

IoT in Focus

CUT THROUGH THE BUZZWORDS AND INTO THE BANKABLE BUSINESS OPPORTUNITY

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Table of contents

Executive Summary	3
Why Does It Take 10 Partners to Start an IoT Project?	4
Partners Case Study: Vital	5
Buy Or Build Your IoT Infrastructure	6
Buy Or Build Case Study: Twyst	7
3 Steps to IoT Deployment	8
IoT Deployment Case Study: Owlet	9
IoT Questionnaire	10



Executive summary

DOES YOUR IOT STRATEGY HAVE A CONNECTION PROBLEM?

You've heard it everywhere: IoT is a game-changer, a disrupter and a gigantic business opportunity for everyone. That's all well and good. However, the reality is that many companies have eyes bigger than their stomachs when it comes to the Internet of Things—and are biting off more than they can chew.

Businesses are struggling to scope and deploy IoT initiatives because, compared to the traditional information technology project, they require different hardware and software resources as well as much more integration.

EVEN 'THINGS' RELY ON INTERPERSONAL COMMUNICATION

IoT challenges traditional business models: these projects typically involve a long list of internal stakeholders and an even longer list of potential service providers.

Most companies say that it can take up to 10 external partners to get an IoT project off the ground. It's already difficult to get all the pieces of technology to work together seamlessly in an IoT project. Having partners who don't always get along or have enough experience actually deploying IoT projects for businesses only causes more disconnects and further delays.

GET CONNECTED-NOW

Your business approach to IoT needs to function much like the technology itself: keep everything connected, with information flowing quickly and smoothly between all nodes.

IoT solutions require close collaboration and communication. Narrow your scope and focus on a solution that you can excel at. Move quickly, nimbly and strategically.

Everyone's jumping into IoT for the same reason: if you're not, you're a dinosaur. While that might be true, that doesn't mean you should demote your critical thinking skills to the Ice Age, too.

WHAT YOU'LL FIND HERE

This guide will start with the why, move through the what and end on the how when it comes to the Internet of Things. By the end, you'll see case studies from businesses much like yours who got IoT up and running—and have a path to market that's more easily navigable, too.



Why does it take 10 partners to start an IoT project?

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EMERGING TECH ADDS COMPLEXITY

IoT starts with data. But setting up the right infrastructure to collect that data may require a myriad of specialists. Securing a non-standard device or avoiding wireless interference is usually outside the typical IT skillset.

Then consider connections, whether they be cellular data plans or 24/7 internet connections with the accompanying infrastructure. Don't forget now that you've collected the data you need to aggregate, store and analyze it in the cloud. (Haven't built the site or the app yet? You'll want to get on that, too.)

WIDER GROUP OF BUSINESS UNITS AT THE TABLE

All those different technologies mean one thing: people-and lots of them.

It involves the CEO looking for efficiencies and innovation. The CIO or IT leader tasked with scoping it. The data analysts. The programmers. And the list goes on: project managers, system integrators, operations specialists, installers, and business stakeholders—all have a role to play in ensuring an IoT project's success from the technology as well as the business side.

DON'T FORGET LIFECYCLE & SECURITY IN AN EVER-CHANGING DEPLOYMENT ENVIRONMENT

You've considered all the stakeholders to consult to deploy along with all the hardware, software and firmware needed to get it done—great. But deploying an IoT solution isn't like putting a product on a shelf. It needs regular maintenance and security updates.

A good IoT solution is dynamic. By that we mean that it should have the ability to adapt and meet the needs of a changing business climate.

CHOOSE YOUR PARTNER WISELY

An IoT project is a lot like building a house. If you know how to lay a foundation, wire the electrical system, lay plumbing and connect your HVAC all while staying within an operating budget, doing it yourself is easy.

That's a lot to ask of an in-house team, especially once you include the time it takes to handhold all the various stakeholders from across the business through a successful implementation. A vigilant outside partner, however, much like a general contractor, can ensure you get your IoT house built on time, on budget and ensure that it's ready to perform when it really counts.

Partners case study: Vital



In the U.S., the financial burden of managing chronic diseases is upwards of \$300 billion annually. Eighty-seven percent of deaths in China are caused by chronic illnesses. As the global population ages, this will only increase. Vital sees a real opportunity to save lives by enabling IoT connectivity on their device, making vital signs key indicators of health that are more useful and easier to manage than ever.

