

EPSON



CHOOSING THE RIGHT AUDIO-VISUAL TECHNOLOGY

**A COMPARATIVE ANALYSIS OF PROJECTION
AND LED VIDEO WALL TECHNOLOGIES**

RESEARCH DESIGN

WHAT

28 interviews conducted with AV solutions providers across 3 markets including a mix of LED video wall and projector solution providers.

Research focused on mid to large AV deployments (>110 inches diagonal screen size).

WHO

A mix of business leaders/senior managers within channel partners/distributors of AV solutions providers.

Focused on LED video wall and projection technology - excluding flat panel/LCD.

WHERE



Singapore



Indonesia



Thailand

INTRODUCTION

The Audio-Visual (AV) industry has witnessed a remarkable transformation in recent years. With the growing demand for immersive experiences, the choice between LED video walls and projectors has become pivotal across many segments and use cases.

This paper focuses on larger display size of 110 inches or more while comparing the two key technologies. It explores the critical factors when choosing a specific technology over the other, the advantages and disadvantages of each technology and finally, the TCO (Total cost of ownership) for each technology. The paper is based on research done in three markets: Singapore, Indonesia, and Thailand.



Four key segments have emerged, each distinctive for AV solution deployments. Each segment has its unique needs, varying decision-making criteria and use cases for deploying AV technology. This diversity makes the landscape highly dynamic and nuanced.

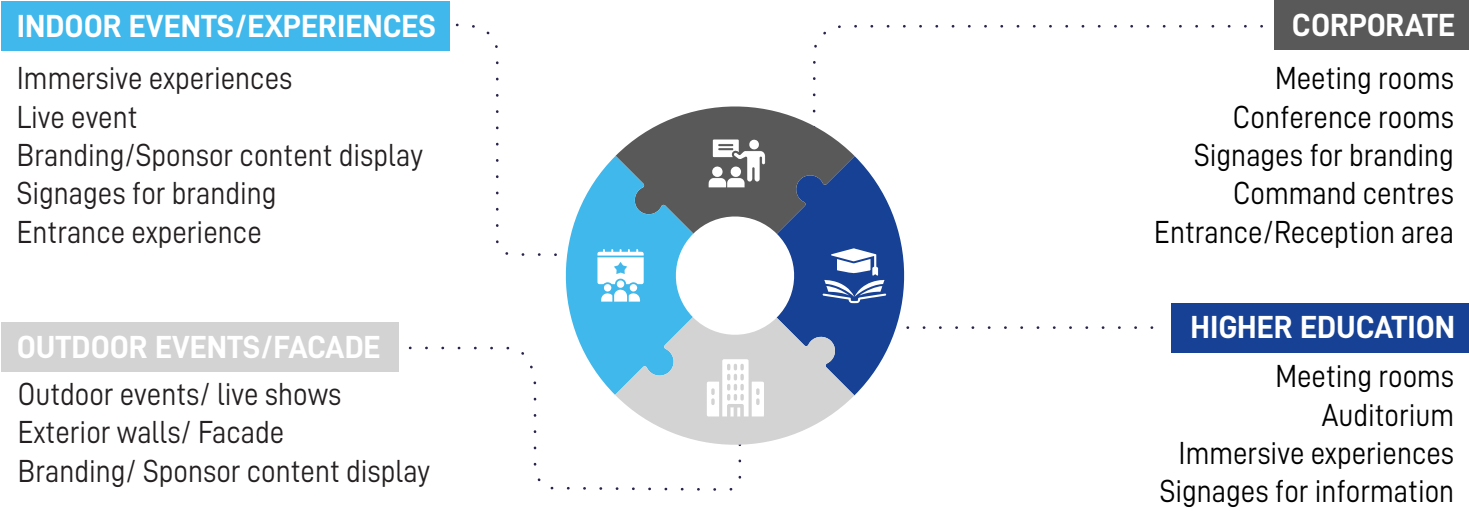


Illustration 1: Use cases in each of the four segments

While each segment has varying needs, research shows there are 10 key factors that influence decision making. While the factors are similar across markets, each factor exhibits nuances based on specific use cases.

