary excellence with an immersive musical experience. Founded by Anchored Hospitality LLP, The Soundtrack Café not only serves delectable dishes but also fosters a unique cultural atmosphere where music and food intertwine seamlessly.

Concept and Design

The concept behind The Soundtrack Café is to provide a haven for independent artists while offering patrons a truly immersive auditory experience. Designed to evoke the magic of "La La Land," the café hosts exceptional performances from emerging indie artists, providing them with a platform to showcase their talent. The café is a meticulously crafted space, featuring state-of-the-art acoustics that transform it into an exclusive hub for indie music lovers.

Upon entering The Soundtrack Café, patrons are greeted with an inviting ambiance filled with the rich aroma of freshly brewed coffee and the delightful sounds of live music. This unique venue is tailored to enhance the sensory experience of its visitors, where high-quality sound systems complement a thoughtfully curated menu designed to tantalize the taste buds.

Architectural Acoustics and Sound Design

To achieve its vision of unparalleled sound quality, The Soundtrack Café has partnered with industry leaders in audio technology. Audio Technik India, the parent company, has assembled a team of experienced audio engineers specializing in architectural acoustics, sound system design, project execution, and post-project support. Their expertise ensures that the café provides not just a place to eat and drink, but a comprehensive experience centered around sound and music.

The Soundtrack Jam Pad is a significant feature of the café, designed as a spacious arena for musicians to showcase their creativity. Endorsed by renowned brands like Bose, QSC, and Sennheiser, this 1,000-square-foot performance space boasts professional acoustic treatment, creating an ideal environment for artists to express themselves.

Mr. Rajesh Patil, the CEO and founder of Audio Technik, India, shared, "Our vision was to create a unique space that centers around sound and music, serving as a common denominator that resonates with our passion." This foundational ethos shaped both the concept and execution of The Soundtrack Café, emphasizing the importance of fostering a creative environment where musicians can thrive.

Curated Musical Experience

At The Soundtrack Café, music is at the heart of the experience. The café has cultivated an atmosphere defined by indie music year-round, with playlists exclusively featuring independent artists. These playlists are refreshed quarterly by the café's sound engineers, who are also musicians themselves. Each day of the week is dedicated to a different genre: jazz on Mondays, post-rock on Tuesdays, experimental sounds on Wednesdays, Indian indie on Thursdays, and indie pop from Friday through the weekend.

Despite the café's compact size, its commitment to sound quality is evident. Professional acoustic treatment ensures that patrons enjoy the highest audio fidelity, creating an immersive environment that enhances both the musical and social experiences. This dedication has garnered a loyal audience, turning The Soundtrack Café into a beloved venue for both casual visitors and serious music enthusiasts.

Audio Systems and Upgrades

Since its opening in 2019, The Soundtrack Café has continually evolved its audio setup to enhance the auditory experience. Initially equipped with Bose FS3 systems featuring suspended subwoofers and 2.5-inch satellite speakers, the café quickly felt the need for a significant upgrade in sound quality due to the diverse genres of music playback and the need to accommodate live music. After extensive research on the tonality, dynamic range and the dispersion pattern that needed to be provided, the Soundtrack team narrowed down on the Sonance Professional range.

The Sonance range is known for its visually aesthetic yet unobtrusive design, while staying true to audiophile roots. Founded in 1983 by Scott Struthers and Geoff Spencer, the company's history began with the invention of the world's first in-wall loudspeaker, which was a result of the founders' recognition of the need for an audio solution that would deliver high performance while being minimally intrusive.

The Soundtrack team reached out to Generation AV, manufacturer's representatives for Sonance in Asia-Pacific and in consultation with their technical teams in India and Singapore, narrowed down on the pendant range of loudspeakers. The professional pendant range from Sonance, ranges from 4" to 8" co-axial 2-way designs with an 8" pendant subwoofer included in the range as well. Aesthetically pleasing while being unobtrusive, the pendant range incorporates several innovative features such as a co-xially mounted pivotable soft dome tweeter, that allows installers the freedom to mount the speakers in open ceilings to suit the interior and lighting design and then shape the sound beam towards the listening areas. This unique feature opens up the ability to place speakers with more flexibility and without compromising sound quality or tonal balance.

The Sonance pendant loudspeakers come in-built with 70/100V line matching transformers and can also run on low impedance, allowing flexibility of design. The versatile PS P63T pendant with a 6.5" woofer was chosen for the main satellites and the PS P83RT subwoofer for bass reinforcement. Driven by an LEA Professional CS354 (300Wx4) smart amplifier that allows the Soundtrack team to control and monitor the venue remotely in real time, the installation is future proofed. The LEA Professional Connect Series amplifiers incorporate 96K DSP processing and loudspeaker management, with in-built presets for over 50 loudspeaker brands in its library. Installation and commissioning was a breeze as all the install team needed to do was dial in the presets for the Sonance speakers, and then finish off with room equalisation. With any one channel that can be set to double the rated power, without losing power on the other channels, running power hungry subwoofers does not need a separate amplifier. Crossover points and bass management are automatically dialled in with the factory presets ensuring even, smooth frequency response across the venue.

This transition not only improved the tonal balance but also allowed for superior sonic detailing, particularly at sound pressure levels (SPL) between 85-90 dB, where conversational sound beautifully blends with intricate audio details. The upgraded audio clarity has received consistent praise, with previously unnoticed instrumentations in track recordings now being highlighted a testament to the meticulous engineering behind the café's sound design.

The distributed audio setup, along with comprehensive acoustic treatments, ensures a fully immersive and consistent sound experience throughout the café, transforming every visit into a memorable musical journey.

Community Engagement and Events

The Soundtrack Café actively engages with its community, hosting a range of events and workshops that cater to both casual patrons and serious music lovers. The first floor serves as a dedicated community space where curated live performances and interactive workshops are held, comfortably accommodating 50 to 60 attendees.

Rajesh emphasized the café's commitment to fostering artistic development, noting, "Renowned artists, such as flutist Naveen Kumar, who collaborates with A. R. Rahman, have held workshops here." This dual-level setup allows for a variety of events, ranging from intimate performances to educational workshops, all within a cozy and alcohol-free environment.

The café has also garnered interest from major brands like Dolby and Roland, who are eager to connect with the musician community cultivated by The Soundtrack Café. Rajesh revealed, "Roland hosted a product training session last month, and there's ongoing interest from other brands to conduct workshops here." This strategic positioning not only enhances the café's reputation but also enriches the experience for local musicians.

Workshops are promoted through customised video content and targeted marketing campaigns, reaching out to potential attendees and securing audiences effectively. For instance, the workshop featuring flutist Naveen Kumar was promoted through engaging Instagram posts followed by a targeted paid marketing campaign. By providing an alcohol-free space, The Soundtrack Café particularly caters to the 18-25 age group, ensuring that the focus remains on music and community-driven experiences.

Acoustics

Prior to this installation, a comprehensive acoustic treatment of the ground floor was conducted by Audio Technik, ensuring that the space is optimized for sound quality. Rajesh elaborated on the significance of these installations: "Our goal was to create an immersive experience that focuses solely on music, without the influence of alcohol. This approach distinguishes us in the market."

Conclusion

The Soundtrack Café stands as a testament to the powerful intersection of music, community, and culinary arts. By providing a unique space where artists can explore cutting-edge audio gear, collaborate with industry experts, and engage in performances, it nurtures artistic expression while empowering musicians to elevate their craft.

As the café continues to grow and enhance its offerings, it remains dedicated to fostering a vibrant community around independent music, ensuring that it remains a beloved fixture in Pune's dynamic cultural landscape.

Nexmosphere Sensors
Elevating Interactive Experiences in Retail and AV Spaces

In today's rapidly evolving landscape of interactive technology, Nexmosphere is a leader in delivering advanced sensor solutions designed to enhance immersive experiences. Their products are reshaping environments in various sectors such as retail, exhibitions, and beyond. This review explores the key features, applications, and overall performance of Nexmosphere's innovative sensors, highlighting how they are transforming the way audiences interact with digital content and displays.

Nexmosphere sensors boast a sleek and modern design, which is ideal for high-end installations. The compact and modular structure allows seamless integration into various setups without compromising aesthetics or functionality. Their robust build quality ensures long-lasting durability, making them suitable for both permanent and temporary installations.

Technology and Features

At the core of Nexmosphere sensors is cutting-edge sensing technology, which includes capacitive touch, proximity, and pressure sensors, all engineered for accuracy and responsiveness. Capacitive touch sensors can detect multiple touch points, allowing for complex gesture-based controls, which increase user engagement and provide a more immersive experience. The technology goes beyond traditional touch, enabling intuitive interactions that feel natural and responsive.

The sensors' versatility is one of their standout features. They can easily integrate with a variety of platforms, including leading content management systems (CMS) and digital signage solutions. This adaptability enables integrators to tailor solutions according to specific project requirements, reducing integration time and simplifying deployment.

