

# 3D Design Software Helps Increase Overall Efficiency

Innovation in design has come a long way. From designing on paper to now on the computer, its journey is commendable. 3D design software has helped many companies achieve more than just efficiency in its processes. Here's a look at Precihole Machine Tools' experience with design software and solutions offered by Dassault Systèmes SolidWorks.

For over two decades, Precihole Machine Tools Pvt Ltd has been providing deep-hole drilling and hole finishing solutions worldwide. Initially started as a small job shop, Precihole Machine Tools now operates in three verticals: deep-hole drilling machine tools, deep-hole drilling services and precision component manufacturing.

To date, the company has manufactured more than 400 different special purpose machines (SPM) for testing, metal cutting and assembly apart from the standard deep-hole drilling machines.

## Challenges with design

Design & Development Manager, Precihole Machine Tools Pvt Ltd, Azhar Ahmed Ayaz Qazi averred, "Developing customized machinery requires a lot of engineering expertise as the machine has to work right from the start. The prototype is your final product. It also requires more time to be spent at the conceptual and design stage in order to ensure that the final product works as predicted."

## Precihole Machine Tools

### Challenge


- ▶ Overdesigning of products
- ▶ Small design errors going unnoticed
- ▶ Reworking of parts

### Solution

- ▶ SolidWorks 3D CAD Software and products

### Benefits

- ▶ Reduced overall design time by 60 per cent
- ▶ Reduced number of errors by 30 per cent
- ▶ Reduced prototyping costs by 60 per cent
- ▶ Design optimization and modularization of machines

 Nedra Pereira  
Senior Feature Writer  
Vogel Business Media India  
nedra.pereira@vogel.de



Source: Precihole Machine Tools

Gun drilling machine design using SolidWorks software

In order to achieve this, tools that help in better visualizing the design, verifying the mechanisms and authenticating the design considerations are required. Prior to the implementation of 3D design software, the company used to work on 2D drawing software for creating complex machinery consisting of more than 3,000 parts. Qazi affirmed, "Design was majorly based on experience of the designer and this usually meant that the product ended up being overdesigned. Further, there will be small design errors that go unnoticed and which finally lead to reworking of parts. Also, identifying interferences and collisions was left for the designer to imagine and rectify."

The company approached Addonix Technologies, a Value Added Reseller (VAR) of Dassault Systèmes SolidWorks for a solution. Dassault Systèmes Professional Channel (SolidWorks) drives its business



**“SolidWorks has helped us eliminate our design errors by almost 30 per cent as compared to what we found before implementing SolidWorks. Even our prototyping costs were reduced by 50 per cent. And the overall design time has reduced by 60 per cent.”**

**Design & Development Manager,  
Precihole Machine Tools Pvt Ltd,  
Azhar Ahmed Ayaz Qazi**

**3D software – a handy solution**

Once the company moved to a SolidWorks 3D parametric modeling environment, all the previously faced issues were practically eliminated. Using SolidWorks, the company was able to build custom tooling suiting various components, which are then added to the standard deep-hole drilling machine, ensuring that its customer got a complete solution for his component.

Apart from this, SolidWorks also has a vast configurable library of standard parts which is essential for machine design. It is easy to drag and drop fasteners, O rings, circlips, etc., that quickly snap onto the specified part, making the design process faster and easy. “The Product Design division is the heart of any engineering company. Customers designing a new part have to release it into production and ensure that it is fully validated which in itself is a long process. There is a growing realization among customers that if they can reuse design data that is already proven, then one can save an enormous amount of time and reduce cost using SolidWorks 3D CAD/CAE tools,” said Director, Addonix Technologies, Samir Panshikar.

Agreeing with Panshikar, Qazi stated, “Quantitatively, Dassault Systèmes SolidWorks has helped us eliminate our design errors by almost 30 per cent as compared to what we found before implementing the software. Even our prototyping costs were reduced by 50 per cent. And the overall design time has reduced by 60 per cent.”

