



GEORGE GILDER'S MOONSHOTS

Uncovering Explosive Stocks With the World's Top Futurist

QuickLogic at the Vanguard of the “Edge AI Economy”

The Edge AI Economy? There's quite a lot packed into those three terms, to say nothing of their combination. In many ways, the phrase captures the very essence of the Cryptocosm. So let's unpack it a bit to understand what it means for our very-near future — and to that of one of our *Moonshots portfolio* favorites, **QuickLogic (QUIK)**.

Come along with us now on a journey to the intelligent edge.

Living on the Edge

Briefly, edge computing comprises small, inexpensive, low-power solutions that enable data processing at or near the source of data generation. In the context of the internet of things (IoT), for example, these data sources include sensors that are integrated with embedded processors of one sort or another.

“Edge AI” brings machine learning algorithms to the processing party.

These are generally compact neural networks, trained to make hyper-local decisions in real time in response to sensor signals of interest. You experience these technologies daily with your smart speakers and other appliances in your home, at work, or in your car.

Indeed, the intelligent edge is proliferating all around you in ways you may not even realize...

But Why the Edge?

There is a host of reasons why the edge is where the action is. Localization of control is a big one. Many applications simply cannot tolerate the latency that comes with sending data across networks and devices, or to and from centralized processors in some remote cloud.

A key driver for the development of the Cryptocosm is decentralization, with computing resources distributed across the myriad edge-resident endpoints. Which brings us to another Cryptocosmic driver: privacy.

The edge is the computing equivalent of “What happens in Vegas, stays in Vegas.” That is, keeping it local, keeps it off the cloud — when you want it that way (more on this in a moment).

But what about security? We've made a point of pointing out in this space that the edge presents entirely new attack surfaces for malicious actors to pursue. This is very true.

On the flipside, however, increasingly distributed architectures also bring with them multiple layers of encryption — and more dynamic encryption mechanisms, to boot. Moreover, a number of remarkable new security tools are emerging (I'm thinking, for example, of [Tempered Networks](#), which segments IoT endpoints, practically cloaking them from prying eyes) that protect edge-deployed intelligence nodes in novel ways. Contrast this with the ever-increasing security and privacy sensitivities associated with the Cloud.

Finally, the edge brings end-to-end resiliency, also by virtue of its distributed nature, which effectively “load balances” the billions of endpoints that will ultimately be deployed. Of course, “cloudlets” will also factor into the equation as edge data will surely benefit from higher levels of aggregated analytics. In any case, with compute residing at the edge, device resiliency is dramatically increased.

None of this is to suggest that edge computing will replace the cloud. Not at all. Rather, we should think of the edge as the decentralized extension of the larger networks. At least for starters. Notwithstanding, we're about to witness a veritable explosion in the edge computing market, which, as we shall soon see, will define an entirely new kind of economy. And it will be transformative.

Think about this: Just a few years ago, more than 90% of all data was processed in centralized data centers. But by next year, we'll see *three-quarters of all data* being processed at the edge. That presents a massive market opportunity. Still, edge computing will function in conjunction with the cloud for what the cloud does best. The edge, though, will belong to smart companies like... **QuickLogic (QUIK)**. And the open source movement will help propel and accelerate the growth of both the edge and the company.

Bringing Intelligence to the Edge in an Open Source Platform That Combines the Best of All Worlds

Last December, we featured an [in-depth interview](#) with QuickLogic CEO Brian Faith. You might recall that the company had just announced a major strategic pivot to embrace the open source movement. Now, open source is nothing new, but what was unusual about QuickLogic's move is that it represented the first major break from the proprietary tools paradigm by a significant player in the FPGA space.

You see, proprietary tools are preferred by FPGA vendors because they create stickiness with their customer bases. By wrapping proprietary tools around their IP, they create a sort of walled garden, locking in their users. That's all well and good, but the fact is, where FPGAs are concerned, this arrangement not only addresses what turns out to be a fairly small market, it severely restricts opportunities for accelerated growth. Let me explain.

First, the big picture. In the US, computer hardware engineers face a market of only 32,000 available jobs, with growth projected at an anemic 2-3% over the next decade. This is lower than the average for all occupations! Not great. Contrast this with a field of nearly *5 million software developers*, with perhaps as many as 1.5 million jobs available, and with employment demand growing by more than 20% over the coming years. You see where this is going.

