

How to Put an Implementable IoT Strategy in Place

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CIOs, CDOs and their direct reports often struggle to find a starting position to create or update an IoT strategy. This research lays out some best practices to get started based on first assessing your IoT readiness through a simple IoT maturity assessment and then building from there.

Key Challenges

- Setting end goals for an Internet of Things (IoT) strategy may seem challenging, as many of the technologies, business models and standards are nascent.
- Organizations embark on IoT strategy with very different starting points based on previous experiences, such as M2M initiatives, as well as how well the IoT vision is articulated.
- Working through the IoT vision can be challenging and often involves getting the participants in the process up to speed with the opportunities offered by IoT technology and how it can be used to enhance products and/or create services.
- A separate IoT strategy can add value, but maximum value is derived when IoT is regarded as part of a companywide digital business strategy initiative.

Recommendations

- Identify your IoT readiness by performing an IoT maturity assessment.
- Refine the vision component iteratively by incorporating knowledge from the previous iteration and evolving business objectives through ideation workshops with key stakeholders.
- Produce an IoT roadmap based on your current location and the next steps, but keep in mind that increasing IoT maturity and vision is an iterative process.
- Ensure the IoT strategy work is part of a digital business strategy initiative or can be fed into one at a later stage to achieve maximum return on effort.

Table of Contents

Introduction..... 2

Analysis..... 3

 Identify Your IoT Readiness by Performing an IoT Maturity Assessment..... 3

 Refine the Vision Component Iteratively..... 5

 Assess Where You Need to Be..... 6

 Invest in Ideation to Further Develop the IoT Vision..... 6

 Produce an IoT Roadmap Based on Your Current IoT Maturity and Vision..... 7

 Ensure the IoT Strategy Work Is Part of a Digital Business Strategy Initiative..... 9

Gartner Recommended Reading..... 9

List of Figures

Figure 1. Sample IoT Assessment Matrix..... 4

Figure 2. Representing Ideas Graphically..... 7

Introduction

A stand-alone IoT strategy adds a lot of value, but even more value is extracted when the IoT work is part of a companywide digital business strategy (see Note 1 for definitions) that helps organizations meet threats and opportunities in an increasingly digital world as part of the business strategy. In this work, IT and line of business (LOB) representatives need to share a common agenda. IoT has proven to be an important ingredient for many organizations when it comes to extending current products or come up with potentially new products under the same or new brands.

All strategies need to address demand (what are the requirements from the organization), supply (how to satisfy demand), governance (how to prioritize and fund the initiatives) and security. What makes IoT more challenging than putting together any other IT strategy is that the demand side is usually not well understood inside the organization and, for most organizations, it is reasonable to expect that it will take several iterations of refining the vision before demand solidifies. The same goes for the supply side of the strategy. Technology advances rapidly while standards and business models remain largely immature, hence the supply side will also take several iterations before it solidifies. For each iteration, KPIs or milestones need to be identified and reported against to keep track of progress. There is not a single way of developing an IoT strategy. This is one way that Gartner has seen clients successfully use.

Analysis

To Achieve Your Goal, Understand Your Starting Point

IoT strategy work is no different than other strategy work in that you need to know the current state or position in order to assess the gap to the future, desired state or position. A good first step to assess the current state or position is to do a quick self-assessment along the two relevant axis: technical capabilities and vision.

Sometimes the work needs to be separated as the maturity and requirements may be very different by division. The work can be either IT led or LOB led. Both can be successful, but a strong involvement of LOB is critical when it comes to aligning the IoT initiatives to business requirements, to help prioritize projects and secure funding. IT can usually contribute a lot of process competency as well as information and case studies about what other organizations have been doing.

IoT has become a big field that was initially spawned from telematics and machine-to-machine (M2M) initiatives about two decades ago (see Note 2 for definitions). Fueled by M2M modules becoming cheaper, more power efficient and the cost of communication decreasing, it was further expanded by the concept of connected devices five to eight years ago and has now become totally proliferated.