MAKING THE PROTOTYPE WORK

"A working prototype was everything to us, but as a startup it didn't make sense to invest in our own engineering team—we were moving fast," said Mark Khachaturian, CTO at Vital. "Yet, we found that few firms have engineers who both understand and support all facets of hardware and software design."

The Vital team started to explore options for contract manufacturers, but felt they weren't taken seriously. A call to an external partner helped them quickly solve their problem: "I didn't realize how much expertise and infrastructure could help us scale and get to market more quickly."

Lou Lutostanski, Avnet's VP of IoT, says that finding the right partner is a common issue for startups like Vital. "It's a tough spot to be in—it's hard to distinguish hype from reality. Startups don't have the time to evaluate companies in separate disciplines and often aren't sure of their exact requirements. So, technical feats can seem huge when in reality most are solvable."

Unlike many startups who don't prioritize their supply chain until they get their first order, Vital was ready to jump right into distribution with Avnet.

More importantly, Vital is able to stay focused on its research and development work to enhance the product with additional measurements, such as EKG readings for cardiac monitoring and perhaps even glucose readings for diabetes management.

FINDING THE RIGHT FORMULA

Vital wanted a single IoT connected finger cuff that could:

- capture key vital signs: temperature, pulse, blood pressure and Sp02 levels
- attach to a smartphone
- connect to the internet via Bluetooth/WiFi
- transmit vital signs to a mobile app

"The healthcare market is full of technology from the 1980s, and we've been talking about changing it since then," said Irv Gross, Vital's Chairman. "Now it's actually happening."

Buy or build your IoT infrastructure

It takes a lot of people to get IoT off the ground. So you might be thinking: should all those people be full-time employees or could a consultant or external partner help stand things up fast?

To build or not to build? That's the question many businesses face when starting to create plans for an IoT project. Let's take a look at the pros and cons of buying and building to help you decide what's best for your business.



BUILDING ADDS CUSTOMIZABILITY, COMPLEXITY

PROS:

- Dedicated in-house team: Building the team in-house means you'll have staff on salary to help not only during the build process but also during the maintenance and lifecycle of your project.
- Fully customized solution: An in-house build allows for an IoT solution that's fully customized.

CONS:

- **Talent takes time:** It takes time to find talent. Plus, since no IoT solution is the same as another, it's harder to vet whether someone's past experience will lead you to the best current solution.
- Customization woes: A fully customized in-house solution isn't vetted for quality and assurance. It's perfect for your use case on paper, but in practice, are there gaps in your implementation?

BUYING INFRASTRUCTURE REQUIRES VETTING, DETAILED GUIDANCE

PROS:

- **Strategic partner speeds time to market:** Strong tech ecosystems offer both custom and off the shelf options. These give clients a balance of tried and true solutions when it comes to infrastructure with customizable points that still make a purchased solution adaptable.
- Global footprint, expansive knowledge: Collective knowledge from a global network means built-in competitive intelligence that can help them vet your business case with an objective eye, run diagnostics to prove ROI early to top executives, recommend the best solutions during the development phase and ensure security and maintenance not only with an on-site deployment but also a lifecycle management engagement.

CONS:

- Outside partners take vetting: The likelihood that a one-size-fits-all approach will work for your implementation is slim. Having more partners increases your risk of failure and cost because it decreases your ability to collaborate and communicate well, and therefore, reduces your agility.
- An external partner needs guidance: Like with hiring an advertising agency or an outside research firm, it will take some extra time up front to get an external team up to speed with your exact business objectives.

Buy or build case study: Twyst

SMART RETAIL FIRST NEEDS A CUSTOMIZED IOT INFRASTRUCTURE: THE STORY OF TWYST

Imagine walking into your favorite store, getting a special offer just for you, choosing your items and then walking out. No line, no checkout. Just a wireless, effortless and secure transaction that automatically charges you for the items in your bag when you leave a store.

That's the not-so-distant future of shopping, and it's being implemented right now by innovators like Kevin Schaff, founder and CEO of IoT start-up Twyst.