-  **SIZE OF DISPLAY**
Size of display required is a factor often considered by corporates and higher education institutions. Be it large signages or auditorium, the size of display does matter.
-  **EASE OF INSTALLATION AND MAINTENANCE**
Ease of installation and maintenance encompasses aspects such as how the installation is set up. Small or large changes to walls, installation of frames, and considerations such as software integration, controllers, and mixers need to be part of the solution. Some solutions can be complex and challenging to maintain over time.
-  **AVAILABILITY OF SPACE**
The space allocated for AV solution deployment covers aspects such as shape, size of the room and the flexibility of the solution to adapt to the given space.
-  **UPFRONT COST AND MAINTENANCE COST**
Upfront cost and maintenance cost include the overall expenses of buying the equipment, installation, labour charges, software systems and controllers as well as maintenance and replacement of hardware.
-  **AVERAGE RUNNING TIME**
Average running time is often a key factor, considering that not all deployments run for a few hours, some run more frequently and for a longer duration at a time. Energy consumption, heating and cooling requirements are often a part of this factor.



COMPLEXITY OF CONTENT DISPLAYED

Complexity of content displayed is critical especially when mixed media is used. The ability to display images and videos clearly is a key consideration when deploying display technologies.



QUALITY OF AV EXPERIENCE

The quality of AV experience refers to the overall experience a particular technology provides, including immersive visual experiences, vivid video quality and clarity of images or content displayed.



ON THE GROUND/REAL TIME TECHNICAL SUPPORT

On the ground technical support refers to the availability, ease, and cost of getting real time technical support. Except for live events, it is not always economically viable to have technical support onsite round the clock.



