

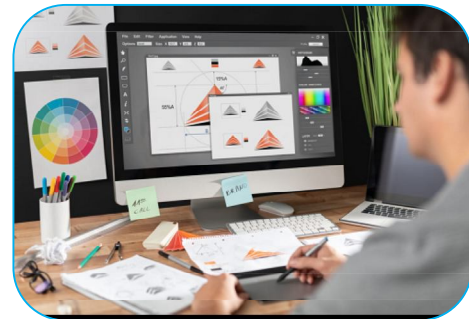


AN ASSESSMENT OF THE ROLE OF COMPUTER AIDED DESIGN (CAD) IN THE CONSTRUCTION INDUSTRY

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ABSTRACT :

The way people around the world carry out their day-to-day activities has been altered by the invention of computer. Virtually all human endeavors, including the clothing industry, have automated their operations. In order to evaluate the impact that computers have had on the industry, we looked at a number of publications as part of this study. We discovered that, despite a few obstacles, Computer Aided Design can significantly ease production, decrease costs, and boost profit margins in the clothing industry.



KEYWORDS : computer aided design, cut costs and make more money.

INTRODUCTION:

Computer aided design is utilized across a wide range of enterprises and occupations, and can be utilized to make compositional plans, building plans, floor plans, electrical schematics, mechanical drawings, specialized drawings, outlines and, surprisingly, the embellishments in your number one motion pictures and television shows. Used by specialists, engineers, and development supervisors, computer aided design has supplanted manual drafting. Users can use it to create designs in either 2D or 3D so they can see the structure. The development, modification, and enhancement of the design process are made possible by CAD. A fashion designer can create new sketches, patterns, and prints more quickly and precisely with CAD software. With the rising utilization of computer aided design, design planners can make numerous varieties of a solitary plan and style and adjust it to shifting material and example. An Overview of AutoCAD's Tools The menu bar, drawing area, several toolbars, command window, model and layout tabs, and status bar make up the basic AutoCAD screen.

PC Supported Plan [CAD] is a product utilized by underlying specialists, engineers, workers for hire and undertaking chiefs to make exact drawings and outlines of new structures or task plans. It can have three dimensions or two dimensions. It finds precise measurements, flaws in designs, and advanced analysis of designs. The coordinates X (horizontal), Y (vertical), and Z (depth) will be present

in every software for computer-aided design. Depending on the need, users can create models in either two or three dimensions by utilizing these coordinates.

Design has made significant strides largely because of the growth of the computer industry. Computers have assisted designers worldwide for several decades. Any engineering project, from simple calculations to intricate graphic design, can benefit greatly from the current computer-aided design systems. There are numerous computer-aided construction software programs available on the market. Up until this point, the most well known has been computer aided design auto CAD which has upheld development industry originators for quite a long time. Nonetheless, the market is as of now being altered by BIM innovation. Construction's future is already being shaped by this tool. Because of the virtual mapping of an object, the technology not only makes easy to design and put into action, but it also makes management and maintenance easier. The characteristics of CAD and BIM technologies as well as their impact on contemporary computer-based design methods are discussed in this paper.

History of CAD

The early 1960s, Patrick Hanratty and Ivan Sutherland, are credited with inventing CAD. While working for General Electric, Hanratty fostered a program he called DAC, the principal framework which utilized intuitive illustrations and a mathematical control programming framework.

Only two years after the fact, in 1963, Ivan Sutherland planned a framework that "kicked off something new in 3D PC demonstrating and visual reproduction, which is the reason for computer aided design." Sutherland described his program as Sketchpad, which allowed designers to "create engineering drawings directly on a CRT" with a "light pen."

The ADAM program was developed by Hanratty in 1971. It was depicted as the "primary financially accessible coordinated, intelligent illustrations configuration, drafting, and assembling framework." Nine out of ten CAD programs have their origins in ADAM.

Over time, Hanratty improved ADAM to run on 16-bit and later 32-bit computers. The program became popular after its name was changed to AD-2000 and it had more capabilities for machining and surfacing.

Purpose of CAD

CAD has taken the place of manual drafting and is used by engineers, architects, and construction managers. Users can use it to create designs in either 2D or 3D so they can see the structure.

CAD enables the development, modification, and optimization of the design process.

The development, modification, and enhancement of the design process are made possible by CAD. Engineers can easily modify more accurate representations and enhance design quality with CAD. Additionally, the software considers the interactions between various materials: As subcontractors add more details to drawings, this is especially important.

Since plans and drawings can now be saved in the cloud, contractors now have access to CAD-based plans and drawings at the worksite. Plan modifications can be easily checked out by entire teams, including the contractor and subcontractors. In this manner, relevant parties can recognize the potential impact of the changes on construction and make necessary adjustments. Communication is enhanced when plans are readily available.

In the end, productivity is increased when all information is used effectively. Using CAD, designers are able to take electrical, plumbing, and other aspects into account, resulting in a more comprehensive design. In the end, this means that there will be fewer changes to the work and fewer surprises during construction.

With all of their features, CAD and its derivatives have become a staple in the construction industry at every stage. Construction has become a job in technology as a result of its technological impact, which has changed the industry forever.

