



VISUAL DISPLAYS

Teams Rooms & Hybrid Spaces 2022 Microsoft Front Row – the display challenges & opportunities

Webinar 1 February 2022
Greg Jeffreys

DISPLAYS, LIGHT & ENVIRONMENTAL EXPERTISE
PRODUCTS, SERVICES, SPECIALIST CONSULTANCY

Presenter – Greg Jeffreys



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- ▶ Managing Director of Visual Displays (formerly Paradigm AV)
- ▶ Specialist consultant in standards, displays, light & lighting, VC lighting, teaching space & meeting room design
 - ▶ Not an AV consultant!
- ▶ Current chair, AVIXA Standards Steering Committee
- ▶ Lead writer, PISCR image contrast standard – and new ISCR standard task group
- ▶ Task group chair ANSI/AVIXA DISCAS standard – image size, resolution, viewing positions/angles, content size guidance
- ▶ Task group working on AVIXA's new UX for AV Design standard
- ▶ President of InfoComm/AVIXA 2012, board member 2008-13
- ▶ Writer and teacher
- ▶ 2020 Outstanding Contribution Award – AV Technology Awards
- ▶ Proud associate of LTSMG & AV User Group



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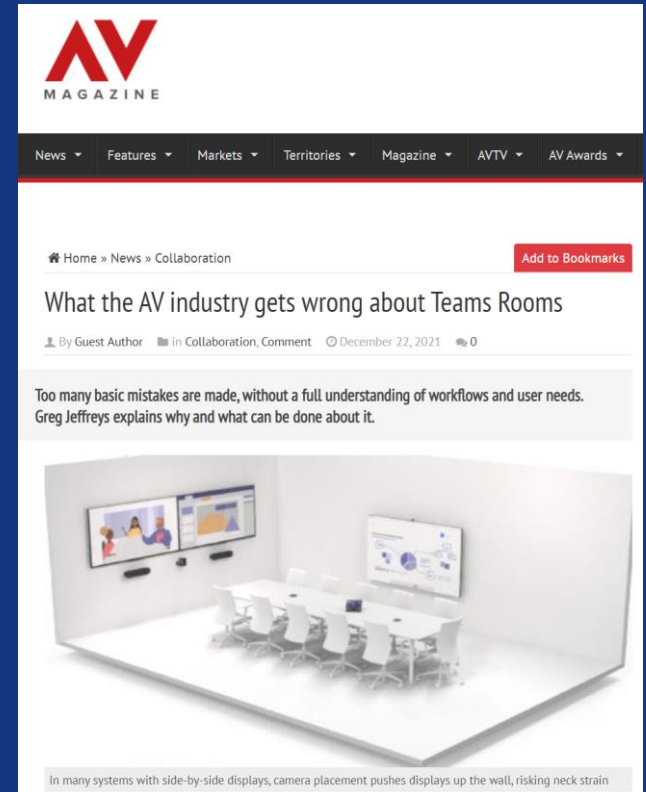


Teams Devices in the Workplace

Bringing Microsoft Teams to your meeting rooms

- ▶ https://info.microsoft.com/UK-TeamMCD-CNTNT-FY21-05May-20-BringingMicrosoftTeamstoyourmeetingrooms-AID-3019979-SRGC4668_01Registration-ForminBody.html

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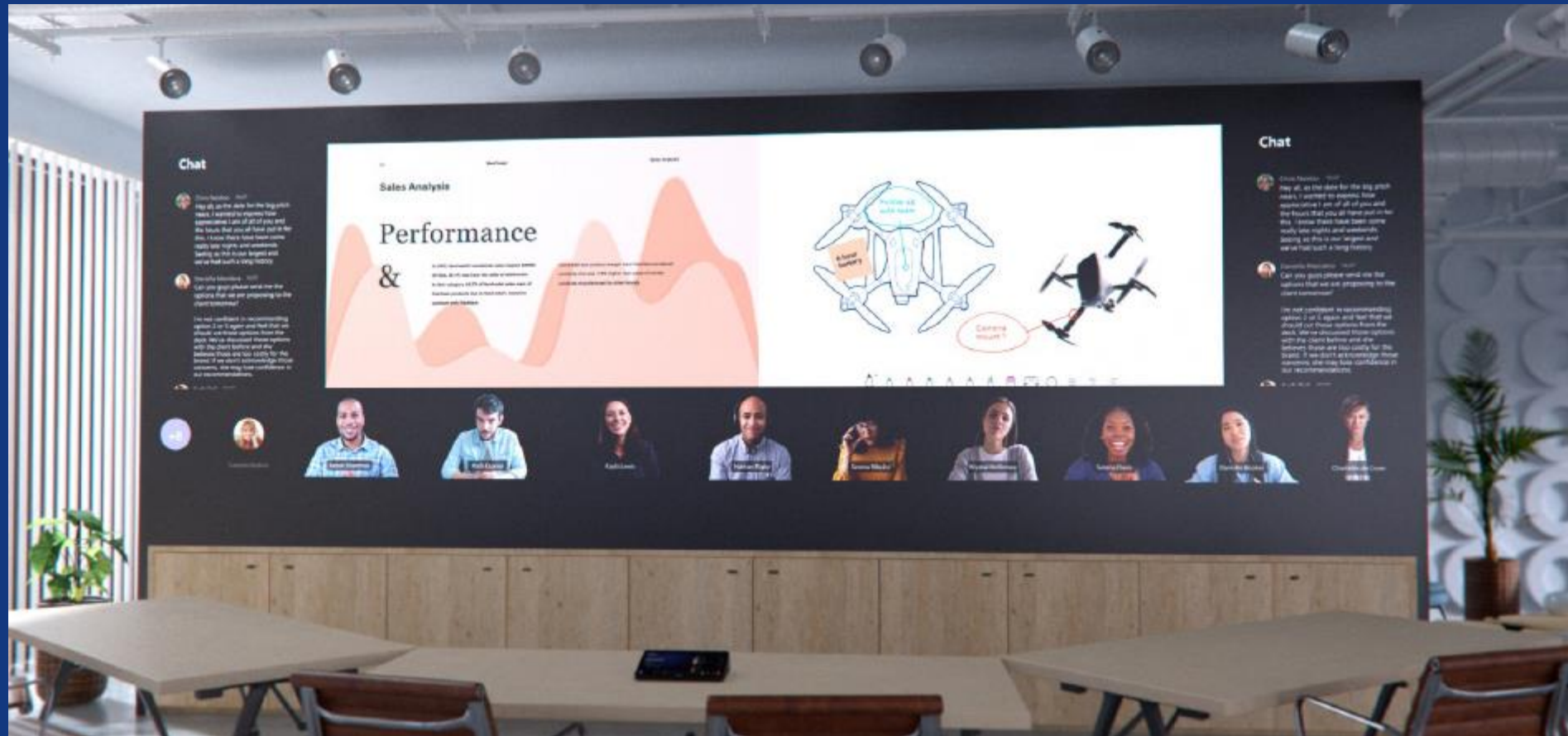


- ▶ https://www.linkedin.com/posts/jimmyvaughan_what-the-av-industry-gets-wrong-about-teams-activity-6879448568025939968-fxKN/

