

**IMPLEMENTASI DAN EVALUASI VISUALISASI
AUGMENTED REALITY (AR) DESAIN JEMBATAN
BERBASIS *BUILDING INFORMATION MODELLING*
(BIM) MENGGUNAKAN AUTODESK REVIT DAN
APLIKASI GAMMA AR
(Studi Kasus: Jembatan Jalan Bengkalis, Sungai
Bengkalis)**

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ABSTRAK

Dalam dunia konstruksi, Visualisasi desain atau Gambar Kerja sangatlah penting. Termasuk untuk infrastruktur jembatan. Visualisasi desain jembatan dalam dunia konstruksi sering kali kurang efektif dalam menyampaikan informasi teknis secara intuitif. Oleh karena itu, diperlukan solusi inovatif, salah satunya dengan penerapan teknologi *Augmented Reality* (AR) yang terintegrasi dengan sistem *Building Information Modelling* (BIM). Penelitian ini dilakukan dengan mengimplementasikan model jembatan yang dibuat menggunakan Autodesk Revit ke dalam aplikasi GAMMA AR untuk divisualisasikan secara langsung di lokasi fisik Jembatan Jalan Bengkalis. Tahapan penelitian meliputi pembuatan model BIM jembatan, melakukan proses integrasi antara BIM dan AR, serta pengujian langsung menggunakan metode *task-based testing* dan *heuristic evaluation*. Proses integrasi berhasil dilakukan dengan dua metode, yaitu unggahan file .IFC langsung dan sinkronisasi melalui *Autodesk Construction Cloud*. Hasil visualisasi AR menunjukkan bahwa model jembatan dapat ditampilkan dengan akurasi tinggi, rata-rata deviasi hanya ± 1 cm dari desain BIM. Namun, ditemukan beberapa kendala teknis seperti tidak tersedianya fitur pengatur kemiringan dan keterbatasan kontrol rotasi. Meski demikian, secara umum aplikasi GAMMA AR dinilai cukup efektif untuk menyampaikan desain, meningkatkan pemahaman teknis, serta mempercepat proses validasi di lapangan. Berdasarkan hasil implementasi dan evaluasi, dapat disimpulkan bahwa teknologi AR memiliki potensi besar baik untuk keperluan teknis, edukatif, maupun manajerial, sebagai bagian dari transformasi digital di sektor konstruksi.

Kata Kunci : *Augmented Reality* (AR), *Building Information Modelling* (BIM), GAMMA AR, Revit, *Architecture Engineering and Construction* (AEC).

**IMPLEMENTATION AND EVALUATION OF
AUGMENTED REALITY (AR) VISUALIZATION OF
BRIDGE DESIGN BASED ON BUILDING
INFORMATION MODELLING (BIM) USING
AUTODESK REVIT AND THE GAMMA AR
APPLICATION
(Case Study: Jalan Bengkalis Bridge, Bengkalis River)**

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ABSTRACT

In the construction industry, design visualization or construction drawings are very important, this also applies to bridge infrastructure. However, conventional bridge design visualizations often fall short in effectively conveying technical information intuitively. Therefore, innovative solutions are needed, one of which is the application of Augmented Reality (AR) integrated with Building Information Modelling (BIM) systems. This study implements a bridge model created using Autodesk Revit into the GAMMA AR application for direct visualization at the physical location of Jalan Bengkalis Bridge. The research stages include developing the bridge BIM model, integrating BIM with AR, and conducting field testing using task-based testing and heuristic evaluation methods. The integration process was successfully carried out through two methods: direct upload of .IFC files and synchronization via Autodesk Construction Cloud. The AR visualization results demonstrated that the bridge model could be displayed with high accuracy, with an average deviation of only ± 1 cm from the original BIM design. However, some technical limitations were encountered, such as the absence of a tilt adjustment feature and limited rotation controls. Despite these issues, the GAMMA AR application was generally effective in conveying design information, enhancing technical comprehension, and accelerating on-site validation processes. Based on the implementation and evaluation results, it can be concluded that AR technology holds significant potential for technical, educational, and managerial applications, serving as an integral part of digital transformation in the construction sector.

Keywords : Augmented Reality (AR), Building Information Modelling (BIM), GAMMA AR, Revit Architecture Engineering and Construction (AEC).