The LIDAR sensor for retail applications is another highlight of Nexmosphere's product line. LIDAR (Light Detection and Ranging) technology uses laser pulses to measure distances, and in a retail setting, this sensor enables precise, real-time mapping of customer behavior. It can track the number of people entering a store, their movement patterns, and where they spend the most time, allowing businesses to optimize store layouts and product placement. LIDAR sensors create actionable data that leads to improved customer experiences and more efficient operations.

The XQ LIDAR Sensor by Nexmosphere is one of the company's most sophisticated solutions, engineered for precise tracking and interaction in retail and interactive environments. The Q series stands out for its capability to enable real-time, contactless engagement by emitting laser pulses that measure distance and generate a 3D map of the surroundings.

Performance

Nexmosphere sensors consistently deliver impressive performance across various interactive applications. With near-instant response times, users receive immediate feedback, an essential feature for maintaining engagement in dynamic interactive displays. This swift response is crucial in environments such as retail stores and exhibitions, where seamless user interaction is key to delivering an unforgettable experience.

The sensors also function reliably under varying environmental conditions, which is especially important for installations in locations that may have fluctuating lighting or temperatures. In particular, the proximity sensors stand out for their accuracy, capable of detecting user presence from several centimeters away. This feature is ideal for settings where hygiene is a priority, such as public spaces, retail, and healthcare environments, where touchless interaction can make a significant difference.

Applications

Nexmosphere sensors have a wide range of applications, from retail to museums and even smart homes. In retail environments, the sensors can transform traditional displays into captivating, interactive showcases that capture customer attention. For example, product displays embedded with sensors can trigger dynamic content when a customer approaches or interacts with an item, providing an engaging experience that encourages product exploration.

In museums and exhibitions, Nexmosphere's technology can be used to create immersive

storytelling experiences. As visitors move through exhibits, the sensors can trigger interactive content, personalizing their journey and providing deeper engagement with the material on display. This level of interactivity can also be extended to smart home environments, where sensors enable user-friendly controls for lighting, temperature, and multimedia systems through simple, intuitive gestures.

Integration and Support

One of Nexmosphere's strengths is its ability to offer comprehensive integration and support for both integrators and end-users. Detailed documentation accompanies every product, and the company's commitment to customer service ensures that any technical issues are quickly addressed. Additionally, Nexmosphere's online community provides a valuable platform for users to share insights and solutions, fostering collaboration and innovation.

A major component of Nexmosphere's technology suite is the Xperience Controllers (X-Controllers). These versatile controllers manage a wide array of sensor inputs and output control signals, enabling seamless integration with media players and digital signage systems. With multiple input/output options, including serial communication (RS232), USB, and GPIO ports, X-Controllers simplify the connection between sensors and displays, ensuring smooth operation across different platforms. Pre-configured profiles also reduce setup time, allowing for faster installations.

Advanced Sensor Technology

Nexmosphere's advanced sensor suite goes beyond basic interactivity. AirGesture sensors, for example, allow users to control displays through mid-air hand movements, making for a completely touchless interaction. This is especially beneficial in environments where hygiene is a top concern. The presence and proximity detection sensors, equipped with infrared (IR) or radar-based technology, enable real-time content changes when users approach a display, offering an engaging and interactive experience without the need for physical contact.

The RFID and NFC interaction capabilities are another highlight, particularly in retail settings. With Nexmosphere's RFID and NFC technology, personalized interactions can be triggered when customers pick up a product, automatically displaying related content on nearby screens. This integration creates a more engaging shopping experience, driving customer interest and purchase intent.

Aurora Protocol for Seamless Control

Nexmosphere's proprietary Aurora Protocol simplifies the integration of sensors, controllers, and media players, ensuring smooth communication between devices. With an open API, Aurora Protocol is compatible with popular content management systems like BrightSign and Scala. It also provides real-time feedback from sensors, enabling precise control over interactive displays and content.

The protocol's flexibility allows developers to create custom workflows based on specific sensor inputs, making it adaptable to a variety of environments, from retail stores to corporate spaces.

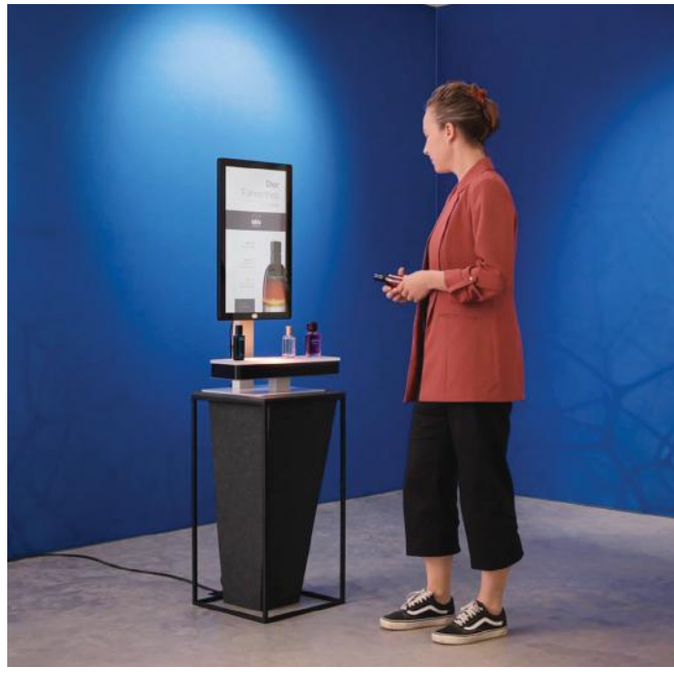
Modular and Scalable Design

Nexmosphere's systems are modular, allowing for flexibility and scalability in any installation. Whether it's a single interactive display or a multi-sensor setup for large-scale exhibitions, Nexmosphere's technology can be easily configured to meet specific project needs. The modular design also ensures that systems can be upgraded or expanded over time, future-proofing installations against technological advancements.

Applications Across Multiple Sectors

While Nexmosphere is widely used in retail environments, its applications extend across multiple sectors. In corporate settings, the technology can enhance lobbies, meeting rooms, and presentation systems by enabling touchless interaction and dynamic content control. In healthcare, the sensors provide a hygienic solution for interaction, making them ideal for hospitals and clinics where reducing physical contact is essential.

Museums and exhibitions benefit from Nexmosphere's sensors by creating more engaging and interactive experiences for visitors, while corporate environments can utilize the technology for touchless control of meeting rooms and lobbies, contributing to more efficient and engaging professional spaces.



Commitment to Sustainability

Nexmosphere is also committed to sustainability. The company designs its products with energy efficiency in mind, incorporating low power consumption into their sensors and controllers. Adaptive brightness is another feature, where light sensors adjust the brightness of digital displays based on ambient lighting conditions, reducing energy use in bright environments and contributing to lower operational costs.

Conclusion

Nexmosphere has established itself as a leader in interactive sensor technology, delivering versatile, high-performance solutions that enhance user engagement across multiple industries. From advanced touchless controls to RFID-based product recognition, Nexmosphere's sensor technology enables dynamic, intuitive, and scalable interactive environments. Whether for retail, exhibitions, or corporate settings, Nexmosphere's products offer a future-proof solution that blends innovation with functionality, setting a new standard for interactive experiences.

The Integral Role of AV Technology In Corporate Real Estate

An Interview with Abhik Roy

In today's fast-paced corporate landscape, the significance of audiovisual (AV) systems cannot be overstated. As companies embrace modern technology to enhance workplace environments, the need for seamless AV integration has become paramount. To shed light on this essential aspect of corporate real estate, we spoke with Abhik Roy, a seasoned professional with over 19 years of experience in Corporate Real Estate and Workplace Interior Design and Build. His insights offer a comprehensive understanding of the complexities and challenges surrounding AV integration in contemporary projects.

A Career Built on Collaboration

Abhik Roy's journey in the realm of corporate real estate began during his tenure at ADRIANSE and flourished at SPACE MATRIX, where he quickly recognized that AV systems are a critical component of any project. "AV can't be separated from the overall project; it's an integral element," he asserts. Treating AV as a standalone aspect can lead to numerous complications, affecting not only the technical execution but also the overall user experience.

As a project manager, Abhik's approach was always collaborative. He made it a point to involve all stakeholders in the design and execution phases, ensuring that everyone was on the same page. This approach has not only allowed him to gain hands-on experience with AV installations but has also equipped him with a solid understanding of various AV products. Currently, his team works directly with Original Equipment Manufacturers (OEMs) like Crestron, Soltech, Sennheiser and Q-SYS to deliver tailored AV solutions for their projects.