Microsoft Front Row



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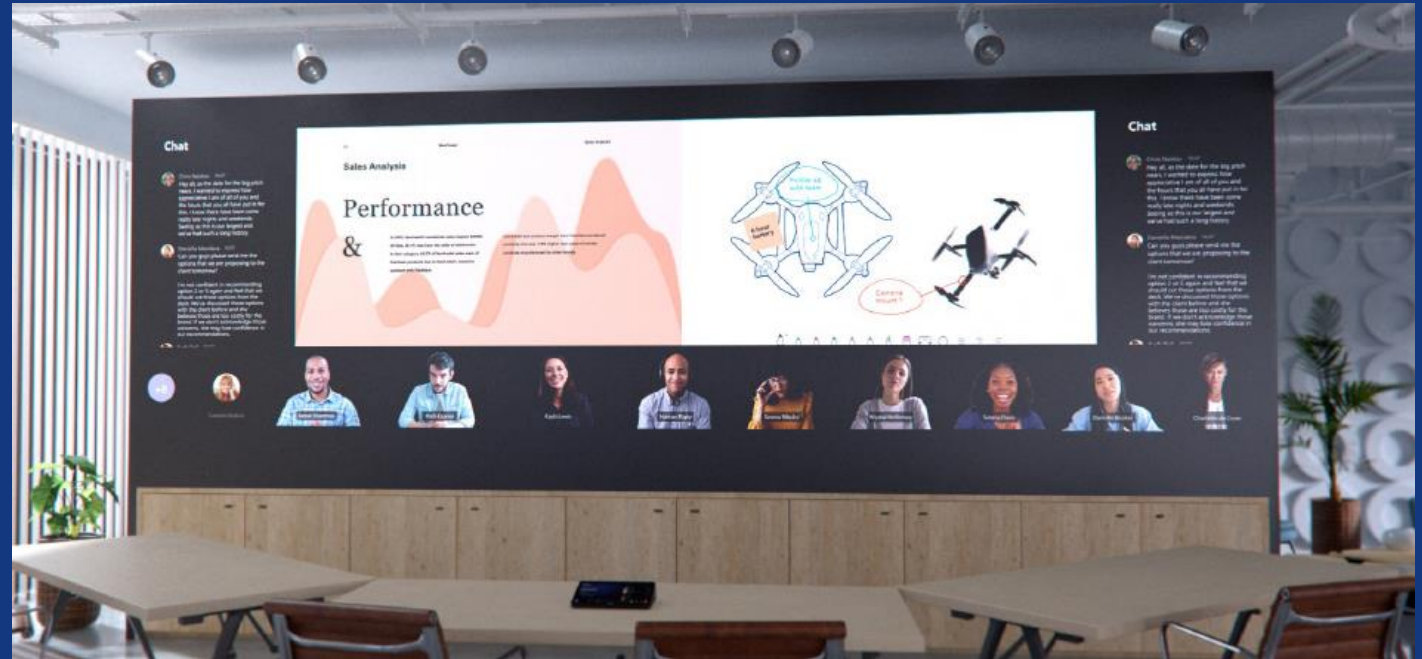


Microsoft Front Row



VISUAL DISPLAYS

- ▶ **Size**
- ▶ **Contrast**
- ▶ **Luminance**
- ▶ **Black level**
- ▶ **Aspect ratio**
- ▶ **Resolution**
- ▶ **Image baseline**
- ▶ **Camera position**
- ▶ **Projection configuration**
- ▶ **Viewer locations and angles of view**

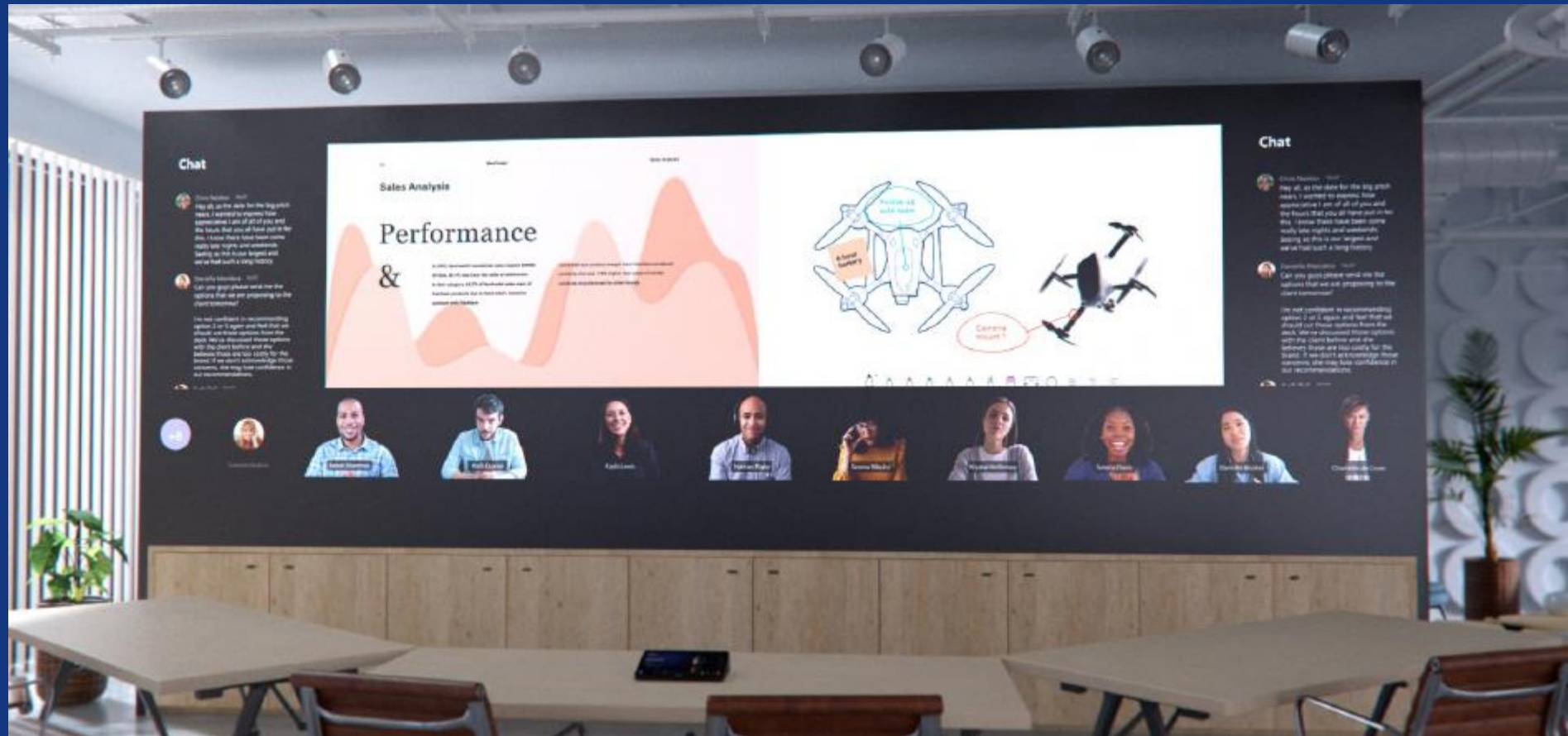


MS Front Row offers opportunities for either step change or incremental improvements for each element – let's break it down

What can we see here?



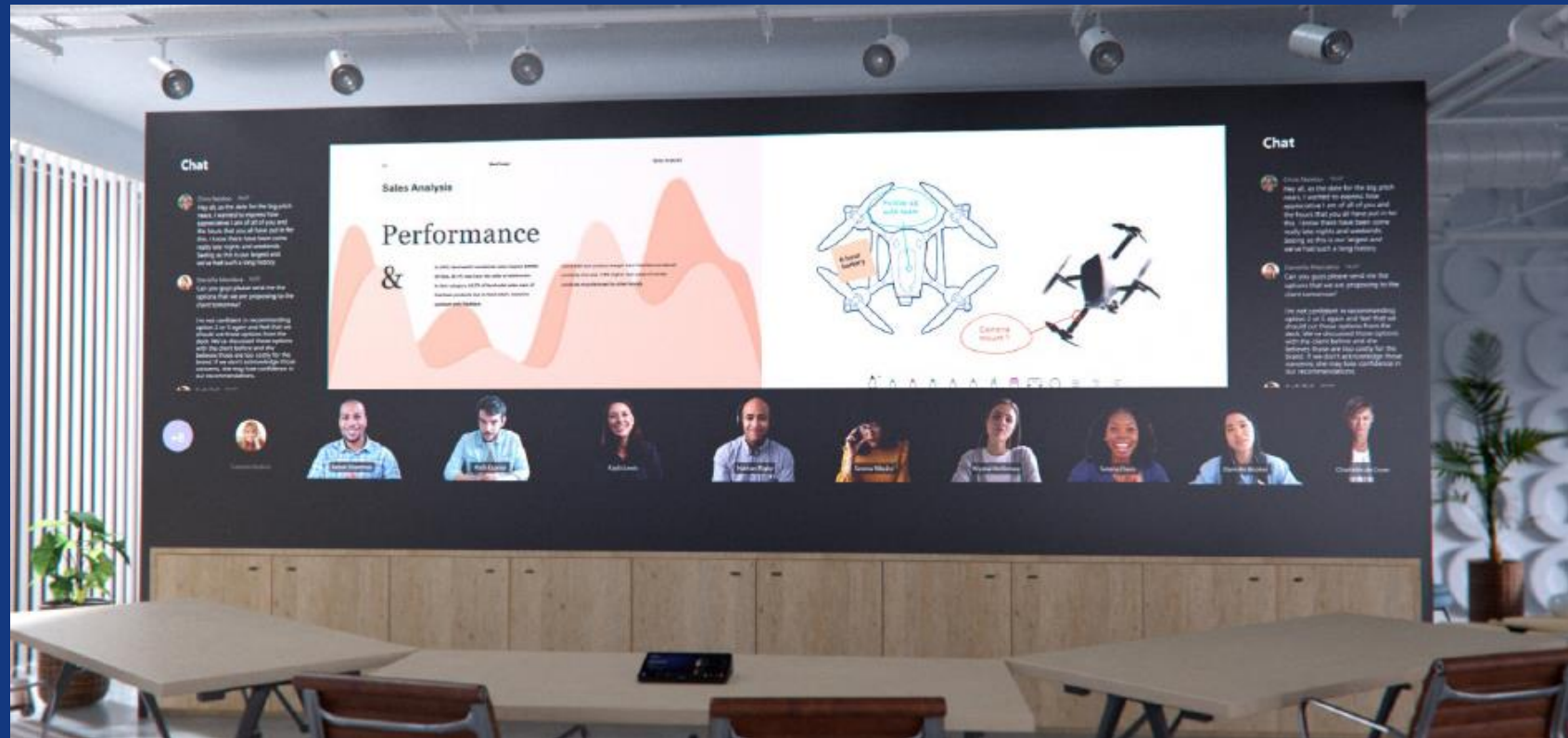
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Low image luminance ('brightness')
Deep black levels
High ambient light - daylight