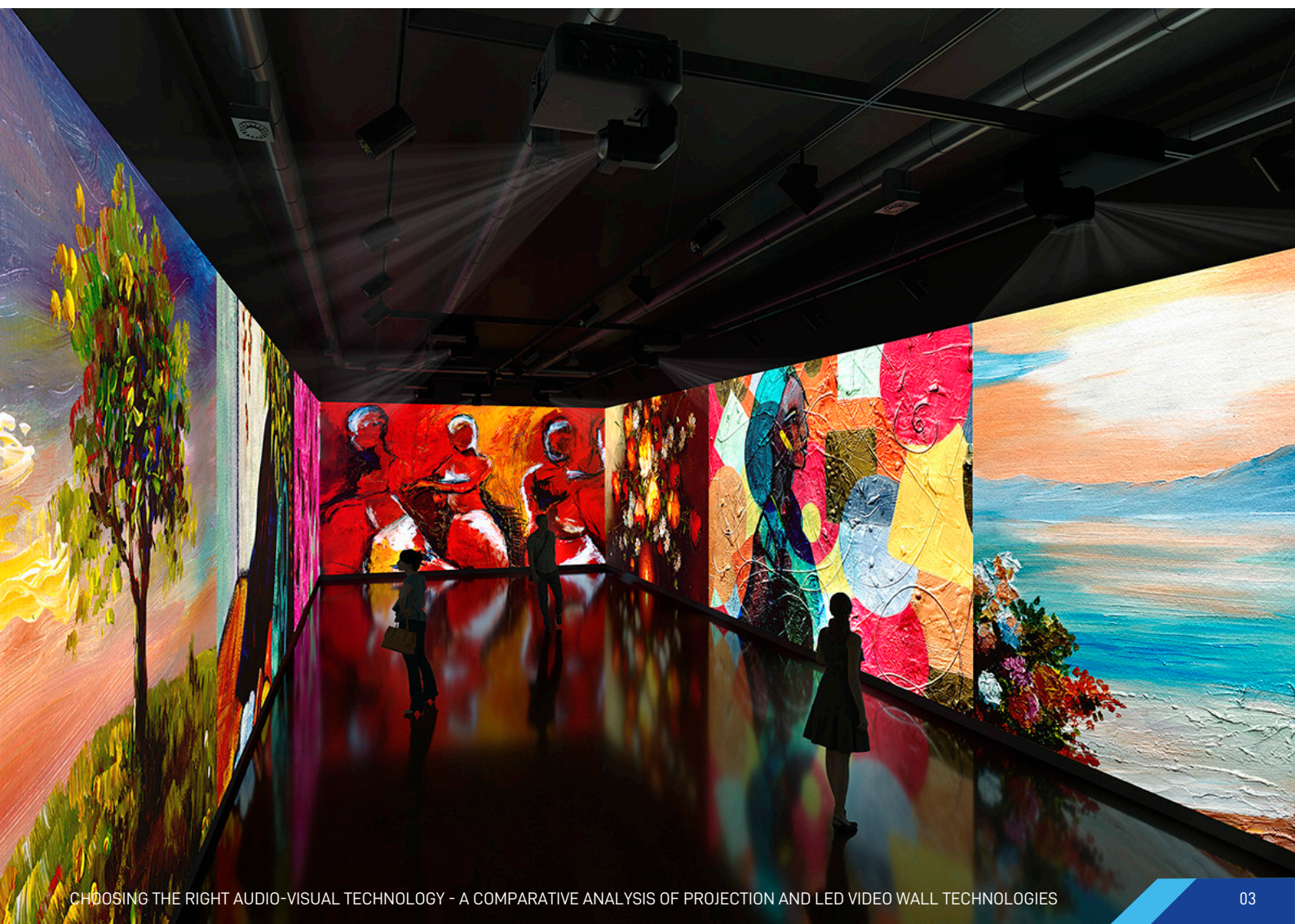
HAZARD/SAFETY CONDITIONS

Hazard/safety conditions refer to potential risks that may occur during display installation, whether it is creating stable background, stage setting or wall hangings.



AMBIENT LIGHT AND ENVIRONMENTAL CONDITIONS

Ambient light and environmental conditions refer to the presence of light, its brightness and the surrounding atmosphere. Unexpected changes in temperature or rains are also taken into consideration. The ability of a solution to be robust across these conditions is often important.





Corporate



Higher
Education



Indoor Events/
Experiences



Outdoor
Events/Facade

TOP 10 FACTORS DRIVING THE CHOICE OF TECHNOLOGY

1	1	NR	NR	Size of display required
3	3	7	5	Ease of installation/maintenance
7	6	NR	NR	Availability of space
2	2	3	3	Upfront cost + Maintenance cost
6	7	5	7	Average running time of AV deployed
NR	NR	2	2	Complexity of content displayed
4	4	1	1	Quality of AV experience
5	5	6	NR	On the ground/real time technical support
NR	NR	4	6	Hazard/safety concerns
NR	NR	NR	4	Ambient light and environmental conditions

Illustration 2: Top factors driving the choice of AV technology selection

Ranked by importance where Rank 1 is most important, while Rank 7 is least important

**NR refers to 'Not relevant'*

The ranking of factors that drive the choice of AV technology is different across the four segments.

CORPORATE AND HIGHER EDUCATION SEGMENTS

While the top factors are similar in the corporate and higher education segments, the size of the required display is the most crucial factor. This determines the application's use case, ranging from meeting rooms, auditoriums, reception areas to conference halls. Essentially, not all AV deployments require large display size. The second most important factor is the upfront cost and maintenance fees. Following closely, the third most important factor is the ease of installation and maintenance. The quality of AV experience ranks fourth in importance while real time technical support on the ground is the fifth most important factor influencing the choice of technology.

The corporate segment places greater importance on the average running time of AV deployment than on the available space, whereas higher education segment values available space more than average running time of content. The corporate segment's preference for extended running times are driven by branded signages at reception and full-day branding events. The survey results have also shown that within these two segments, customers based in Singapore are less cost sensitive compared to Thailand and Indonesia.

