

Software development

Shapr3D

Shapr3D integrates PLM Components in a leading application for computer-aided design on iPad Pro

Product

PLM Components

Challenges

Deliver the next generation of 3D CAD on mobile computing devices with rapid time-to-market

Ensure customer satisfaction and loyalty with next level 3D modeling technology

Enable customers to move their product data to/from third party applications

Keys to success

License software components to accelerate time-to-market

Replace original 3D modeling kernel with Parasolid

Select Parasolid and HOOPS Exchange to maximize data access and exchange

Select D-Cubed 2D DCM to deliver a parametric sketching capability

Results

Developed a prototype based on Parasolid within a week

Released a commercial application based on Parasolid within a year

Quadrupled company's growth metrics, with Parasolid being the determining factor

Provided customers with a highly intuitive 2D sketching system based on D-Cubed 2D DCM

Parasolid and D-Cubed components enable software start-up to enter new market with assurance of quality and reduced investment

What will be the next CAD breakthrough?

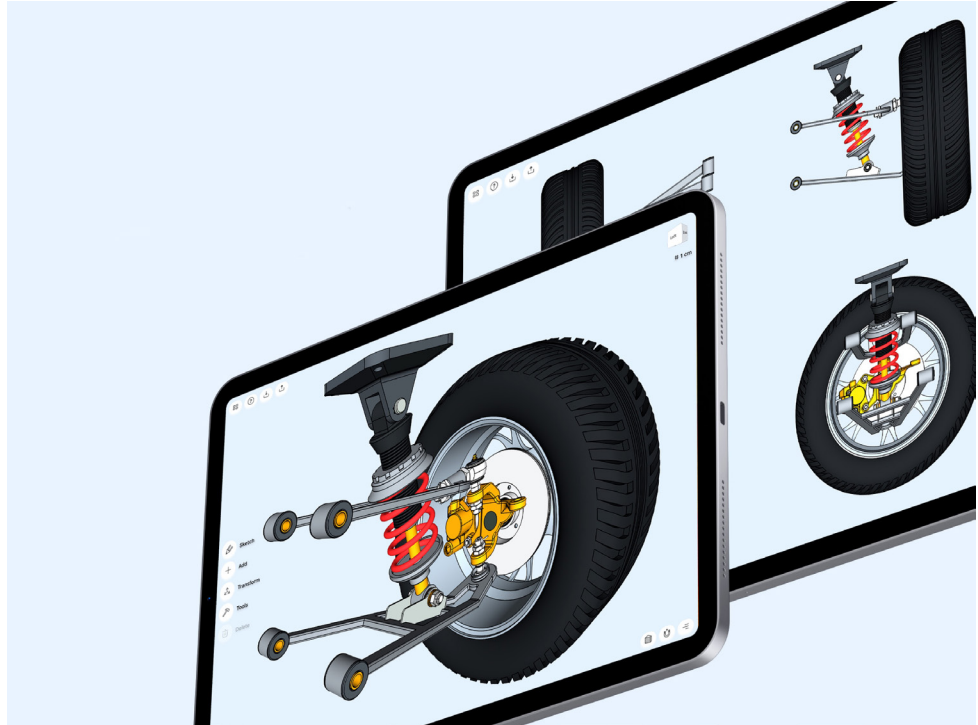
Computer-aided design (CAD) has evolved significantly since 3D modeling technology was introduced in the 1970s. Continuous

innovation has created impressive design capabilities across hundreds of applications. Recent milestones include advances in modeling, such as direct editing independent of a design history, and the convergence of modeling with boundary representation (B-rep) solids and facet data in a common environment. At the same time, new applications have emerged to leverage transformational technologies like additive manufacturing and the cloud.



“The Parasolid XT data format dominates 3D model representation in our industry. We estimate this enables up to 75 percent of our customers to move their Shapr3D designs to other 3D modeling applications without translation.”

