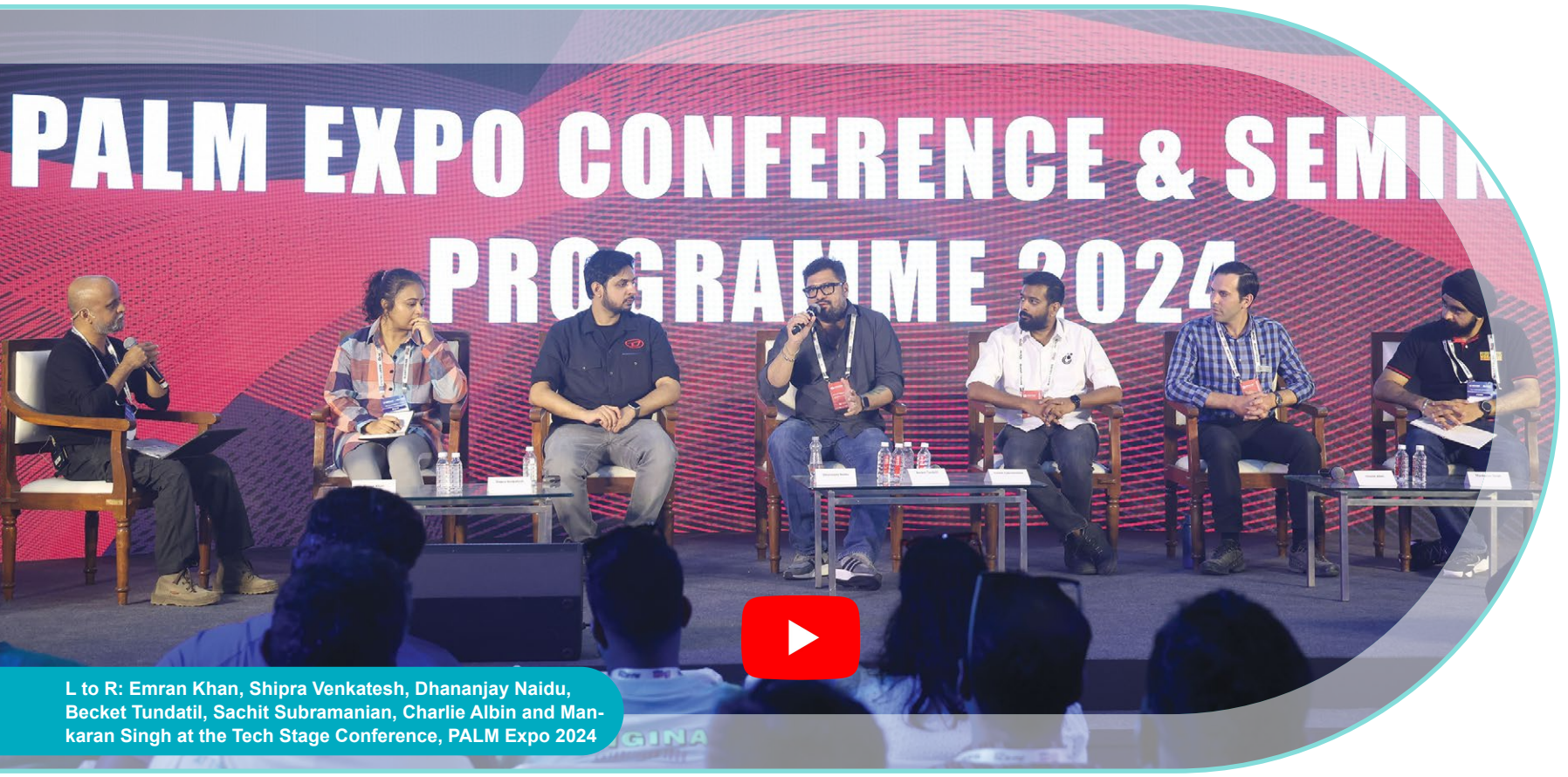
BUILDING THE ULTIMATE LIVE EXPERIENCE: INSIGHTS FROM INDUSTRY LEADERS



L to R: Emran Khan, Shipra Venkatesh, Dhananjay Naidu, Becket Tundatil, Sachit Subramanian, Charlie Albin and Mankaran Singh at the Tech Stage Conference, PALM Expo 2024

*When the brightest minds in event production come together, the insights they share can transform an industry. At PALM Expo 2024, a powerhouse panel of experts **Becket Tundatil** (Lighting Designer, **Fireflies**), **Charlie Albin** (Systems Engineer, **Meyer Sound**), **Dhananjay Naidu** (Stage Designer & VJ), **Mankaran Singh** (Technical Director & Co-Owner, **Men at Work**), **Sachit Subramanian** (Co-founder & Managing Partner, **Circle Pro Audio**) and **Shipra Venkatesh** (Technical Producer, **BMS and Live ARR**), moderated by **Emran Khan** (Director, **Reset Live**) took the stage to discuss the evolving landscape of large-scale event engineering. Read on to discover how technology, training, and innovative design are redefining the art and science of live event production.*

Khan set the tone for the discussion by addressing the essential role of collaboration in stage design, prompting **Dhananjay Naidu** to share his experience working on a large-scale project. "Collaboration is not an option but the essence of stage design," Naidu stated.