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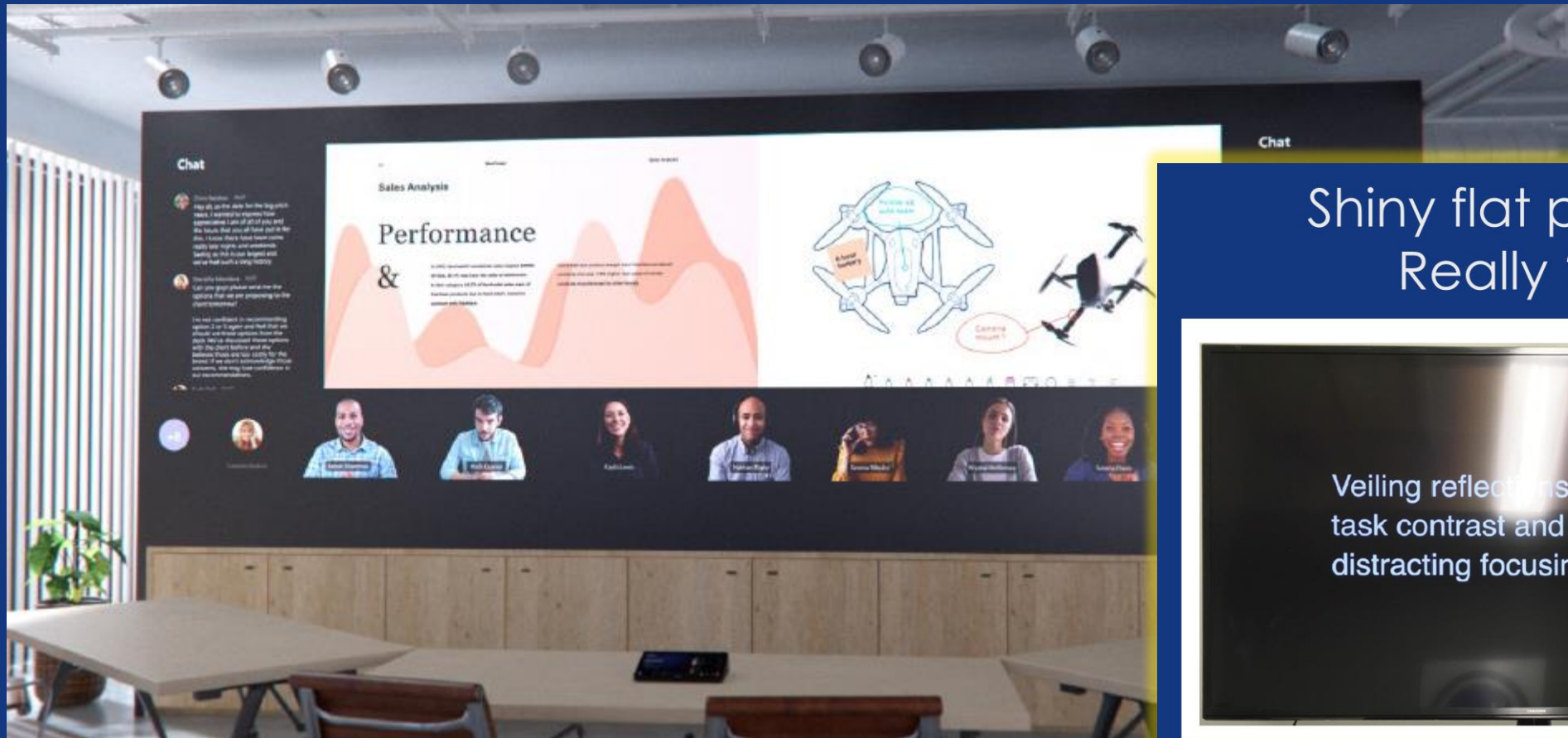


Matt screen

Non-reflective surface



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Shiny flat panels
Really ?!

Veiling reflections can reduce
task contrast and create
distracting focusing cues

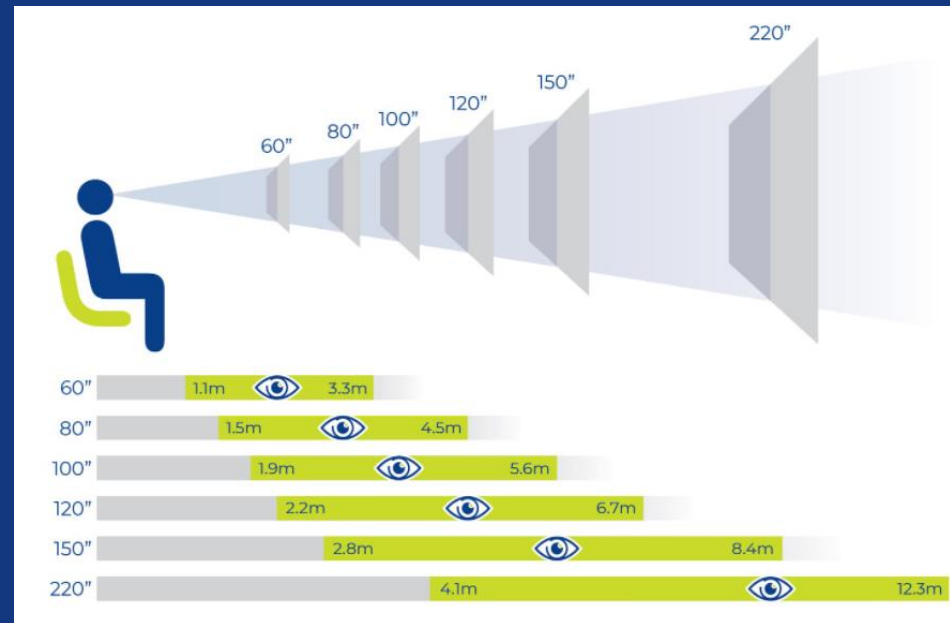
Size really matters



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DISCAS

Display Image Size
for 2D Content in
Audiovisual Systems



Room design 101!



Use 3% Element Height as starting point

- ▶ $3\% \text{ElementHeight} = 6$ from old 4 / 6 / 8 rule
- ▶ Farthest viewer to be no farther than 6 x Image Height (IH)
 - ▶ e.g. if Image Height = 1m, then farthest viewer should be within 6m
 - ▶ e.g. if Farthest Viewer is 12m from screen, then Image Height to be at least 2m high
- ▶ BUT...