So, big question: if you're a company building hardware products that are targeted to a shrinking population of hardware engineers, how will you grow? More directly, what will you *disrupt* in order to grow?

The Big Move to Open Source — and a Development Platform for the Masses

Brian Faith is convinced that just as RISC V disrupted the processor space, open source design tools will disrupt the FPGA space. How? By making the technology available to a much larger potential user base.

To this end, in 2018, the company began its pivot away from its traditional markets in favor of building a platform that would be scalable to the masses. “This meant focusing more of our engineering resources,” Faith explained, “ensuring the platform could be usable by the many, and without a lot of direct support from our own engineers.”

Accordingly, the QuickLogic team engineered fully-integrated end-to-end hardware and software stacks aimed straight at developers working in high-growth edge-computing markets. Markets such as wearables, hearables, smartphones, consumer electronics, industrial, military, and IoT — markets and applications that will benefit from the company’s novel EOS S3 FPGA SoC platform, which also features an embedded Arm® processor. (Both FPGA and embedded processor components are needed to cover the waterfront of edge computing.)

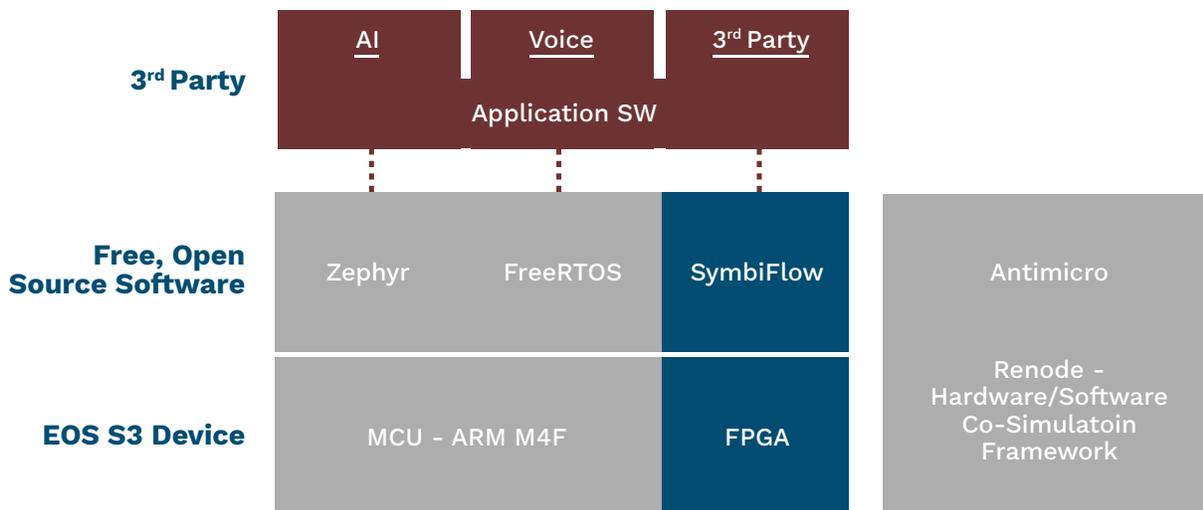
As Faith explains,

“If you believe that AI and machine learning is here to stay, and if you agree with the research that programmable logic [the SoC’s eFPGA compute fabric] brings value in these use cases where algorithms are evolving faster than ASIC technology can keep pace, then I think you can also believe that QuickLogic is exceptionally well-positioned to take advantage of this evolving market.”

Indeed. As to the embedded Arm processor, it performs its complement of functions that span a runtime operating system, support of the system design kit environment, and FPGA configuration, among other things.

It’s a combination that grew out of the company’s collaborations with Google to create QORC — the QuickLogic Open Reconfigurable Computing standard. And it’s pretty slick. It’s also geared for appeal to the massive population of software developers targeting their applications to the edge.

QuickLogic’s QORC Development Ecosystem Defined in Collaboration with Google and Antmicro



Calling all Developers

The QORC initiative is truly groundbreaking. “This open source tool chain,” Faith continues, “which sits on top of our hardware, makes the technology accessible to the masses, and easy for software engineers to use — even when developing in their preferred environments, like Python, for example. The system is able to take those inputs and convert them to FPGA gates for execution on our boards. In short, it means we can start targeting pure software engineers with our hardware.”

Now, remarkable as this may be, it’s actually about to get even more interesting.

