

# THE DESIGN AND BUILD A C-BIM (CONSTRUCTION BASED BUILDING INFORMATION MODELING) SYSTEM BASED ON IoT TO PRODUCE SUSTAINABLE BUILDING PLANNING

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## ABSTRACT

Technological advances have affected the work in the construction sector. Indonesia through the Minister of Public Works and Public Housing No.22/PRT/M/2018 instructs that all developments with an area above 2,000 m<sup>2</sup> are required to have integrated planning, one of which is through BIM. This regulation is a derivative of the world agreement in developed countries that have implemented it first. Not all industries in the construction sector can implement this policy, due to the lack of innovation related to BIM. UNY is still doing conventional development planning. This study aims to: 1) determine the product form of the C-BIM system for planning and implementing construction projects; 2) determine the level of cost efficiency through the application of the C-BIM system for the implementation of construction projects; 3) how big is the role of partner industry in developing C-BIM system products to be used in national scale construction works.

The C-BIM system development model uses the Development Life Cycle System through the v-waterfall approach. The stages of the approach include: specification of user requirements related to C-BIM, architectural design, component design, program coding, to testing. Partners involved in the study are engaged in the planning, implementation and supervision of construction. Experiments on the C-BIM system product were carried out at the Entrepreneurship Building of the Wates UNY campus with aspects of structural work review including: column, beam and slab work; and architectural work including: wall and floor covering work. The level of output efficiency of the C-BIM system product is carried out by comparing the implementation of conventional construction projects with the implementation of construction projects using the C-BIM system.

The results of this study include: 1) the product of the C-BIM system for planning and implementing construction projects in this research review using software revit (autodesk) and teklaBIMsight; 2) the level of cost efficiency through the application of the C-BIM system for the implementation of construction projects in the aspect of structural work review (column, beam and slab work) was obtained at 15.69%; and architectural work (wall and floor covering work) obtained by 6.69%; 3) the role of partner industry in product development of the C-BIM system in this study is in the form of planning designs through 2-dimensional drawings along with backup volume calculations for aspects of structural work reviews (column, beam and slab work) and architectural work (wall and floor covering work).

Kata Kunci: *C-BIM, Sustainable Development, UNY*