He highlighted a 2020 **Budweiser** stage designed for **Supersonic**, which won the **Sponsorship Activation of the Year award**. This project was a three-way collaboration between **Awakenings** from the Netherlands, Budweiser, and Supersonic. Naidu elaborated on the complexities of integrating these diverse entities, explaining how his team studied Awakenings' signature stage designs and combined them with Budweiser's brand aesthetics, incorporating the brand's distinctive straight lines and angular motifs.

Stage Design's Influence on Audience Experience

Discussing audience engagement, Naidu highlighted his work with **DGTL**, a Dutch festival known for its immersive 360-degree stage layouts. Traditional stage setups often direct all elements toward the audience, but DGTL's approach surrounded attendees with multiple scaffold towers and visual elements. This ensured that audiences were never overwhelmed by a singular focal point but instead experienced an enveloping atmosphere.

"The one thing that I noticed when I started doing stage design is that everything used to come from the front and come towards the audience, but I had a very breakthrough opportunity with DGTL, and I had a chance to

work with the studio that kind of pioneered a different way of thinking about stage design," Naidu noted. This setup fosters an energetic loop between performer and audience, heightening engagement. He stressed that whether designing for a massive **IMAX-scale production** or an intimate DJ stage, the objective is always to create an immersive experience tailored to the venue and audience size.

Innovations in Lighting and Remote Production

Khan then turned the discussion over to **Becket Tundatil**, inquiring about his most innovative lighting designs and the software solutions that drive them.

Tundatil revealed that remote lighting productions have emerged as a game-changer, citing an event he executed in 2022 for the **Hum TV** Awards in Toronto. Due to logistical constraints, the lighting design was controlled remotely from Mumbai. "The client asked for a technical solution, and we made it happen," he recalled. The team used **TVU One v3** for live broadcast directly to their studio over a leased-line internet network. This setup provided minimal delay for monitoring the stage and the show. They maintained direct communication with the CCU operator and lighting operators through an app-based communication system.

The team leveraged an **MA Lighting** console to facilitate remote control, with real-time data support from MA Lighting experts. The show file was programmed in Mumbai, then transmitted to the Toronto venue, where an on-site engineer monitored the console. Using an IP-based Zoom network, they maintained continuous video feeds of the stage, enabling 24/7 remote supervision. "We worked in shifts, adjusting cues while the team in Toronto executed our design," Tundatil explained, underscoring the potential of technology to overcome geographical barriers in live production.

Sound Engineering for Large-Scale Events

Khan moved the discussion towards sound engineering, asking **Sachit Subramanian** of **Circle Pro Audio** about the key challenges faced in large venues. Subramanian reflected on the industry's former reliance on large speaker boxes. "At that time, it was a very common notion within the industry that if you have to have a large concert, a large event, or anything large, you need a large box of speakers," he noted. The belief that only 15-inch speaker boxes could project sound effectively was dominant. Subramanian recalled a 2018 **Sunburn** gig in Mumbai featuring **Kygo**, where he challenged conventional wisdom by advocating for a smaller-format speaker box. Using advanced audio software, his team mapped out precise sound distribution, proving that the maximum variance in decibel levels for the last audience member was just 3 dB. This innovation also introduced sustainability benefits. "If I have to carry 48 large-format boxes, I'll need three or four trucks. But by reducing the footprint, I save on diesel, trucking costs, and manpower for unloading and rigging," he explained.

Charlie Albin of **Meyer Sound** echoed this sentiment, discussing the advantages of modern lightweight speaker systems such as Meyer Sound's **PANTHER**. "Improving the design of our equipment, our loudspeakers, our amplifiers, making them smaller, lighter, and more efficient, allows us to cover a bigger audience area with a smaller format box," Albin said.

To achieve consistency, modern prediction software allows engineers to simulate coverage, tonality, and system tuning in advance. "By the time you get on-site rigging speakers, you've already left it too late to choose what's right. The prediction software is now a fundamental part of decision-making," Albin explained. Subramanian agreed, noting that manufacturers like Meyer Sound, **d&b audiotechnik**, and **L-Acoustics** continually refine these tools.