István Csanady
CEO
Shapr3D



Today, applications continue to deliver incremental enhancements, but what will be the next breakthrough? Despite innovation in mobile computing, most 3D CAD software trails other applications that take full advantage of this megatrend. Mobile devices have long excelled at consuming content, and a wide selection of media and entertainment applications have flourished. But it's only recently that such devices have introduced the user interface and performance that are needed for 3D content creation, which explains the limited innovation in mobile 3D CAD. Modern tablets offer much better performance. With the processing power of the latest Apple® iPad Pro® now rivaling

MacBook Pro® laptops, it's no surprise that Adobe® is bringing Photoshop® software to the iPad®.

The next generation of CAD on mobile devices

Shapr3D is a Hungary-based startup that's delivering 3D CAD for the mobile platform. Now designers and engineers can work anywhere at any time while also benefiting from the intuitive touch screen interface that mobile computing offers. The user interface is easy to master, enabling any user to quickly integrate Shapr3D into their workflow.

Now running on numerous iPad models, Shapr3D built their initial application on the iPad Pro. This platform offers the required performance for 3D modeling and benefits from a touch stylus that delivers the precise user-interaction needed for professional-grade design.

Building new CAD applications is a serious undertaking. To bring products quickly to market, technologies are licensed so developers can focus on their core expertise and innovation strategy. Shapr3D sought to license a reliable 3D modeling engine that would run natively on iOS, Apple Inc.'s mobile operating system, while they focused on pioneering an intuitive design interface to take full advantage of the iPad Pro. Adopting lean start-up principles (build, measure, learn, repeat), Shapr3D initially developed a minimum viable product (MVP) that used

an open source 3D modeling kernel which they had ported to run natively on iOS.

Within one year, Shapr3D's development cycle hit a bottleneck. The robustness and performance of the geometric modeling code wasn't achieving the quality metrics that Shapr3D needed to scale for the best user experience across a high-volume market.

"Companies underestimate how important it is to create a quality modeling experience in early development. Elevating product quality to the highest level is critical to sustaining any business advantage," says István Csanady, chief executive officer (CEO), Shapr3D, "The longer companies wait to figure this out, the harder and costlier it is to fix their mistake."

"The application programming interface and documentation were of the highest standard and, with the collaborative support of Siemens Digital Industries Software, we brought a product to market within 12 months that was an instant success."

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The benefits of high quality platform technologies

Shapr3D switched its modeling kernel to Parasolid® software from Siemens Digital Industries Software's PLM Components portfolio. Shapr3D quickly created a basic prototype with Parasolid and made its first commercial release within a year.

"Parasolid worked like a dream straight out of the box – we couldn't break it," says Csanady. "The application programming interface and documentation were of the highest standard and, with the collaborative support of Siemens Digital Industries Software, we brought a product to market within 12 months that was an instant success. The new 3D modeler was a real game-changer; our growth metrics quadrupled, with Parasolid being the most important factor."

Shapr3D is the first CAD system to run Parasolid software natively on iPad and has become the highest-rated CAD application in the App Store®. As of July 1, 2019, Shapr3D has received 20,912 ratings worldwide, with an average rating of 4.725 on a 5.0 scale. This rating score has been consistent since the company's Parasolid integration in December 2017. The product has been a marquee application for Apple Inc., with Shapr3D featuring in keynote speeches at events and in advertising for their professional business solutions.

Integrating new applications into established software ecosystems

Around 80 percent of Shapr3D customers are professional 3D designers, mechanical engineers and industrial designers. The company is particularly focused on conceptual CAD, which enables customers to develop innovative ideas more quickly and into production. Customers choose Shapr3D for conceptual CAD because of its accessibility and user-friendly touch interface on iPad Pro. Conceptual designs are often transferred to other applications for downstream operations like analysis and manufacturing. This means Shapr3D needs to ensure data interoperability with third-party CAD, computer-aided manufacturing (CAM) and computer-aided engineering (CAE) applications.

