



White Paper

The Edge to Enterprise – Avnet and IBM Partner to Deliver a Compelling Connected and Cognitive IoT Offering

Sponsored by: Avnet

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IDC OPINION

The Internet of Things (IoT) continues to dominate discussions around boardroom tables, in IT departments, and at industry forums. The long-term effects of this market are yet to be felt, but organizations are beginning to see the IoT as a critical enabler on their path to digital transformation. By connecting endpoints – and understanding the behavior and data – organizations can change business processes, create new revenue streams, improve productivity, or eliminate inefficiencies.

However, organizations are still struggling with how to step into this market. Cost and security concerns are always top of mind when looking at new investment areas, but organizations are also struggling with how to engage with vendors to help architect a solution that is right for their own purposes. The vendor ecosystem in the IoT is complex. The IoT is not just one piece of technology but an interrelated collection of hardware, software, services, and connectivity that must work together as a bigger solution. The challenge is finding the right vendors or partners that can work to bring a holistic and complete solution together.

In this market, it is of paramount importance for vendors to determine where strategic partnerships are needed and beneficial in serving their customers' needs. Partnerships that will succeed will have complementary offerings and skills, tools to enable their teams to work side by side, and the mutual desire to serve the customers' best interests. One such example is the work that Avnet and IBM, through their strategic partnership, have done to bring a cohesive solution to market that covers the IoT spectrum of "edge to the enterprise."

IN THIS WHITE PAPER

This white paper examines the Internet of Things market with a lens on the complexity of the vendor ecosystem and how partnerships are enabling holistic solutions to come to market. It discusses the overall market opportunity that IoT is creating, especially in the industrial sector. The white paper also discusses the key benefits of a successful partnering strategy when evaluating IoT solutions. An overview of Avnet's edge-to-enterprise IoT offering – in partnership with IBM and using its Watson IoT portfolio – is also provided.

SITUATION OVERVIEW

The IoT as an Enabler of Digital Transformation

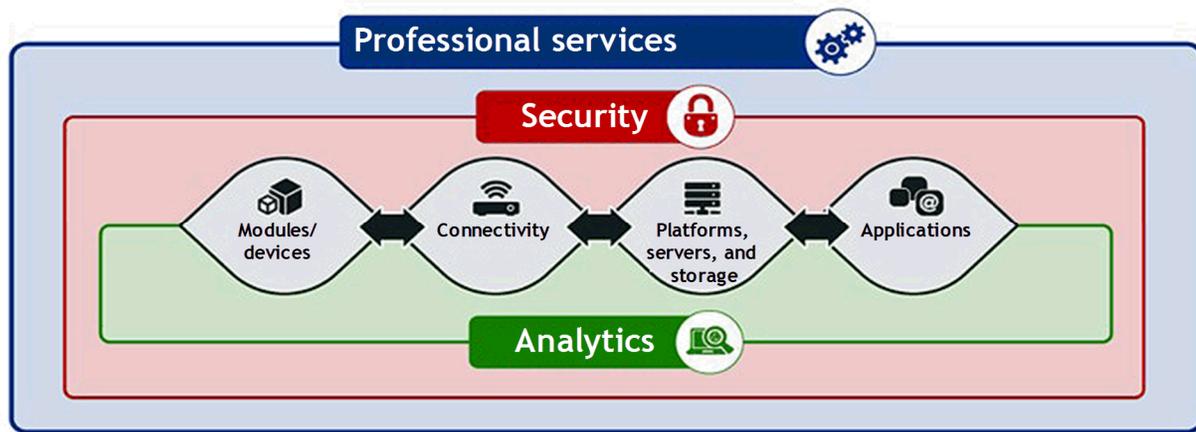
The Internet of Things is a key enabler of digital transformation. Digital transformation is affecting organizations across industries and regions as they look to adopt a connected strategy to monitor, observe, and capture information from endpoints. IDC defines digital transformation as the continuous process by which organizations adapt to or drive disruptive changes in their customers and markets (external ecosystem) by leveraging digital competencies to innovate new business models, products, and services that seamlessly blend digital and physical and business and customer experiences while improving operational efficiencies and organizational performance. With IoT as a key element of digital transformation strategies, organizations are seeing significant changes to their businesses, whether they are evident in improved productivity, deeper customer insight, reduced costs, or even additional revenue streams.