Identify Your IoT Readiness by Performing an IoT Maturity Assessment

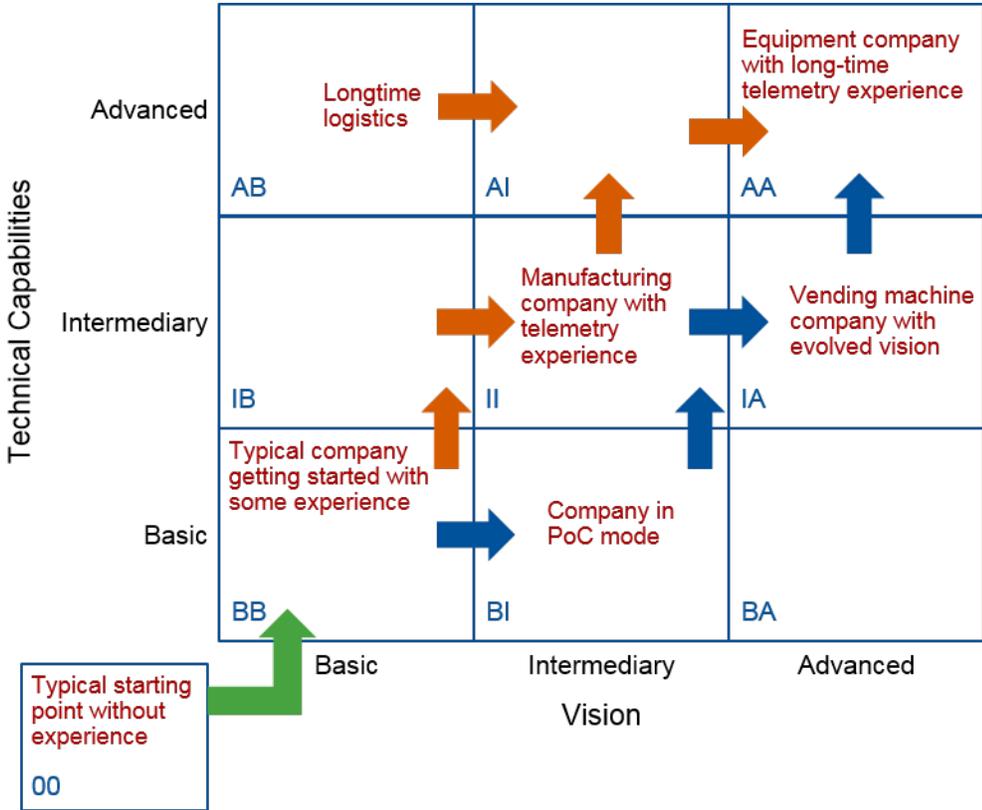
For each of the axis, rate your organization as either basic, intermediate or advanced according to the following criteria:

- Technical capabilities
 - Basic
 - The organization has no prior experience when it comes to procure or operating IoT or M2M solutions.
 - Intermediate
 - The organization has been operating or procuring M2M or IoT solutions for more than two years. Some of this experience may be in the area of OT, for example, telemetry solutions to remotely monitor assets like pumps, transformers, compressors, etc.
 - Advanced
 - The organization has been involved in large-scale IoT or M2M projects for more than five years, probably in more than one area/division and IT has been a partner in the development of the solutions.
- Vision
 - Basic

- The organization has assigned responsibility for ideation around IoT and vision formulation is in early stages.
- Intermediate
 - LOB has been educated about the potential IoT and has an understanding of the technological capabilities. A first version of an IoT strategy has been developed and accepted by relevant stakeholders.
- Advanced
 - The organization already is shipping products/services in operations that leverage IoT or M2M technologies and are now working on the second or subsequent iterations of an IoT vision. All relevant stakeholders have an understanding of how the current initiatives have impacted the organization.

Please note that some organizations will have a starting point outside of the 3x3 matrix in the box labeled 00, indicating that some work needs to be performed to get into the matrix (see Figure 1).

