



Case Study

Silex Technology Provides Always-On Connectivity to Next-Gen CogniToys



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The Challenge

Elemental Path, a startup specializing in the development of conversation-based technology, wanted to improve their wireless connectivity, streamline the connectivity process, and increase product functionality while keeping development costs low for their smart, educational toys, known as CogniToys.

The Solution

Elemental Path worked closely with Silex Technology to incorporate a custom, low-cost, and low-power Wi-Fi module with dual-band Wi-Fi connectivity and on-board processing that streamlined the connectivity process, increased the functionality, and ensured always-on connectivity of its second-generation CogniToy, Scout.



Scout, Elemental Path's second-generation CogniToy, is powered by Silex Technology's Wi-Fi module to ensure always-on connectivity.

Today, interactive voice-activated smart devices have a range of uses in many households – from full home automation to delivering on-demand answers to virtually any question you can think of. These devices are typically connected to the Cloud and use machine learning to get to know user preferences to grow their knowledge base, becoming ever more relevant and useful.

As with any Internet-of-Things device, constant connectivity is critical, and reliable Wi-Fi modules are key to success of the product. For these devices to be truly useful, consumers need the product to work all the time, every time.

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Elemental Path engineers are dedicated to bringing this technology to kids in a safe, easy-to-use, and educational format through their CogniToys, adorable dinosaurs that help kids discover and learn. These CogniToys are powered by Elemental Path's proprietary technology known as "Friendgine," which humanizes the interaction between people and software by enabling the toys to engage in real and personalized conversations.

Connectivity is Critical to Any IoT Application, Especially for Kids

With a technology-based educational toy, one of the most important factors is ease-of-use out of the box. If the set-up and configuration of the toy is complex, users can easily become frustrated before they can even engage with the product – resulting in it being cast aside and never to be used again. For a Wi-Fi-enabled toy, like a CogniToy, seamless connectivity is at the heart of its ease of use.

With Elemental Path's first-generation CogniToy, users ran into ease-of-use issues as a result of connectivity problems stemming from the single-band 2.4 GHz Wi-Fi module used in the toy. Since many in-home Wi-Fi networks are solely 5 GHz or selectable dual-band devices that need to be manually configured to connect with a 2.4 GHz device, the Wi-Fi module in the CogniToy was not automatically connecting to some in-home Wi-Fi networks.

Additionally, since the 2.4 GHz band is highly congested, in densely populated areas, such as large condo or apartment buildings, even when 2.4 GHz routers were in use, some of the CogniToys were having a hard time finding and connecting to networks. Simply put, connectivity issues were preventing this new toy from providing kids the learning, entertainment, and joy that it was designed to deliver.

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Elemental Path's first-generation CogniToy, which proved to be a valuable educational platform that Elemental Path knew it could iterate on to further improve its benefits and functionality.

Elemental Path was determined to simplify the connectivity process and solve these initial problems, but ran into challenges with the lack of phone support from their Wi-Fi module manufacturer. They were committed to responding to their customer concerns quickly, which proved to be difficult when they were spending so much time searching for answers due to inadequate support from their Wi-Fi partner.

When It Absolutely Must Connect: A New Partner for the Second-Generation Toy

As Elemental Path started development for its second-generation product, their engineers wanted to take what they learned from their first CogniToy launch so they could make their second-generation CogniToy an even better experience for users.

The two biggest improvements they wanted to make were centered around using a dual-band Wi-Fi module with an on-board processor to power their sophisticated application and finding a company that could provide reliable connectivity while also offering superior support.

Elemental Path knew its original supplier was working on building a 5 GHz Wi-Fi module into its product road map, but it was not ready when they started development. They also knew they would still struggle with support issues if they worked with the same vendor. So, they began to consider

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other options. Through the company's existing relationship with Qualcomm, they connected with Silex Technology and started exploring options Silex Technology could offer.

A Custom Silex Module to Power a Sophisticated Application

Silex provides a wide variety of off-the-shelf Wi-Fi modules as well as custom modules to meet virtually any embedded wireless application. Once Elemental Path consulted with the Silex engineering team, Elemental Path decided to go with a custom approach to power their application.

As an early proof of concept, Silex Technology ported Elemental Path's application code from their single-band module to the Qualcomm QCA4010 module. This was possible because of Silex Technology's engineer's technical know-how and expertise as well as their intimate knowledge of the QCA4010 module architecture and its ThreadX RTOS development environment. This proof of concept showed Elemental Path that they could make one of the biggest improvements they were focused on with their second-generation CogniToy while still keeping costs low.

This proof of concept resulted in Elemental Path selecting Silex Technology as their Wi-Fi partner for two reasons: it showcased the company's technical capabilities and demonstrated how willing Silex was to share their experience and provide support, which was important to Elemental Path. In the end, this led to the development of the SX-SP242 module, a dual-band low-energy, low-power Wi-Fi module with an onboard processor that met all Elemental Path's technology and cost requirements.



The custom dual-band low-energy, low-power SX-SP242 module Silex Technology Developed for Elemental Path's second-generation CogniToy.

Not only did Silex Technology provide Elemental Path with the technology they needed, they offered the support they required throughout the development process and beyond. First, as a Qualcomm Authorized Design Center (ADC) Silex Technology has access to the Wi-Fi module's source code to

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make changes that most companies do not have. This was a huge advantage when developing the proof of concept and final module.

Additionally, Silex Technology helped Elemental Path port its software from their first-generation device to the SX-SP242 module, which made the transition between Wi-Fi modules faster and smoother. Throughout the development process, the two companies worked together closely and had weekly calls. If there was ever an issue that Silex couldn't address, they contacted Qualcomm directly and quickly received an answer, a connection made possible through their ADC relationship.

Elemental Path CEO Donald Coolidge believes consumer robotics will be ubiquitous in 10 years, and as a result, he plans to continue evolving their CogniToys for many years to come. Thus, he wanted to ensure the Wi-Fi module provider they selected could not only support this product, but that the company was also aligned with their long-term goals.

"Because of the amount of contact we had directly with Silex Technology engineers throughout the development process, we feel confident they will continue to provide the direct support we need for this product and all future application development," Coolidge said. "We also feel strongly that Silex not only supports what we are doing right now, but we know their product road map, feel confident in their technical expertise, and know we have formed a partnership that will continue to support our development well into the future."

About Silex Technology

Silex Technology is an embedded network technology company specializing in local area network and wireless (802.11 a/b/g/n) technologies providing software, modules or turnkey products. As the world's leading supplier of print servers, Silex Technology is leveraging its technology and know-how into new applications as well as developing new technologies to meet the expanding need for connectivity for consumers and business users. Silex Technology has regional offices for sales, marketing and development in Japan, U.S., and Germany. Silex Technology is vertically integrated to support the customer from design to production maintaining the high quality standard. For more information, please visit www.silextechnology.com.

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