

ADVANTAGES OF USING ARCHICAD IN MODERN ARCHITECTURAL DESIGN

Building Information Modeling (BIM) technologies are an integral part of the new architectural design process. ArchiCAD supports the creation of complex buildings by providing an advanced environment in which a project is designed and developed from conceptualization to final documentation. This is a case study to evaluate the use of ArchiCAD to provide a more accurate and efficient method of design than numerous other formats.

In this case study, the design of a single-family residence using ArchiCAD is reviewed. The research was completed by comparing the time needed to generate a digital twin to the time required to draft a residence using conventional drafting. The research involved using parametric features to model structural components of the home such as pitched roofs and complex stairways. These features produce slope calculations automatically and assure compliance with building regulations that are critical to the integrity of the architectural project.

ArchiCAD's internal Energy Evaluation tools were an important part of this study as it shows how strict residential energy efficiency standards are becoming for building designs. In ArchiCAD, after assigning thermal properties such as insulation for the exterior wall layers and energy-efficient glazing for the windows, the thermal performance of a single-family home can be simulated. The architectural planner was able to see how much natural light enters the interior spaces during different times of the year through the software's sun study features. This kind of analytical data is helpful in determining the best orientation of a building on the site to help keep heating costs down in winter and to help prevent overheating in summertime.

BIMx hyper-model technologies were used in this project as well. The BIMx hyper-model allows one to experience a three-dimensional virtual tour of the building that has been designed through interactive navigation. By exporting the completed ArchiCAD model to the BIMx environment, one can see how the aesthetics of technical minimalism are displayed, as well as have an effective tool for communicating complex structural decisions.

A study of several computer-generated technical challenges and integration of "smart home" features to improve energy efficiency through the use of automated lighting and shading controls is also included. The results of conducting this study indicate that ArchiCAD significantly reduces the amount of human error through its virtual building model. Synchronization of changes made in the 3D model is supported by all 2D sections and elevations are updated as they occur, which ensures the accuracy of technical documents is preserved. Additionally, ArchiCAD provides support for establishing sustainable living environments through its energy analysis tools.

In conclusion, this study shows that ArchiCAD is not only a traditional drafting tool but a full-featured BIM solution that completely changes the way architects work. By providing tools for parametric modeling, automated technical documentation, and energy evaluations, ArchiCAD allows architects to more accurately model their designs while being creative. The practical application of a Virtual Building model to

one single-family house project resulted in a significant reduction in the chance of making mistakes due to poor communication between trades and improved design of complex structures such as large multi-pitched roofs. Additionally, incorporating Smart Home technology into a Virtual Building model allows architects' work to meet the sustainability goals of modern society through improved environmental analysis. ArchiCAD and BIM will become vital skills for all future professionals as the construction industry moves towards total digitization. This will help create functional, aesthetically pleasing, and energy-efficient buildings that comply with international standards, which contribute to an improved quality of the built environment.

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