In the words of an AV system integrator with presence in all three markets, "For the corporate and education segments, budget is an important factor, though not the only one. Ease of installation and maintenance, as well as on the ground real time technical support is also crucial, given that these organisations may lack the necessary skills for deployment and maintenance over time."

INDOOR AND OUTDOOR EVENTS

The top factors that drive the choice of AV technology for indoor and outdoor events are relatively similar. The quality of AV experience (immersive or live events) is the most important factor for both segments when deciding on the AV technology. The second most important factor is the complexity of the content being displayed, whether the content to be displayed is video, static images, mix of the two or live video streaming of event happening on-site. The third most important factor is the upfront and maintenance cost of the deployment. Hazard is of greater concern for the indoor events compared to outdoor events due to the shorter display's proximity to the audience. For outdoor events and building facades, the fourth most important factor is ambient light and environmental conditions (such as rain, wind, heat, and cold).

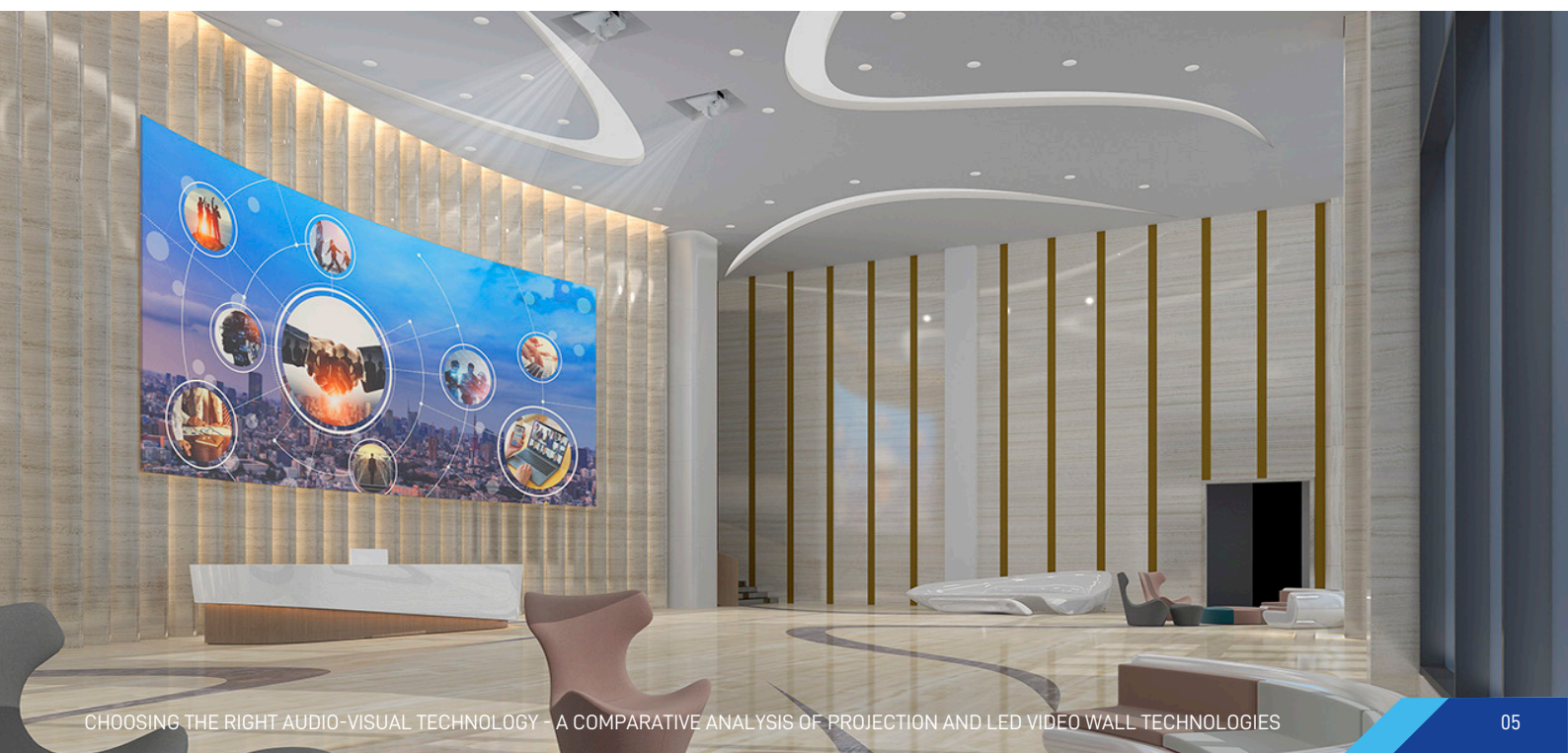
For indoor events, the fifth most important factor is the average running time, followed by the real time technical support available on the ground and the ease of maintenance as the seventh factor. For outdoor events and façade, ease of installation/maintenance is the fifth most important factor, followed by hazard or safety of deployment with the average time of running display being the least crucial factor.