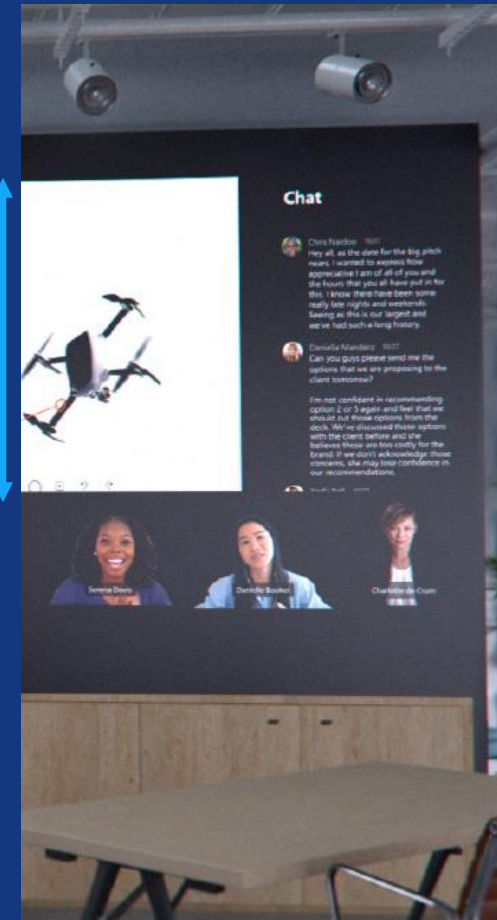
Apply DISCAS to main content window height – not image height



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- ▶ DISCAS %ElementHeight (%EH) default = 3%
- ▶ $3\%EH = 6 : 1$
 - ▶ (Farthest viewer no more than 6 x image height)
- ▶ If content window = 60% of image height
- ▶ Then ratio becomes 3.6 : 1
 - ▶ $(0.6 \times 6 = 3.6)$

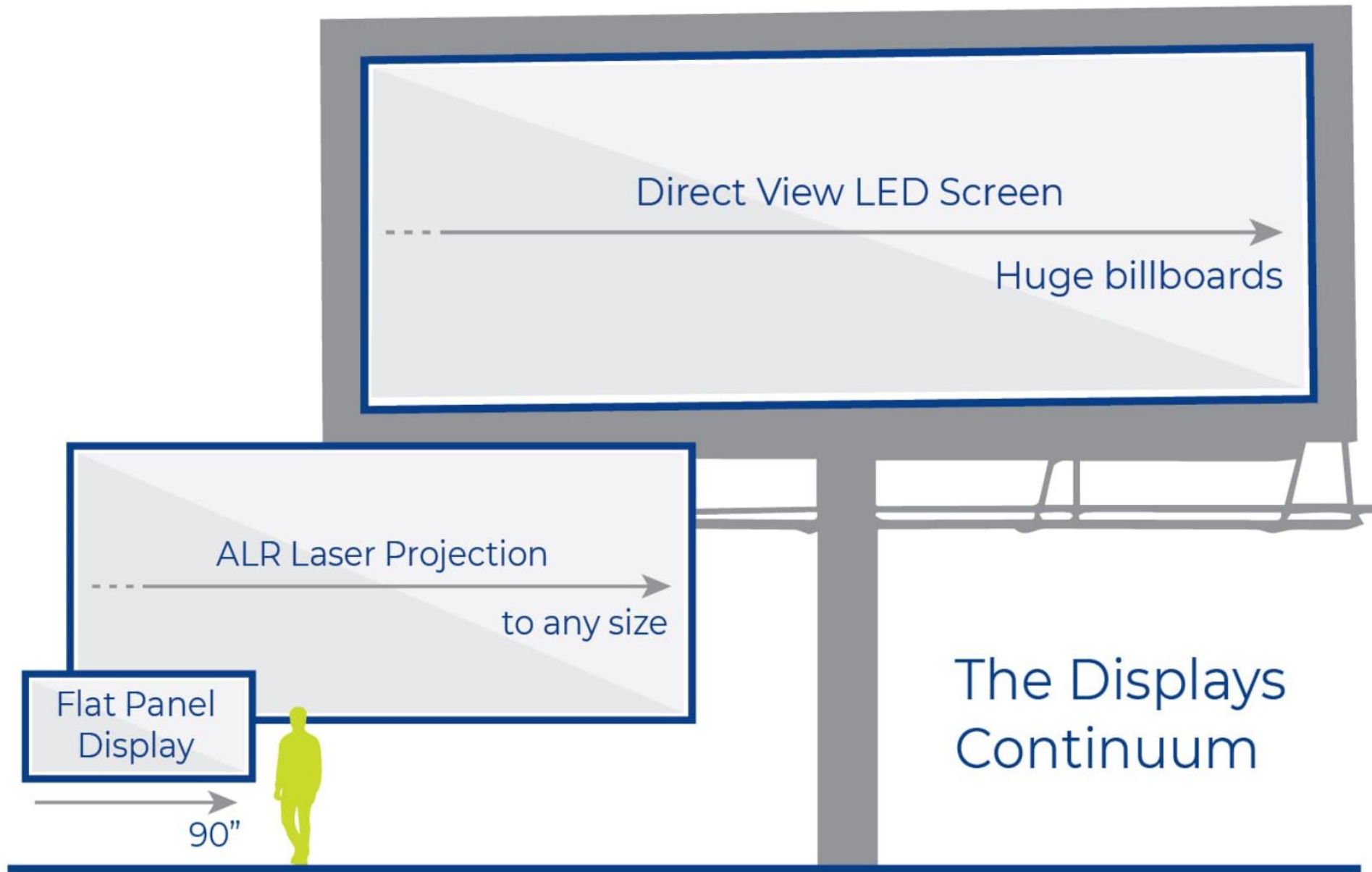
Content window
e.g. 60% of
image
height



Full
image
height



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2022 – Year of Projection Done Properly



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Projection Done Properly



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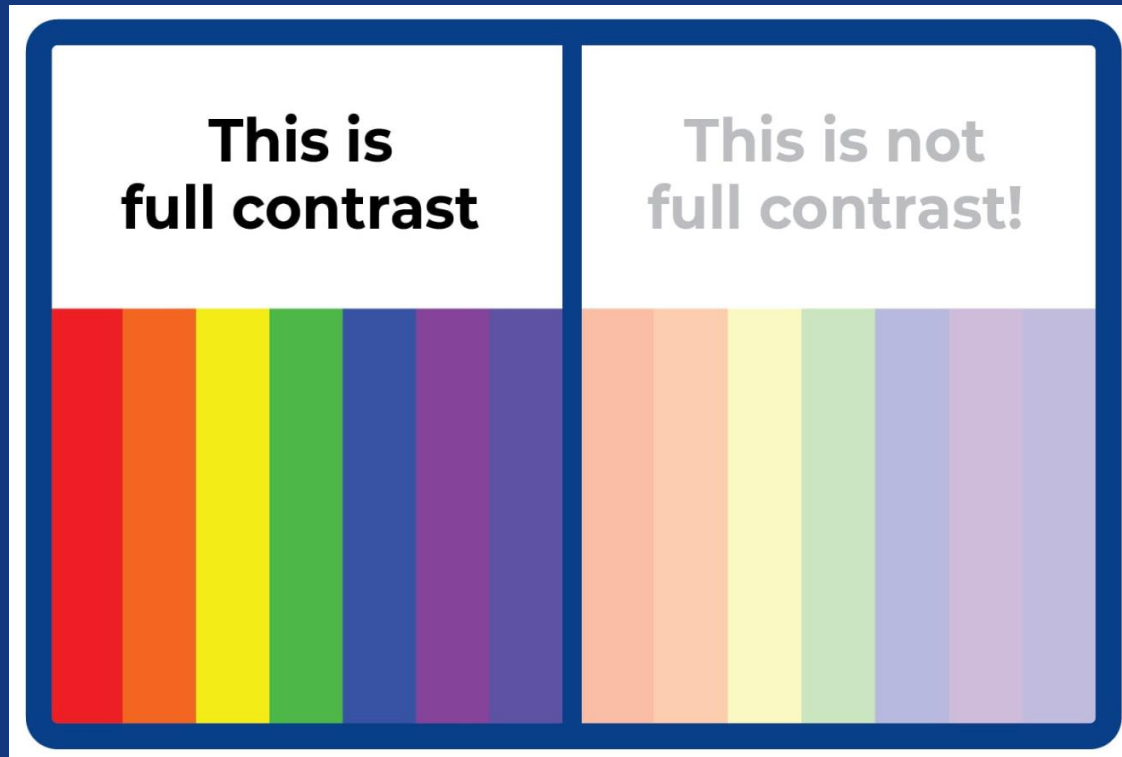
Allows deployment of Digital Canvas concept

- ▶ DISCAS standard sets the minimum image size – not the maximum
- ▶ Moving up to projection done properly removes size limitations
- ▶ Moving up to the 'digital canvas' concept expands Teams Rooms possibilities
- ▶ Lifesize remote participants become possible
- ▶ Moving up to the 'digital canvas' concept removes barriers

Contrast is key driver



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Low contrast even damages perceived resolution.

