



# I D C W O R K B O O K

## Investing in an Internet of Things (IoT) Solution: Asking the Right Questions to Minimize TCO

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Adapted from IDC's *Worldwide Internet of Things Taxonomy*, IDC #243397

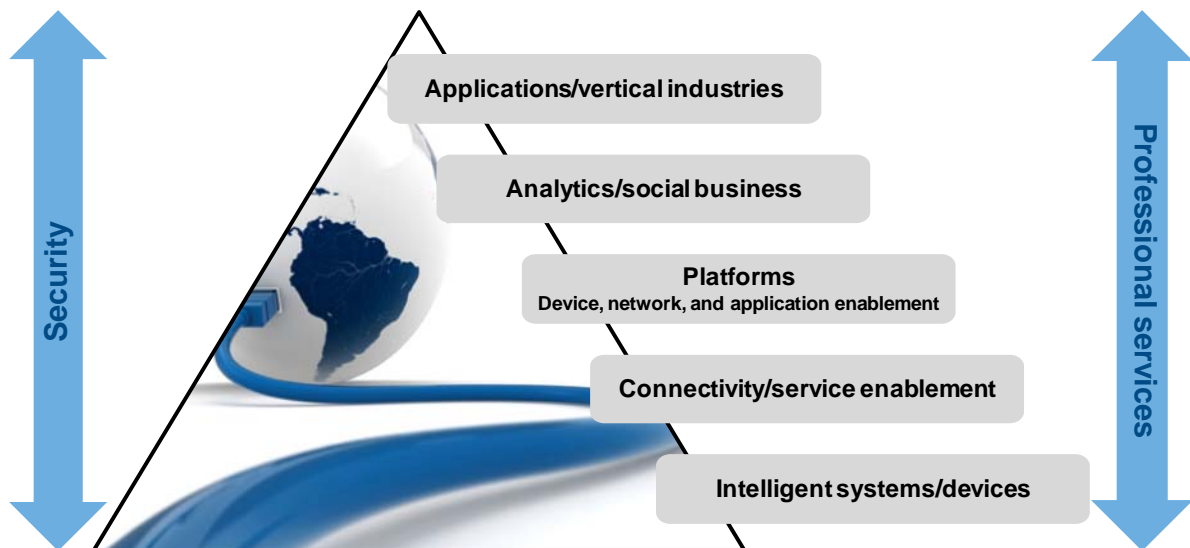
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As the concept of the Internet of Things (IoT) is socialized to businesses, several tough decisions need to be made in terms of investing in its implementation. The Internet of Things, as described by IDC, is a network that connects devices, or "things," and always includes autonomous provisioning, management, and monitoring.

The IoT is innately analytical and integrated. The overall concept of IoT has several components, including the devices (or endpoints) that will be connected, the connectivity, the platforms to manage the endpoints and applications, and the analytics capability required to manage the data and turn it into something meaningful for decision makers to act on or review. Figure 1 outlines the components of the Internet of Things and the piece parts that need to be considered prior to making a full investment in an IoT deployment.

**Figure 1**

The Internet of Things



Source: IDC, 2014

IDC has not forgotten about the term "machine to machine" (M2M). From IDC's view, M2M is an older, but often still used, industry term that became popular to describe a network facilitating communications between — either wired or wireless — devices. Its origins can be placed somewhere around the time that computer networking automation took place. Early applications were in telemetry and industrial automation.

IDC characterizes M2M as a precursor to, and now a subset of, the Internet of Things. It is unduly narrow to think of M2M as reflective of the burgeoning, full opportunity. Some reasons for this perspective are as follows:

- Billions of things are increasingly managed by intelligent systems transmitting exabytes, zettabytes, and yottabytes of data. Without intelligent systems management and connectivity throughout value-adding platforms (device, network, and application enabled), data analytics systems, and applications, M2M as an insular solution would present a constrained revenue opportunity for the ecosystem in the long run.
- Ecosystem players outside of device and connectivity vendors are driving innovation as much as — if not more than, in some cases — players within the more narrowly defined M2M ecosystem.
- Feedback continues to be shared that underscores the value of enterprise solutions being holistic solutions. The full value of an IoT customer, therefore, is most fully and accurately measured across all of the piece parts that communicate to return the end users' IoT benefits.

