KUBIT

From Real World to CAD

Figure 1, Team photo taken in front of the headquarters in Dresden, Germany.

The company kubit develops software for surveying and as-built documentation, most of which works in conjunction with Autodesk software as third-party plug-ins. With its global headquarters located in Dresden, Germany, and US headquarters in Houston, Texas, the kubit team strives to provide software solutions which create an efficient, precise process for extracting design deliverables from real-world measurements.

Improving As-built Workflows

kubit was co-founded in 1999 in Dresden by Dr Oliver Bringmann and Matthias Koksch, who were friends from university. Oliver had just finished his dissertation in computer science and had a passion for programming and problem-solving. Matthias had been practising as a professional surveyor for two years, and hence had first-hand experience of the lack of available tools for real-world measurement. Together, the two partners aimed to change the surveying-to-CAD process and bring simple, efficient tools to industries in need.

The duo's first product set out to improve the workflow for building measurement with a total station. The young kubit team realised that, by connecting a total station's measurements directly to the command prompt of AutoCAD, common field issues such as forgotten measurements and poor hand sketches could be completely avoided and that CAD-knowledgeable people could become surveyors. The product TachyCAD was born and remains a top-selling product for the organisation today.

After years of sustained growth, kubit's team (Figure 1) in Germany and the United States currently totals 35 people. Development and product management take place in Dresden (Figure 2), while sales, marketing and partner relations are shared between the German and US offices. The product portfolio now extends beyond total station solutions to handheld lasers, photogrammetry and laser scanning technology. As stated by Dr Bringmann, "kubit supports multiple devices so surveyors can choose the most efficient technology for every project. Our software helps to automate the field-to-finish process, but ensures the operator always has control."

Figure 2, 3D point cloud of kubit headquarters in AutoCAD.

Technology-driven Product Mix

kubit's mission is to provide hardware-independent software solutions which efficiently and accurately help close the gap between the real world and completed design deliverables. The majority of kubit software work as third-party plug-ins for AutoCAD. Programs like kubit's TachyCAD and DistToPlan connect total stations and handheld lasers to AutoCAD in the field, while kubit PhoToPlan provides an array of image correction and classic photogrammetry tools in AutoCAD. Finally, laser scanning families PointSense and VirtuSurv are leading kubit's future in cutting-edge tools for extraction of intelligent information and geometry from point clouds in AutoCAD, Revit and beyond.

The management philosophy is simple: think from the user's point of view, listen to the customer's pain and anticipate what they will need next. These principles will enable a company to create a product which solves problems and serves the customer well. The philosophy seems to be working as kubit software has now exceeded 5,000 users worldwide and revenue is growing steadily year on year.

Figure 3, PointSense Plant extracts intelligent piping and structural elements from point clouds in AutoCAD.

3D Data Boom

The demand for 3D data capture is growing at an incredible rate in most major industries, thanks in part to the ever-progressing laser scanning industry. Only a few years ago, entry into the scanning market was considered risky, complicated, very expensive and fraught with workflow problems. Computers lacked the power to handle massive datasets efficiently, and software for managing such datasets was scarce. Today, the market trend is towards lower-priced hardware and more hardware options which allow users to choose their device based on accuracy, volume, range and budget. Static scanners, mobile scanners, handheld scanners, total station/scanner hybrids and point clouds generated from photogrammetry all offer potential options depending on the job at hand. Software, traditionally regarded as

lagging behind hardware, is now beginning to catch up with more powerful infrastructures for handling point clouds. The data capture process is easier than ever before. Co-founder Matthias Koksch says, “Obtaining a point cloud is simple nowadays. Data capture is one thing; to add intelligence to this data so that it is easy to use in the design process is another. The real challenge is the conversion in the deliverables. kubit wants to play an important role in using advanced pattern recognition algorithms to continue to improve this process.” The answer does not lie in hardware that can scan a billion points per second or software that can handle point clouds; the real solution is developing an overall, optimised workflow per industry and getting users to a finished product, quickly and accurately. This is where kubit intends to focus continual improvement per industry.

So far the company has focused on the plant, building and heritage worlds. Products like kubit’s PointSense Plant

Figure 4, VirtuSurv for Revit used to extract BIM model from point cloud data.

(Figure 3) aim to improve the AutoCAD piping and structural designer’s workflow by extracting intelligent, catalogue information from point clouds or making it easier for drafters to extract specific tie-in points and analyse equipment, all within the familiar AutoCAD environment. The continuous push for BIM is further fuelling the requirement to extract useful information from as-built data. The kubit team is also answering this call with new VirtuSurv extraction tools for Revit (Figure 4) which help architectural designers to model BIM elements from laser scan data. The opportunities are plentiful and the demand for innovation is far from slowing down.

What Lies Ahead?

The kubit team believes that a much bigger future lies ahead for the capture industry. The days of the early adopters in 3D capture will soon be behind us (if they are not already). The major software players such as Autodesk, Bentley and Google have already made a significant commitment to bringing reality data to the masses. As a result, hardware options will continue to become more affordable and experience greater reach. More industries will begin to see data capture as a necessity. This will bring an entirely new world of applications and opportunity for those involved. The kubit team sees a world where no designer starts from a blank canvas. Real-world data and new design will become common, and workflows will continue to be better defined per industry. kubit envisions a cycle of capturing the real world, modifying the real world in the design world, and bringing the design data back to reality (via 3D printing, more automation, etc). kubit will continue to improve workflows within the current focus industries while expanding into new industries which need improved workflows. As technology progresses, kubit plans to continue doing what it does best: step-by-step growth while adapting and benefiting from booming 3D global trends. The future looks bright in 3D.

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