15:1 contrast ratio PISCR / ISCR



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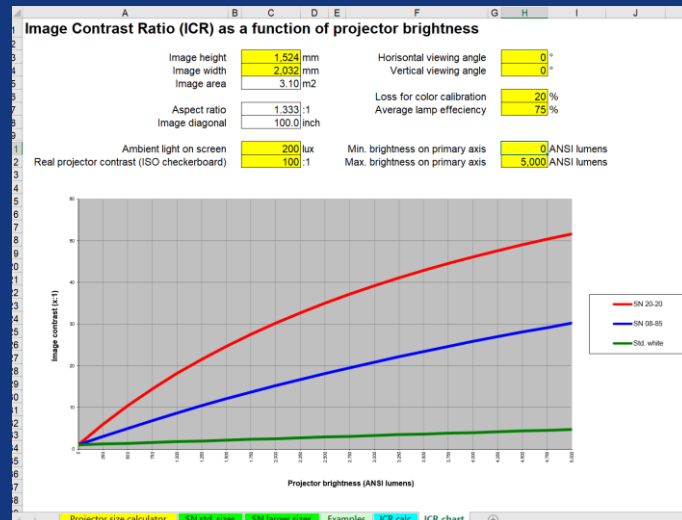
The white squares' average luminance (brightness) must be 15 x more than the black squares.
ONSCREEN – NOT FROM PROJECTOR

- ▶ In standard installations 15:1 is almost always impossible to achieve
- ▶ **Use ALR (ambient light rejecting) projection screens**

Projection done properly = select screen first, projector last

- ▶ Choose the correct ALR (ambient light rejecting) projection surface for each space
- ▶ Do the maths for correct projector lumens & contrast

Image width (mm)	2500	mm
Image height (mm)	1406	mm
Screen area (m ²)	3.515	m ²
Image brightness required	350	cd/m ² [nit]
Screen gain	.8	
LUMENS (lm) =	4829	These are the 'real' lumens required from the projector, once you have applied some kind of 'reality check' factor to the brochure lumens



Asthenopia ('eye strain')

The significance of black levels



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TO CALCULATE TASK LUMINANCE		
Task luminance = $lx / \pi \times PG$		
[lux = lumen / m ²]		
Ambient light in lux	400	<i>You should have 300-500 lux on a meeting room table</i>
Peak Gain of task (eg paper)	1	
TASK LUMINANCE =	127	cd/m ² [nit]
Task luminance ratio	2.5	: 1
MAX DESIRED IMAGE LUMINANCE =	318	cd/m ² [nit]
PISCR contrast ratio required	15	: 1
MAX PERMITTED BLACK LEVEL (relative to the max white level permitted on your image)	21	cd/m ² [nit]



Task Luminance Ratio – essential but overlooked

Aspect ratios ?

Resolution ?



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- ▶ 32 : 9? (2 x HD)
 - ▶ 3840 x 1080
- ▶ 21 : 9
- ▶ From UHD
 - ▶ 3840 x 1646
- ▶ The future is 4K vertical pitch
 - ▶ It's 2160 in both 4K & UHD
 - ▶ Current practical choice = 3LCD pixel shifted UHD

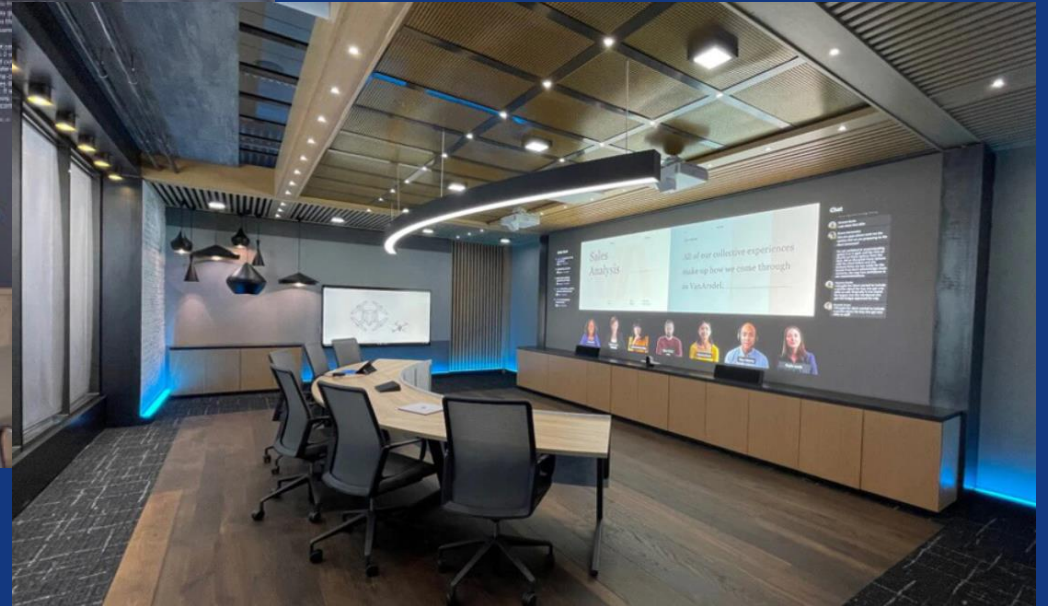
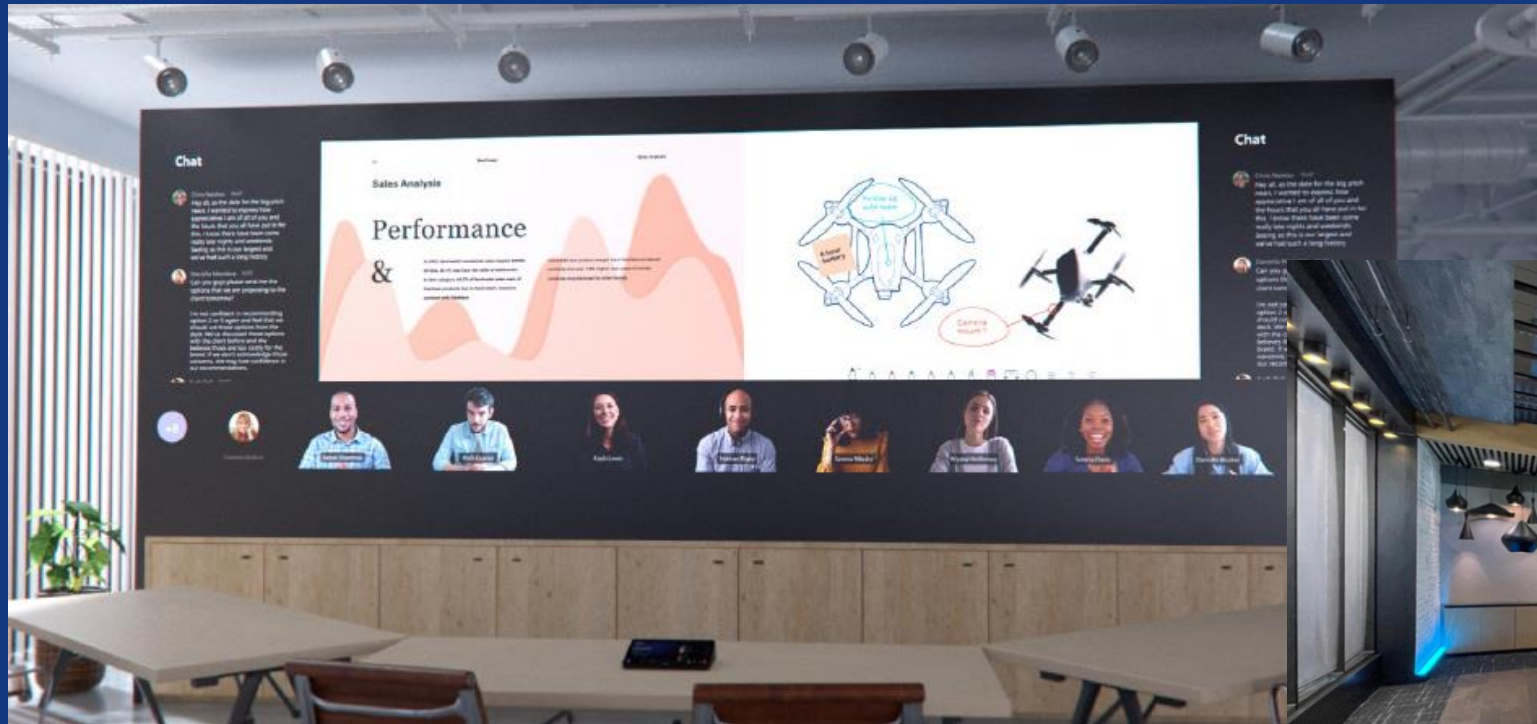


Image baseline ?

