RAYVIO BRINGS UNIQUE UV LED TECHNOLOGY TO LIFE IN RECORD TIME WITH JABIL'S DIGITAL PROTOTYPING AND ONE-STOP-SHOP PRODUCT DESIGN SERVICES

"We are poised to create a whole new industry with never-before-possible applications. With help from Radius and our product partners, we can really change the world on a fundamental level while addressing some of the biggest problems of the 21st century."

Dr. Robert Walker,
Co-Founder and CEO, RayVio

Case Study

RayVio

Company: RayVio

Industry: Health and Hygiene

Country: Hayward, CA, USA

Website: www.rayvio.com

CHALLENGES

- Demonstrating unique UV LED technology to inspire potential product and brand partner participation.
- Special expertise required to build working product prototypes in a short timespan.

SOLUTION

- Radius Innovation & Development offered highly specialized skills and state-of-the-art digital prototyping to cut development time in half.
- Complete end-to-end services enabled production of 200 water bottle iterations in record time.

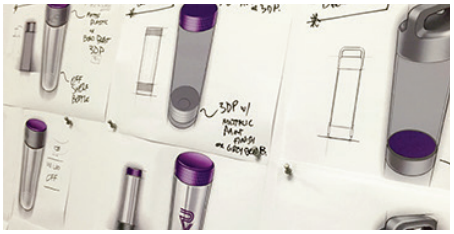
BENEFITS

- Jabil and Radius enabled RayVio to elevate its business development and spur early partner engagement by bringing its technology vision to life.
- RayVio has validated its technology claims, inspiring confidence and growing support for its "microchip of health" and ability to support never-before-possible applications.

RayVio is an advanced health and hygiene company aspiring to make the world a better place by delivering clean water and environments with its game-changing UV LED technology. The company's patented technology has disrupted the entire UV market by lowering cost and performance barriers to set the stage for a new class of products designed to protect billions of consumers from germs in water, air and on surfaces.

RayVio's powerful technology is embedded on a semiconductor chip that can be integrated easily into a variety of consumer products, including water bottles, mobile phones and everyday appliances. Called a "microchip of health," the technology enables far-ranging hygiene and water safety applications.

According to Dr. Robert Walker, co-founder and CEO of RayVio, the company's technology kills 99.9% of germs, including superbugs, within 60 seconds and without chemicals or costly consumables. "We're empowering people to take control of their health and hygiene," he explains. "Products using our technology can provide clean water and safety from infectious diseases, particularly in environments where governments can't or won't provide that level of protection."



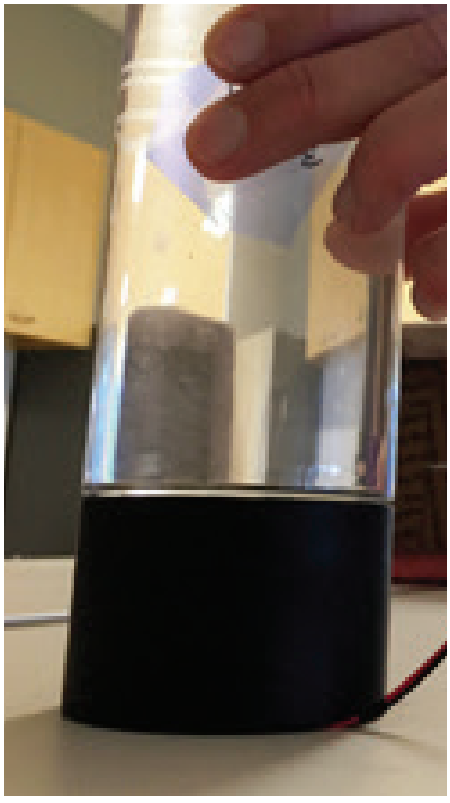
Igniting Imaginations, Inspiring Innovation

The essence of RayVio's UV LED breakthrough originated from a doctoral thesis developed by Dr. Yitao Liao, co-founder and chief innovation officer at RayVio. He addressed how to improve the efficiency and affordability of UV LED technology while packaging it with other sensors and electronics to purify drinking water, treat major illnesses and instantly disinfect surfaces. "Our goal was to push this technology into the world as soon as possible," explains Liao. "We needed to make it easily accessible to a wide variety of brand and product partners."