"There are many events that need highly immersive experiences and multi-format content to be displayed, a combination of video, live streaming, or images. These factors are even more important than the upfront cost or maintenance cost for these deployments. If clients get the experience they want, they are open to spend more money, depending on the content format and experience needed to choose between projector or LED video wall. It's the experience that matters the most," in the words of a regional AV solutions provider.

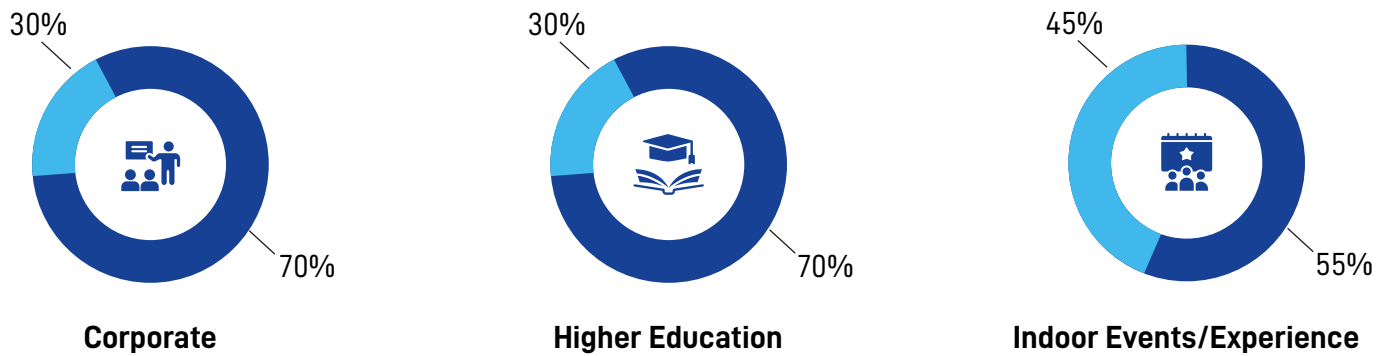
"Outdoor events and façade installations especially at marque locations are not very cost sensitive as customers are ready to spend money for the best experience. Some customers prefer LED video walls while others prefer projectors, depending on the exact use case and external environmental conditions," a regional AV solutions provider explained.

Hazard and safety issues are particularly important for live events. The provision for insurance increases costs and accidents triggered by AV deployments during live events are a key concern especially in Singapore compared to Indonesia or Thailand. Across the segments studied, Singapore customers show higher budget flexibility in comparison to Thailand and Indonesia.

The availability of technical skills is relatively low in Thailand and Indonesia. While the cost of labour in these two markets is relatively low compared to Singapore, retaining staff with technical skills is a difficult task.



Across the three markets studied, most user segments have a preference for a particular technology.



Outdoor Events/Facade - No preference observed.

LED video wall Projector

Illustration 3: Preference of technology by segment

The corporate and higher education segment does show preference towards projection technology primarily because the use cases are often indoors, and budget is by far the biggest criteria in choosing a solution. Ease of installation and maintenance for projector clearly makes them a choice for these two segments.