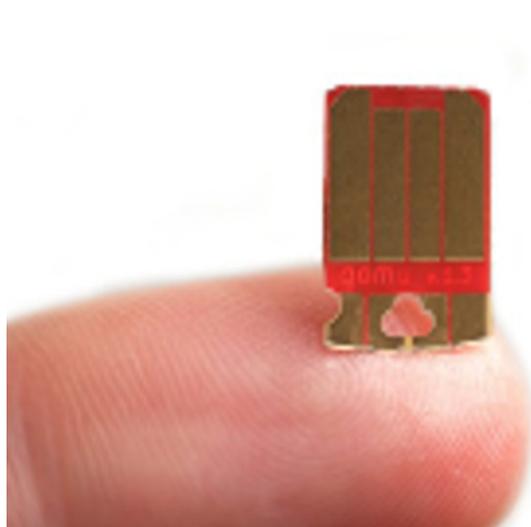
Brian tells us:

“If I were to say even a year ago that people will be able to use their smartphones to run FPGA tools, I’d have been laughed out of the room. But here we are. Think about the number of users now: I’m not talking about tens of thousands of FPGA engineers or even a million software engineers, but billions of people around the world who now can have the tools needed to program our intelligent edge devices. And they run on a smartphone. This is a real tipping point — a true democratization of the hardware, and an exciting opening of the edge frontier.”

Indeed, QuickLogic technology gives a real edge to those bringing intelligence to the edge. And to these ends, the hits keep coming. The company is currently in the process of launching three new development kits. “The first, launching this week,” Faith tells us, “is in conjunction with our Amazon AVS certification. It’s called the QuickFeather AVS reference design, and is intended for manufacturers to evaluate the ‘Alexa User Experience’ and build proofs-of-concept for smart voice-initiated Alexa built-In devices with Close-Talk support.”

The company is also launching the next generation of its QuickFeather platform, called SparkFun Thing Plus QuickLogic EOS S3. “As the name would indicate,” Faith explains, “this dev kit is being manufactured and sold by SparkFun, a popular source of electronic dev kits and components that will also be distributed through our collective worldwide distribution channels. Spark Fun has a diverse set of sensor boards that can connect seamlessly with the Thing Plus dev kit, making it easier for our customers to build proofs-of-concept for AI/ML-enabled systems using EOS S3 and SensiML.”

SensiML, you might recall, is QuickLogic’s wholly-owned subsidiary dedicated to transforming raw sensor data into meaningful insight. The SensiML Analytics Toolkit provides an end-to-end development platform for data collection, labeling, algorithm and firmware auto-generation, and testing. Interestingly, SensiML had its origins as one of Intel’s New Business Initiatives to build AI toolkit for the Curie IoT microcontroller.



“In December,” Faith adds, “we launched the SensiML Community Edition, expressly for the needs of experimenters, innovators, and product R&D teams. The Community Edition provides the means to build fully functional edge IoT inference models using one’s owned existing label or unlabeled data sets, newly captured sensor data sets using SensiML data capture lab, or models built leveraging SensiML growing data depot — a library of example and community data sets. Since the start of the year, we’ve added more than 100 Community Edition users and expect the number to increase throughout the year.”

And last but certainly not least, just last week QuickLogic announced its smallest dev kit ever, the Qomu — a tiny form factor dev kit that brings the power of the company’s EOS S3 SoC into a USB Type A port. Seriously: an SoC complete with FPGA fabric and Arm Cortex-M4F MCU that fits inside a USB port, and supported by 100% open source tools.

It’s all very exciting for the acceleration of all things edge.

Finally, not to neglect other significant news, Faith tells us that the momentum in the company's smartphone business continues with the addition of another two 5G-enabled smartphones. "2020 was a very good year for our smartphone business. We exited 2020 with a total of 10, up from three at the start of the year. These new phone launches should lead to much stronger revenue in 2021 and beyond for the smartphone segment for us."

All told, QuickLogic's course-correcting pivot is proving a stellar success — one we believe that puts the company on a trajectory into a higher orbit and deeper space.



About *George Gilder's Moonshots*

As one of the world's most prominent technology futurists, George Gilder has a history of making eerily accurate predictions in technology. That's why Forbes calls him a technology "prophet..."

Now George Gilder and his team of analysts are their most radical and influential ideas to a small group of investors — so they can profit from the next major breakthroughs in tech.

If you want to learn more about Moonshots — including Gilder's research on a new development he's calling 3x bigger than 5G — [click here](#).