Figure 1. Sample IoT Assessment Matrix



Source: Gartner (July 2015)

In Figure 1, several different types of organizations are depicted in red just to exemplify the following concepts:

- "Typical starting point without experience" (in 00 box) — Depicts a company that is just starting the IoT journey and once the organization has gone through a learning phase and started to articulate the vision, it follows the green arrow into the BB quadrant.
- "Typical Company getting started with some experience" (in BB quadrant) — A typical company getting started with their first IoT strategy without any prior experience of having IoT or M2M solutions in operation. After operating at this level, it would typically advance relatively quickly into either the BI quadrant following the blue arrow or work on refining their capabilities (see below) and follow the orange arrow into the IB quadrant.
- "Company in PoC mode" (in BI quadrant) — An organization that has developed a strategy and may be in pilot or proof-of-concept stage. After the pilot, it is likely that the organization will invest in further capabilities and follow the blue arrow into the II quadrant.
- "Longtime Logistics" (in AB quadrant) — A logistics company that has been using Track and Trace solutions for its trucks for a couple of decades and is now operating its third generation of Track and Trace solutions while getting started on working on an IoT strategy to evaluate how to improve competitiveness using IoT technology. As the vision matures, this organization will move into the AI quadrant.
- "Equipment Company with longtime telemetry experience" (in AA quadrant) — An equipment company that has been equipping its products with a telemetry platform for over a decade to collect basic information about the operations of the product. The company now has a strategy in place for how to deliver value-added services to its client base by also geotagging additional information collected and cross-referencing that with information such as yield to generate recommendations or forecasts for their clients.
- "Manufacturing Company with telemetry experience" (in II quadrant) — Manufacturing company that historically has equipped its products, such as copy machines, with basic telemetry functionality to report information such as usage and is now working on an IoT strategy to look at how to improve in other areas. After further refining the vision, this organization is likely to follow the blue arrow into the IA quadrant. Alternatively, the organization can choose to further invest in refining its capabilities and follow the orange arrow into the AI quadrant.
- "Vending Machine company with evolved vision" (in IA quadrant) — Manufacturing company with a fleet of vending machines that has historically had telemetry functionality for fault detection, location tracking and replenishment and is now looking at optimizing yield through adaptive merchandizing. In this process, it will need to improve its capabilities and will follow the blue arrow into the AA quadrant.

Refine the Vision Component Iteratively

IT organizations need to work with LoB to establish how to refine the IoT vision based on competitive pressure and desired investment levels. Sometimes this involves the IT organization having to show the value it can bring to the discussion to avoid potential shadow IT initiatives. This work is frequently done through ideation workshops with the relevant stakeholders. For each iteration of the vision, it is critical to identify KPIs or milestones to report against to assess progress as well as identify major shifts in the underlying assumptions.

There is no universal law that suggests that all companies in all verticals need to achieve the highest level of refined IoT vision. It is more about understanding that from an outside-in perspective and what is an opportunity to your organization that will turn to a threat in two to three years if you don't move on it and a competitor does.

Depending on type of organization and LoB requirements, the vision could be focused on enhancing existing products and/or processes or be much more radical and aim to establish new products or business models.

Assess Where You Need to Be

Depending on which one of the nine quadrants you are currently in, only adjacent quadrants could be considered realistic targets for advancement. Each organization will define its own journey over time, balancing its own maturity and evolutionary requirements to that of the competitive landscape. It is important to understand that this is an iterative process, as requirements on either axis grow and certain activities need to take place to evolve the overall position. In many situations, it is difficult to plan more than one move ahead, and each move can take anywhere from six months to 18 months.

Invest in Ideation to Further Develop the IoT Vision

The IoT vision needs to be continually enhanced to stay relevant. Successful organizations invest in ideation sessions with LoB representatives to uncover new potential opportunities as well as to perform business enablement reviews. Ideas are the fuel that powers an IoT vision and strategy. IoT has the potential to create significant changes to business models, and may require radical innovative thinking to identify new opportunities. Where possible, involve a wide range of people in the search for ideas on the principle that the more ideas you uncover, the more likely you are to find something useful.