The Consequences of Late Involvement

Despite his proactive stance, Abhik acknowledges that one of the most significant challenges in AV integration is the common practice of engaging AV consultants and integrators at the last minute. He recalls a particularly challenging project in recent time, where an IT client from the U.S. faced substantial issues due to late AV involvement. "They came in at the last moment and started ripping open the partitions and ceilings because the cabling hadn't been done according to their requirements," he explains.

Such last-minute interventions can compromise the quality of the interior finishes and lead to unnecessary disruption. The challenge is often compounded by the fact that clients are aware of these potential issues but may be constrained by global partnerships and procurement processes that delay AV integration. This scenario illustrates the importance of early engagement to avoid costly adjustments and maintain project integrity.

The Role of IT in AV Integration

Abhik highlights another crucial aspect of AV integration: the relationship between AV systems and the IT department. In many organizations, especially in corporate settings, AV systems often fall under the purview of the IT department. "Typically, the real estate team, which manages construction and infrastructure, doesn't have direct control over AV procurement," he notes. This disconnect can lead to delays as projects transition through the IT department's processes, prolonging timelines and creating frustration for all parties involved.

To address these challenges, Abhik advocates for the integration of AV planning from the very beginning. He provides a practical example: "If you're purchasing furniture like a sleek boardroom table but haven't made the appropriate provisions for the accompanying technology, it can lead to issues later on." This highlights the necessity of considering AV elements in the overall design and planning process to ensure a cohesive and functional workspace.

The Importance of Early Engagement with AV Consultants

One common question that arises is whether organizations engage AV consultants during the design stage. Abhik confirms that they do when clients request AV system designs. However, he notes a growing trend where clients' IT teams act as consultants, occasionally going directly to vendors for assistance. While this approach may seem efficient, it often leads to mixed results.

"The clients manage the process themselves and bring in an integrator just to install the system," he explains. This can result in a disconnect between the design vision and the final implementation, as not every integrator operates with the integrity necessary to ensure quality. Some may push for unnecessary or overpriced products, leading to a suboptimal outcome.

Abhik emphasizes the value of having a consultant involved from the start. While not entirely unbiased, consultants provide a broader perspective and can mitigate some of the challenges that arise from in-house decision-making. "Having that independent viewpoint can help guide clients toward better solutions," he adds.

Bridging the Gap: Client Engagement and Understanding

When discussing how to bridge the gap between various stakeholders, Abhik highlights the client's role in recognizing the importance of AV integration. "It starts with the client understanding that AV is a key part of the overall design," he explains. Whether it's an interactive display or a boardroom setup, every element contributes to the user experience. If AV isn't integrated smoothly, the experience suffers, which can diminish the effectiveness of the workspace.

For example, Abhik points to the impact of camera placement in meeting rooms. "A poorly positioned camera can result in awkward angles or poor visibility, impacting video calls." He also underscores the importance of lighting, especially in boardrooms, where even light distribution can enhance video quality and create a more professional atmosphere.

To foster a culture of collaboration, Abhik emphasizes the importance of engaging the IT team from the outset. "We encourage clients to involve their IT teams in the discussions from day one," he states. By doing so, all elements of the project can be thoroughly considered, minimizing the risk of oversights that can compromise the final outcome.

Understanding Client Needs and Procurement Processes

The procurement process often raises questions about whose recommendations clients follow when selecting AV systems. Abhik notes that clients generally rely on his team's suggestions but emphasizes the importance of remaining within the client's comfort zone. "If a client is comfortable with a specific brand, we work around that," he explains. However, he also acknowledges that Crestron and other brands may not offer comprehensive solutions, necessitating the inclusion of other elements in the overall design.

Ultimately, the decision-making process varies from project to project. While Abhik's team provides expert recommendations, the final call often rests with the client, especially when they choose to finalize procurement directly.

Navigating Communication Challenges with AV Teams

Effective communication between design and AV teams is crucial for successful project outcomes. Abhik notes that while many AV professionals are open and receptive, there are occasions when some may become unreasonable or non-cooperative. "Sometimes, they only think from a technical perspective and do not consider the broader design implications," he points out.

Navigating these challenges requires patience and a commitment to understanding each team's perspective. Abhik emphasizes the importance of building relationships and fostering open lines of communication, as this can significantly enhance collaboration and lead to better results.

The Future of AV Integration in Corporate Projects

Looking ahead, Abhik is optimistic about the evolving landscape of AV integration. He observes that clients are becoming increasingly aware of the importance of comprehensive planning and collaboration from the outset. "Clients have started to recognize what might go wrong, especially as many companies are managing multiple projects simultaneously," he explains. Lessons learned from past experiences encourage clients to engage all relevant stakeholders early in the process, which paves the way for smoother project deliveries in the future.

As the corporate landscape continues to evolve, the integration of AV systems will remain a critical component of successful project management. Abhik Roy's insights serve as a valuable reminder of the importance of early engagement, collaboration and understanding in achieving optimal outcomes in corporate real estate and workplace design. By prioritizing these principles, organizations can create work environments that not only enhance productivity but also foster innovation and collaboration among teams.

A-Frame Kiosk Displays
Versatile, Cost-Effective Marketing Tools for Retailers

The A-Frame Kiosk is a revolutionary digital standee that empowers brands to communicate effectively and efficiently. With its user-friendly interface, brands can effortlessly change content based on demographics, time of day, or customer interests, all with a simple click of a button. This dynamic capability ensures that messages are always relevant and engaging.

A-frame kiosk displays, commonly known as sandwich boards, have become a staple in retail for businesses aiming to capture attention and effectively communicate with customers. These versatile displays are used in both indoor and outdoor settings, offering a flexible and impactful marketing tool across various retail environments. Here's a detailed product review highlighting their features, benefits, drawbacks, and practical applications.

The design and build of A-frame kiosks are a key selling point. Constructed with sturdy materials like metal, often aluminum, or heavy-duty plastic, they are built to withstand the rigors of high-traffic areas where they might be bumped or jostled. Their double-sided display format allows retailers to present different messages on each side, capturing attention from multiple directions. This double exposure maximizes visibility, especially when strategically placed in busy areas such as storefronts or entrances. Many models also feature interchangeable panels, which allow retailers to easily swap out printed materials, chalkboards, or whiteboards, providing flexibility for daily promotions or special events. Outdoor A-frame kiosks, in particular, are often weather-resistant, featuring UV-resistant panels and waterproof frames, ensuring durability against varying weather conditions. Despite their sturdy build, these displays are designed to be lightweight and foldable, making them easy to move around and reposition as needed.

A-frame displays come in a variety of sizes, typically ranging from 24"x36" to larger 36"x48" options. The size is often chosen based on where the display will be placed, whether it's a small indoor space or a bustling outdoor sidewalk. For retailers looking for customization, many A-frame kiosks offer options to print custom panels that incorporate branding, logos, or specific designs. Chalkboard A-frames are another popular option, providing complete flexibility to store staff to write and change messages regularly, making it easy to keep promotions fresh.

One of the major advantages of A-frame kiosk displays is their ability to grab attention. Whether placed on a sidewalk or near a store entrance, these displays are highly effective in drawing the eye of passing pedestrians. They are a great way to highlight sales, promotions, or new product arrivals, ensuring that customers are informed before they even step inside. Their double-sided nature further enhances their ability to catch the attention of passersby from both directions, maximizing their impact in high-traffic areas.

Another significant advantage is their cost-effectiveness. Compared to more permanent advertising solutions like digital signage, A-frame kiosks are relatively inexpensive. This makes them an ideal marketing tool for both small and large retailers looking to keep costs down while maintaining visibility. The reusability of A-frame displays also adds to their value. Whether using chalkboard surfaces or interchangeable poster frames, retailers can update their messaging regularly without incurring ongoing costs, making them a smart investment for long-term use. Additionally, the portability and flexibility of A-frame kiosks make them highly adaptable to changing store layouts, sidewalk sales, or special events. Being

easy to move around and reposition means they can be placed wherever needed to drive traffic or communicate promotions effectively. This ability to update messaging daily ensures that A-frames remain relevant and fresh, a critical aspect in the fast-paced retail environment.

Durability is another strong point of these displays. Many A-frame kiosks are built to withstand daily wear and tear, including outdoor elements like rain, wind, or strong sunlight. For businesses that need both indoor and outdoor visibility, weatherproof A-frames are a practical, long-lasting solution. This makes them particularly appealing for retailers who want a reliable signage option that can perform consistently, regardless of weather conditions.

However, there are a few drawbacks to A-frame kiosk displays. One of the main limitations is their reach. They are effective at communicating with local, physical audiences but have no way of reaching a broader or online audience. This limits their utility in a world where digital engagement is becoming increasingly important. The space available for advertising is also relatively small, requiring retailers to be concise and impactful with their messaging.