Another product that was implemented in the company’s design department is



**“SolidWorks has complete toolset to overcome any business challenges that customers might face whether it is to design, validate, publish or manage CAD data. SolidWorks solutions work together in allowing potential customers to make their products better, faster, and at a lower cost.”**

**Director, Addonix Technologies,  
Samir Panshikar**

through its Value Added Resellers. Speaking on how VARs help end-users make right decisions according to their requirements Sales Director – SolidWorks India, Dassault Systèmes, PM Ravikumar asserted, “We invest significant time and resources to assist our VAR community with programs like technical and sales training & workshops, certification, boot camps, new product launch roadmap, annual conferences and kick offs. We do this so that our VARs can meet the customers’ expectations and requirements in the market. We address the entire product development and engineering process to help designers design without limits. All our VAR AEs are SolidWorks certified and offer support to our customers.”

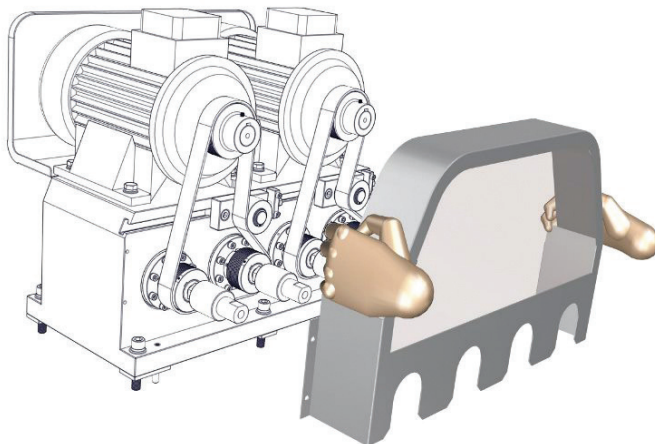
SolidWorks simulation. This product helps in designing critical load bearing machine parts optimally through results obtained from various analyses available in the simulation.

Qazi mentioned, “Especially in case of creating special purpose machines such kind of verification at the design stage ensures the product will function correctly the first time itself. This reduces a lot of time spent in correcting design errors during the testing stage. Working in the same SolidWorks window and getting results is a big bonus that SolidWorks simulation offers. Updating the model based on finite element analysis results and then running analysis over it for verification is real quick. The interface is very simple for any designer to understand and is equally effective for producing output. Overall we have achieved a lot of time saving, thanks to simulation which has in turn reduced the time to launch new product or refine existing models.”

**Not just for design**

For every machine manufactured there is a requirement of a machine manual to be made. Usually this occurs after the machine has been designed. SolidWorks helps out even in this perspective. SolidWorks Composer aids in creating machine manuals, allowing for a visual take rather than just simple text for clear understanding of the machine’s working. Because of the associativity between SolidWorks CAD data and SolidWorks Composer, all changes can get updated immediately. Hence, the manuals can be concurrently created with

Source: Precihole Machine Tools



**A visual of how operating instructions appear in SolidWorks Composer**





“About 90 per cent of enhancements come through the mode of ‘listening to our customers’ and the remaining 10 per cent of the enhancements come from our R&D that is responsible for creating new technology functionalities.”

Sales Director – SolidWorks India, Dassault Systèmes, PM Ravikumar

the designing stage itself. “We create simple operating instructions using series of step by step images or by generating animations that run through the process. We are able to generate these 3D animations in-house where earlier we used to spend a lot of time as well as money getting it outsourced,” quipped Qazi.

SolidWorks Composer also helps in creating 3D animations. “Machine animation showing various assemblies and explaining the working of the machine has been a very useful tool for prospective clients. We also create animations to convey machine concepts to our customers to get their design approval. This adds up in competing for sales internationally,” added Qazi.

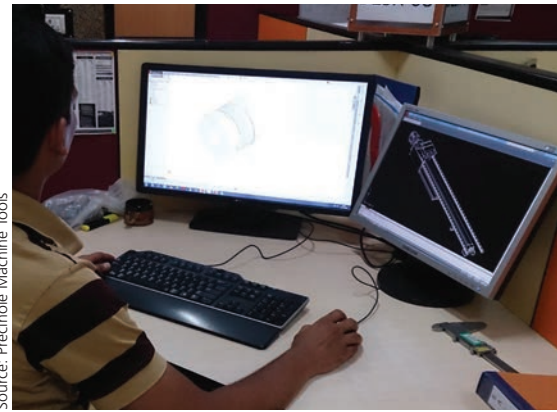
**Designing on a large scale**

Designing multiple products also builds up a lot of data for archiving. As the company’s design data was on a server and accessed by multiple designers at one time, issues were being faced on the time taken to open and save the stored data of parts and machine assemblies. There were also instances wherein data was mistakenly moved into another folder or deleted and then it had to be restored from the backup or created all over again.