IDC defines the IoT as a network of uniquely identifiable endpoints (or "things") that communicate bidirectionally without human interaction using IP connectivity. The ecosystem that supports the IoT includes a complex mix of technologies not limited to modules/devices, connectivity, IoT platforms, storage, servers, security, analytics software, and IT services. IDC expects that by 2020, spending on the IoT will be \$1.46 trillion, with more than 30 billion "things" connected.

It is important to note that IoT is not a single technology or application but a complex collection of hardware, software, services, and connectivity that must come together cohesively to solve a business problem. IDC has identified the IoT ecosystem as having several key players, including component manufacturers, connectivity providers, and software/storage/server and cloud vendors, as well as the analytics and security and the IT services needed to deliver a holistic solution. Figure 1 provides a diagram of the interworking elements of the ecosystem.

FIGURE 1

Elements of the IoT Ecosystem



Source: IDC, 2016

Role of IoT in the Industrial Segment

While IoT has the potential to affect organizations across industries, one could argue that IoT has been happening in the industrial sector for years. However, deployments were often point solutions that weren't integrated, nor did they deliver the data in a meaningful way that processes could be optimized, overlay services could be offered, or feedback loops could be created. The IoT is driving significant transformation in the industrial sector.

For manufacturers, the IoT is bringing the necessary capabilities to connected products, assets, and supply chains. Manufacturers and their suppliers can leverage a combination of software, cloud, sensors, and IP-enabled connectivity to change products and processes. The information captured in connected products and processes can serve as a feedback loop to change design or improve productivity. It also has the potential to transform industrial organizations from being product focused to being service focused with the ability to connect, monitor, manage, and maintain disparate endpoints.

However, manufacturers are still struggling with how to step into this market, particularly with regard to engaging with vendors to help architect a solution that's right for the individual organization's own purposes. The vendor ecosystem in the IoT is complex. The IoT is not just one piece of technology but an interrelated collection of hardware, software, services, and connectivity that must work together as a bigger solution. In talking with organizations preparing to integrate a connected product or process strategy, IDC found that one of the biggest hurdles is deciding what device to deploy for the specific use case. Yet, after that decision is made, figuring out how to layer on the platform, analytics, and cloud infrastructure can become complex. It becomes even more critical to find a vendor that can provide the guidance, capabilities, and ecosystem relationships in making these investments.