AN IDEA AND THE TEAM TO MAKE IT REAL

In 2015, Kevin, drawing on his background in data analytics, had an idea – to eliminate points of friction in retail, like the checkout line, and capture in-store behavior to turn it into actionable data. Then he entered into the Innovation Lab, a partnership between Avnet and Arizona State University.

That's where he architected an IoT product from the ground up. Twyst's smart bag (or any shopping container like a cart) is designed to detect an item's presence and transmit data via a Bluetooth low energy (BLE) network.

With the help of the right partner, Kevin chose and sourced the right technology – the microprocessor, RFID reader and sensors that go in the bag, and the beacons that go throughout the store – to produce and refine early prototypes.

Adds Kevin, "My background is software. That's true for most IoT entrepreneurs. Hardware is complicated. You can lose your market position and momentum if you design it wrong. The ability to work with Eric and get his guidance and expertise was a huge benefit."

WHAT'S NEXT FOR TWYST?

Now well past the design phase, Twyst is entering full-scale production and installation into its first big-box retailer, moving from an innovation lab participant to a full-fledged customer partnering with a large technology ecosystem in Avnet.

"Having a partner help in the design phase as part of the innovation lab was highly valuable. Now, I'm at a point where we're putting a sensor platform across 300 stores in different cities. How can a start-up handle those logistics? Production, inventory, distribution, even returns? Their ability to help us rapidly scale is fueling our growth," Kevin said.

Kevin added: "As an entrepreneur, you want to build maximum value before you formalize your venture capital. We get to keep more of our company – more equity. That's every entrepreneur's dream."

3 steps to IoT deployment





CONSULT

Once you've decided whether you are building or buying your IoT infrastructure, you'll need to consult with the internal or external team running point on the project to map out the exact journey your IoT deployment will take. Ask yourself questions like: What does it need to return in order to afford its cost? What's a possible product roadmap? What do you have that's ready for an IoT deployment in-house?

A good point person will then perform a readiness assessment. An engineer with a brilliant idea versus an entire organization ready to go forward with an implementation are at two different development stages. Try to calculate cost, value and ROI here, too. The right executive buy-in gets you the resources, time and support you need to move into the next phase.



DEVELOP

In the develop phase, you should clean up the initial plans created in the consult phase to optimize for performance and cost as well as to find the fastest, most profitable route to market.

Here's where boards get developed, the cloud platform gets built out and the analytics framework is set. It's also when all the business relevant features are configured from analytics, cognitive services, artificial intelligence (AI) and machine learning. Then, you'll tackle UI/UX of all consumer-facing web platforms and applications, the data visualization that might be needed as well as ensuring device management and connectivity is well thought out throughout the life of an IoT deployment.

DEPLOY

Hopefully during the consult phase you also thought about how all the parts of your IoT solution will be deployed. Ensure that either your internal or external partner has the capabilities to install, support and service on-premise during the crucial weeks and months of initial implementation.

Here's where forward stocking for backup hardware, technical customer support, and tech support for Wi-Fi or cellular networks, gateways, web interfaces, apps and your new cloud platform all come into play. Make sure you don't get caught just hiring anyone to install. What if it breaks during the process of installation? What if a critical piece is stolen days before deployment?

Security and data privacy plans laid out in the consult phase and created during development also come full circle in deploy. Each functionality needs to be enabled and tested for interoperability when things change.

No matter who's on point, don't rush through the three steps.

Whether this process is done with a homegrown in-house team or by buying an IoT infrastructure that's customized to your business need, the consult-develop-deploy process is crucial to creating an environment where a new IoT solution can succeed.

IoT deployment case study: Owlet

THE RIGHT DEPLOYMENT MADE FOR LIFESAVING TECHNOLOGY: THE STORY OF OWLET

In 2012, Kurt Workman was a full-time chemical engineering major wanting to start a family of his own. But he knew that with his wife's congenital heart defects, they could face health challenges and plenty of sleepless nights.



That was all the inspiration Kurt needed for the genesis of Owlet and its breakthrough product: the Smart Sock. A health monitor for newborns to wear at home, the Smart Sock is designed to notify parents if heart rate and oxygen levels fall outside preset zones. This helps give anxious parents peace of mind. A coincidental run-in with fellow BYU student and electrical engineering major Zack Bomsta, himself a new dad, helped solidify the trajectory of the device.