Maintenance is another consideration. For chalkboard or dry-erase A-frames, constant updating is required, which can become time-consuming for staff. If the messaging isn't refreshed regularly, the signs can become stale or irrelevant, potentially leading to a negative impression from customers. Additionally, in outdoor settings, weather conditions such as rain or wind can sometimes damage the display materials or wear down the content, making regular upkeep necessary to maintain their appearance. A-frames positioned outdoors may also be vulnerable to theft or vandalism, especially in unsecured areas, so retailers must take precautions to ensure their signage is secure when the store is closed.

A-frame kiosks also lack the digital engagement that more modern signage solutions offer. As retailers increasingly turn to digital tools for interactivity and dynamic content, A-frame kiosks might feel outdated in tech-driven environments where instant, real-time updates and customer interaction are essential.

Despite these drawbacks, A-frame displays remain highly practical for a variety of retail applications. They are perfect for storefront promotions, where retailers can advertise sales, new stock, or special services to entice foot traffic. Restaurants and cafes, in particular, frequently use A-frames to showcase daily specials or happy hour deals, which can effectively draw in more customers.

Inside larger stores, A-frame kiosks can be used for in-store navigation, guiding customers to specific sections such as seasonal items, sale products, or new arrivals. For temporary events like pop-up shops, sidewalk sales, or seasonal promotions such as holiday deals or clearance events, A-frame kiosks offer a portable, cost-effective way to communicate with customers. Even at outdoor markets or farmer's markets, vendors often rely on A-frames to attract attention and display pricing, offers, and branding in environments where visual communication is key.

In conclusion, A-frame kiosk displays offer an affordable and flexible solution for retail environments, providing high visibility, easy customization, and portability. While they lack digital interactivity, their simplicity is part of their appeal—they effectively draw attention and communicate essential information in a straightforward, visually engaging manner. For small to mid-sized retailers, restaurants, and outdoor markets, A-frame kiosks remain a go-to tool for creating strong, immediate visual impact in high-traffic areas.

DAYLIGHT HARVESTING

Harnessing the Power of Daylight, The Future of Energy-Efficient Lighting.

In a world where energy efficiency is no longer a mere choice but a necessity, the pursuit of innovative solutions to reduce power consumption has become a top priority. Among the many sustainable practices being adopted globally, daylight harvesting is emerging as a key player in transforming how we light our buildings and reduce our environmental impact. This intelligent lighting control strategy, which adjusts indoor lighting in response to the availability of natural light, offers a practical approach to reducing energy use while improving the quality of indoor environments.

Daylight harvesting has gained traction in both commercial and residential sectors, largely due to its dual benefits: it helps to significantly cut down energy costs and minimizes the ecological footprint of a building. In the simplest terms, it's a system that uses sensors to measure the amount of natural light present in a room and adjusts artificial lighting accordingly. When there's plenty of daylight streaming through windows or skylights, the artificial lights automatically dim or switch off entirely. When natural light decreases, artificial lights gradually brighten to maintain consistent illumination levels.

This approach is particularly useful in spaces with large windows, such as offices, schools, hospitals, or retail spaces, where natural light can be used most effectively. However, the application of daylight harvesting isn't limited to large buildings—it can be integrated into homes, apartments, and smaller offices as well. The system not only contributes to energy efficiency but also enhances the overall well-being of occupants, as natural light has been shown to boost mood and productivity.

The Technology Behind Daylight Harvesting

At the heart of any daylight harvesting system is the photocell or photosensor, a light-sensing device installed in strategic locations throughout the building. These sensors continuously monitor the intensity of ambient light, and this data is sent to the building's lighting control system. Based on the readings, the control system adjusts the electric lighting to achieve the desired lighting level. Modern systems are sophisticated enough to create smooth transitions, avoiding the jarring experience of lights suddenly turning off or on.

In some systems, multiple sensors are used to account for variations in daylight across different parts of the room. For instance, a sensor placed near a window will detect more daylight than one placed further inside the building. The system can balance the lighting needs across these zones, ensuring consistent light levels throughout the space.

Crucial to the success of a daylight harvesting system is the integration with dimmable lighting. Traditional incandescent or fluorescent lights are not as easily adjustable, but modern LED lights, which are highly efficient and offer greater flexibility in terms of brightness, are ideal for daylight harvesting systems. LED lights can be dimmed to a wide range of light levels without flickering or losing efficiency, making them the perfect partner for intelligent lighting controls.

Benefits of Daylight Harvesting

One of the most immediate and measurable benefits of daylight harvesting is the reduction in energy consumption. Buildings that use daylight harvesting systems typically see a 20-60% reduction in lighting energy use, depending on the building's design, location, and the amount of natural light available. This translates into significant cost savings for building owners and occupants, particularly in large commercial spaces where lighting can represent a substantial portion of the energy budget.

Beyond the financial savings, daylight harvesting also contributes to the environmental sustainability of a building. Reduced energy use means less reliance on fossil fuels for power generation, which in turn leads to lower carbon emissions. In fact, lighting is responsible for about 10-20% of total electricity use in commercial buildings, so any reduction in this area can have a considerable impact on a building's carbon footprint.

While the financial and environmental benefits of daylight harvesting are often the most cited, the human benefits are equally compelling. Numerous studies have shown that exposure to natural light can improve mood, boost productivity, and enhance overall well-being. In work environments, employees exposed to natural light tend to be more alert and experience less eye strain than those working under artificial light alone. In educational settings, students exposed to more daylight often perform better academically and report higher levels of engagement.

Another key advantage of daylight harvesting is its contribution to building performance certifications like LEED (Leadership in Energy and Environmental Design) and WELL Building Standard. These certifications prioritize energy efficiency and occupant health, and daylight harvesting systems can help buildings meet the criteria for both. By incorporating smart lighting controls, building owners can earn points toward these certifications, which are increasingly in demand as businesses and tenants seek out sustainable and energy-efficient spaces.

Daylight Harvesting in Action

The practical implementation of daylight harvesting systems can be seen in many forward-thinking projects around the world. Take, for example, The Edge in Amsterdam, one of the world's most sustainable office buildings. The building uses an advanced daylight harvesting system that integrates seamlessly with its smart lighting and shading controls. The result is a dynamic lighting environment that adjusts automatically throughout the day, reducing energy consumption while maintaining optimal lighting conditions for employees.

In New York City, the Bank of America Tower employs a similar strategy. As one of the greenest skyscrapers in the U.S., the tower's daylight harvesting system contributes to its overall energy efficiency, helping it achieve Platinum LEED certification. Natural light floods the building's interior, and artificial lighting is automatically adjusted based on the amount of daylight entering the space.

Even in retail settings, where aesthetics and customer experience are paramount, daylight harvesting is being embraced. Retailers like Walmart have implemented these systems in their stores, using natural light to create a welcoming environment for shoppers while reducing energy costs. By making better use of available daylight, retailers not only cut energy consumption but also create a more pleasant shopping experience.

Overcoming Challenges

Despite the many benefits of daylight harvesting, there are challenges to its widespread adoption.

One of the primary barriers is the initial cost of installation, particularly for older buildings that may not be designed with natural light in mind. Retrofitting an existing building with the necessary sensors, control systems, and dimmable lights can be expensive, although the long-term energy savings often offset the upfront investment.

Additionally, daylight harvesting systems must be carefully designed and calibrated to ensure they function optimally. Poorly placed sensors or incorrect calibration can lead to inconsistent lighting levels or excessive reliance on artificial lighting, undermining the energy-saving potential of the system. For this reason, it's essential to work with experienced designers and technicians when implementing daylight harvesting technology.

Lastly, daylight harvesting is most effective in climates with abundant natural light. In regions with frequent overcast skies or long winters, the amount of daylight available may not be sufficient to achieve significant energy savings year-round. However, even in these areas, daylight harvesting can still contribute to reduced energy use during the brighter months.

The Future of Daylight Harvesting

As building technologies continue to evolve, daylight harvesting is poised to become an integral part of the smart buildings of the future. Advances in sensor technology, data analytics, and artificial intelligence are enabling even more precise and efficient lighting controls. For example, future systems may be able to predict changes in weather patterns or occupancy levels and adjust lighting in real-time to further optimize energy use.

Moreover, as sustainability becomes a driving force in real estate development, more buildings will likely adopt daylight harvesting as part of a broader strategy to achieve energy efficiency and enhance occupant well-being. In a world where the pressure to reduce energy consumption continues to grow, daylight harvesting stands out as a solution that not only saves energy but also creates healthier, more comfortable spaces for people to live and work.

By harnessing the power of daylight, we are not only brightening our interiors but also illuminating the path toward a more sustainable future

Command Centers and Control Rooms
Exploring the Latest Technology and Design Trends

A command center, or control room, centralizes an organization's monitoring, coordination, and alarm management, providing real-time visibility into key operations. Also known as NOCs or SOCs, these hubs leverage advanced audiovisual systems like control panels and displays to streamline decision-making and ensure smooth operations. Command centers are critical in sectors like government, military, law enforcement, and utilities, where seamless management is essential. Partnering with skilled AV integrators ensures that these systems remain secure, reliable, and fully functional.