How high from the floor?



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► Impact on camera position

Camera position & deployment



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Projection lens issues: Standard, wide angle or UST ?



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The VDL Digital Canvas



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Display systems for Teams/Zoom/hybrid meeting and teaching spaces

Next-generation display solutions for the best possible hybrid meeting experience. The VDL Digital Canvas is the ultimate hybrid meeting display designed to deliver an authentic and inclusive user experience to bridge the gap between in-person and remote attendees and facilitate more effective collaboration.

Find out more visit:

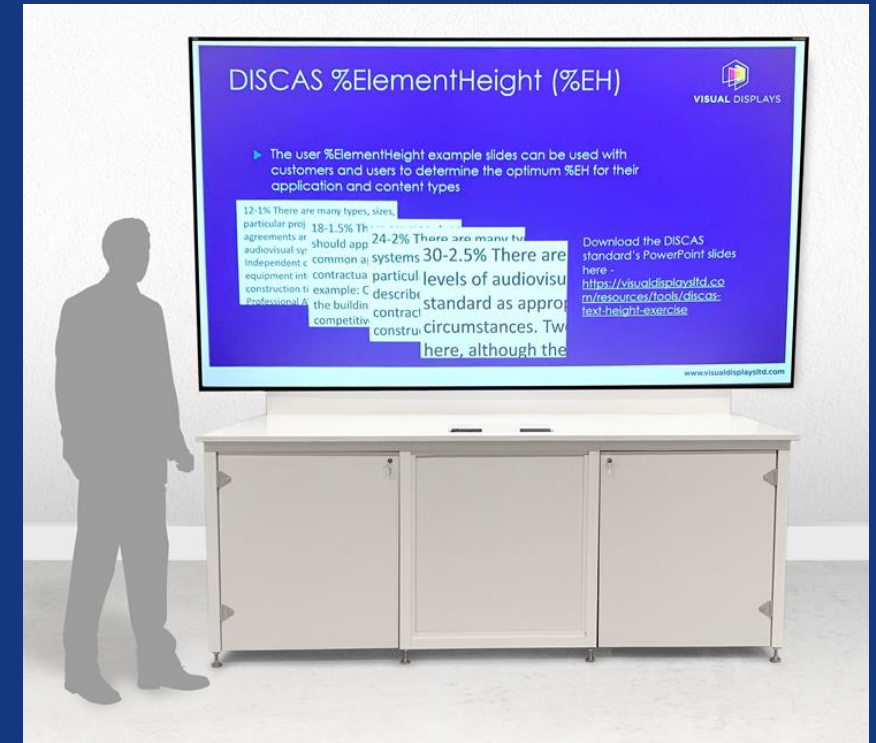
www.visualdisplaysltd.com/meeting-board-room-screens/teams-rooms



VDL Digital Canvas – 120", 140" & bespoke sizes



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Find out more visit:

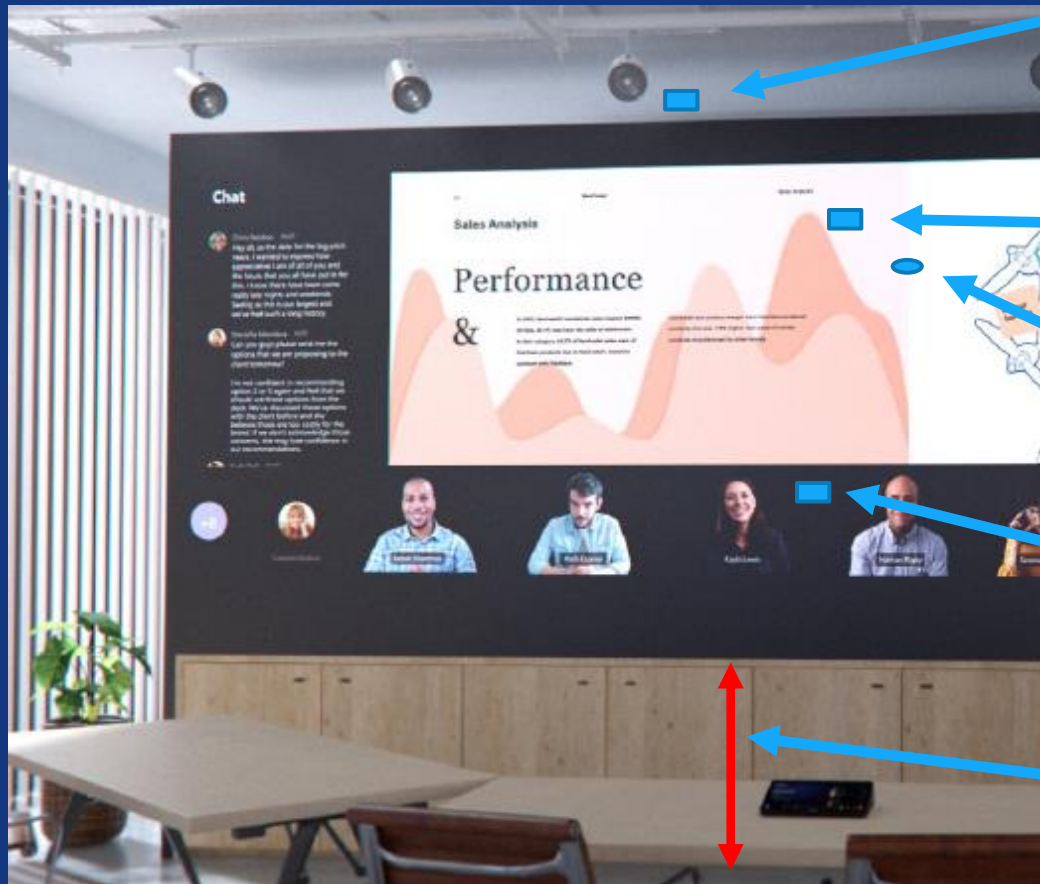
www.visualdisplaysltd.com/meeting-board-room-screens/teams-rooms

UST projection unlocks camera position limitations

Eye to eye connection?



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Camera in offset position used with perspective correction (like keystone control)