Ensuring Structural Safety in Event Production

Shipra Venkatesh, Technical Producer from **BookMyShow** emphasised that one of the most significant challenges in large-scale event production is ensuring the safety of structures. She highlighted that while inventory is available, the key lies in correctly applying safety standards across all production elements.

"It's one thing to invest in inventory; it's another to invest in training, understanding your inventory, and maintaining it properly in equipped warehouses," she explained. She stressed the importance of rigorous load calculations using software like **AutoCAD** and **Vectorworks** to ensure that structures can safely support their intended loads. With experts such as **Mankaran Singh** on board, production teams can approach each project with greater confidence in structural integrity.

Venkatesh also spoke about the increasing availability of black steel in India, which has been instrumental in improving event structures. She referenced the Ed Sheeran tour, explaining that while the central structure came as part of the touring package, the four towers used for rigging LED screens, sound, follow-spot cages, and cameras were sourced locally. This development has provided event engineers with more efficient, space-saving options that reduce visual obstruction.

"If you don't think a structure is safe, don't rig on it. Put your foot down, fight if you have to, and eventually, all our shows will be safe," she urged.

Strategic Planning and Execution for Seamless Production

A major operational challenge highlighted by Venkatesh is the lack of planning time between project confirmation and site execution. Due to budget constraints and negotiations, production teams often find themselves transitioning straight from finalisation to implementation, leaving minimal time for strategic planning.

"If you go into a site absolutely unplanned, it's going to be chaos," she stated. "Always be prepared for the worst."

She recommended having a detailed production schedule that includes contingency plans to account for worst-case scenarios. This schedule should be followed rigorously and adjusted daily as needed.

Leveraging Technology for Technical Challenges

Venkatesh illustrated how technology has played a crucial role in overcoming logistical and technical hurdles. She referenced the 2022 Sunburn Goa festival, where high-resolution visuals required six to eight 4K outputs, far beyond what most touring artists typically provide. The introduction of **Barco E2 systems** revolutionised screen management, allowing for better processing and standardisation of video outputs.

However, she also stressed the importance of discussing power infrastructure when planning large-scale productions.

"One of the things that often gets overlooked when we talk about sound, lighting, and video is power. Intelligent power consumption, battery usage, and alternative fuels are critical topics right now, especially with evolving environmental regulations," she said.

She compared the power management of two major concerts, U2's 2019 show in Mumbai and **Ed Sheeran's 2024** performance. In 2019, U2's team shipped in their own 2,000 MW generators due to concerns about stable power availability in India. However, by 2024, Sheeran's entire show was powered using locally sourced generators, reflecting significant advancements in India's event power infrastructure.

Subramanian elaborated on technological advancements in power management, specifically the introduction of cam locks (power locks) that support up to 400 amperes without leakage, improving safety and efficiency. He also discussed biodiesel gensets and ongoing research into charging batteries via solar panels, which could lead to more sustainable power solutions for live events.

Advanced Rigging and Structural Planning

Mankaran Singh, an expert in rigging and trussing, discussed how safety has become a more significant concern over the years. Previously, event priorities were focused on sound, video, and lighting, with rigging being an afterthought. However, increased training and unfortunate accidents have heightened awareness about the importance of proper rigging and risk assessment.

"If you fail to plan, you plan to fail," Singh stated. He emphasised the necessity of conducting a thorough risk assessment using a risk matrix to identify potential hazards and implement mitigation strategies.

He shared a case study from the U2 concert at D.Y. Patil Stadium, where 250 tons of steel, LED screens, and audio equipment needed to be evenly distributed. The team used **Portadeck** ground protection mats to dissipate loads efficiently, preventing damage to the venue's infrastructure.

Another example was the Ed Sheeran tour, where venue selection played a critical role in production planning. Choosing a venue that could accommodate large crowds while allowing material handling equipment such as cranes and forklifts was crucial for smooth execution.

Singh highlighted a project in Jaipur where an aerial act, along with lighting and audio fixtures, was initially planned to be rigged from the ceiling. However, structural analysis using Vectorworks and Braceworks determined that the venue's ceiling could not support the required load. As a result, the team opted for a ground-support system instead.

"This is where pre-visualisation and engineering tools are valuable in preventing costly and dangerous mistakes," he noted.

He also discussed the challenges of working in venues with inadequate grounding, citing an **A.R. Rahman** concert where a 100-metre-wide, 15-metre-high structure had to withstand extreme wind conditions. To ensure stability, the team installed custom-manufactured cantilever brackets and added 75 tons of ballast.

