

Comparative Analysis of Reality Capture Applications for the Construction Industry

Mohammed Mawlana¹, Aakash Bhanushali¹

¹ Department of Construction Management, Thomas Jefferson University, Philadelphia, USA

INTRODUCTION & AIM

This research focuses on a direct comparison of widely used 360° and 3D virtual tour applications in the AEC industry, evaluating their documentation, visualization, and educational usability based on outputs generated from 360° cameras and smartphones, primarily in the construction sector.

METHOD

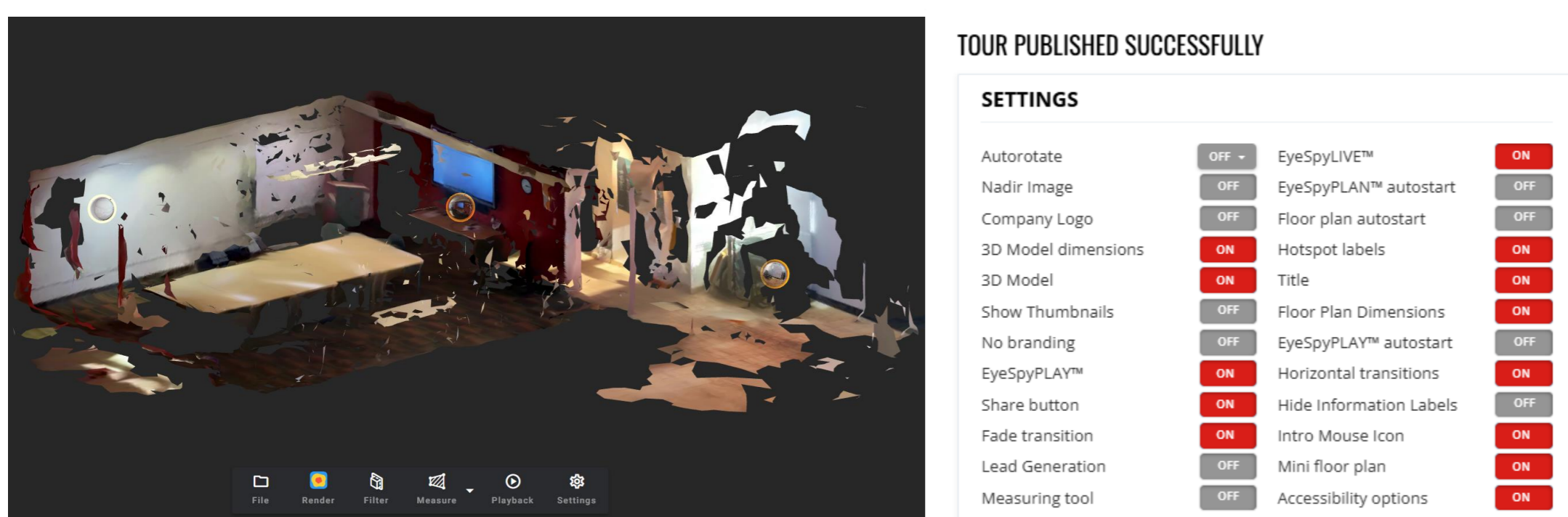
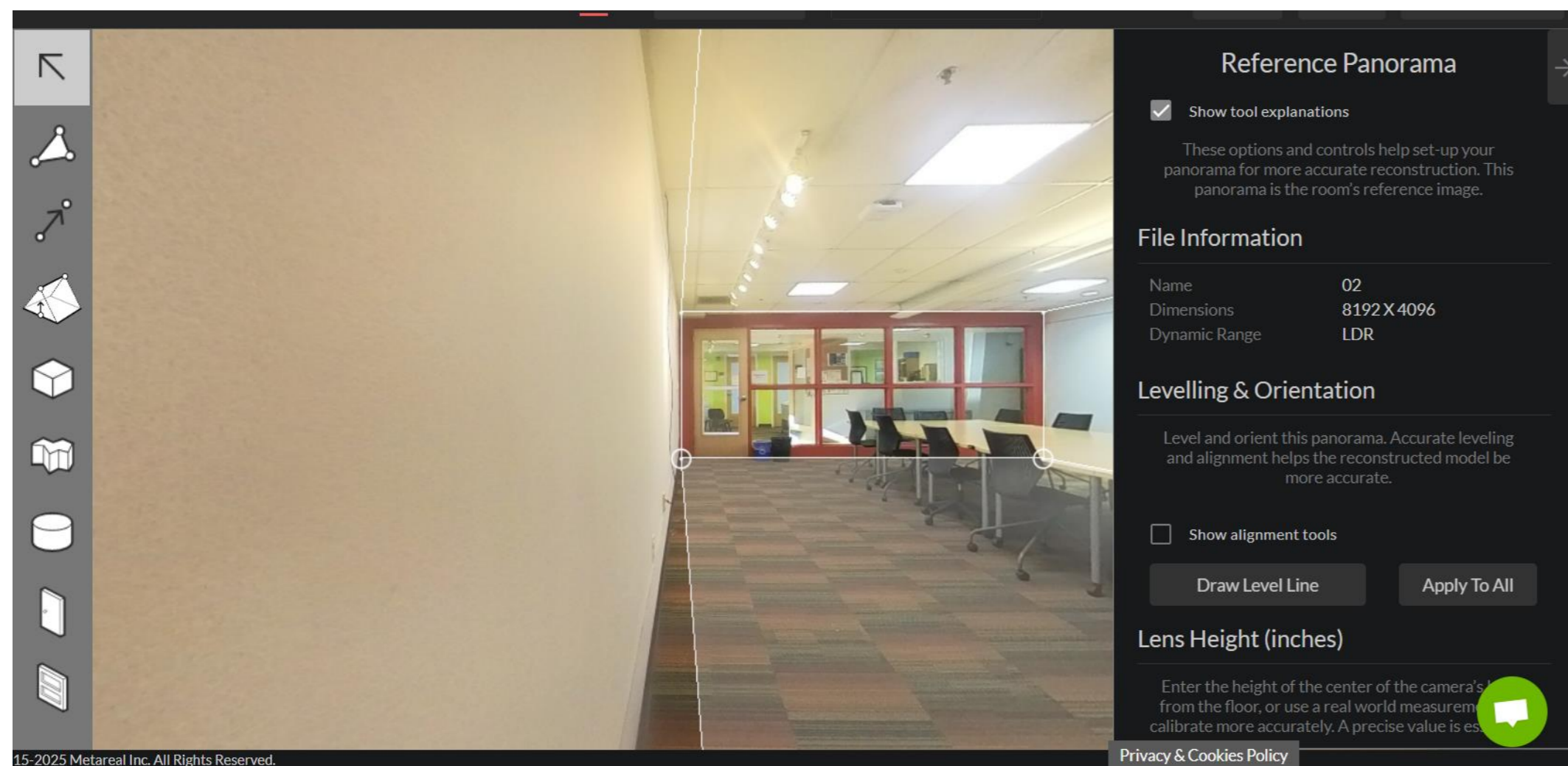
Generated workflows using set parameters and standardized captures with the Insta360 X3 across all platforms and evaluated on specific details.