Small form factor camera in free space in front of screen

Camera behind aperture centre screen

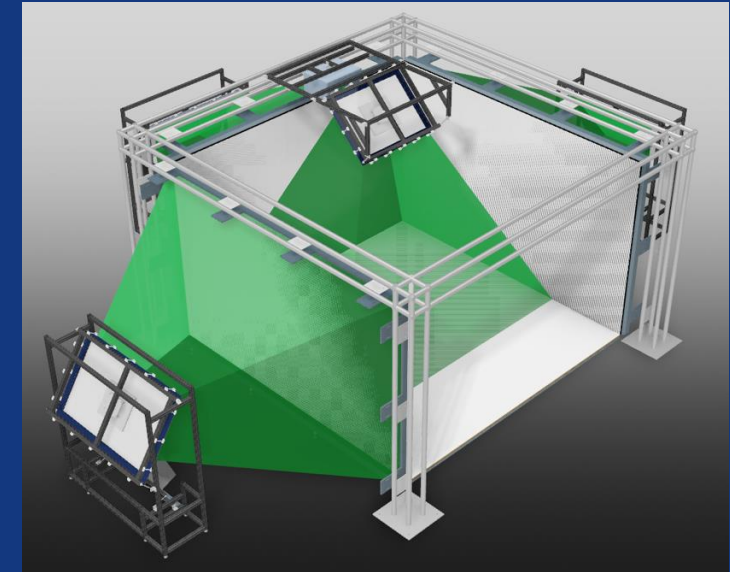
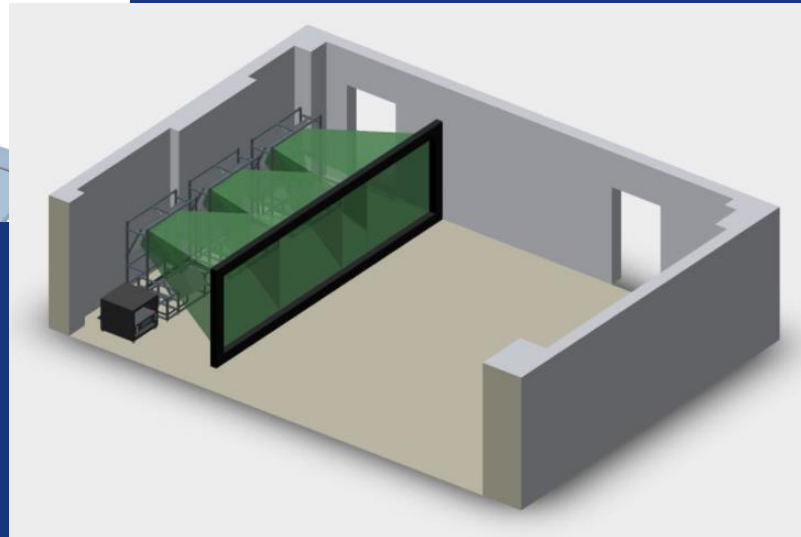
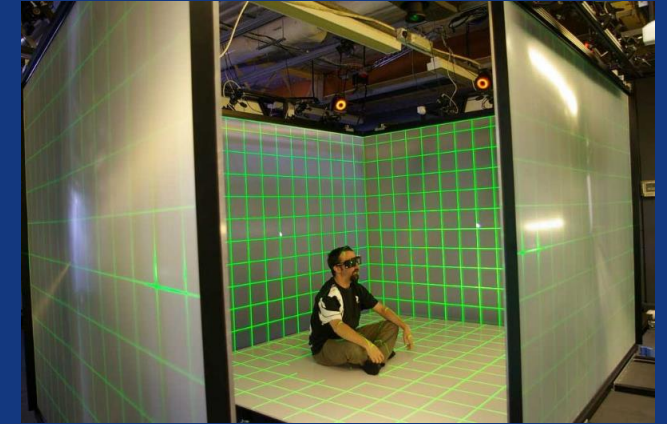
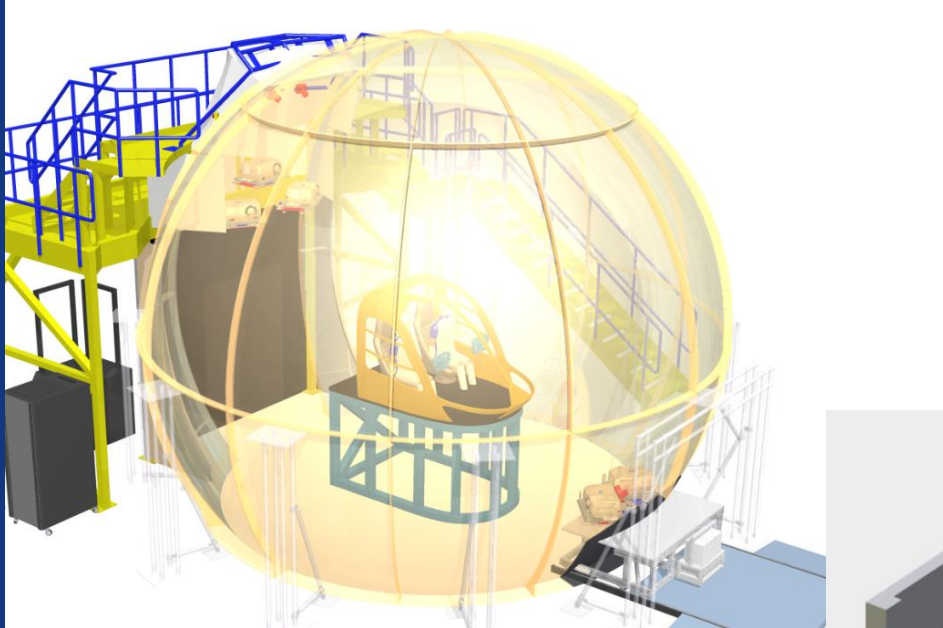
Camera in front of 'dead' space on digital canvas

Allows baseline to floor to be optimised

Our background in immersive brought us here



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Real time design tools



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Project anything from anywhere onto anything

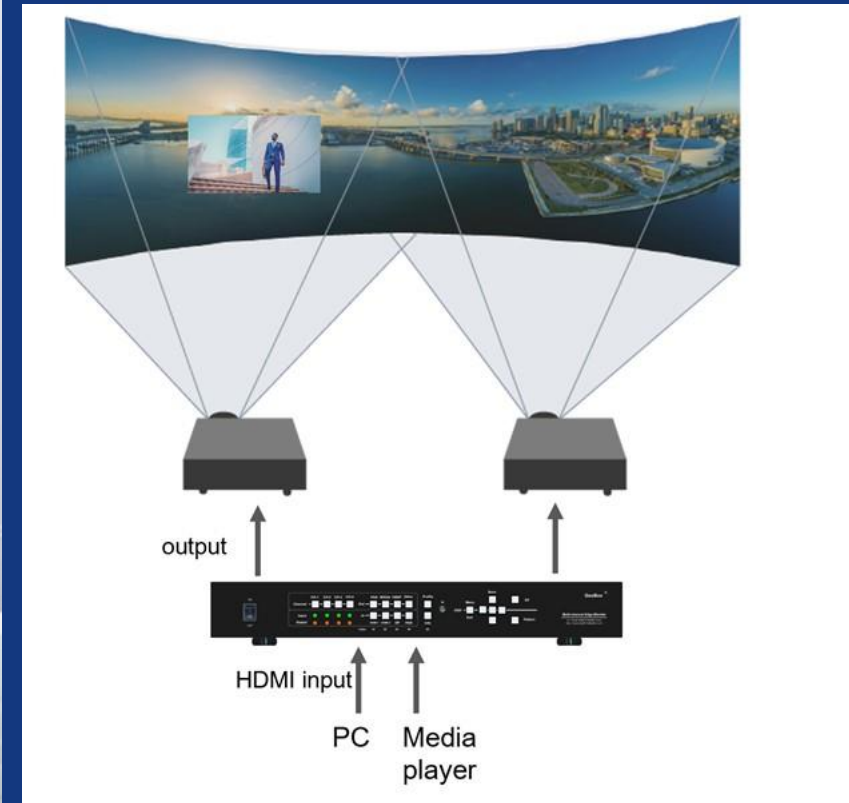
The screenshot shows the Portal Devices software interface. On the left is a sidebar with a tree view containing: Coordinate System, Facility Boundaries (Top, Bottom, Left, Right, Front, Back), Models (Hemidome, Test Screen), and Projection Channels (Projection Channel with SONY GTZ380, Lens A, and Unnamed Projector/Lens). The main 3D view shows a grey dome with a cyan grid projected onto its interior. A small 3D model of a projector is shown at the bottom left, with lines indicating its projection frustum. On the right, there are control panels for Position (X: 0.002, Y: 3.098, Z: -13.409), Orientation (X: 0.000, Y: 0.000, Z: 0.000), and Frustum Mode (Grid checked, Brightness Heatmap unchecked, Min Lumin: 1.000 ftL, Max Lumin: 50.000 ftL). At the top right of the interface are buttons for Projects, Share, Logout, and a user profile for matt@portaldevices.com.