Picking a Vendor in the IoT

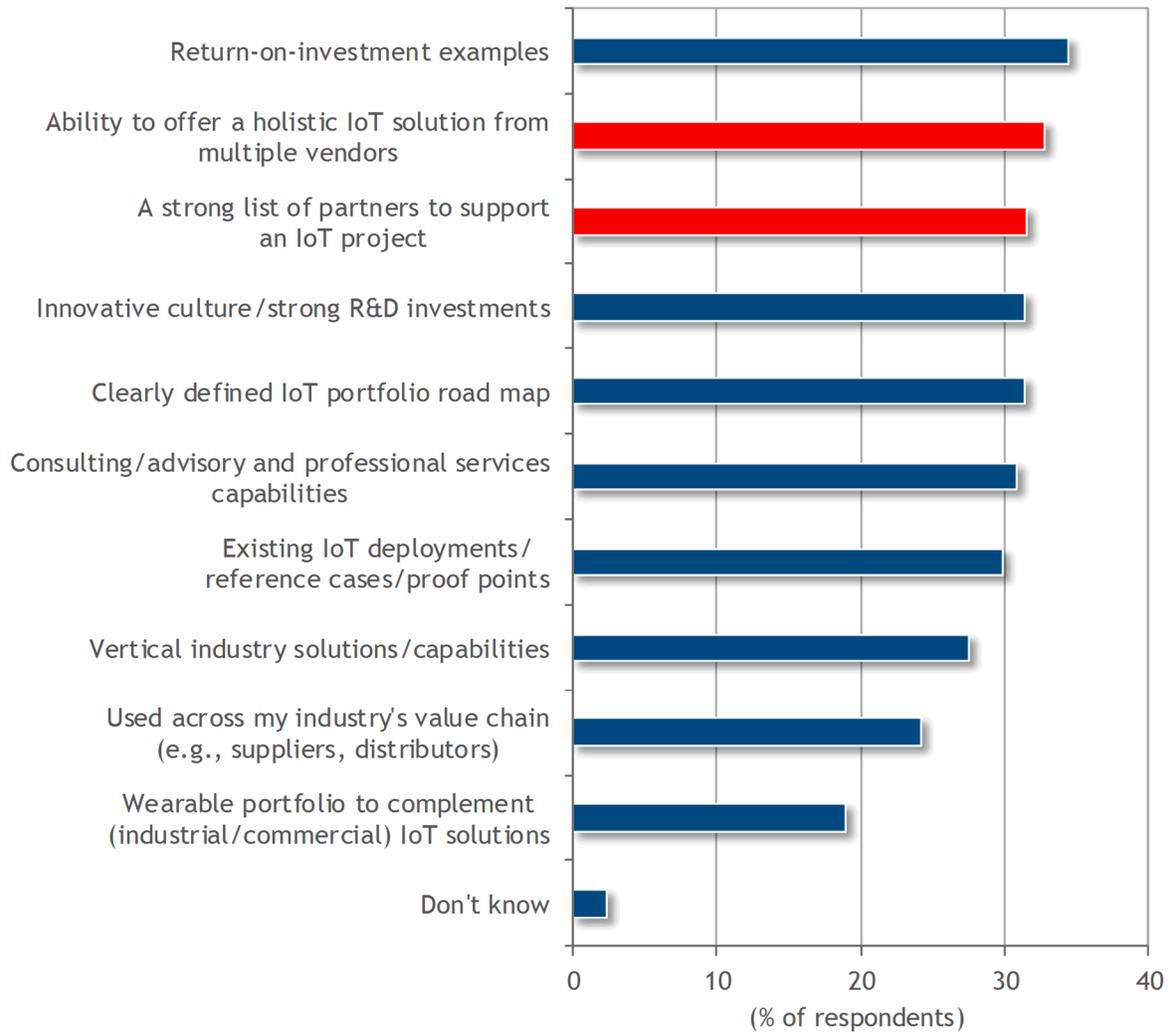
Finding the right vendor is a challenge that many organizations are struggling with today as they contemplate IoT projects. What vendor will best serve the organization's needs as a partner in an IoT investment and the overall deployment is critical as the IoT strategy is determined. IDC believes that no one vendor will provide all the elements; rather, a group of vendors will partner to develop a holistic offering across their assets. While one vendor may take the role of being central to the project, this vendor will have to rely on the expertise, products, and solutions that its partners have included.

IDC conducted a research study in mid-2015 to examine the preferences, plans, opportunities, and challenges facing IT and line-of-business decision makers across 15 countries globally. When respondents were asked about the selection criteria used when choosing an IoT vendor, it became clear that these decision makers are looking for a proven, holistic IoT solution that comes from a strong group of vendors with established strategic partnerships across the ecosystem (see Figure 2).

FIGURE 2

Factors for Selecting IoT Vendors

Q. When you are selecting IoT vendors and suppliers to help you achieve your 2015 and 2016 business/technology strategy, what are the top 3 IoT vendor/supplier criteria?



n = 1,971

Source: IDC's *Global IoT Decision Maker Survey*, July 2015

IDC continues to see the IoT market evolve as enterprise decision makers look to vendors that have established partnerships as a means to support their customers' needs and requirements. Vendors that have embraced strong partnership strategies are positioned for success because it means they have recognized that the strengths of their collective assets and offerings outweigh their individual opportunity.