BARRIERS THAT POP UP OVERNIGHT

"I don't think any of us could fully grasp the design challenges of what we were trying to do when we set out," Zack said. "Not only were we trying to create an IoT device, but we were trying to create a device using clinically proven technology. On top of that, it was a wearable that had to stay on a baby's foot, which can quadruple in size in the first year."

"In our journey, new barriers seemed to pop up overnight. We had to find creative ways to overcome them, and Avnet has been involved since the early days in helping us do that," he said.

One of those barriers came about a year into development. The Owlet team had assumed that the sensor module on the baby's foot could send data straight to a smartphone through Bluetooth. But further testing uncovered range constraints and communication reliability issues. With delivery dates promised to early backers rapidly approaching, the team realized they needed a dedicated Base Station – a go-between that communicated with both the sensor and the smartphone. With that realization came major implications.

As the team was frantically trying to identify the right Wi-Fi chip set, Avnet as a distribution partner introduced them to another start-up that happened to be developing just the module Owlet needed.

OBSERVATIONS DEMONSTRATE SAFER SLEEP, HAPPIER HOMES

Continuing support from Avnet has helped Owlet reach even further after their product launch. In a recent longitudinal observation, the device notified parents of 47 clinically verified life-threatening cases. In one case, the parents of a premature infant about to be released from the NICU purchased the Smart Sock. Before they even left the hospital, the device issued 5 low oxygen notifications, which were confirmed by the hospital monitor, offering vital information to help address the issue quickly.

The peer-reviewed report on the longitudinal observation also detailed how Owlet helped 82% of the users in the study group adhere to the American Academy of Pediatrics safe sleep guidelines for infants. What's more, 96% of parents reported less anxiety and 94% reported better sleep.

Not only is the Smart Sock helping give parents peace of mind, but it has amassed the largest dataset of infant cardiorespiratory home monitoring that's ever existed. Over time, these could serve as important clues to better understanding infant health. Owlet shows that IoT isn't just a buzzword, it's critical technology that reaches every corner of life. Now it's all a matter of what we do with it.

Ready to jump into the Internet of Things?

HERE'S HOW TO USE THIS WHITEPAPER TO GET YOUR IOT PROJECT OFF TO THE RACES

A well-rounded solutions provider can help anyone from a maker and startup to a business or enterprise get IoT off the ground. In fact, by leveraging our ecosystem of businesses, suppliers and partners, Avnet helped each of the companies featured in our case studies above get their products to market.



We have been working to forecast the technologies of the future for decades. So we're well suited for understanding the complex network of partners, technologies, protocols and regulations that an Internet of Things deployment presents.

When considering each part of this whitepaper, here are the questions to ask yourself to ensure your projects gets out of the starting gate-whether or not you end up working with Avnet:

PROJECT PARTNERS

- What's your overall IoT project roadmap?
- How will you measure success? Who will you have to measure success for?
- Is your IoT business model a sustainable one? Does it line up with the overall goals of your business?
- Have you taken hardware and software security into consideration?
- How will you handle lifecycle management for your solution?

INFRASTRUCTURE

- Are you building an in-house IoT team? If so, who will lead—IT or OT?
- Is the cost of onboarding, salaries and benefits worked into your project plan?
- Will you need these same employees post-launch, or will your employee needs change?
- Are you employing an outside firm to help guide your IoT project? If so, who will internally liaison with them?
- What will your vetting process be to understand if this external partner can fit your needs?
- How will you educate this partner on your business and its goals in order to let them deliver you the best solution?

IoT DEPLOYMENT

- Do you have a readiness assessment or pilot in place to prove project viability?
- Do you have buy-in with senior management? Important business stakeholders?
- Have you had a second set of eyes check for gaps in product roadmaps?
- Do you have IoT security specialists who aren't versed in only IT or OT?
- How will you handle hardware, software or firmware updates in the future?
- Have you assessed the inventory and future development of the hardware in your system? Are any components going end of life that you need to worry about?

These are just a sample of the many questions the IoT presents. However, there are technology solutions companies like Avnet who aren't dependent on a specific supplier or company, but can independently assess your business requirements and provide intelligent solutions in a crowded, connected world.



FOR MORE ON AVNET'S IOT CAPABILITIES, VISIT AVNET.COM/IOT.

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