Multiple projection Principles and practice



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Curved screen VDL Digital Canvas

- ▶ Reciprocity – remote & in-person are more equal
- ▶ Organic, human-friendly configuration
- ▶ UST vs standard lens
 - ▶ Impact on camera position
- ▶ Wide range of aspect ratios and resolutions
- ▶ IP and tools based on our simulation & immersive display modelling tools
- ▶ Part of our design consultancy



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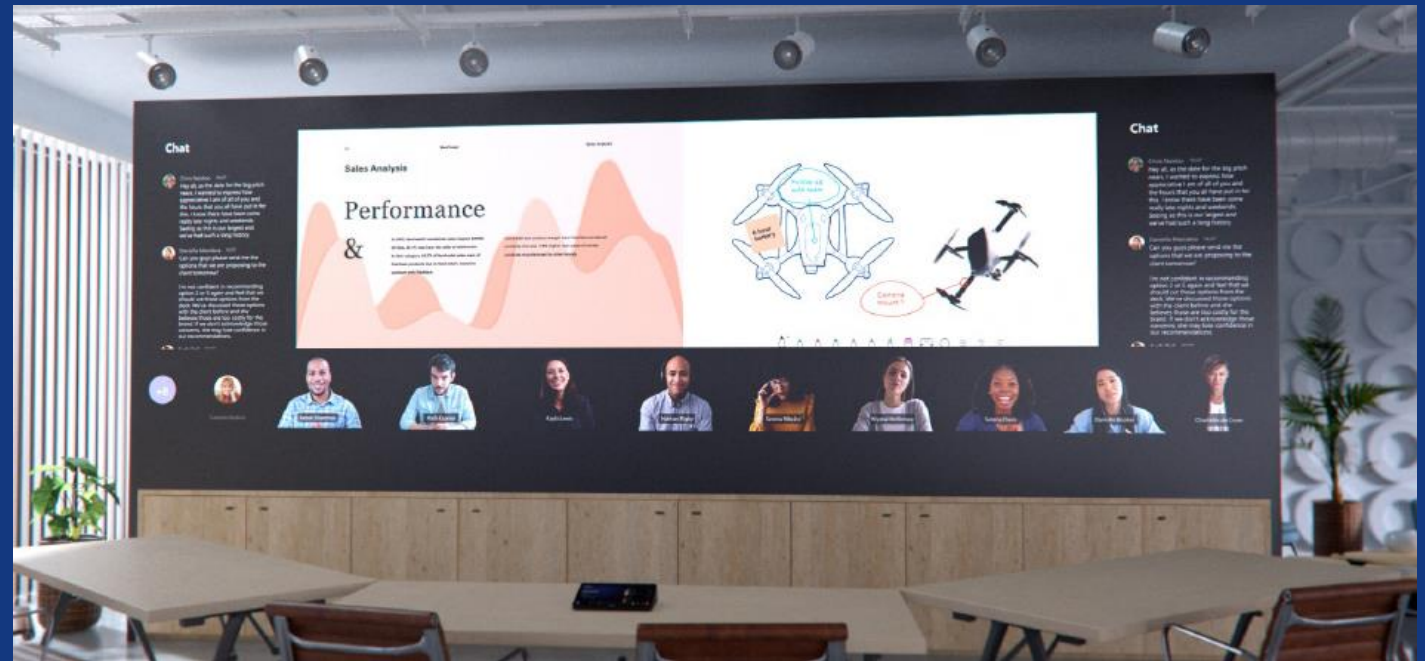


Microsoft Front Row – REVIEW



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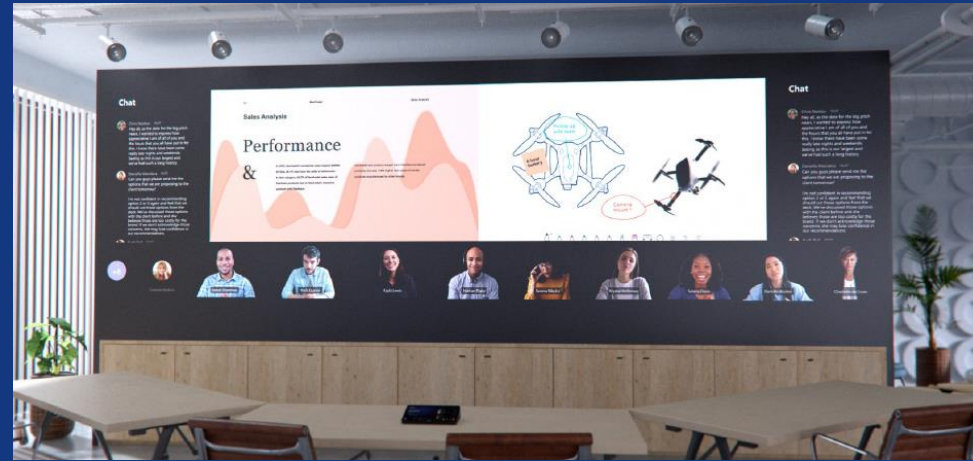


VDL Digital Canvas

If there's just one thing to take away...



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- ▶ You can have it all
- ▶ Right now



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What we can do for you

Use any or all of our services

- ▶ Specialist consultancy
 - ▶ (not AV consultancy!!)
- ▶ Design
- ▶ Manufacture
- ▶ Solutions & technology
 - ▶ VDL Digital Canvas Displays
 - ▶ Projection screens of all types
 - ▶ Immersive displays
- ▶ Proof of concept, product development, system troubleshooting
- ▶ Advanced laser tools
- ▶ We work actively with all parts of the channel - from end user through to reseller
- ▶ All hardware and solutions supplied through reseller/integrator channel

AV User Group



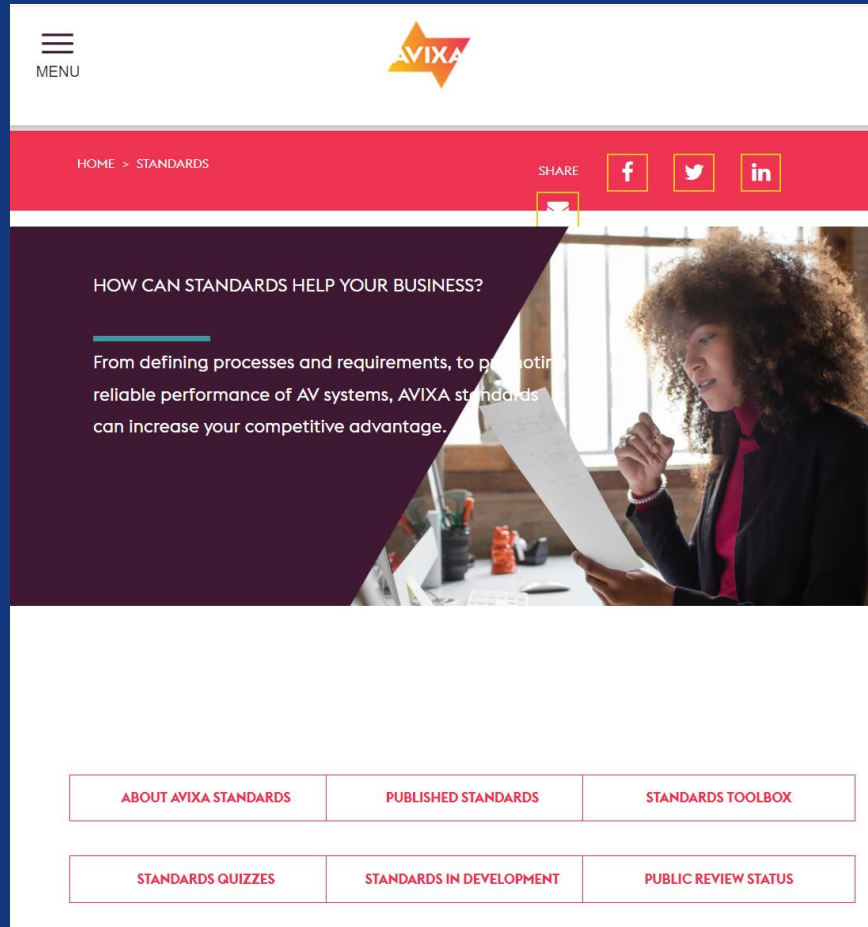
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▶ <https://www.avusergroup.com/>



AVIXA Standards – in 2022?



The screenshot shows the AVIXA Standards website. At the top left is a menu icon and the word "MENU". The AVIXA logo is in the top center. Below the logo is a red navigation bar with "HOME > STANDARDS" on the left and "SHARE" with Facebook, Twitter, and LinkedIn icons on the right. The main content area features a dark purple background on the left with the heading "HOW CAN STANDARDS HELP YOUR BUSINESS?" and a paragraph: "From defining processes and requirements, to promoting reliable performance of AV systems, AVIXA standards can increase your competitive advantage." To the right of this text is a photograph of a woman with curly hair looking at a document. At the bottom, there are two rows of buttons: "ABOUT AVIXA STANDARDS", "PUBLISHED STANDARDS", and "STANDARDS TOOLBOX" in the first row; "STANDARDS QUIZZES", "STANDARDS IN DEVELOPMENT", and "PUBLIC REVIEW STATUS" in the second row.



▶ <https://www.avixa.org/standards>



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