RayVio's founders sought an effective way to demonstrate how its solution worked without getting into the technical "weeds." "The idea is so big and technology so compelling, it's difficult to describe it without getting bogged down in UV LED language that people don't understand," says Walker. "We decided it made more sense to build some actual products so partners could envision the potential and be inspired to join us."

To bring its technology vision to life, RayVio decided to develop a self-disinfecting water bottle that would purify water in 60 seconds. "Developing a water bottle with built-in UV LED technology would provide safe, clean water anywhere, anytime," says Liao. "The challenge was building a working prototype that went well beyond a simple reference design to provide a beautiful product that people could relate to."

For that level of specialized expertise, RayVio turned to Radius Innovation & Development, a consulting firm acquired by Jabil in 2012. With integrated manufacturing experience and capabilities, Radius is uniquely qualified to help companies like RayVio dramatically accelerate the product development process. Radius is adept at understanding how lifestyles and emotions connect with great design and product experiences to drive positive consumer outcomes and build brand loyalty. "The shape, look, touch and feel of the water bottle were all critically important," says Liao. "When the light turned on, the bottle had to be beautiful and functional. Radius knew what we wanted to accomplish and had the vision and expert services to make it happen in record time."



Idea to Prototype in Six Weeks

One of the first things about Radius that stood out to RayVio was the team's relevant backgrounds and experiences. With countless development projects featuring embedded semiconductors, disinfecting solutions and water-related products, Radius brought special knowledge to the table that ultimately proved invaluable in producing a prototype that validated RayVio's technology claims. "Not every firm understood what we were trying to achieve, but Radius got it and had the relevant experience to back it up," Liao says. "The decision to go with Radius was straightforward."

> "Radius helped us bring our technology vision to life -in six weeks- by delivering a tangible product to show our growing partner ecosystem. Using advanced technologies, Radius powered through 200 product iterations to produce prototypes in half the time it normally takes. Jabil's ability to offer all these integrated capabilities under one roof can greatly reduce time-to-market and the costs associated with introducing any new technology."
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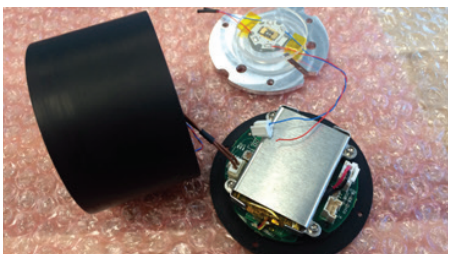
> **Dr. Yitao Liao, Co-Founder and Chief Innovation Officer, RayVio**

Shortly after joining forces, Radius supplied RayVio with a 30-question form that probed crucial aspects of the technology and market. "The questionnaire forced us to make decisions about market reach, design options, cost implications, timing, etc.," recalls Liao. "As an electrical engineer, I was pleasantly surprised at the detailed thought process used to drive the projects, especially since time was of the essence."

Together, the team weighed a variety of options to showcase the UV LED technology in the design of the water bottle. RayVio made several trips to Radius in San Jose, as its offices are co-located at the Jabil Blue Sky Innovation Center. Considered a treasure trove of the latest technology tools and manufacturing solutions, Blue Sky also is home to the Radius Digital Prototyping Lab (DPL), where ideas and product prototypes undergo a rapid, iterative process of design, build, analysis and testing. A plethora of options are presented and vetted until the list shrinks to the ultimate product that meets all design and production parameters. "Radius always presented lots of options, despite the demanding project schedule," Liao adds. "We were very impressed with the state-of-the-art facilities at Blue Sky. The rapid prototyping facility was a major contributor to our success."



Another success factor was the team's ability to produce multiple iterations of the water bottle in short order. The user experience experts, designers, engineers and mechanical engineers at Radius explored various bottle architectures and configurations. The ideation process included working on design options, simulations and materials selection while addressing potential pitfalls involving LED window placement, heat dissipation and power.

