

PROFILE

Name: Apprentice.io
Location: Jersey City, NJ
Founded: 2014
Website: apprentice.io

CHALLENGE

Provide hands-free access to critical diagrams, manuals, instructional videos, photos, instrumentation data, and other digital information to lab and manufacturing workers without causing a pause in workflow.

SOLUTION

Integrate the latest Moverio[®] BT smart glasses from Epson with the new Apprentice augmented reality platform to help technicians, scientists and engineers work more efficiently in a range of high tech and pharmaceutical development and manufacturing environments.

Augmented Ability

Epson Moverio Key to a Fast-Growing Biopharma Research and Manufacturing Platform



“If you sit behind a computer all day, you always have information at your fingertips, but if you work in a lab or manufacturing facility, it’s a different story. Yet critical, hands-free information can be very valuable to workers in those environments.”

That’s Angelo Stracquatano, CEO of Apprentice.io, talking about the new Apprentice augmented reality platform. Apprentice, he says, allows people who work with their hands to easily access digital information throughout the day, whether they are performing experiments in a lab or working in a biopharma manufacturing suite.

To make that possible, Apprentice relies on the latest Moverio BT-350 smart glasses technology. Epson has incorporated its projector technology and front-facing camera into a lightweight pair of glasses, which, together with the Apprentice platform, allows workers, engineers and scientists to view schematic diagrams, product manuals, instructional videos and other digital information hands-free. At the same time, the built-in Moverio camera allows them to capture visual data quickly and naturally without pausing from their work.

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“Having a pair of smart glasses like the Epson BT-350 is incredibly empowering,” Stracquatano explains. “Individuals don’t have to pick something up or put something down to view important information. They can be completely hands-free and have the most up-to-date data available to them. They can also capture information in the environment around them just by looking at it.”

The Idea Behind Apprentice

Stracquatano, a software engineer with a background in mobile application development, remembers being very intrigued when the first smart glasses were introduced in 2013. He and global sales leader, Gary Pignata, began talking about starting a company that would use wearable devices to help technicians, scientists and engineers work more efficiently in pharmaceutical research and manufacturing.

“I was the one who would build the applications, with my partner providing the expertise in biopharma,” Stracquatano recalls. Although there were regulatory hurdles and deployment challenges, their plan was a good one and the company grew rapidly.

Using the Moverio smart glasses, Stracquatano explains, is very natural, with the image it displays appearing to be projected about eight feet in front of the user.

Thus, it's possible to show a schematic diagram just to the side of a bioreactor while the worker is setting it up or to project the steps in a standard operating procedure to guide a technician performing those steps.



It was a straightforward idea in a field too often dominated by science fiction-like claims. “We’ve been able to succeed with this emerging technology, but we’re doing it in a way where it doesn’t have a lot of the sizzle that people are thinking about when they think of augmented reality,” Stracquatano says.

At the root of the Apprentice platform are three basic modules.

The first, *Manuals*, provides access to safety checklists, batch records, or other information through the smart glasses. “We always start out with the procedures and documentation that the client already has, so it’s easy to prove the value of the technology,” Stracquatano explains. From there, clients may add photos, videos and 3D renderings, depending on their needs and the value of the process.

“We’re all human, and sometimes operators or engineers get confused, don’t know what to do or simply guess, and that leads to expensive mistakes,” he adds. In a modern biopharma plant, error-free performance is especially important because a single batch of medicine may be worth tens of thousands of dollars. But it’s especially difficult in an industry where genome-based, single-batch medications are becoming common, so *Manuals* can be a huge help.

A second module, *Gauge*, allows researchers and factory workers to capture information from various instruments using the camera built into the Moverio glasses, then input it automatically into the factory or laboratory suite. “We’ve actually been able to cut transcription time by up to 60 percent, as well as avoiding the inevitable transcription errors,” Stracquatano

explains. When capturing data, *Gauge* also captures still photos, validating the data for audits.

Gauge can also help operators and technicians interpret various kinds of instrument readings. For example, a red “X” can appear in the glasses when an operator looks at a piece of equipment that’s already in use to make sure he or she doesn’t try to open it by mistake. If *Gauge* readings are outside established parameters, the software can recognize that and color-code them so operators instantly know if something is wrong.

A third module, *Tandem*, is a remote troubleshooting component that allows experts, not on site, to see what an operator is seeing via Moverio’s built-in front-facing camera. “The return on this investment becomes very clear,” Stracquatano says. “You are using the headset to live stream exactly what you’re looking at to vendors, colleagues or subject matter experts somewhere else in the world. And, so they don’t have to hop on a plane to solve your problem.”

Clients, including top 25 pharmaceutical companies, are using Apprentice in manufacturing, research and development, and also in facilities maintenance, quality assurance, safety, training, and packaging. It is deployed in more than 15 countries on four continents around the world.

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—ANGELO STRACQUATANIO, CEO, APPRENTICE.IO

“I’ve given a lot of demonstrations of Apprentice and it’s very interesting to see how people react,” Stracquatano says.

“I can talk about augmented reality and ‘smart glasses,’ but people don’t really understand until they put a headset on. Once they experience it, it’s magical. The tone of the meeting completely changes.”

Epson Moverio

Stracquatano says he and Pignata decided early on that their software should be device agnostic, that it should work with any brand or type of smart glasses available on the market.

That said, the Moverio BT-350 is an outstanding choice because it is extremely lightweight, yet provides a high-contrast, highly accurate, high-definition Si-OLED color display at a reasonable price. It includes a five-megapixel camera, a microphone and a

powerful, very compact, wearable quad-core CPU with a multi-touch pad. Unlike some other smart glasses, Moverio has both lenses available for viewing and is able to support 3D content. All of these capabilities help the device to run the Apprentice applications, record and store still images and HD video, and tie into the enterprise network.

Moverio is also a proven solution, having been used by companies around the world to create and enhance the experience of their customers. Apprentice has used Moverio since AFS was organized in 2015.



For the future, Stracquatano hopes that Apprentice will help empower working people to take on more and more complex tasks. “We feel that the kind of labor where you do the same thing over and over again will eventually be fully automated. That said, we also expect there to be more and more tasks where someone working together with the computer can achieve substantially better results than either a human or machine could on their own. We’re seeing that now in the manufacture of single-use, personalized medicines.

“As cycle times get shorter, and time to market gets faster, there are going to be huge demands placed on human labor to be able to keep up,” Stracquatano adds. “I think that’s where this intersection of AR and AI, this highly automated, highly sophisticated manufacturing is going to help.”

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For the individual working in these environments, he notes that “it’s very challenging to collaborate globally, stay compliant, access procedures, capture information, understand what that information is and how it relates to what you’re trying to do on a day to day basis. So we built our solution not around augmented reality but around real pains from real people.”

“The beauty of the Moverio BT-350 is that its OLED screen is completely featherweight, but you can have large amounts of content in your field of view.”

“If you’re a scientist or an engineer, working in industrial, complex manufacturing or research environments, having this content available to you on an incredibly lightweight and safety-compliant device is really powerful.”

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