"The Parasolid XT data format dominates 3D model representation in our industry," says Csanady. "We estimate this enables up to 75 percent of our customers to move their Shapr3D designs to other 3D modeling applications without translation. To ensure comprehensive interoperability with other applications, we also licensed HOOPS Exchange from Tech Soft 3D, which has a tight integration with Parasolid and delivers additional data access and exchange options."

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Solutions/Services

Parasolid
[siemens.com/parasolid](https://www.siemens.com/parasolid)

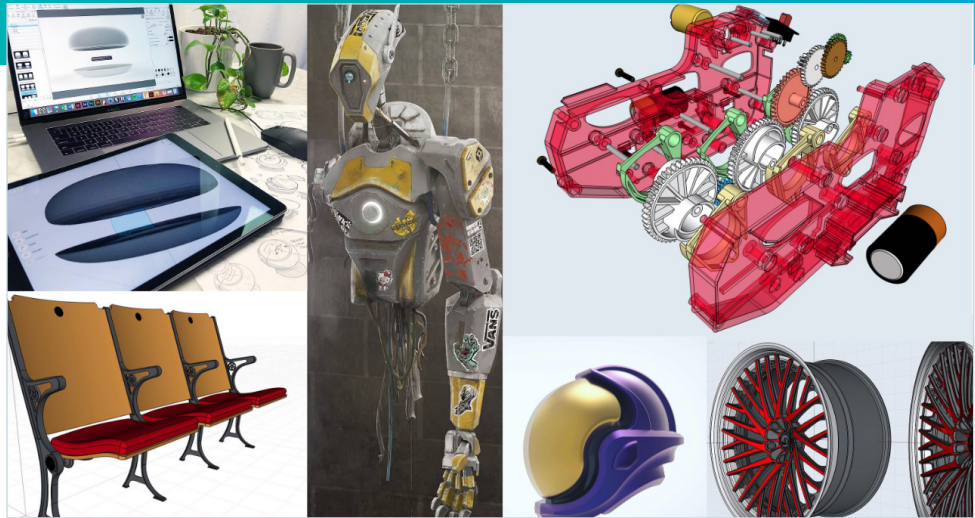
D-Cubed 2D DCM
[siemens.com/d-cubed](https://www.siemens.com/d-cubed)

Customer's primary business

Shapr3D develops professional 3D computer-aided design software designed specifically for the iPad and Apple Pencil®. [shapr3d.com/](https://www.shapr3d.com/)

Customer location

Budapest
Hungary



Intelligent 2D sketching

Having established superior 3D modeling and data access capabilities, Shapr3D focused more of its attention on the app's sketcher, which many designers use to create 2D profiles that are swept or spun into 3D solids. The company wanted to create the most intuitive and precise sketching experience possible. To achieve this, they integrated the D-Cubed™ 2D DCM software from Siemens Digital Industries Software. This software component enables sketches to be defined accurately and easily using dimensions and constraints, such as distances, angles and symmetries. Design variations are easily explored by modifying the values of dimensions.

"D-Cubed is extremely effective in geometric constraint solving so we didn't hesitate to build on our relationship with Siemens and integrate 2D DCM," says Csanady. "We created a neat implementation of the solver; for example, our app monitors the stylus and its relation to existing sketch

geometry, which enables constraints to be applied automatically while the user is sketching and infer which type of geometry the user intends to draw."

Keeping up innovation

Shapr3D has made great strides in delivering the next generation of CAD for mobile devices and intends to stay at the leading-edge of innovation. The company is keeping a close eye on Convergent Modeling™ from Siemens. This technology is available to Parasolid customers and enables applications to integrate facet data sources, from 3D scanning for example, into the B-rep modeling environment that is common to design engineering applications. The company is also considering possible benefits of complementary modeling techniques, such as subdivision modeling for generating organic, freeform shapes and direct modeling, for editing 3D models without the need for a design history.

Siemens Digital Industries Software

Americas +1 314 264 8499
Europe +44 (0) 1276 413200
Asia-Pacific +852 2230 3333

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