Technical functions – 3D virtual modeling, photogrammetry, LiDAR, and BIM/CAD exports.

Usability – interface & workflow clarity, and intuitiveness.

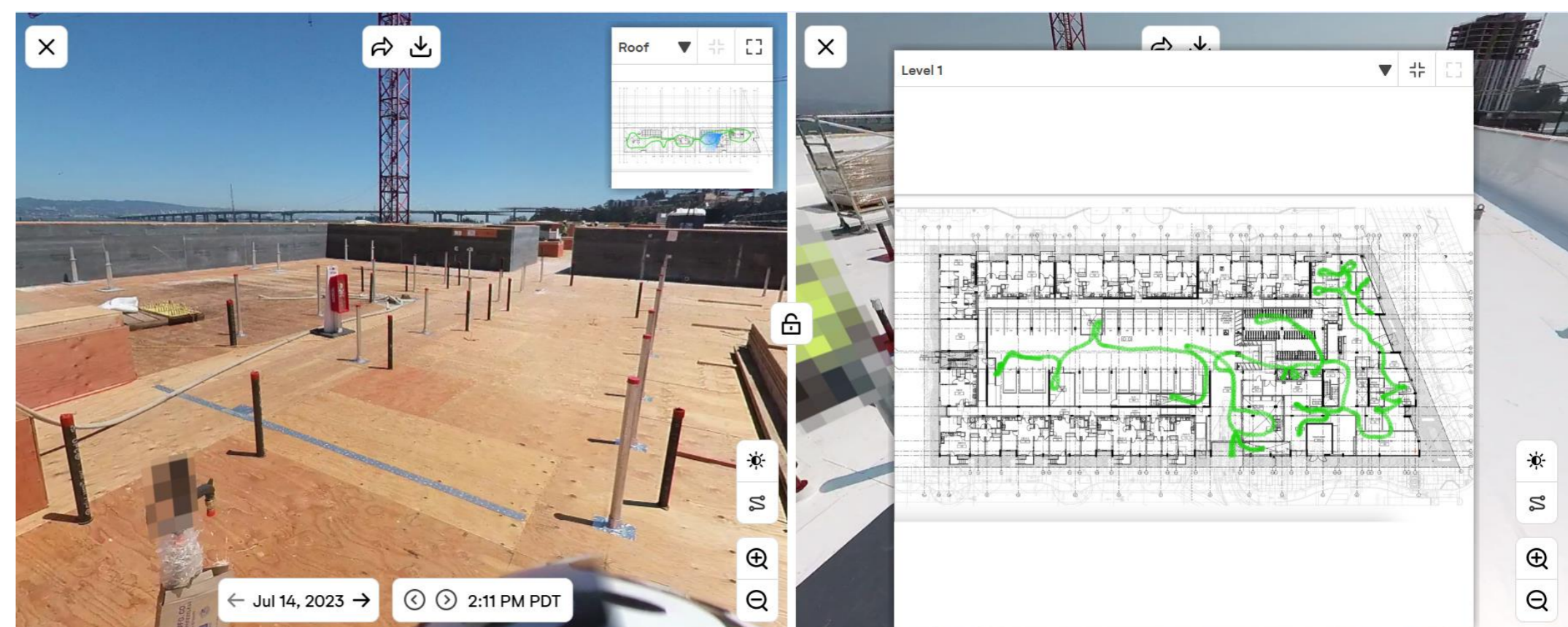
