

Augmented Reality Applied to Tenant Improvment Industry

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Abstract

As technology keeps on advancing and expanding into different markets, the Construction Industry has adapted these new breakthroughs. The industry has already adapted the concept of 3D Modeling, however with Augmented Reality this takes BIM to the next level. Augmented Reality can assist in numerous attributes within the construction process to help manage the project more efficiently. Given these words, this paper helps to highlight the key factors of Augmented Reality and how it enhances the Tenant Improvement process. Tenant Improvement is extremely detail orientated and focuses more furnishing rather than larger infrastructure like most construction projects. Thus, with the assistance of Augmented Reality Owners, Architects, and Contractors can collectively review and coordinate the design and constructability of the project simply through an Ipad. The research shown in this report discusses how new programs such as Vuforia, EasyAR, and SmartReality APP overlay 3-D models onto the REAL LIFE image of the space being constructed. The AR technology detects geometric differences from the model and the 2D image being picked up by the camera and automatically corrects itself. This in turn minimizes changes made within the project and therefore, saves money and time.

Key words: Augmented Reality, 3-D Model, Detail Orientated, Automatic, Self-Correcting, Coordinate

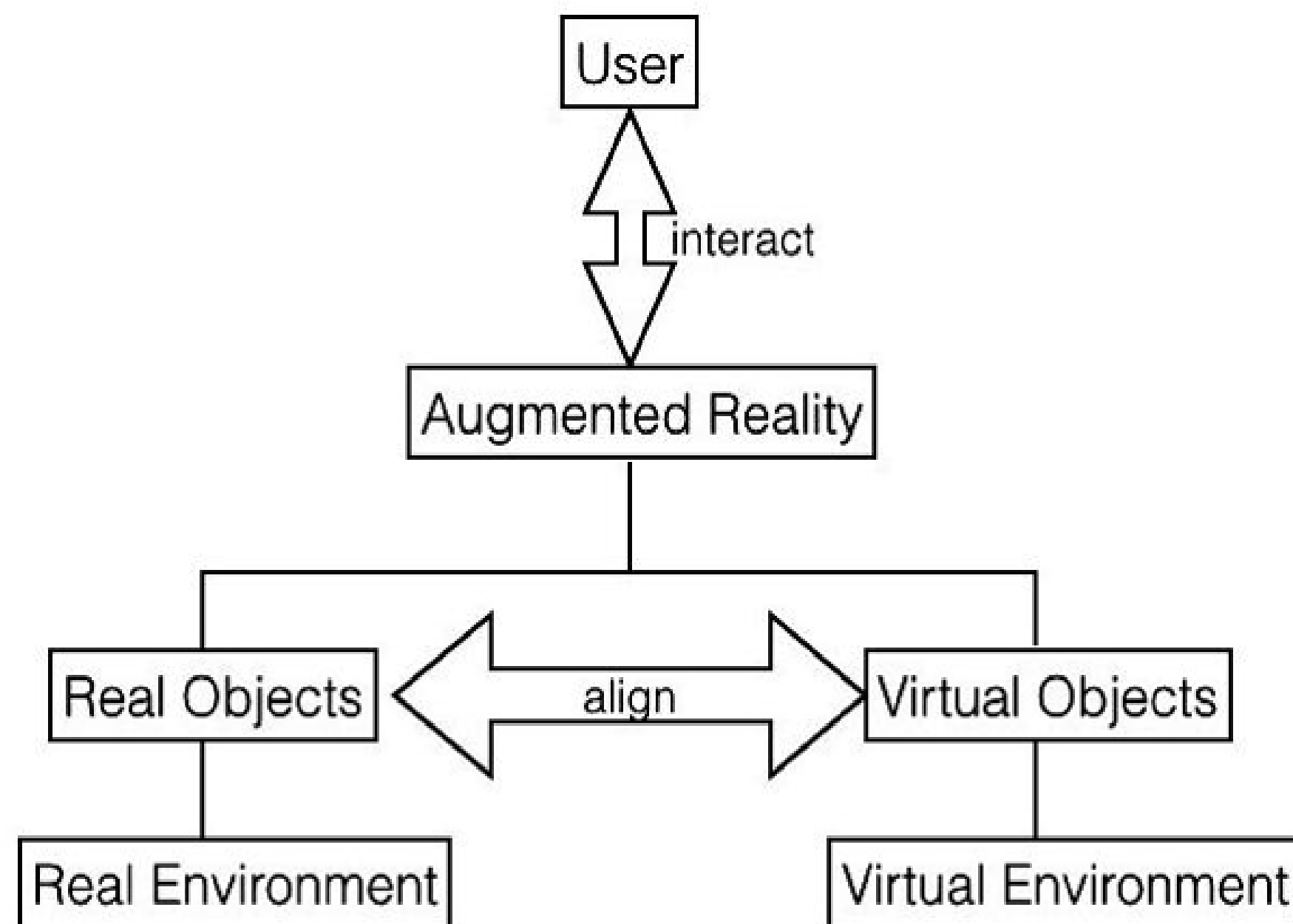


Fig.1 Augmented Reality

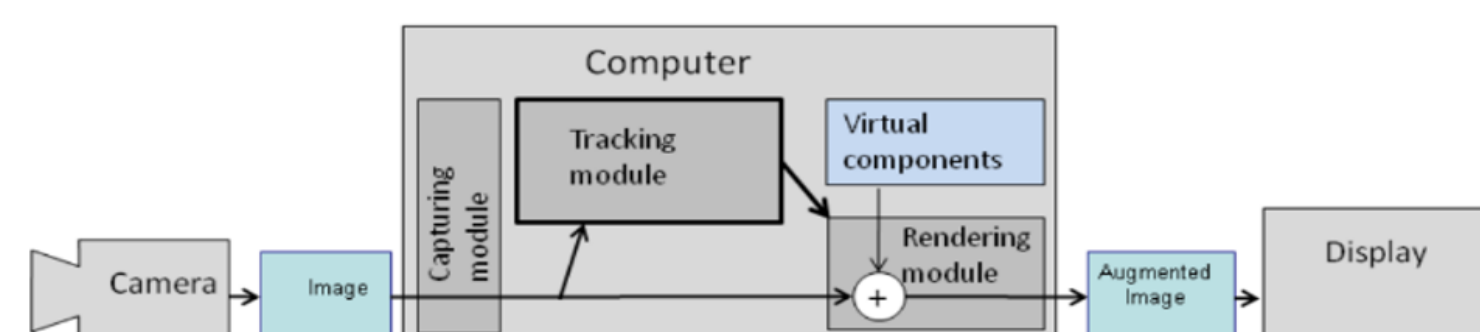


Figure 2. Flowchart for an AR system [3]

The tracking module is the key of the augmented reality system; it calculates the relative pose of the camera in real time.