A Brief History of CAD in construction

Programs like Sketchpad made CAD possible in the 1960s. The CAD/CAM Hall of Fame claims that Sketchpad, in particular, laid the groundwork for current CAD versions.

Computer aided design innovation immediately started to trade manual drafting processes for everything from electric circuits to car parts.

CAD really took off in the construction sector when it became precise enough to be used in engineering applications.

Since then, building design and construction have relied heavily on CAD software. In point of fact, you would be hard-pressed to find a significant building project that did not make use of CAD in some way.

Advantages of Computer-Aided Design [CAD] in construction

It offers several advantages for contractors, structural engineers, architects and project managers, each of them are given below.

- The level of precision and accuracy that can be achieved with technical drawings is the primary benefit of computer-aided design software. Numerous handy automation tools are available for modifying and altering existing drawings in order to quickly modify customized programs.
- By storing the plans and drawings in the cloud, it aids contractors. Contractors can use their plans anywhere thanks to this. Additionally, if they are a part of a project-wide shared file, they will be able to quickly see any changes to the plans.
- It gives project managers the ability to visualize the building and all of its components, including the tiniest screws and steel beams. You will have access to an extremely precise building blueprint as a result, giving you the flexibility to alter design choices.
- Structural engineers in the construction industry are able to easily create more accurate representations and make adjustments to them to enhance the quality of the design.
- The software gives architects a model overview of the plumbing, electricity, and other parts, which helps them make a design that is more complete. In the end, this means that there will be fewer changes to the work and fewer surprises during construction.
- It makes use of the cloud's computing power and the entered design parameters, such as the material, construction or manufacturing method, and costs. The power of the cloud generates a number of design options based on the goals and parameters.
- At the point when the plan for a proposed building, street or extension is made on a computer aided design software, the representations that the innovation gives makes it simpler to earthworks groups to predict how the completed construction will look from the beginning.
- Structural engineers can now create maps and examine specifications for a large area. Because of this research, designs for railways and tunnels can be made with more information, lowering the likelihood of mistakes and saving money in the long run.
- The product permits conceptualists to take a crude thought and transform it into a three-layered plan. This permits various parts of an improvement group to commonly survey a proposed plan thought and create ideas that can without much of a stretch be carried out.
- Computer aided design allows you to get to your arrangements from the cloud, so you can pull it up in a moment on your cell phone on the off chance that you needed to.

Different Types of Computer-Aided Design [CAD] in construction

There are two different distinctions among the types of CAD software used in the construction industry.

2D / 3D CAD for technical drawings and drafting

Utilizing 2D/3D CAD software, technical drawings provide the precise shape, dimensions, and composition of an object for fabrication. Drawings come in one of two varieties. The first is a sketch,

which is a drawing done without tools. The second is the final drawing, which is a drawing made with tools.

There are many types of technical drawings, including:

- 3D drawings (isometric, point of view)
- Detonated view 3D drawings
- Complete working drawings
- Detail drawings (2D symmetrical projections)

When the plan is prepared the drafters use PC supported plan (computer aided design) programming to foster floor plans, building drawings, building examination plans and finishing formats.

Without the use of stencils or other technical drawing tools, drafting designs can be done more quickly and precisely with CAD software. It additionally permits clients to record and clarify drawings with text, aspects, pioneers and tables. A technical drafter can make revisions in the event of errors with 2D or 3D technical, which is more reliable than manual drawing, in which the drafter must start from scratch.

CAD for Solid Modeling

Due to the rising costs of construction and the creation of complex structures, CAD Solid Modeling is thought to be one of the most common practices utilized by various vendors for outsourcing purposes. The software uses cutting-edge tools to modify, create, analyze, and improve object models, as well as to make animations and special effects of projects and buildings. Among its functions are:

- a comprehensive view of the proposed buildings from every angle, complete with all prominent features, colors, and shapes.
- Investigating all planning components before the beginning of the genuine development process
- Plan age and amount computation of an undertaking

Computer aided design strong demonstrating comes in three sorts, 3D computer aided design for wireframe, 3D computer aided design for surface displaying and 3D computer aided design for strong demonstrating.

The future of CAD: Generative Design

The utilization of computer aided design has developed unequivocally throughout the long term and has changed fundamentally - and will keep on doing as such after some time. Convenience and speed will be the most important features of CAD software and technologies in the future. In the end, the design process ought to be made simpler, faster, and more effective.

These three goals are doable with generative design.

Generative plan programming utilizes the plan goals and boundaries entered, like material, development or assembling technique and expenses, and the figuring force of the cloud. The power of the cloud generates a number of design options based on the goals and parameters. These choices can be exceptionally mind boggling: In the 3D CAD software that is currently available, it would take days or weeks to create them yourself. Additionally, such intricate design options will be attainable with the help of 3D printing technology.

Generative plan will move the job of creators, architects, and modelers. Engineers will collaborate with technology to create and focus on setting goals and criteria by using computers as drawing tools. Technology will ultimately decide which design is best.

CONCLUSION

Hiring an AutoCAD Designer with experience in computer-aided design (CAD) can greatly simplify the construction process, whether it be designing intricate architectural plans or complex building structures. High-end platforms like Toptal provide access to AutoCAD Designers with

exceptional skills who can improve the precision and speed of your construction projects. The various benefits and types of CAD utilized in construction are discussed above.

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