AutoCAD and Computer

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Abstract: Earlier manual drafting & design was carried out by using tools like scales, Compasses, protectors, T-square, Mini Drafter etc. For engineers and architects, it was time taking and not fit for repetitive design. After evolution of latest technologies and innovation in high end computers with development of software, designing & drafting becomes easier, accurate and faster. Manual drafting is now replaced by latest CAD Tools used with computers. One of the software applications for Computer Aided Design (CAD) & drafting is AutoCAD. It is very useful not only with engineering industry but many other industries too.

Keywords: Computer Aided Design, AutoCAD software, drafting tool, Personal Computer, modelling, analysis.

1. INTRODUCTION

In the old days manual drafting method was used by architects and engineers. It was time taking process due to use of pen and papers. Nowadays industries are using Computer-Aided Design/Drafting systems with help of computers to design, drafting, modelling and even analysis too. These Computer Aided Design & Drafting tools replaced the manual drafting method. There are various software for design purpose in the market, but one of the most user friendly commercially CAD software is **AutoCAD.**

2. WHAT IS AUTOCAD

The word **AutoCAD** is made up of two words "**Auto**" (Logo of the Company) and "**CAD**" (Computer Aided Design /Drafting).It was first developed by USA based company Autodesk founded by Mr John Walker and launched in December 1982.AutoCAD application is designed to run on mini computers and personal computers. This CAD tool allowed the users to to create detailed technical drawings and was affordable to many smaller design, engineering and architecture companies. It was launched in 1988 in India. AutoCAD is a 2D and 3D modelling software which is used with help of Personal Computers. The first version of AutoCAD was R1 after that R2, R3,….. and upto R14.In year 2000, Autodesk launched a version of AutoCAD 2000 after that 2001, 2002….. and so on. The latest version is 2022, launched in March 2021.

3. LITERATURE REVIEW

"AutoCAD allows creation not just for normal drawing. Logically connected fragments can be placed on the allocated layers or grouped in compound objects. And we consider them as a whole entity. AutoCAD "remembers" position, size, color of the constructed objects and writes down this data in an internal database for their subsequent search, analysis, and processing. AutoCAD can function with a wide range of personal computers and graphic workstations under control of various operating systems [1], [2]."

"AutoCAD is a powerful tool for automating graphical work based on personal computers. It gives the user possibilities which earlier could be realized only on big and expensive computing systems: any drawing that was drawn manually can be constructed with AutoCAD now. AutoCAD is capable to perform almost any kinds of graphic works [3], [4]."

4. PRODUCTS AND ITS APPLICATIONS

AutoCAD products are in the form of collections and are as follows:

(a). Architecture, Engineering & Construction Collection (AEC): It provides designers, engineers and contractors a set of BIM and CAD tools supported by a cloud-based common data environment that facilitates project delivery from early-stage design through to construction.