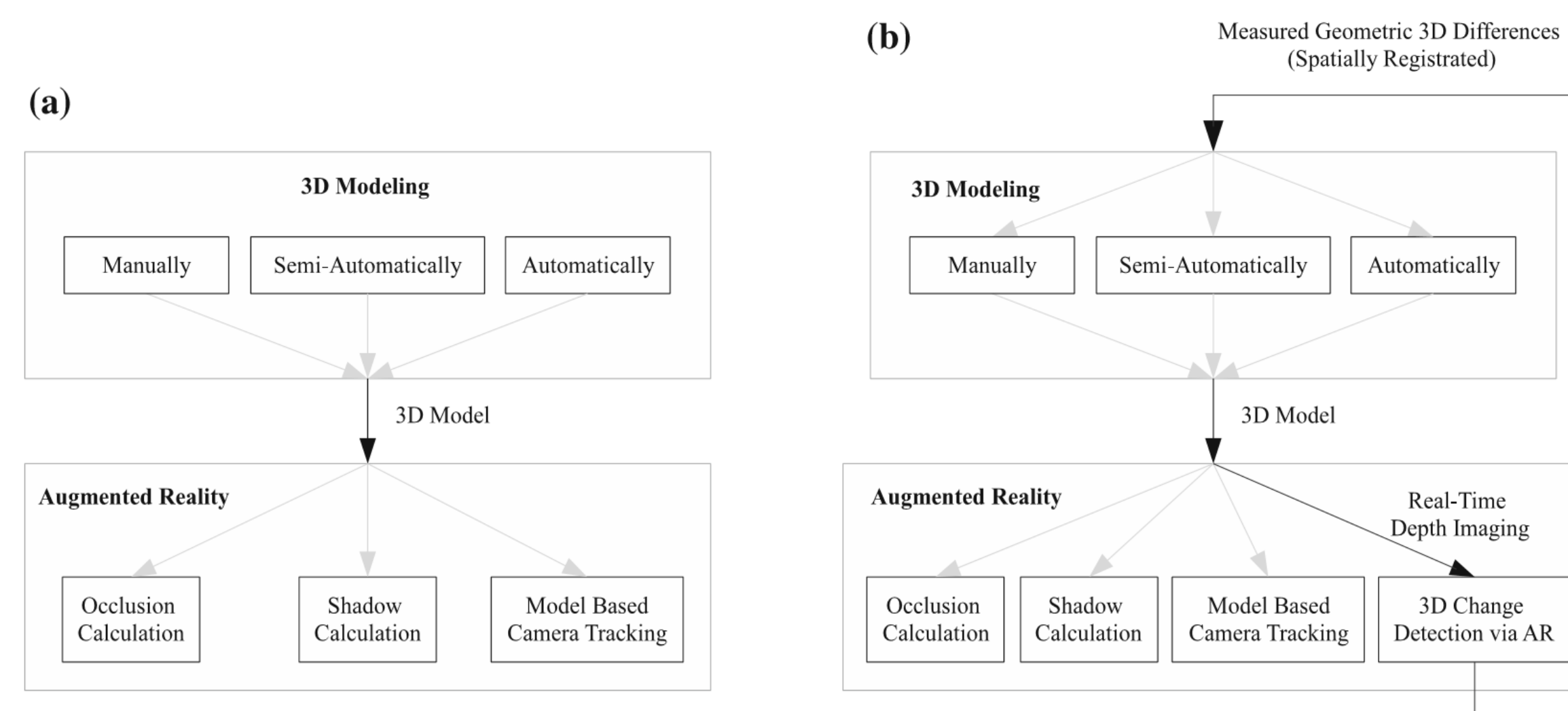


Fig. 1 **a** Conventional framework: The 3D model is used as input for the AR application, but not vice versa. **b** Proposed framework: AR is used to detect geometric differences between the 3D model and the

