UNIVERSITI TEKNOLOGI MARA

COMPUTATIONAL FLUID DYNAMICS SIMULATION USING MODEL FROM BUILDING INFORMATION MODELING SOFTWARE

MUHAMMAD KHALID BIN CHE ABD AZIZ

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of the requirements for the degree of
Master of Science
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AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student	:	Muhammad Khalid bin Che Abd Aziz
Student I.D. No.	:	2019691444
Programme	:	Master of Science (Mechanical Engineering) – EM703
Faculty	:	Mechanical Engineering
Dissertation Title	:	Computational Fluid Dynamics Simulation Using Model from Building Information Modeling Software
Signature of Student	:	……..
Date	:	March 2021

ABSTRACT

The study of integrating Building Information Modelling software (BIM) and Computational Fluid Dynamics (CFD) to predict the outcome of air conditioning system design is lacking. Currently in Malaysia or globally, there is relatively few research have been done which incorporated approach of integrating BIM and CFD to predict the outcome of air conditioning system design, and this study aims to better predict the design outcome using simulation model produced from integration of BIM and CFD. A literature review was carried out to explore on existing CFD studies and BIM studies that focuses on the implementation and examples of done researches related to BIM in thermal simulation modelling. The data which related to BIM and CFD were collected from several sources such as, conference papers, books, journal articles and material obtainable on the internet. CFD simulation is performed for a room model which was produced from BIM and CFD software integration, and the simulation is compared with a room model which was produced from CFD software only. The simulation is performed for both models for 3 different case of inlet supply flow rate. The simulation which uses BIM and CFD integrated model has better reflection of the air flow and temperature of the real room air conditioning system. Better reflection gives more accurate simulation data of the real room air conditioning system compared to the simulation which does not use the BIM and CFD integration model. The temperature and air flow distribution for the room model which was produced from the BIM and CFD software also shows significant difference between the 3 different inlet supply flow rates in comparison to the other model. In this study it was shown that the using the model produced from integration of BIM and CFD helps air conditioning system designers to predict the outcome of the air conditioning design more accurately and also helps in optimization of the air conditioning design.

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