(b). Product Design and manufacturing collection (PDMC): It The collection is a powerful set of applications that provides extended capabilities to Inventor and AutoCAD for engineers who design complex and customised products, equipment and systems. It extends Inventor with add-ins for tolerance analysis, simulation and production layout. It use connected products for 2D drafting, large-scale design review and visualization &Connect to Fusion 360 to access next-generation capabilities and collaboration
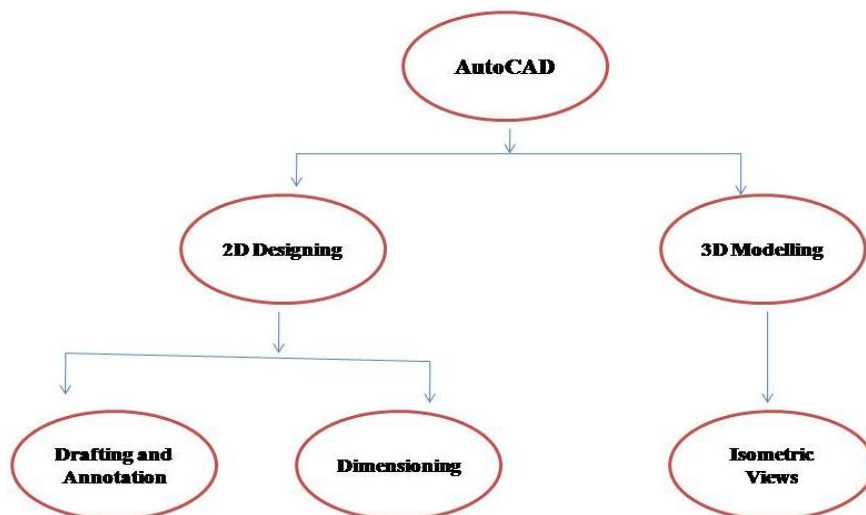
(c). Media and Entertainment Collection: It includes all of the tools you need to build a powerful and scalable 3D animation pipeline for complex simulations, effects and rendering. It provides from detailed battle sequences to hyper realistic creatures, render your toughest projects with Arnold. It create complex effects including explosions, fire, sand and snow with Bi frost for Maya. It empower artists with a choice of tools to produce beautiful, film-quality work every time. Various top products are mentioned in table-1.
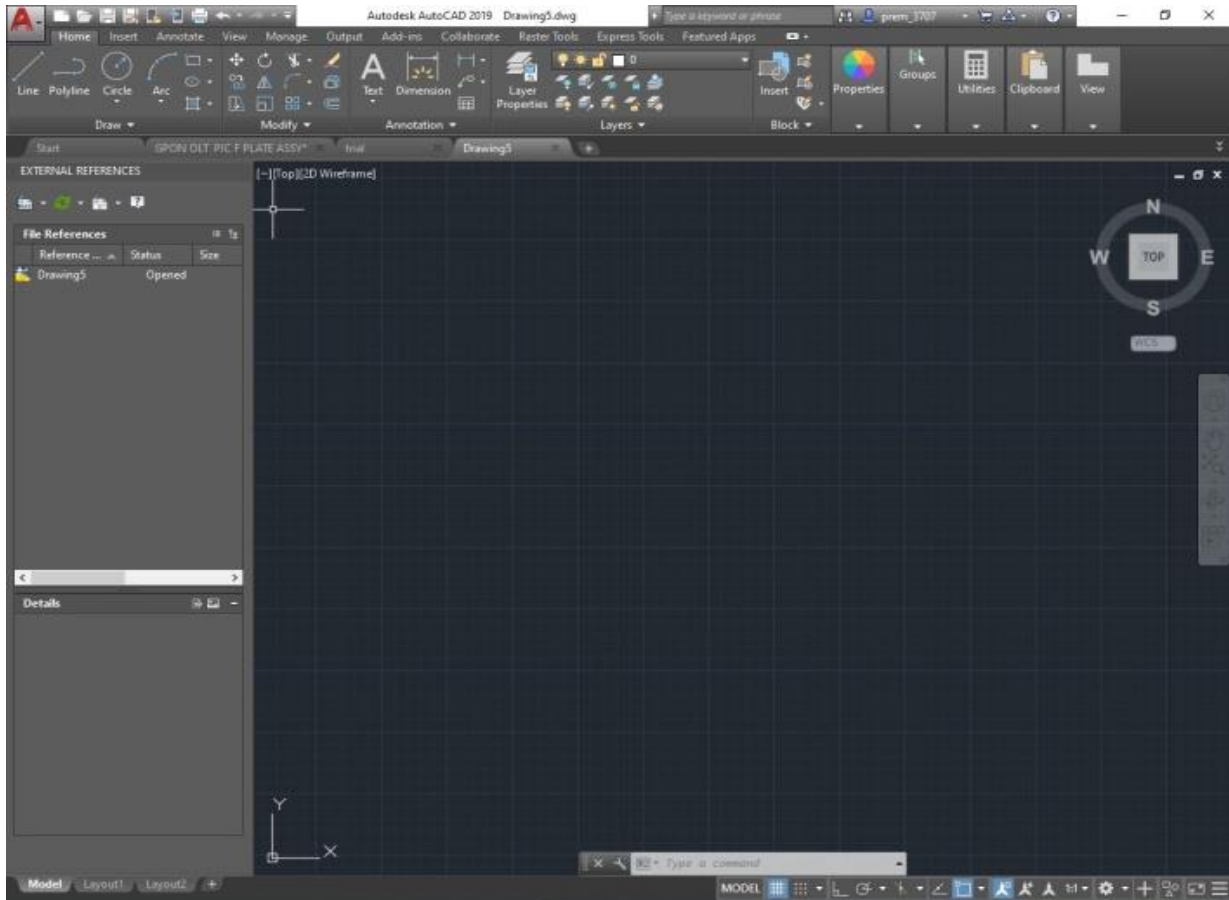
Table.1. Top AutoCAD Products

S No	Product Name	Uses
1	AutoCAD Architecture	Architectural drafting
2	AutoCAD Civil 3D	Civil Engineering Design & Documentation
3	AutoCAD Electrical	Circuit Design and panel layout
4	AutoCAD LT	Quick design Documentation
5	AutoCAD MAP 3D	GIS and Mapping
6	AutoCAD Mechanical	Mechanical Design and drafting
7	AutoCAD MEP	Draft, design and documentation of building system
8	AutoCAD P&ID	Piping and Instrumentation diagram
9	AutoCAD Plant 3D	Plant Layout design
10	AutoCAD Raster Design	Raster Images, maps and aerial photos
11	AutoCAD Structural Detailing	Structural detailing
12	AutoCAD Utilities Design	Design overhead and underground structures

5. WHAT CAN IT DO

AutoCAD screen is shown in Fig.-2 and its application in graphics design is shown in Fig.-1.

Fig.-1.Application of AutoCAD

Fig.-1. AutoCAD Screen

6. BENEFITS OF AUTOCAD

It allows to draw and edit digital 2D and 3D designs more quickly and easily. The files can also be easily saved and stored on cloud to access anywhere and anytime by the user.

Following are the other major benefits:

1). **Modification point of view**: In this application major benefit is to easily edit, change and manipulations in the design by using computer.

2). **Production point of view**: In this we can create a reusable block library using window system to get easy access. For repetitive components we can use block library to increase the design efficiency and makes process faster.

3). **Accuracy point of view**: In this we can create more accurate design and even very small size of components to be designed.

4).**Easy to prototype**: Once the model is ready to use, we can feed it to 3D printer for rapid prototype

5). It improves productivity in drafting & shorter preparation time required for drawing.

6).It reduced manpower requirements &modifications in drawing are easier.

7).It is more efficient operation in drafting & very low wastage in drawings.

8). It maintains very good accuracy of drawing & easy in documentation.

7. LIMITATION/DRAWBACK OF AUTOCAD

As mentioned in above paragraph regarding benefits, but it has some limitations/drawback too. Which are as follows:

(1). As we know that this software have many modules so it requires more space for installation and storage.

(2). Large amount of memory required for better viewing of the graphics.

(3). Huge investment for the software purchase.

8. CONCLUSIONS

AutoCAD is very power full tool for CAD purpose in engineering drawing and easy to use. It is useful in 2D & 3D both type of drawing. It can save the time for project. In latest version some analysis also is done.

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