Looking at these issues, Addonix Technologies suggested the company to use the Enterprise Product Data Management (EPDM) solution offered by SolidWorks.

On implementing the EPDM solution, the company saw various benefits including ease of access to ongoing designs; data is easily organized and searchable; users are updated with revision status of a work-in-progress part, etc.

Panshikar informed, “The good thing about Dassault Systèmes SolidWorks is that it has the best in class software solutions to transform innovations to business success. SolidWorks has complete toolset to overcome any business challenges that customers might face whether it is to design, validate, publish or manage CAD data. SolidWorks solutions work together in allowing potential customers to make their products better, faster, and at a lower cost. Precihole Machine Tools was using 2D software and now they fully migrated to SolidWorks and further implemented SolidWorks Composer, SolidWorks simulation and our Enterprise PDM solution.”



Source: Precihole Machine Tools

Engineer designing a part using SolidWorks software

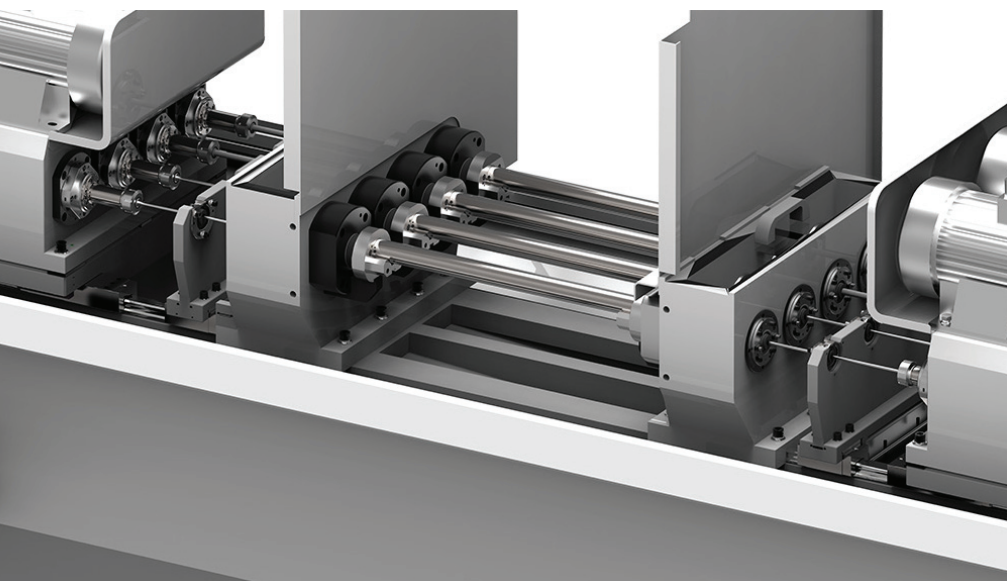
Adding to why SolidWorks facilitates better designing, Ravikumar revealed, “Dassault Systèmes SolidWorks releases a new version of the software every September, which usually has 200+ enhancements. Over 90 per cent of these enhancements are customer driven or requested by customers. We have a dedicated team called ‘product definition team’ which decides what goes into the next version of the software. This team visits our customer sites, observes the usage of software and has detailed discussions on the enhancements that customers look forward to.”

**Future forward**

Precihole Machine Tools has since come a long way. The company has ventured into two new businesses and formed two companies — Precihole Sports Pvt Ltd and Solidaire Composites Pvt Ltd. At Precihole Sports, precision target shooting air rifles and accessories are being developed and it has already become a premium brand with the Indian shooting fraternity. Solidaire Composites is venturing into a very niche and upcoming technology wherein it develops polyurethane and polyurethane composites products for various applications like interiors, automotive parts, etc. The range of SolidWorks products the company uses has helped in its journey to design and manufacture at a faster pace.

Taking it forward, Qazi is also a User Group leader in the SolidWorks User Group community. There are more than 200 SolidWorks User Group communities worldwide, under the aegis of which users meet every month to share tips and insights and, share experiences which can facilitate the design community’s growth to the next level.

Source: Precihole Machine Tools



Four spindle gun drilling SPM manufactured by Precihole

**MMI**