Historically, command centers relied on radio communication, static maps, and manual tracking. With technological advancements, the integration of computer systems and digital displays became standard, and today, AV technology revolutionizes these spaces with real-time data visualization, seamless communication, and immersive training capabilities. Industries such as manufacturing, healthcare, utilities, transportation, defense, and security operations require 24/7 monitoring and data-driven decision-making, and advanced AV solutions empower these sectors to operate efficiently, respond swiftly, and proactively tackle challenges.

Latest Technical and Design Trends

Simplified and Advanced Operator Workstation

The shift from traditional workstations with multiple monitors to setups featuring one or two larger displays controlled by a single keyboard and mouse is transforming command centers. This streamlined design enhances efficiency, reduces physical strain, and simplifies workspaces while maintaining full access to critical information.

Advances in video wall processor technology now enable the management of up to 18 inputs in Keyboard Video Mouse (KVM) mode, with baseband technology ensuring zero latency. Operators can manage the same number of feeds on fewer screens, improving situational awareness, ergonomics, and allowing for more compact, functional desks.

Enhanced Cyber Security

As vast amounts of data are stored in the cloud and uploaded constantly, cybersecurity has become crucial in preventing hacks and data leaks. The Internet of Things (IoT) has transformed control rooms by creating interconnected systems, but this increased connectivity also heightens security risks.

To mitigate these vulnerabilities, prioritizing cybersecurity is essential. Advanced platforms and tools now secure data exchange in control centers, ensuring safe operations. Implementing systems that automatically interconnect modules and standalone networks using military-grade encoders helps manage core network sources and significantly reduces cybersecurity risks, safeguarding critical control room activities.

Decentralization and Remote working

Post-pandemic, decentralization has become a global norm, with major organizations restructuring to enable faster responses, quicker resolutions, and more detailed monitoring. Employees work remotely, optimizing their time and handling multiple tasks simultaneously. Collaboration across various locations has improved, allowing control room operators to manage critical functions in real time without being physically present.

This has led to enhanced situational awareness, as real-time data is consistently available to all relevant personnel. With modern control room

technologies, decision-makers can securely access critical information systems from anywhere, ensuring efficient and informed decision-making at all times.

Industrial Internet of things (IIOT)

We are set for a significant tech upgrade on our IIoT platform, integrating a network of devices, sensors, and instruments that will work together to collect, monitor, and analyse data. This upgrade will lead to increased data sources, improved accuracy in monitoring, and expanded applications across various sectors. Key functional benefits include predictive maintenance, where complex data analysis will notify us of maintenance needs for expensive equipment, asset tracking, supply chain optimization, and enhanced energy management.

Virtualizations and cloud services

Virtualization and cloud services are transforming control room infrastructure by providing flexibility and scalability while reducing costs. These platforms allow companies to cut down on physical hardware, improve security, and support remote work. Key benefits include cost savings, easier administration, enhanced scalability, better security, and dynamic load balancing. Virtualization also supports contingency planning and allows businesses to adapt quickly to changing needs, making it an efficient solution for modern control rooms.

The zero-client-based approach to virtualization provides a significant advantage by enabling the sharing of virtual machines, allowing multiple users to access a single virtual machine simultaneously.

Ergonomic Workspaces

There is an increasing emphasis on designing ergonomic workspaces in control rooms to boost operator comfort and productivity. Sit/stand consoles are essential for creating optimized workstations, enabling operators to switch between sitting and standing to reduce back strain and maintain focus throughout their shifts. Equally important is the quality, placement, and high resolution of monitors, which contribute to visual ergonomics by allowing operators to view critical information clearly without eye strain. The workspace layout should also ensure that vital information is easily visible within the operator's direct line of sight, minimizing unnecessary head or eye movement.

Smart City Integration

Command centers are increasingly becoming a key component of smart city infrastructures, enabling improved coordination and management of essential urban services like traffic control, emergency response, and public safety. In India, smart cities are setting the standard for more livable urban areas. Integrated Command and Control Centers (ICCCs) empower city authorities by collecting and analysing vast amounts of data, helping automate administrative processes and enhance the quality of municipal services. These centers play a pivotal role in improving urban living conditions, with information and communication technology-driven solutions being applied across various sectors—from fostering a healthier environment and improving traffic flow to enhancing public safety and optimizing energy use.

Integration of Artificial Intelligence (AI) and Machine Learning (ML)

AI and ML are transforming emergency response systems by enabling real-time data analysis, predictive analytics, and automated decision-making, reducing response times and optimizing resource allocation. The future of control rooms lies in virtual operator assistants powered by real-time analytics and AI, which enhance efficiency and decision-making.

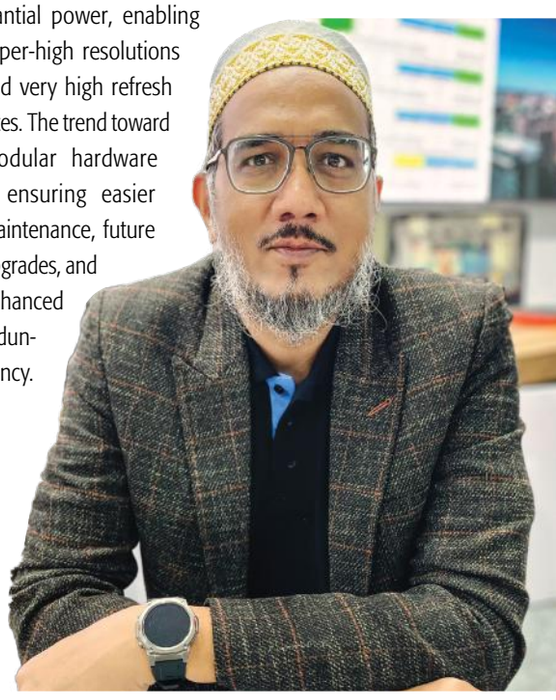
AI and ML are increasingly integrated into control room solutions, particularly in areas like AI-powered video threat detection. The introduction of AI chipsets in the video surveillance market has further advanced capabilities, enabling smarter decisions through visual classification and metadata analysis.

Advancements in Display resolutions

In control rooms, where every pixel can convey crucial information, the ability to discern subtle imagery differences is vital for distinguishing between routine operations and potential incidents. The shift towards higher-resolution displays, such as 4K and beyond, enhances visual clarity in video feeds, enabling operators to monitor critical details for informed decision-making. Advanced codecs like H.264/5 support direct IP video streams, delivering crystal-clear images that offer a comprehensive operational overview. As the demand for real-time data visualization grows, manufacturers are heavily investing in improving display technologies to meet these evolving needs.

Miniaturization of Video Processors

Video processing units are becoming increasingly compact while delivering substantial power, enabling super-high resolutions and very high refresh rates. The trend toward modular hardware is ensuring easier maintenance, future upgrades, and enhanced redundancy.



Mustafa Rampurawala
Business Head, Solutions India Systems (P) Ltd.

Additionally, AI-assisted content management and automation are set to revolutionize the software industry, streamlining workflows and improving efficiency in video processing applications.

LED Innovations

Displays and LEDs are leading the charge in innovation, with pixel pitches shrinking to as small as 0.4mm, creating an incredibly immersive experience in control rooms and various other environments. These advancements are transforming how information is presented, enhancing clarity and engagement in critical monitoring and decision-making scenarios.

Conclusion

With these emerging trends, the future of control rooms is poised for a remarkable transformation. Modern control rooms will be equipped with advanced technologies, including humanoid robots for monitoring and control, enabling real-time decision-making in virtual environments where participants from around the globe can collaborate seamlessly.

Permanent vs. Temporary AV Installations
Balancing Creativity with Practicality

In the realm of the creative industry, the art of installation–whether permanent or temporary–plays a pivotal role in delivering breathtaking visual experiences. From projection mapping to immersive setups, installations transform spaces, breathe life into sites, and leave lasting impressions. Both permanent and temporary installations come with their unique advantages and challenges. While creativity forms the backbone of both, the approach, planning, and execution differ significantly, driven by their respective durations, budgets, and design requirements.

Permanent Installations: The Marathon of Meticulousness

Permanent installations, much like a marathon, demand long-term focus and careful planning. They are built with the expectation of standing the test of time, often for several years, making durability, sustainability, and precision key concerns. The nature of these installations requires extensive deliberation in every aspect, from design and technology to maintenance and site restrictions.

When it comes to hardware for permanent installations, one cannot afford to compromise. Every piece of equipment is selected with an eye toward long-term use, ensuring reliability over extended periods. In permanent installations, the choice of materials, lighting systems, projectors, and software must endure not only daily wear and tear but also potential environmental and operational stresses. This necessitates a deep focus on the initial investment and potential maintenance over time. The long-term vision often results in more refined and detailed elements, making the installation a feat of both creativity and engineering.