FUTURE OUTLOOK

Benefits of a Strong Partnership Model

In the Internet of Things, the complexity of the market and the solutions themselves will not disappear anytime soon. Organizations will be looking for ways to simplify their deployments, and it will be critical for the supply side to have coordinated efforts as a means to deliver holistic and seamless solutions to meet the requirements of these customers.

In talking with organizations that have begun IoT projects and those that are looking to invest in a connected strategy, IDC has built a list of benefits that partner solutions bring to the market, including:

- **Complementary skills/offerings.** Vendors working with partners that offer products, services, or solutions that don't overlap, but complement, the initial product set will see success as they work with partners that have complementary skills or offerings.
- **Ecosystem savvy.** Vendors working with partners that offer exposure to new areas of the IoT ecosystem will help ensure that the combined offer is reaching the largest buyer audience possible. This is especially important for vendors that have a legacy in the IT side of the business. The IoT introduces many elements of operations technology (OT), and having a partner that can speak the language of OT and bridge the gap between IT and OT is priceless.
- **Digital transformation philosophy.** It is important for vendors working together in a partnership to have a collective view on how they can help their customers evolve digitally using the best of their hardware, software, and services capabilities.
- **Edge-to-enterprise capability.** Vendors that can bring together a solution that solves the whole package of edge device, software, services, and connectivity for an organization have an advantage over vendors providing point solutions. In the former instance, organizations can focus on the outcomes and business change rather than worry about how the piece parts will fit together. This saves time and resources in the end and delivers an integrated solution.

The Role of the Device OEM in the IoT Partner Ecosystem

While all elements of the IoT ecosystem — whether hardware, software, services, or connectivity — are critical in building a holistic solution, IDC would be remiss in not mentioning the important role that the device OEM plays in the ecosystem. These particular vendors are critical to ensuring the design and engineering of these "things," including the functionality that allows them to be connected in the first place.

The device landscape in the IoT is extremely fragmented, and organizations are facing the challenge of picking the "right" connected device to fold into a connected solution strategy. While evaluating different solutions, customers need to look at who their vendors are partnering with from a device OEM perspective to ensure that the best devices and sensors are incorporated into the overall solution architecture.

IoT solution providers that have established strategic partnerships with device OEMs as a means of focusing on specific use cases or vertical applications demonstrate understanding the importance of piecing together all the elements necessary to build a holistic IoT solution.

AVNET AND IBM PARTNERING FOR A HOLISTIC IOT PROPOSITION

Avnet is a provider of electronic components, embedded technology, and technology solutions. The company works with device OEMs and equipment manufacturers as well as resellers and ISVs. Avnet is positioned to play an important role in the Internet of Things because of its close relationships with not only device OEMs but also the resellers and ISVs that are bringing IoT solutions to market. In other words, Avnet has the breadth in its offering to provide a full IoT experience from the edge to the enterprise through hardware, software, and services integration from the endpoint (or "thing") to the gateway to the network to the datacenter or the cloud. However, like all vendors in the IoT market, Avnet cannot solve the overall complexity of IoT by itself. As a means to building out its IoT portfolio and providing scale to its portfolio, Avnet has strategically partnered with IBM.

From its Embedded and Electronics Marketing business, Avnet has the capability to provide the devices, gateways, and connectivity, and with its Technology Solutions business, Avnet is able to bring the expertise through its business partners in the areas of analytics, data warehousing, security, asset management, and cloud.

According to IBM's Jack Desjardins, the partnership with Avnet is a strong fit because IBM's customers need to have access to the smart, connected endpoints that have connectivity and cloud functionality built within the components. This allows IBM to integrate these components into IBM's Watson IoT Platform.

IBM itself continues to invest heavily in the IoT and seeks to be a key player in the market. In April 2015, IBM announced a \$3 billion investment over the following four years to deliver IoT solutions and services to its customers – with the focus on efficiently helping create, build, and manage connected products and systems at the heart of the IoT. In late 2015, IBM announced its IBM Watson IoT portfolio, which continues IBM's focus on being the provider of enterprise IoT by enabling businesses to transform their industry with new services, offerings, and sources of revenue.