real scene. Then the measured geometric differences are fed back into the 3D modeling pipeline and are used to update the 3D model

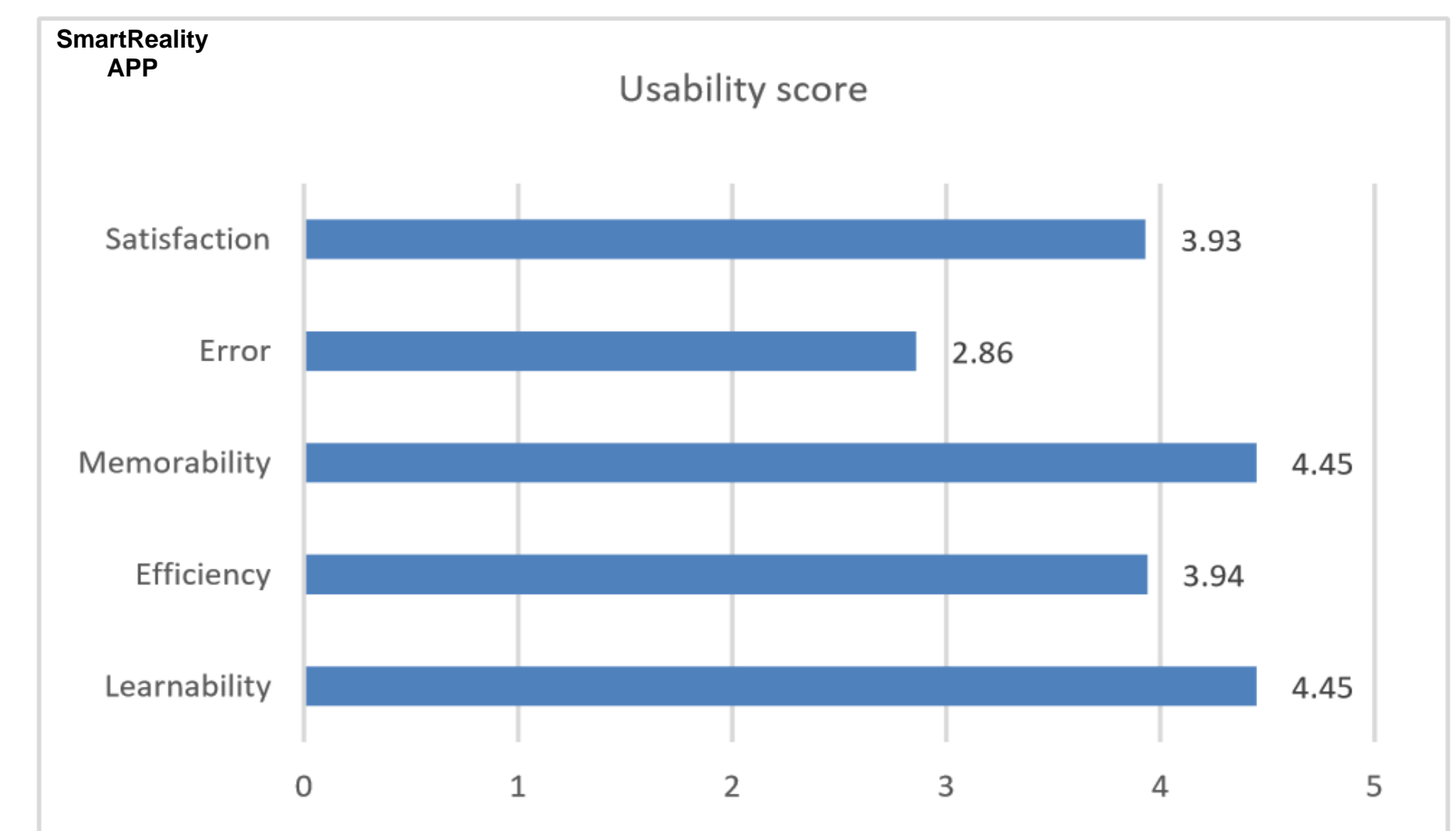


Figure 12. Average score in five usability metrics