On the other hand, for the indoor events and experiences segment, the preference for projector and LED video walls is similar. For indoor events and experiences, where the background wall is unstable and not flat, projectors have an advantage as mounting video wall is difficult. For scenarios where other light sources or interruptions impact the viewing experience, LED video walls seem to be preferred.

For outdoor events and facades, the technology used is project-specific with no particular preference observed. The final decision depends on the customer's budget, prior experience, satisfaction with the technology used and expected environmental conditions.



Projector and LED video wall technology each has its own advantages and disadvantages over the other.

PROJECTOR



ADVANTAGES

- Short or negligible downtime compared to LED video wall.
- Lower upfront cost.
- High endurance and flexibility with any surface (even with wet or irregular surfaces).
- Less maintenance fees over a period of five to six years.
- Energy efficient (20% to 30%) depending on size of installation.
- Less maintenance cost* when using laser projectors.
- Less complex deployment and execution.
- Vivid and detailed image quality.
- No issue with few dead pixels or single panel needing replacement installation.
- Easy & less hazardous to set up a system.

*No required maintenance for the light source for up to 20,000 hours. All Approximate time until brightness decreases 50% from first usage. Measured by acceleration test assuming use of 0.04-0.20 mg/m3 of particulate matter. Time varies depending on usage conditions and environment. Replacement of parts other than the light source may be required in a shorter period.

DISADVANTAGES

- Projector is perceived as old technology by some customers.
- Less outdoor usage case studies as projectors may pose challenges in achieving bright images in outdoor installations as compared to LED video walls.
- Tends to get affected by bright lighting, so it performs the best in lower light environments.
- Shadows or intrusive objects (wall hangings unexpected changes to stage settings etc.) can impact the overall experience.

LED VIDEO WALL



ADVANTAGES

- Brighter than the projector when used in bright light/daytime.
- Can be configured to any desired screen size, provided the budget and space can match.
- Better picture/video quality on larger installations.
- Easily attracts people's attention, has high familiarity.
- Upfront cost is reducing each year.
- Cost of controllers/content management software is coming down.
- LED video wall providers offering free signage software.

DISADVANTAGES

- Consumes more energy.
- High maintenance especially after two to three years.
- More expensive than projectors in terms of upfront cost.
- Difficult to match pixel and image quality if one panel within the whole installation fails.
- The risk level during installation and maintenance is higher, as compared to projectors.
- Needs stronger surfaces for mounting and more setup time.
- Time-consuming to amend once screen size is fixed.
- Not suitable for usage on irregular and wet surfaces.

"Upfront cost of deploying a LED video wall is quite high when compared to projection technology. Maintenance of LED video wall panels is also a bigger issue, especially for larger display sizes of 200 inches and above. In such cases, a single LED panel may need replacement after 5 or 6 years, requiring the entire installation to be dismantled. This not only adds to the downtime but also increases the overall cost of the solution," an AV solution partner who offers both LED video wall and projector technology explained.

"Projection solution is very flexible when catering to indoor live events or staging rough and dynamic backgrounds. Projection technology is flexible with less hazards when installing the solution. We do not want anything to go wrong in a live event as that can really impact the experience of the event. We believe projectors have a definite advantage over LED video walls in such scenarios," a senior project director, responsible for configuration of AV technology, explained his organisation's preference for projectors over LED video walls when comparing the two technologies.