Singh underscored the importance of selecting the right vendor partners who understand and adhere to safety protocols. He acknowledged that his transition from investment banking at Goldman Sachs to event production initially made it difficult for people to take him seriously. However, his passion for the industry and commitment to learning allowed him to establish credibility.

"It's all about passion. If you're ready to learn, you can do anything," he emphasised.

Recent Technological Innovations in Stagecraft

Mankaran Singh highlighted how inventory control software such as **Rentman** has revolutionised equipment tracking and management. By integrating RFID and barcode technology, companies can monitor equipment movements, log damages, and ensure that faulty equipment is serviced before being sent out again.

A significant shift has also been seen in design software. Many professionals have transitioned from **AutoCAD** to **SketchUp** and then to **Vectorworks**, which has become the industry standard. Singh showcased detailed drawings created for high-profile projects, such as AR Rahman's stage design, demonstrating how Vectorworks facilitates precise modelling, bill of quantities (BOQs) generation, and structural planning.

Another crucial development has been the use of static modelling software like **Braceworks** for load calculations. This software allows professionals to predict potential structural complications before arriving on-site. However, Singh emphasised that these tools do not replace structural engineers but rather work alongside them to ensure safety.

Load cells have also gained traction in India, particularly for large-scale productions. The Ed Sheeran project, for instance, used load cells to monitor a 14.5-tonne centre halo screen, ensuring that real-time weight distribution was accurate and did not overload structures. Singh pointed out the necessity of variable speed hoists such as Kinesis, which help prevent sudden load shifts in statically indeterminate systems. These innovations significantly enhance safety and precision in rigging operations.

A critical gap in the industry remains the consideration of dynamic loads in calculations. Singh stressed that safety factors, such as 10:1 for general rigging and 3:1 for flying humans, must be adhered to. While India is catching up with global safety standards, there is still work to be done in standardising and implementing best practices.

The Role of Training and Certification

Singh underscored the paramount importance of training in ensuring that industry professionals remain updated on evolving safety protocols. He actively participates in training initiatives and advocates for industry-wide education.

Charlie Albin discussed how training operates at multiple levels. On-site personnel must be trained to interpret software-generated load data and ensure correct implementation. Rental companies need guidance on selecting appropriate rigging hardware and motor hoists that comply with global standards. While no single global rigging authority exists, industry leaders provide valuable research that can be adapted to local markets.

Sachit emphasised that India's industry is passion-driven, and structured training is essential for making informed decisions when purchasing equipment. Many rental companies prioritise cost over quality, often opting for cheaper speakers or rigging solutions without considering their real-world applications. His company follows a rigorous process: train first, purchase later, implement a structured workflow, and audit results. This approach ensures that equipment is used optimally, irrespective of whether it pertains to lighting, video, audio, or rigging.

Future Preparations: AI and Automation

As the discussion turned to the future, industry experts expressed excitement about the potential of automation and AI in event production.

Shipra Venkatesh highlighted motion tracking and automation as key growth areas. She also underscored the importance of sustainability, pointing out that Indian venues and governments are beginning to discuss more organised, eco-conscious event production. A move towards structured on-site operations, including designated workstations, inventory lists, and efficient dumping areas, could streamline event execution nationwide.

Dhananjay Naidu provided a deep dive into the impact of AI on stage design and event planning. He recalled introducing AI-driven tools to his team, demonstrating how AI can generate presentations, stage designs, inventory sheets, and SOPs tailored for event companies. AI allows professionals to filter through hundreds of generated options, often revealing creative and mathematically viable solutions that might not have been considered otherwise.

Naidu shared a practical AI application, he used AI to perform a static load calculation for an eight-light truss system. By feeding the AI specific equipment details, it produced a calculation that was within two kilograms of the final verified result. Such capabilities enhance efficiency by reducing the likelihood of human error in early planning stages.

Vectorworks has also integrated AI-powered visualisation, allowing professionals to convert technical drawings into rendered stage images. This feature, barely a month old at the time of the discussion, is expected to revolutionise pre-visualisation in stage design.

Looking ahead, AI is poised to transform multiple aspects of event production, from conceptualisation to execution. As Naidu humorously remarked, by next year's PALM Expo, half the stalls might be AI-driven.

The PALM Expo discussion highlighted the critical role of technological innovation, rigorous training, and AI-driven efficiency in modern stadium event production. Industry leaders are embracing software advancements, automation, and sustainability to create safer, more precise, and innovative productions. As India continues to evolve in this space, the emphasis on structured workflows, training, and cutting-edge tools will shape the future of large-scale events. AI, in particular, is set to redefine workflows, making event planning faster, safer, and more creative than ever before.

To view the full conference session, visit the link –
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