Reduce Your Design Overheads, the CAD Way

WHITE PAPER

It's CAD world out there. From Boeing Aircrafts to perfume bottles, all are designed using engineering software. For instance, in 2007, dentists alone spent a whooping $250 million in CAD to design tooth crowns and bridges!

What's Design?

Before knowing what is "design overheads" and "computer aided design", let's start understanding what is design. A business dictionary says design is "realization of an idea into a configuration, drawing, model, mould, pattern, plan or specification."

Broadly, you can group design into three categories: product design (things), environmental design (landscapes) and communication design (information). And the "design overheads" are anything – time, tools, processes, etc – that stands between your visualization of a design and making it into a "configuration, drawing, model, mould, pattern, plan or specification."

Prior to 1982, when Professor David C Gossard, a MIT professor,first created images of geometric models on a computer, thus giving birth to the era of CAD, designing used to be a manual process. During World War II, an army of draftsmen were drawing on a drafting board each and every component of "B-17 Flying Fortress" aircraft, which was used for bombing; months went by before creating models of components in wood for testing.

Fast forward to the CAD era, now the designs of Boeing aircrafts are digitally created, presented and tested on computer monitors, resulting in huge reduction of overheads in terms of time, cost and errors.

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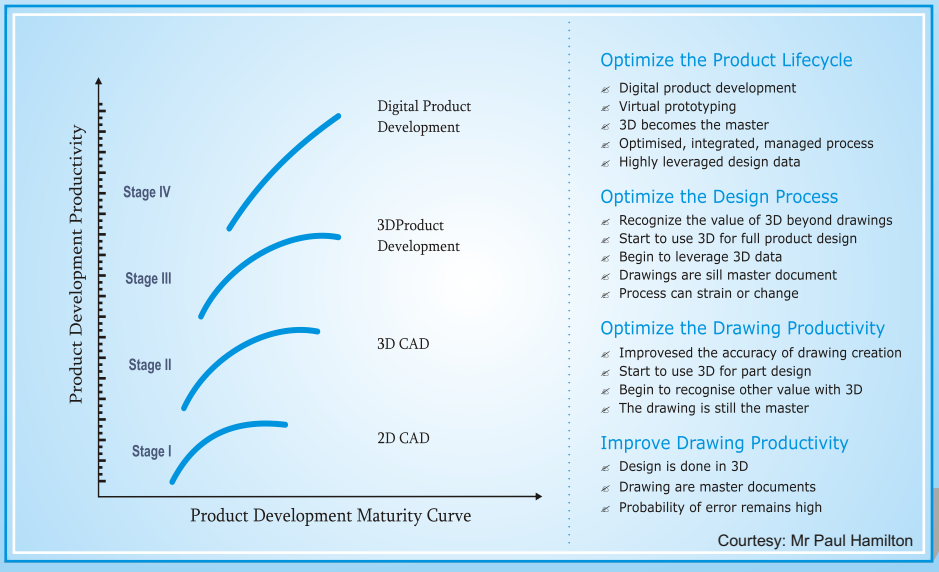
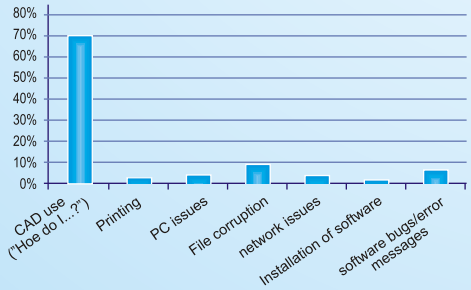


Training

"CAD TRAINING IS FOR YOU"

A major part of CAD adoption cost is not hardware or software it is training. The CAD Managers' Survey 2008, published by Eatyourcad.com, shows that by far "the most common support issue raised in 70.7% of all cases relates to a lack of knowledge of the CAD software being used. That means employees do not have any, or enough, formal training. They are mostly self-taught, on the job. Learning is reactive rather than proactive. (See the illustration)

CAD adoption cost



Source: eatthecad.com

Post global economic recession, companies are taking to a considered approach to hiring they want to know your CAD skills. CAD users are required to learn new software and contribute to the productivity growth of their companies. For this a focused training and committed assessment is required. The India-based CADD Centre is committed to enhance bridge your CAD skill gap by offering

Personalized Training: CADD Centre believes experts are made, not born. With practice, experience, and encouragement – and a healthy dose of fun thrown in - anyone can become a CAD expert.

Authorized Training: The Centre creates its courses to help you develop the expertise you need to get to the next level. CADD Centre has been spreading the knowledge of CAD, CAM, CAE and PPM for close to 22 years. To align the business/technological needs of global OEM's and provide authorized training solutions, it has created a strong eco-system of partners with Principals such as Dassault, SolidWorks, Autodesk, PTC and Bentley.

The Work Flow

The design process starts with a vision, an idea in your mind, and followed by your understanding of the high-level concept - you should know the main principles and major parts. Then, you create a draft by pen and paper, or using a simple vector graphics or simple CAD programs.

Next comes, the key part of CAD designing that is, 2D or 3D modeling using CAD, which will enable you to use standard parts, or parts created by other team members, in your model. Files representing a part can be downloaded from the Internet, or local networks. By putting these predefined parts into your project, you ensure that they are correct.

Now, you virtually assemble all the parts into a machine or mechanism and analyze for FEM (Finite Element Method) and Kinematics. Finally, from your 3D models, you generate a set of engineering drawings for manufacturing. While you present your 3D model, you create photo realistic images and/or animations to present your design. You can consider using rapid prototyping techniques to present a physical 3D model. Major CAD/CAE/CAM software companies develop and sell tools that cover the whole cycle.

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Increasing CAD Usage

CAD software packages, ranging from 2D vector-based drafting systems to 3D solid and surface modelers, come with different specializations: architectural engineering construction (AEC), general-purpose, mechanical CAD, solid modeling, visualization and rendering, and facility management. There is a CADD program for virtually every engineering discipline you can think of.

The Outlook

CAD is one part of the whole Digital Product Development (DPD) activity within the Product Lifecycle Management (PLM) process, and as such is used together with other tools, which are either integrated modules or stand-alone products, such as: Computer-aided engineering (CAE) and Finite element analysis (FEA); Computer-aided manufacturing (CAM) and Product Data Management (PDM).

An estimate puts that there are about 20 million CAD users across the world today. The average company now uses 3.5 CAD packages and the global CAD market is estimated to grow at 15% in 2010. The main growth driver is increasing hardware capabilities and affordability.

CAD products are making inroads even into hitherto untapped service sectors such as food and beverage, retail and apparel, and even, financial and investment services. Hence, irrespective of the domain, CAD skill enriches productivity.

Benefits of CAD

Presentations:	Create fine drawings with hundreds of colors, line types, hatch patterns, etc
Flexible editing:	Make quick alterations to drawings
Accuracy levels:	Do away with mathematical calculations and create accurate shapes
Storage:	Store thousands of drawings on your computer or Internet
Project reporting:	Prepare project reports with cost estimates on the fly