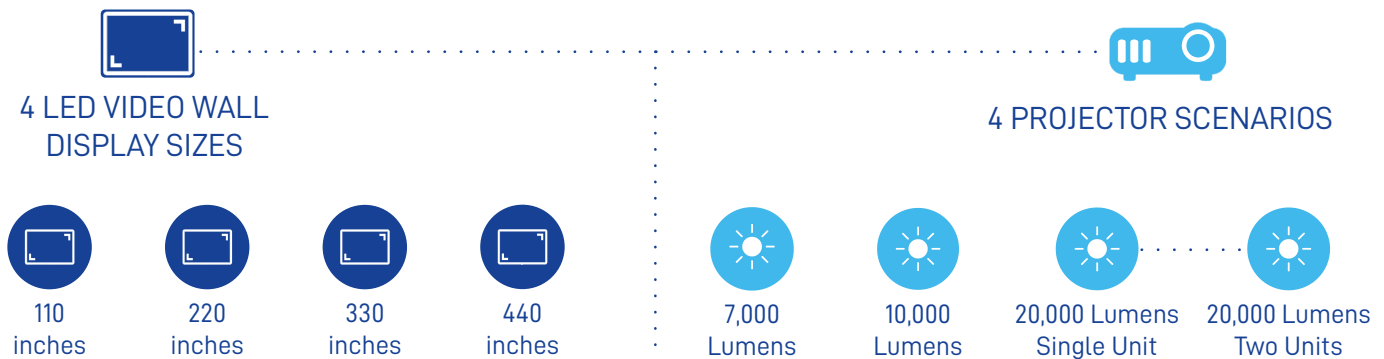
"Although the cost of individual modular LED video wall panel is decreasing with each passing year, one significant bottleneck we face is matching the picture quality, colour, and brightness at the time of replacement as LED video wall panel modules wear off over a period of 4 to 5 years. Carrying a huge amount of inventory is not viable. Matching picture quality is at times difficult even if the brand of LED video wall panel is the same," a LED video wall solution expert explained the challenges he and his team face when maintaining a LED video wall deployment beyond 4 to 5 years.

Photo courtesy of Wings of Time, Sentosa, Singapore



Total Cost of Ownership for Projector versus LED video wall

For a realistic comparison of the two technologies, 8 different scenarios are taken into consideration.



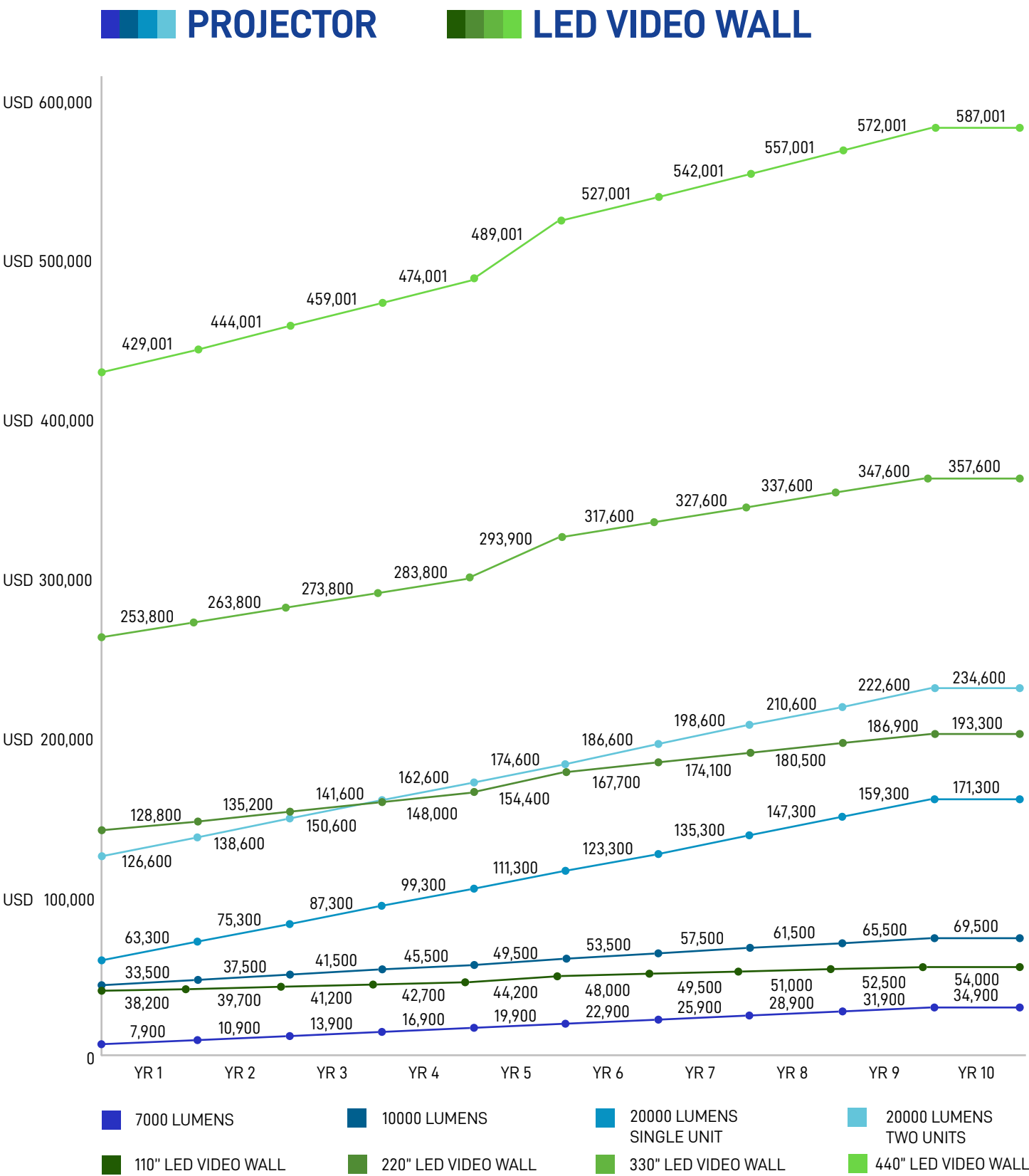
For LED video wall solution, the TCO cost includes:

- ✓ Average upfront display panel cost across top LED video wall brands (pixel pitch size of 1.26mm with 14 feet viewing distance).
- ✓ Number of panels deployed in the configuration (LED video wall panels of 606 x 342mm or 743 x 743 pixels are standard panel sizes used to create customised LED video wall solutions). 110 inches, 220 inches, 330 inches and 440 inches diagonal wall configurations are scenarios used.
- ✓ Mounting hardware, installation, and labour costs for the configuration.
- ✓ Additional hardware/software required includes splitters, controllers, media players as well as content management software.
- ✓ Troubleshooting and maintenance include hardware/software maintenance, repairs or replacement of LED video wall modules or single panel for colour, brightness, and contrast irregularity. This also includes labour costs to conduct planned maintenance or troubleshooting when required.

For projector solution, the TCO costs include:

- ✓ Upfront unit cost of the projector and screen.
- ✓ Installation charges for the projector, and projector screen including labour costs and mounts.
- ✓ Troubleshooting and maintenance of projector light source, lens cleaning etc.
- ✓ Life of light source is 20,000 hours and is maintenance free.

Illustration 4: TCO (in USD) projector versus LED video wall



A comparison of the total cost of ownership for the two technologies over a period of 5 to 10 years, shows that laser projectors are 35% to 275% more cost effective compared to LED Video wall deployment. The cost saving on larger display sizes is even higher than smaller sized deployments, primarily driven by lower upfront cost as well as lower maintenance cost (lower wear and tear) and energy consumption for projection technology.

IN CONCLUSION

Laser projection technology does stand out as a versatile and high-quality choice for a wide range of applications. Its advantages, including cost-efficiency, installation flexibility, reliability, and outstanding visual performance, make it an ideal solution for corporate offices, educational institutions, indoor entertainment venues and experience centres, as well as outdoor events. The ability of laser projectors to enhance the quality of the audio-visual experience in museums further underscores its advantage in the AV industry.

As demand for more immersive audio visual experiences increase, laser projectors are poised to play a pivotal role in elevating the visual experiences across these diverse segments. Their adaptability, durability, and capacity to provide immersive environments continue to make them a compelling choice.

ABOUT EPSON



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