However, permanent installations often face site restrictions, which can impact the overall design and the vision for the project. This was evident in our installation at "Bahu Fort in Jammu", a site steeped in history and cultural significance. The need to preserve the heritage of the fort meant that the installation had to work within the bounds of strict regulations. From obtaining permissions to maintaining the aesthetic integrity of the site,

the process was meticulous. We installed lasers and moving heads at a desired distance from the façade to avoid invasive alterations to the site's architecture, carefully adhering to preservation guidelines.

Having a dedicated team of professionals from the inception of the project was crucial. Experts in architecture, lighting, and heritage site management worked closely with us to ensure that every element of the installation was harmonious with the surroundings. Despite the restrictions, the show at Bahu Fort became a milestone in the projection mapping industry, blending cutting-edge technology with the timeless beauty of the fort.

The beauty of permanent installations lies in their ability to integrate seamlessly into a location. When done right, they become part of the environment itself, enhancing the site's value and offering spectators a consistent, awe-inspiring experience. This balance between innovation and preservation, between modern technology and ancient heritage, underscores the unique charm of permanent installations.

Temporary Installations: The Sprint of Spontaneity

On the opposite side of the spectrum, temporary installations are like a high-stakes sprint. With tight deadlines, limited budgets, and rented equipment, the room for experimentation increases but so does the pressure to deliver. These installations are fleeting, designed to create an impact within a short timeframe and then disappear, leaving behind only memories. In contrast to the meticulous, long-term planning of permanent installations, temporary projects allow for a more dynamic and creative approach.

The freedom in temporary installations comes

with its own set of challenges. The timeline is often the most significant constraint. With a limited window to set up and execute, there is little room for error. Equipment is usually rented, and everything from logistics to design must be completed swiftly. The creative freedom, while exciting, is tempered by the need for quick solutions and adaptability.

Our recent experience at "Agauda Fort in Goa" is a perfect example of the challenges and triumphs of temporary installations. This was a large-scale event, and as with any outdoor event, nature had its own plans. Heavy rain was a constant threat, and we had to monitor weather forecasts closely to adjust our installation schedule accordingly. There was no second chance to delay the event; it had to proceed as planned, come rain or shine. Despite the weather, we managed to execute the show smoothly, and it was well-received across the country, earning accolades from attendees and industry peers alike.

The unpredictability of temporary installations can be both a curse and a blessing. On the one hand, weather conditions, technical failures, or last-minute changes can wreak havoc on the plans. On the other hand, these very constraints often push the creative team to think on their feet and find innovative solutions. In the case of the Agauda Fort show, we had to adjust our equipment placement and modify our plans on the fly, but the end result was a spectacular display that exceeded expectations.

What makes temporary installations particularly special is their fleeting nature. Unlike permanent setups, which are designed to last for years, these installations exist only for a brief moment. Their impermanence gives them a unique charm—like fireworks, they are here one minute and gone the next, leaving an unforgettable impact on the audience.

The Middle Ground: Blending Creativity with Practicality

Both permanent and temporary installations are driven by the same goal: to create a memorable experience. However, the path to that goal differs significantly. Permanent installations require careful, measured decisions that will hold up over time. These decisions are informed by longevity, site restrictions, and the need for precision. Temporary installations, on the other hand, allow for a freer, more experimental approach but require quick thinking and adaptability.

Creativity plays a crucial role in both types of installations. In permanent setups, it is often about finding innovative ways to blend technology with existing architecture or natural surroundings, all while adhering to site regulations and long-term durability. In temporary installations,

creativity is more spontaneous, as teams find ways to deliver maximum impact in a limited timeframe, often within tighter budget constraints.

At Bahu Fort, we leaned on the creative side to harmonize the show with the heritage site, maintaining a minimalist aesthetic to blend with the natural beauty of the location. At Agauda Fort, we pushed the boundaries of what could be achieved in a short time, adapting to unpredictable conditions without sacrificing the quality of the show.

A Tale of Two Journeys

In the world of installations, whether permanent or temporary, there is no one-size-fits-all approach. Each project brings its own set of requirements, constraints, and opportunities. Permanent installations are like a test match—long, drawn-out, and demanding sustained focus and precision. Temporary installations, on the other hand, are like a T20 match—fast-paced, high-pressure, and exhilarating.

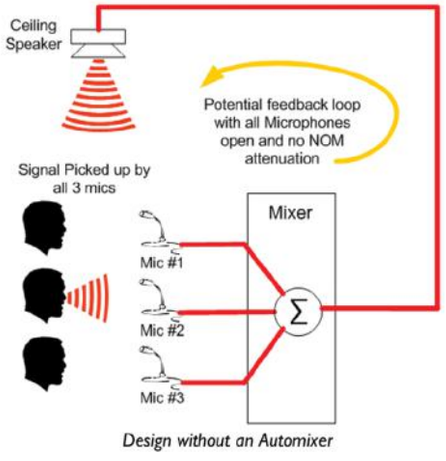
Both types of installations teach valuable lessons in creativity, planning, and execution. They push the boundaries of what is possible and allow teams to explore new ways of engaging with audiences. And at the end of the day, whether it's a show that runs for years or a one-night spectacle, the goal remains the same: to create something that leaves a lasting impact, long after the lights have dimmed and the equipment has been packed away.

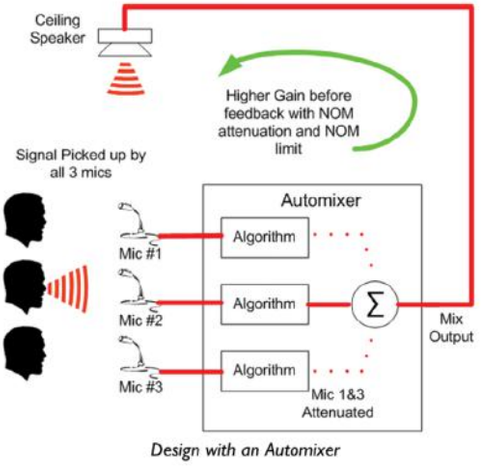
DSP Applications

Audio Signal Processing Part 2 Powering the Nation's Progress

By Prashant Govindan

Applications in professional sound





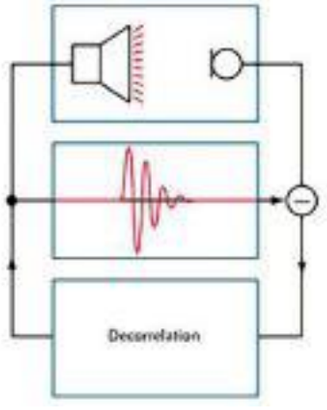
Courtesy: Biamp Cornerstone

In the years after the development of the basic mathematical construct for signal processing, many strides have taken place especially in the audio domain, where DSP has been used very effectively to bring more functionality and efficiency in audio electronics.

One of the many applications that we have seen in the professional audio space has been of that in the vocal and speech processing equipment in install applications.

Notable examples of these products include the Shure SCM 810, the Peavey Automix2 and the Audio Technica 0604. Equipped with basic fixed point DSP processors, these products provided one functionality – microphone auto mixing, and they all did this remarkably well, though the algorithms employed differed slightly lending to their own signature sound and working.

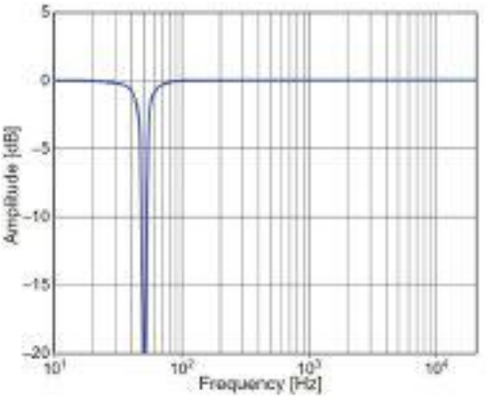
Similarly other audio functionality such as acoustic feedback elimination – a big problem in live and install sound setups also got the DSP treatment. Marketed by several manufacturers as feedback "destroyers" or feedback "killers", these products were targeted primarily at sound rental companies and system integrators, who would employ them to remove feedback from very difficult venues and events. Essentially an adaptive filter, that would target resonant frequencies and apply "notch" filters in real time, these devices are loved and hated just as many times for their ability to provide a quick fix but to also destroy useful signal in those frequencies.



Notch filter: Source: Wikimedia Commons.

There are two main methods used in discriminating feedback from other sounds. The first method focuses on the relative strength of harmonics. The idea is that while music and speech are rich in harmonics feedback is not.