In rapid-fire fashion, Radius powered through hundreds of bottle designs as well as dozens of sealing solutions to build the final bottle prototype. At the DPL, specialists used leading-edge CAD tools, 3D printing, CT scanners and digital die cutters with computer numeric control (CNC) mills to build and test all the parts. Collaborative problem solving was fueled by regular face-to-face meetings and phone calls between RayVio and Radius engineers who shared a common purpose. "Our communication was always efficient and productive," Liao says. "I have a lot of trust in Radius. Our shared passion and domain expertise led to the development of a beautiful water bottle."

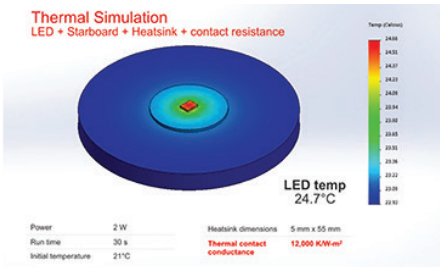
By taking advantage of the DPL's equipment and services, Radius increased the number of iterations while dramatically shortening the time to make changes and produce modified designs. "Radius helped us bring our technology vision to life – in six weeks – by delivering a tangible product to show our growing partner ecosystem," says Liao. "Using advanced technologies, Radius powered through 200 product iterations to produce prototypes in half the time it normally takes. Jabil's ability to offer all these integrated capabilities under one roof can greatly reduce time-to-market and the costs associated with introducing any new technology."

Validating the Value of UV LED

With working water bottle prototypes, RayVio quickly accelerated business development with brand and product partners. "Having such beautifully designed prototypes has really helped in securing early partner engagements and moving the business forward," says Walker. "Not only can we validate the value of our technology, we can explain how manufacturing volume can scale exponentially."

RayVio credits Radius for jumpstarting its technology vision. "The advantage of working with Radius is having a complete team to address the different aspects of the technology that needed to be integrated," explains Liao. "Their dedication, expertise and state-of-the-art facility helped bring everything together in a very aggressive timeframe."

Pent-up demand for a working prototype from potential customers around the world has prompted RayVio to produce more. "Being able to put a prototype quickly into the hands of potential customers has really helped our business," says Liao. "The opportunity to see, hold and use the bottle gives customers a lot of confidence in our technology and ability to help them reach volume production scale quickly."



In addition to engaging product partners, RayVio is gearing up efforts to share the promise of its technology with potential backers.

In November 2016, the company launched an Indiegogo campaign to raise funds to produce Ellie, the world's first portable UV LED baby bottle sterilizer. Using RayVio's patented UV LED technology, the sterilizer will eradicate e. coli, Salmonella, Staph and Listeria, along with antibiotic-resistant superbugs, such as MRSA. The company plans to follow this campaign with another to support the production of a portable water bottle that travelers can use to disinfect water on the go. A third crowdfunding campaign will focus on a flowing water application, a water faucet that literally disinfects water as it's dispensed.

RayVio's ability to demonstrate the power of its UV LED technology is opening the door to all sorts of applications. For instance, the company is exploring the feasibility of partnering with a solar company to produce a solar-powered, self-disinfecting water pitcher for rural Africa, where clean and safe water is scarce. Thanks to work with Radius and the ability to produce a prototype in six weeks, RayVio is one step closer to fulfilling its mission to make the world a better – and safer – place.

"We are poised to create a whole new industry with never-before-possible applications," concludes Walker. "With help from Radius and our product partners, we can really change the world on a fundamental level while addressing some of the biggest problems of the 21stcentury."

About Jabil

Jabil is a digital product solutions company providing comprehensive electronics design, production and product management services to global electronics and technology companies. Offering complete product supply chain management from facilities in 27 countries, Jabil provides comprehensive, custom solutions to customers in a broad range of industries. Nypro, a Jabil company, specializes in medical devices, with a global footprint of ISO13485 and FDA registered facilities, manufacturing many of the most recognized medical brands for major healthcare and wellness companies. Jabil common stock is traded on the NYSE under the symbol, "JBL". Further information is available on Jabil's website: jabil.com.