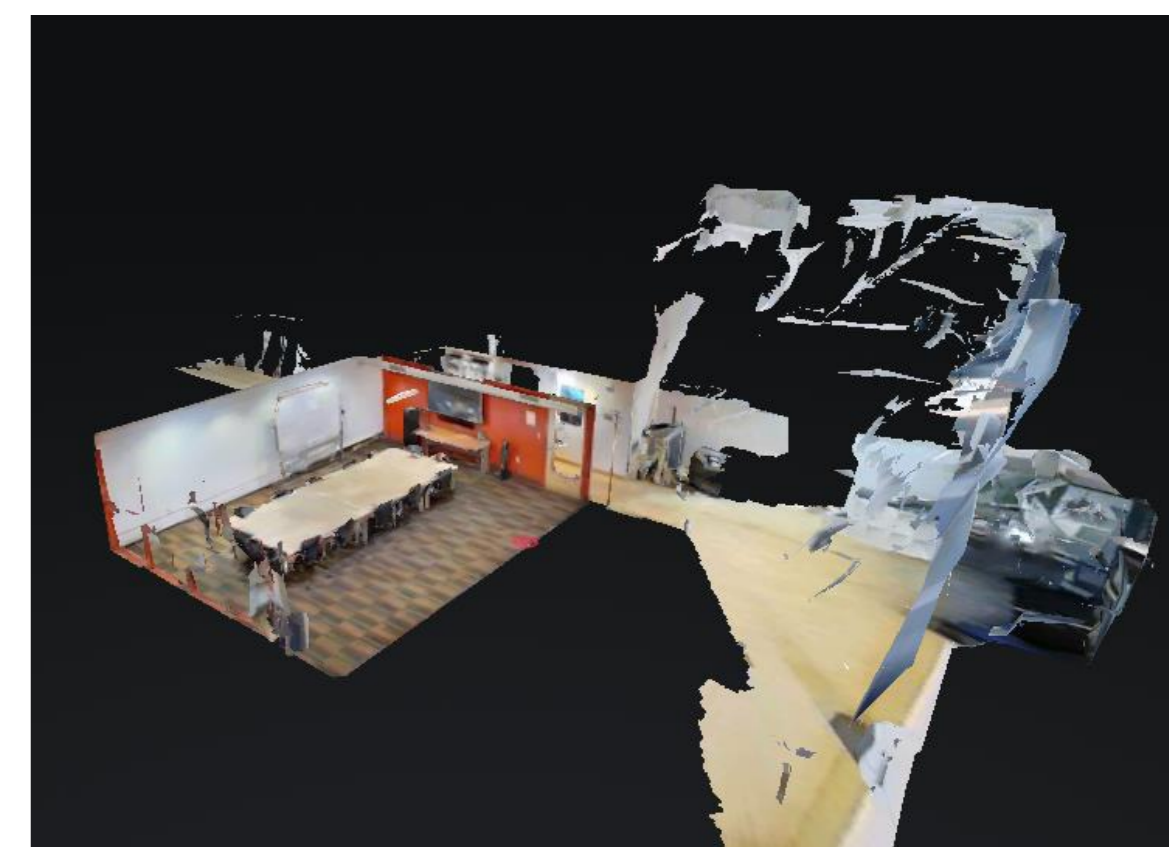
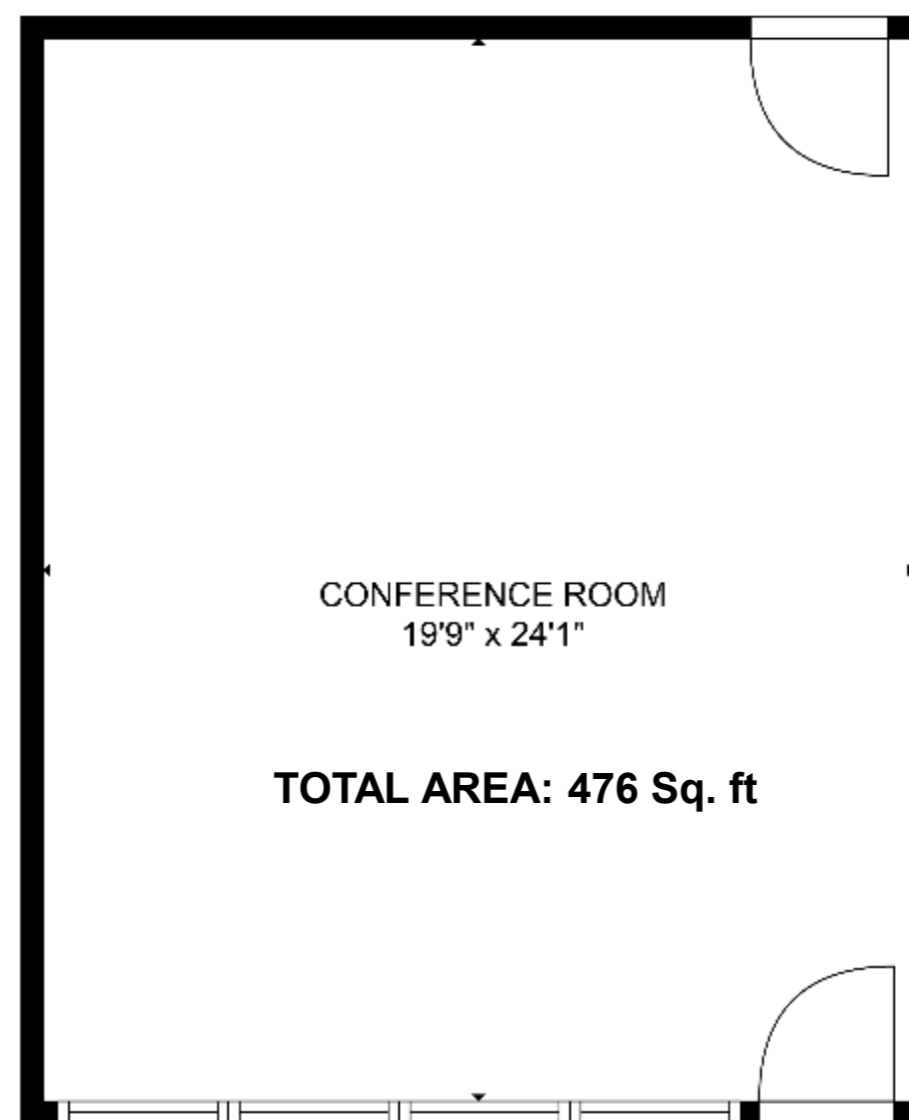
Output quality – accuracy of 2D layouts, measurements, and resolution of walkthroughs.