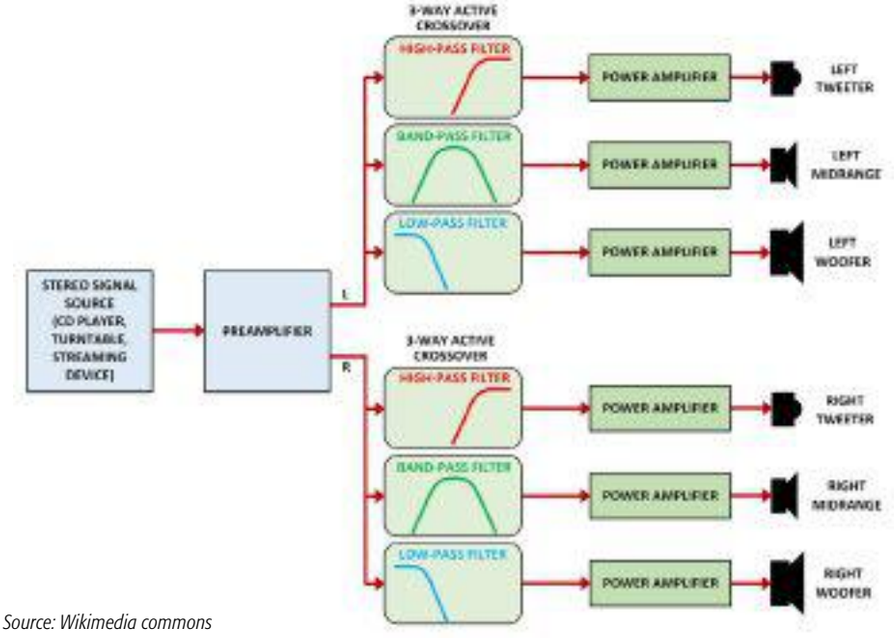
Another method for discriminating feedback from desirable sound is to analyze feedback through some of its more unique characteristics. This can be done without analyzing harmonic content. For example a temporary notch can be placed on a potential feedback frequency. Feedback is the only signal that will always decay (upstream of the filter) coincident with the placing of the notch. However, because placing a temporary notch is intrusive some other mechanism needs to be used to identify potential feedback frequencies before a temporary notch is placed for verification. One such useful characteristic is that a feedback frequency is relatively constant over the time that its amplitude is growing. This constant frequency combined with a growing magnitude proves very useful as a precursor to the temporary notch.



DSP got incorporated into loudspeaker management as well for providing active separation of frequency bands to drive low frequency, mid and high frequency drivers with maximum efficiency.

With the ability to choose between filters to provide the ideal bandpass curve for a 2-way or 3-way loudspeaker setup, these products remain an integral part of every loudspeaker manufacturer's arsenal till date. While most of these products are tailored to specific loudspeaker types, most of them also offer options to users to create custom filter curves to fit specific requirements.

Many independent DSP companies now manufacture precision loudspeaker management DSP products that may be adapted to a wide range of loudspeaker types and applications. Notable amongst these are some well-known names such as BSS Audio, dbx, XTA, Dolby Lake and so on.

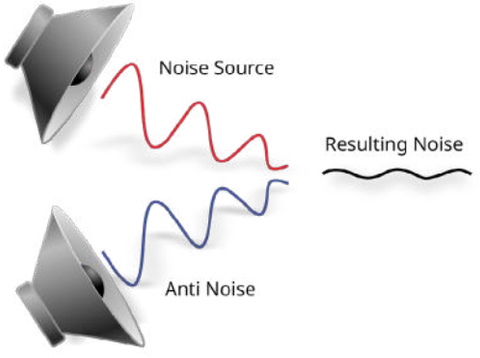


Source: Wikimedia commons

Basic loudspeaker management processors have the capability to route audio inputs from a mixer, or another processor and essentially function as a digital crossover for driving different elements of a 2-way, 3-way or even a 4-way loudspeaker system. This function may be depicted as follows:

Other notable applications of DSP include line noise suppression/elimination and acoustic noise cancellation. While line noise suppression has been used in telecom equipment, acoustic noise cancellation is a relatively recent addition. In the 1950s Lawrence J. Fogel patented systems to cancel the noise in helicopter and airplane cockpits. Adapted subsequently by many manufacturers primarily in the aerospace industry, this has spilled over into the professional and consumer space, with most manufacturers now claiming to have at least one active noise cancellation product in their range.

Adaptive algorithms are designed to analyze the waveform of the background aural or nonaural noise, then based on the specific algorithm generate a signal that will either phase shift or invert the polarity of the original signal. This inverted signal (in antiphase) is then amplified and a transducer creates a sound wave directly proportional to the amplitude of the original waveform, creating destructive interference. This effectively reduces the volume of the perceivable noise. In the professional audio world, adaptive acoustic noise cancellation features in ceiling microphone tiles, professional video conferencing soundbars and also in-built into DSP hardware to detect and provide active noise cancellation especially on video conferencing systems.



Adaptive filters have also been effective in reducing echo resulting from microphones in the far-end picking up sound from loudspeakers and then relaying it back to the other parties. This is usually observed in early speakerphone systems which employed full duplex audio, and in early telecom conferencing systems.

Several manufacturers released hardware implementations including Gentner (later renamed as Clearone), ASPI digital (later acquired by Polycom and rebranded as the Polycom Vortex line), Symetrix Symnet, Biamp Audia and Nexia amongst others. With most of these products aimed at the installed audio conferencing and video conferencing markets, most of them became obsolete with the increasing trend towards VoIP and Web conferencing. VC hardware with in-built soft implementations of AEC started appearing as customers preferred an all in one solution. With the advent of web conferencing platforms, acoustic echo cancellation is now embedded in all software end points be it Microsoft Teams, Zoom, Webex or any of the other platforms.

Other slightly esoteric and specialized applications of DSP in professional audio is in experiential and immersive platforms in entertainment and cinema. Audio processing in home and professional cinema applications has been the norm especially for surround sound and spatial audio.

From processing cinema soundtrack on stereo, to "surround sound" to "spatial audio" and "immersive" sound, digital signal processing has been in the forefront of cinema sound from the late 70s to today. Companies like Dolby Laboratories and DTS have with their own unique way to add stereo separation and add depth and 360-degree sound in two and now three dimensions. DSP fueled many a cinematic experience ranging from the first title to incorporate Dolby Stereo processing in 1971 (A Clockwork Orange) to current titles in Dolby Atmos with over 32 discrete channels.

Immersive formats for non-cinema applications, including in virtual reality and augmented reality headsets, or in real time programmable technologies ranging from TiMax to Meyer Sound's Constellation allow sound designers to place sound sources in a 3-D map and can animate "sound objects" that move dynamically or adapt to listener input.

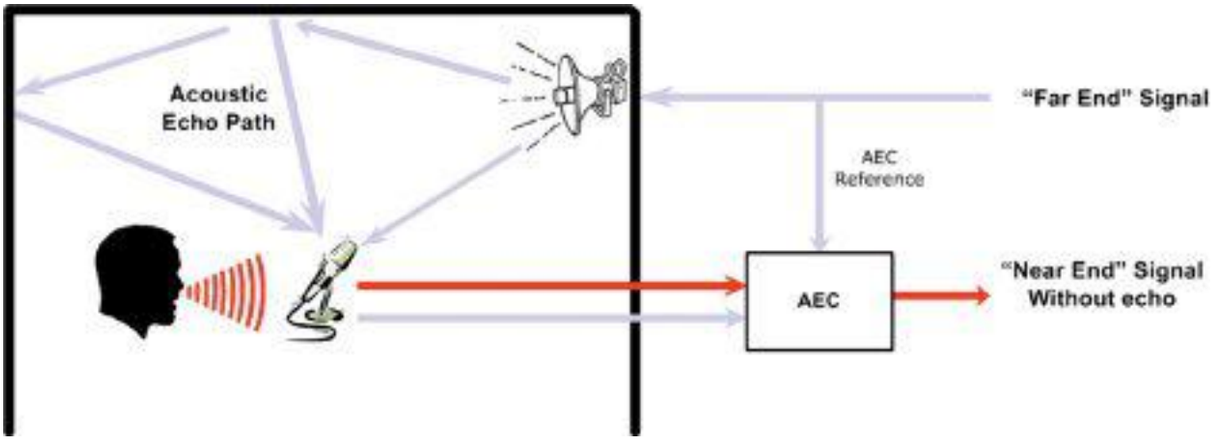
DSP technology has come a long way especially in custom applications that require sound in difficult acoustic spaces. Specialist DSP applications

can create soundscapes adapted from specific venues such as say the Sydney Opera House to the Madison Square Garden or the newly opened Sphere. This exciting realm is called adaptive and variable acoustics. Essentially using multiple microphones embedded in surfaces such as walls and ceilings, listening to the acoustics of the venue, this technology aims to recreate the exact reverberations and acoustic characteristics of a specific venue for a specific performance. For example, for pure speech, the system would adapt to make the space less reverberant and therefore more intelligible and for a chamber orchestra, would inject just the right amount of reverberation and delay to mimic the acoustic of a large auditorium. Several manufacturers in this space use DSP algorithms to achieve these at the push of a button.