IDC offers the following recommendations to businesses looking to lower their overall total cost of ownership for services for their IoT/M2M strategies:

- **Plan for the number and intensity of initial solution deployment activities.** Determine the time to market required for an IoT/M2M solution and determine how long your company can afford to spend getting its program up and running. Look for the right device to fit the purpose of your deployment and to ensure that your back-end systems can handle the additional data load created from an IoT/M2M implementation
- **Don't underestimate the need for a connectivity management platform.** Be sure that your business has an easy plan for ensuring that its IoT-related connectivity charges are accurate and the connectivity is maintained, especially during peak (or important) times. Businesses should expect to source IoT/M2M solutions that leverage platforms to fully automate connectivity and application usage if required.
- **Understand if your company can afford to invest in the applications and data analytics required to truly generate the value of an IoT/M2M deployment.** The future of IoT/M2M is in large part about the value of the applications and data analysis that emerges from the massive amounts of data IoT/M2M solutions generate. Ensure that your IoT/M2M partner is able to assist in linking captured data with back-end systems. A cloud solution that stores data and makes it accessible from many different avenues will increase the value of the overall deployment.
- **Ensure that your company understands the fixed and variable (or recurring) costs.** Before choosing a vendor and moving forward with an IoT/M2M solution, make sure your company understands not only the fixed costs but also the variable costs associated with the program. Especially with IoT/M2M deployments, several costs can be either variable or recurring.
- **Ensure that your IT organization has the resources for a smooth deployment.** Businesses should also consider working with a vendor that can assist in the end-to-end deployment of an IoT/M2M solution. If not, decision makers will have to consider staffing, budget, and skills available to handle hands-on management and monitoring they want in their IoT/M2M solution.

## An IoT/M2M Deployment and Management Checklist

Companies that are building IoT/M2M strategies as a path to gain operational cost efficiencies, improve productivity, or innovate new revenue-generating services of their own should consult the checklists in Tables 1 and 2 when evaluating vendors.

Please note that the checklists are provided as a means to help direct and pose questions that will enable a business to begin an active internal dialogue related to the deployment value and ongoing management effectiveness of an IoT/M2M solution.

**Table 1**

### Questions Companies Should Ask Themselves About IoT/M2M Deployment and Management

<b>1. What degree of time and resource constraints have you estimated with your IoT/M2M strategy?</b>	
Consider the lifetime of the full IoT/M2M deployment.	
How is your IT team staffed and assigned? Consider the costs and benefits of outsourcing key parts or the entire management of your connected device solution	
Consider the average life of IoT/M2M devices and applications. What is your plan for device outages? Consider how your company will recover and account for the downtime and minimize connectivity charges.	
<b>2. What are the critical factors your IoT/M2M solution requires?</b>	
Consider requirements such as service-level agreements around device connectivity and network uptime, strategies for cost control, scalability of data storage, and flexibility of the solution to grow with your company's vision into the future regarding analytics and applications. Consider the end-user impact of connectivity or application problems.	
<b>3. What degree of visibility do you and the business units or teams you support require into the costs of the IoT/M2M solution, including network costs?</b>	
What frequency of reporting, level of detail, and opportunities for cost mitigation do you and the departments or units you support require?	
<b>4. What are the expectations for addressing these challenges with managed or hosted services?</b>	
What capabilities do you expect to add with managed or hosted services that you do not currently have internally?	
What are "make or break" factors?	
<b>5. Is the organization committed and ready — in terms of personnel, dollars, and agreed-upon strategy— to deploy the IoT/M2M solution with the investments necessary to reach optimal value in the desired time frame?</b>	

Source: IDC, 2014

The checklist in Table 2 is meant to help your company assess the likelihood of specific costs occurring and the potential impact on the business.

**Table 2**

Variable IoT/M2M Cost Items That Companies Should Assess with Prospective Solution Vendors to Minimize Total Cost of Ownership

		Likelihood of Occurrence	Impact on Business
<b>Data usage costs</b>	Seamless network switching between higher-cost and lower-cost networks and higher-speed and lower-speed networks		
	Devices with high and low usage on the same data plan		
	Cellular data plan overage costs because of malfunctioning devices and applications		
	Midcycle rate plan changes		
<b>Troubleshooting</b>	Device downtime		
<b>Life-cycle costs – supply chain</b>	Setup of APIs, static IP addresses, VPN hardware, ICMS, and APN		
	Initial customization, professional services		
	Device certification (one country? multiple countries?)		
	Data or analytics application updates		
	Ongoing customization, professional services		
	Need to access data for ongoing or post-event analytics		
	Device upgrade or repair costs		
<b>Life-cycle costs – suspend/resume</b>	Device suspension (at launch or repeatedly)		
	Staging of device activations — large quantities versus small quantities over the course of the IoT/M2M solution rollout		

Source: IDC, 2014

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