Cost structure – free-tier limitations, subscription, and pay-per-use models.



RESULTS & DISCUSSION

Matterport and CubiCasa offer advanced levels of digital twin outputs with high accuracy, while Asteroom delivers a balanced level of usability. Zillow Home 3D, CloudPano, and Kuula are more effective as entry-level platforms. Construction-focused platforms like Cupix and OpenSpace AI are effective in advanced site documentation.



Results Summary Table

Software	360° Input	Floor Plan Output	3D Model	LiDAR Support	BIM Export	Free Version	Paid Cost (USD)
Matterport	✓	✓	✓	✓ (Pro3)	✓	Very Limited	\$9.99–269/month
CubiCasa	X (photo)	✓	✓	X	✓ (paid)	✓	\$35–\$50/project
Zillow Home 3D	✓	✓ (only w/ 360)	✓	X	X	✓	Free
Asteroom	✓	✓	✓	✓ (with phone)	X	Limited	\$35–\$59/project
CloudPano	✓	X	✓	X	X	Limited	\$10–\$79/month

CONCLUSION

This comparative study concludes that each virtual tour platform has specific significance in terms of its technical capabilities and usability, which ultimately depends on project-specific requirements and budget. Matterport is the most explored option in terms of technicality, offering a balanced combination of output accuracy and cost.