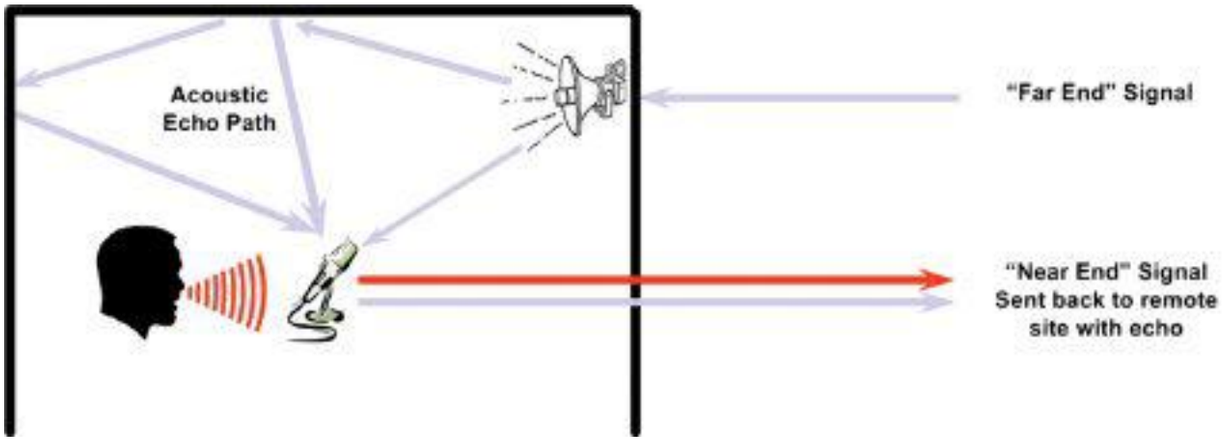
Other DSP applications are in the embedded space within products that require the manipulation of a sound beam from an array of loudspeakers to be focused on a specific area. This is achieved using minute variations in time and phase to create a beam that may be "steered" or "shaped" to avoid hard surfaces and focus energy on listening areas. Conversely, when applied to an array of microphones, this can as a large directional microphone element which can pinpoint and capture sound from a specific spot in the room.

Coupled with user-friendly and interactive GUI, DSP is now prevalent in even the most common consumer audio devices such as sound bars and Bluetooth speakers and headphones. With sound processing now available through the convenience of mobile devices, DSP has truly transcended from the rarefied specialist domain to everyday gadgets. Now with the introduction of voice enabled devices and artificial intelligence engines, digital signal processing is poised to play an even more important role in our everyday lives.

Control of DSP hardware has been with user GUI that is tailored to intuitively change parameters, routing and by incorporating familiar interfaces such as faders and knobs from the analog world. This enables users to seamlessly transition from using analog audio gear to their digital counterparts. Further control is enabled through custom control screens that may be designed using control systems or physical faders, buttons and knobs supported through general purpose input/output interfaces on most DSP hardware units.



Acoustic Echo
Courtesy: Biamp Cornerstone



Acoustic Echo Cancellation (AEC)
Courtesy: Biamp Cornerstone

Noida, UP Retail

Transforming Experiences
Cutting-Edge LED Videowall Innovation

Consultant: ASK Consultants
Integrator: Vallect
Category: Retail
Client: DLF Mall of India, Noida
Contact: www.askconsultantsindia.com

DLF Mall of India, located in Noida, Uttar Pradesh, is the second-largest mall in India, covering over 2 million square feet across seven floors. The mall is divided into five distinct zones representing different regions of India: Market Place, International Boulevard, The High Street, Family World, and Leisure Land. To enhance the mall's visual appeal, the project involved installing advanced LED videowall solutions, both indoors and outdoors, to create engaging digital experiences and promote brands effectively. The client sought high-quality displays to elevate customer engagement through powerful visuals.

Challenges arose, particularly with the outdoor videowall, which suffered from corrosion due to environmental exposure and high levels of sulfur in the air. This caused rapid deterioration of the mounting structures. Additionally, instability in the power supply disrupted operations and created compatibility issues with older systems. Further obstacles included working within limited timeframes and managing logistical costs.

The solution involved installing 14 videowalls, including a unique display of LED tiles wrapped around a square pillar. Xtreme Media provided the videowalls, ensuring a centralized, user-friendly control system. Outdoor panels were treated with sulfur-resistant coatings and mounted on robust structures to withstand harsh weather. These dynamic displays transformed the mall into a visually captivating space, enriching the customer experience.

Vizag Education

Vallect Transforms IIM Vizag
Auditorium with Advanced AV Solutions

Consultant: NA
Integrator: Vallect
Category: Education
Client: IIM, Vizag
Contact: www.vallect.com

Vallect was selected as the AV integrator for the specialized design and installation of advanced AV solutions in the auditorium at IIM, Vizag. This large-scale installation includes a state-of-the-art 500+ seat auditorium equipped with cutting-edge audiovisual technology to enhance the learning environment. A 2.5 mm Active LED Videowall with a high resolution of 3120 x 1755 and a brightness of at least 600 NITS was installed to ensure vivid, crystal-clear visuals for indoor presentations. Additionally, a PTZ camera was incorporated to cover the entire space, along with video recording capabilities and wireless presentation functionality for flexibility and seamless interaction.

The audio system includes Line Array Speakers, FOH speakers, amplifiers, and subwoofers, all controlled by a 12X8 DSP. This system ensures high-quality sound, from powerful performances to subtle background music. For effective communication between presenters and students, wireless gooseneck, lavalier, and handheld microphones were integrated.

Furthermore, a stage monitor display, along with a control and switching system, was installed to ensure smooth operation. The installation required careful consideration of space utilization, ensuring that the AV solutions aligned with the functional needs of both students and faculty, delivering a cohesive and user-friendly experience across the auditorium.

New Delhi Hospitality

Enhancing Acoustics at Qavalli
A Perfect Blend of Sound and Ambiance

Consultant: NA
Integrator: VMS Delhi
Category: Hotels & Resorts
Client: Qavalli Aerocity, New Delhi
Contact: www.vmsdelhi.com

Qavalli, a lively Indian restaurant located in Aerocity, New Delhi, is widely recognized for offering a unique dining experience, enhanced by its captivating live Qawwali performances. However, the restaurant faced an acoustic challenge due to the 16-foot-high ceiling in the performance area, which could potentially cause sound distortion. To address this, the management consulted with system integrator Sandeep Duggal, who collaborated with Alphatec to find a tailored solution. Following a comprehensive assessment, a combination of Tannoy speakers, Turbosound equipment, and Labgruppen amplification was recommended. This included two VX15HP, three VX8, and four VX6 speakers, all selected for their ability to deliver clear high frequencies with minimal distortion. Additionally, a Turbosound 1 NuQ118b subwoofer was chosen to provide strong, immersive bass, ensuring a well-balanced sound spectrum. To power and control this sophisticated speaker system, a Labgruppen PD 3000 and E 600:2 amplifier was installed. The speakers were carefully positioned to accommodate the architectural constraints of the 16-foot ceiling, greatly enhancing the overall acoustic quality. With the new system in place, the high notes of the Qawwali performances became clear, rich, and smooth, creating an immersive and enjoyable sound environment for the guests.

Bangalore Experience Center

AVFx Experience Center
Showcasing the Future of Zoom Spaces Solutions

Consultant: AVFx
Integrator: AVFx
Category: Experience Center
Client: AVFX, Client Experience Center
Contact: www.avfx.in

AVFx previously conducted around 15 demos per month, each customized to specific client needs. However, this process incurred significant costs in transportation, time, manpower, and equipment, often resulting in device damage. To streamline operations and reduce the need for multiple demos and POCs at client sites, AVFx established an Experience Centre. This facility allows clients to explore the full range of solutions in one place, offering a seamless workflow from personal devices to meeting rooms and large-scale town halls.

The AVFx Experience Centre showcases the latest in Zoom Spaces technology, providing hands-on demonstrations of cutting-edge solutions for workplace communication and collaboration. The centre features various Zoom-based systems, such as virtual reception, visitor management, workspace reservation, wayfinding, and digital signage. Visitors can also explore different Zoom Room configurations, from small to extra-large spaces, equipped with intelligent director functions and enhanced meeting management tools.

Partnering with leading hardware brands like DTEN, Jabra, Crestron, Sony, Samsung, and Logitech, the centre demonstrates how these advanced technologies integrate with Zoom Spaces for optimal performance. The AVFx Experience Centre offers a comprehensive look into the future of workplace technology, blending innovation with functionality for a superior collaborative experience.

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