Tagent and Cadence

"With Cadence, we have a hosted environment that's secure, backed up, and maintained correctly. We can be successful without having to worry about the CAD flow. And from a business perspective, anything we can outsource that isn't our core competency, that's a big win for us."

Jarie Bolander, Co-Founder and Vice President of R&D, Tagent

The Customer

A recent study shows pathology labs make some kind of mistake with 8% of the samples they process. Founded in 2004, Tagent Corporation helps medical labs reduce that error rate. The Silicon Valley-based company develops revolutionary antenna-on-chip wireless technology integrated into custom ASICs to help labs track large numbers of samples more efficiently and accurately.

Tagent was developing the industry's first RF ID tag with an antenna embedded right in the chip. This chip is then embedded in a label that goes on vials for tracking purposes, from the patient, through lab processing, and out for disposal—a huge improvement over conventional bar codes.

Jarie Bolander, Co-Founder and Vice President of R&D at Tagent, explains, "The bar code system can only perform one read at a time. You pick up a tube, scan it, put it down. Labs waste a lot of time tracking and locating tubes with this methodology. With Tagent's RF ID tag, you can perform bulk reads on an entire tray of tubes, ensure they're all there, and locate individual tubes from any instrumented areas in the lab."

The Challenge

Tagent had already developed the antenna design and archi-tecture, but needed additional analog/mixed-signal (AMS) design tools and expertise to integrate and complete the chip. A key decision concerned hiring in-house custom design experts vs. outsourcing the work. And with a small internal team, they would need CAD support.

"Our core competency is the ability to collect and transmit power with an antenna-on-chip system. We don't want to hire CAD guys; we don't want to build a huge infrastructure to support

Business Challenges
- Required additional AMS design tools and expertise to complete the chip
- No onsite CAD support team / limited existing infrastructure

Design Challenges
- Fully integrate an RF ID tag on a piece of silicon
- Ensure the antenna doesn't interfere with the chip logic
- Incorporate a new custom IC design flow with advanced modeling capabilities

Cadence Solutions
- Hosted Design Solutions
- Virtuoso Analog Design Environment

Results
- Created the industry's first RF ID tag (just 2mm by 2mm) with an antenna embedded in the chip by leveraging a hosted front-end design environment
- Mitigated risk and optimized time to productivity with a proven, unified CAD environment
- Streamlined the design and implementation process by three months

staff," says Bolander. "Anything that allows me to outsource that in a reliable, secure way is a big win for us. When Cadence discussed their hosted design environment, I thought it was right on."

The Solution

Outsourcing the critical yet non-differentiating elements of a production-grade design helps reduce cost and risk. Cadence® Hosted Design Solutions provides production-proven technologies, methodologies, design services, a secure IT infrastructure, and a collaborative framework to optimize the customer's time to productivity. The result is a robust and streamlined flow enabling customers to quickly incorporate the latest design techniques and advanced product capabilities without the risk.

In lean organizations like Tagent, CAD and IT support typically falls on the designers themselves. Cadence Hosted Design Solutions eliminated this problem. Tagent designers could focus on designing, rather than on CAD configurations, process design kits, and other issues. Tagent didn't have to buy any equipment, hire new personnel, install software, or keep up to date on the CAD flow.

> " *Typically CAD flows can take up to two months to set up properly. Cadence had us up and running in two days.* "

Collaboration

Tagent's antenna-on-chip design was bold such a design can interfere with the chip logic and can break some of the processing the fab does. The Tagent team had to come up with a set of design-for-manufacturing rules, which would require advanced modeling capabilities.

The collaborative framework of Cadence Hosted Design Solutions let Tagent supplement their own engineering team with Cadence tools and experts at the right point in their design cycle. Cadence designers on the other side of the country did a major portion of the design that required custom AMS expertise, using Virtuoso® Analog Design Environment to optimize modeling; Tagent designers handled anything that touched the antenna.

The hosted environment made it easy for Cadence experts to work with the Tagent team, regardless of location. Bolander says, "We all had the same CAD flow; it was completely unified. That's a big deal. It's worth its weight in gold. Not being in

sync with the CAD flow—if something comes back and doesn't work—you've wasted eight weeks and hundreds of thousands of dollars."

Leveraging Cadence Hosted Design Solutions, Tagent optimized their productivity. They saved almost two months worth of work by not having to set up internal infrastructure, and they streamlined the actual design process by nearly three months.

Security and scalability

Even though a patent had been filed back in 2002, developing such revolutionary technology with huge implications for the medical industry meant that security was a key concern. With a hosted environment, Tagent was assured of security in terms of encryption and redundancy—nobody could access their data or IP, and if anything was inadvertently deleted, it could be restored quickly.

"With Cadence, I have all the confidence in the world. We've deleted data on our end that we shouldn't have deleted. We call up Cadence, ask if it can be restored, and in a few hours it's restored," Bolander explains. "They have the redundancy. I don't have to invest in the infrastructure. It gives me peace of mind that the environment we're in is secure, backed up, and maintained. I don't even need to think about it."

Cadence Hosted Design Solutions can also scale to support temporary and long-term customer needs, whether it's supporting a few designers in a single location or multiple large design teams distributed globally. The Tagent team had sprint capacity when they needed it.

Summary and Future Plans

Cadence experts helped Tagent tapeout their revolutionary chip on time. When it entered the market, no other technology, wireless or otherwise, could compete with the small size, read range, and durability necessary to achieve the substantial savings enabled by the Tagent RF ID tag. What's more, consumers are guaranteed timely and reliable medical care. From collection all the way to disposal, labs will always know where their tubes are. This translates to reduced error rates and additional cost savings.

Tagent was very pleased with Cadence Hosted Design Solutions and plans on using it for their future development. "We like the level of service and the responsiveness," Bolander says. "Cadence is very customer-focused. Anything to solve the customer problem is what they're going to do. I feel very confident that any issue I have will be solved rapidly and to my advantage."