Making the Edge-to-Enterprise Story a Possibility

One of the biggest assets Avnet brings to the embedded end of the spectrum is its new Industrial IoT (IIoT) Starter Kit, which is based on Avnet's MicroZed platform. Avnet also offers its Visible Things platform to customers in EMEA. The IIoT Starter Kit provides the hardware and embedded software to connect smart sensors to the cloud. It allows organizations to prototype and develop designs with the technology building blocks that allow for production-grade industrial systems.

The Avnet Industrial IoT Starter Kit provides an excellent example of how Avnet's smart, connected systems can integrate with the IBM Watson IoT Platform, bringing additional cloud services and applications from the IBM Bluemix portfolio. With Avnet's IIoT Starter Kit and IBM's Watson IoT solution set, customers have the chance to rapidly build out IoT solutions that are smart and connected and have access to the robust cognitive capabilities that IBM offers.

Both the edge solutions and gateway are IBM Bluemix enabled, allowing easy integration into IBM's Watson IoT Platform. The Watson IoT Platform is a fully managed, cloud-hosted service that makes it simple to build and deploy applications for IoT devices, sensors, and gateways. It provides solutions for device registration, connectivity, control, rapid visualization, and storage of data derived for the IoT. When combined with the IBM Bluemix environment, and access to secure Watson APIs, the platform allows users to integrate and analyze predictive, cognitive, and contextual analytics for stronger decision making. In the end, the IBM partnership brings the cloud to Avnet's OEM customers. Conversely, it allows IBM customers to gain access to, and integrate with, the OEMs building

connected sensors and devices. The partnership between Avnet and IBM is made real by the integration of their best-of-breed technologies

Avnet also provides OEMs and ISVs with access to IBM's Bluemix and Watson IoT Platform services via the Avnet Cloud Marketplace so they can design and build scalable and secure IoT applications for connected sensors using a simple, common, and open development environment. To support this effort, these OEMs and ISVs can leverage Avnet Academy to access IBM Bluemix and Watson IoT Platform training.

At the other end of the IoT spectrum, Avnet's partnership with IBM provides the important linkage to the cloud and analytics functionality that is crucial to developing end-to-end IoT solutions. In particular, IBM provides the expertise and tools needed for cognitive analytics, information management, data warehousing, asset management, and security. These are critical elements for organizations to develop IoT solutions that take an edge-to-enterprise approach.

Together, Avnet and IBM are able to provide a complete solution – from the device and gateways to the datacenter and cloud through to the business applications and analytics needed to drive business outcomes ranging from operational improvements and enhanced customer experiences to full industry transformations. Put simply, Avnet is facilitating the connection between the cloud and analytics and the increasing number of smart sensors through its IoT development kits and platforms through Avnet Cloud Marketplace at the silicon layer. The combination of Avnet Design Services and IBM's global cloud footprint as well as industry-leading cognitive capabilities and Watson IoT Platform provides a compelling end-to-end IoT solution for OEM and ISV developers.

Avnet and IBM – A Complete IoT Offering

The strategic partnership between Avnet and IBM provides an excellent case study of how vendors can come together to augment and complement offerings for a market. In the case of the Internet of Things, this partnership allows both vendors to contribute to a holistic value proposition that truly extends from the edge to the enterprise. From providing the right tools to the device OEMs to develop connected solutions to providing the links to cloud and analytics functionality, the Avnet-IBM combined offering gives Avnet customers from both the OEM perspective and the reseller perspective the tools necessary to enable and deliver IoT solutions.

CONCLUSION

The Internet of Things market requires a complex set of devices, software, and services to come together in order for meaningful solutions to be developed. The solutions that will resonate with customers are those that account for the entire spectrum of the IoT value chain – from the edge to the enterprise. IDC acknowledges that no one vendor can provide that complete value proposition because the IoT is a collection of technologies across the entire IT landscape. With this in mind, vendors must work together to develop cohesive offerings. The Avnet and IBM partnership embodies a holistic strategy to solve the challenges of allowing connected sensors to link to the necessary cloud and analytics applications needed for IoT outcomes to be realized.

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