Kinetic Vision

Powerful Immersive Experiences Revolutionize Product Development and Manufacturing

As digitalization progresses in the manufacturing world, augmented reality (AR) and virtual reality (VR) are among the technologies that break the barriers of creativity in multiple verticals, proffering users with a virtual perception of manufacturing lines, retail environments, and products in action. Thanks to advanced, powerful processors and GPU-enabled graphics cards, new products and processes can be developed virtually using a real-time simulation called extended reality (XR). However, there is a catch. The scarcity of resources for technological research and development exploration makes it tedious for manufacturers to explore, test, and validate technologies to improve efficiency and the quality of their products. This is what Kinetic Vision intends to change.

Since its inception in 1988, Kinetic Vision, a full-service research and development company, has been offering a spectrum of services to supercharge product innovation and time-to-market. From developing concepts for new products, visualizing industrial and mechanical designs, implementing new manufacturing processes, prototyping, modeling and simulation, Kinetic Vision's XR platform does it all.

In his interview with CIO Applications, Rick Schweet, President of Kinetic Vision, shares his insights into his company's unique value proposition and advanced services for tackling challenging product and technology development.

How has Kinetic Vision positioned itself in the AR/VR marketplace?

At our core we are a technology development company. AR, VR and XR are powerful tools that help our customers design, visualize and collaborate while they develop new products and processes. For example, creating a new manufacturing line is a costly, time-consuming process when done the traditional way. Utilizing 3D CAD in the design development is a start in the right direction, but building a physical prototype and the software to control it, and then testing the system and debugging the software using physical hardware is extremely inefficient. Just one small change can delay development by weeks or months. Conversely, when designing the system using an XR simulation, iterations are done in hours or days. Once the hardware and software are tested, optimized and debugged virtually, the entire system is transferred to the physical space. That's the concept of a true digital twin.

Rick Schweet,
President

What are the challenges your clients face in the AR/VR landscape and how does Kinetic Vision address them?

Most of our clients are large companies that are slow to embrace new ideas without a quantifiable return on investment (ROI). The biggest challenge for us two years ago was helping our clients understand the benefits of AR/VR/XR technology and its impact on ROI. It was an educational process, but once they understood the possible use-cases in R&D, marketing and manufacturing, they jumped on board.

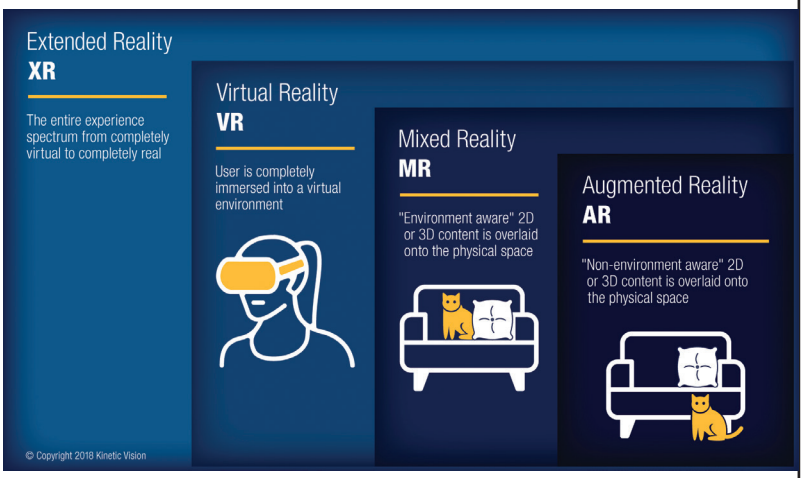
However, implementing these technologies into the R&D pipeline requires a dual understanding of digital product development and AR/VR/XR tools—expertise in one or the other isn't enough. Our secret sauce is that we have the multidisciplinary skills needed, including design, engineering, software development, visual communication and real-time simulation. Our knowledge of traditional R&D methods allows us to effectively implement these new digital development approaches.

How do your products and services benefit your clients?

We speed product innovation by utilizing the latest technologies and effectively integrating various design and engineering disciplines. This dates me, but we're conceptually similar to the Lockheed Martin Skunk Works team that created the SR-71 Blackbird in the 60's: a small team of

experts with diverse skills that formed a cohesive team with streamlined project management. They created an extremely innovative product in a very short amount of time. Many of our projects require three or more skill disciplines to complete. For example, any sort of electromechanical device requires industrial design, mechanical design, electrical design and software development. Most companies can't provide these skills under one roof, and create the efficiencies that save our clients time and money.

We've also created an AR app that runs on mobile devices that virtually places new product concepts on anywhere from conference room tables to store shelves. The specific product can be user-selected and the data is dynamically downloaded from the cloud or the customer's secure network. The product looks 100 percent realistic and once placed the user can zoom or move completely around it just like the real thing was there. Our customers love this functionality; it energizes review meetings and engages people way more than traditional presentations.



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Our most complex work involves XR simulations, which are validated digital twins of physical environments. The use-cases span the spectrum of possibilities, from product and process R&D, to market research and training. The common denominator is the integration of multiple inputs. These environments are not just simple navigable three-dimensional spaces; they often include virtual machinery, robotic systems, IoT sensors, camera systems and the software to integrate it all together. In addition, our XR simulations bring all the project stakeholders on board during the development process. For example, development of a new manufacturing line in XR not only enables the R&D team to virtually design and optimize, it also allows the safety, training and maintenance groups to participate along the way. This integrative collaboration occurs even when the key stakeholders work thousands of miles apart—all they need is a VR headset.

What are the different disciplines required to construct an XR environment?

Creating traditional VR scenes require just two different skill-types: a computer graphics (CG) digital artist and a VR developer. XR environments are much more complex and require 4-5 additional disciplines. Most technical environments involve large CAD assemblies that need to be parsed and simplified by a design engineer. Then a CG digital artist further reduces the model complexity and creates materials and textures to add realism. Next a VR developer integrates the model into the game engine. Implementation of camera or sensor systems requires an electrical or mechanical engineer. Modeling of complex sub-systems might necessitate that a modeling and simulation engineer create a "black box" equivalent. Often custom software is written to interface the scene with external networks or to control custom systems within the XR environment. If the XR digital twin is used as a platform to create synthetic training data for machine learning, an AI developer is required. All told seven disparate disciplines may be needed instead of the two required for a typical VR environment. We are fortunate to have all those resources in-house, and are unique in that respect.

What does the future hold for Kinetic Vision?

Our customers are all interested in how AI, specifically machine learning, can help them solve their most difficult problems. They hear of the success stories with personal digital assistants, image recognition and self-driving cars and wonder how they can leverage their existing data to create these systems. Developing AI for new processes has a "chicken and egg" problem however; the data requirements are huge but often physical training data isn't available. The solution is synthetic data, which is artificially created but indistinguishable from the physical information. Our expertise in creating synthetic data for machine learning lead to the formation of a new division, Deep Vision Data, which specifically focuses on this market. We see this business as our greatest potential growth area. CA