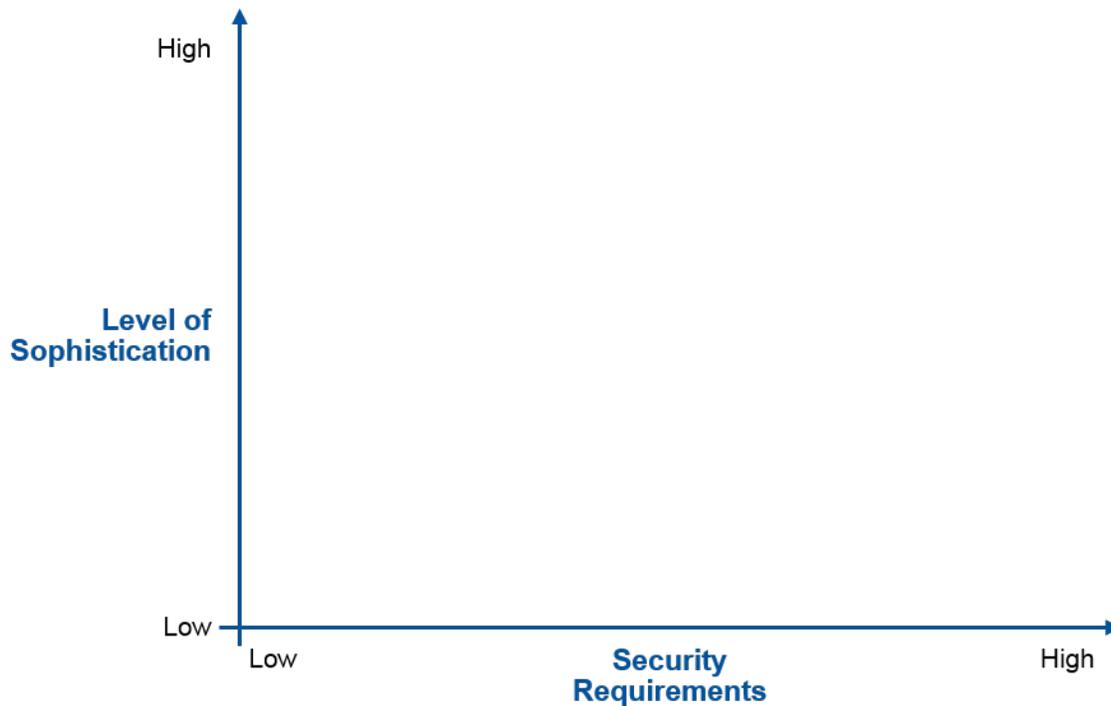
There is no single optimal way to generate ideas, and organizations will typically use several complementary approaches such as:

- Workshops where small teams are given a fixed time to discuss and suggest ideas for ways to use IoT in their business area
- Competitions with prizes to reward great ideas; one approach is to structure these as "challenges" searching for solutions to specific business problems
- Hackathons where developers create hardware/software prototypes in a short, fixed time, typically a day or two usually with prizes for the winners
- Collaboration with external organizations such as universities, often using tactics such as competitions or hackathons
- Exploit ideation tools, which help the organization collect, refine and evaluate suggestions
- Education sessions such as "IoT lunches"

- Technology seed programs, for example, giving devices such as Arduino to staff to encourage experiments

New ideas can be plotted in a graph like the one in Figure 2 to facilitate assessing them. The further "up and to the right" the ideas are positioned, the more expensive it typically is to realize them.

Figure 2. Representing Ideas Graphically



Source: Gartner (July 2015)

Produce an IoT Roadmap Based on Your Current IoT Maturity and Vision

Depending on which one of the nine quadrants and one box best reflects your current capabilities and vision, different components will be of different importance to your organization moving forward. As the vision is refined and technology evolves, the previous decisions need to be revisited and assumptions and/or architecture and products may need to be changed to enable the organization to move forward.

In Figure 1, we've plotted potential evolutionary movements. This doesn't exclude lateral movements by acquisitions or by massive changes introduced by outsourcing. Some suggested activities when moving along the two axes are as follows — not all activities may be relevant depending on target architecture and priorities may be different for different organizations:

Initial — Moving from the box 00 into the quadrant BB:

- Select architecture

- Decide on sourcing strategy
- Assess security requirements
- Select M2M service provider
- Select middleware for integration and management
- Develop vision through ideation
- Develop APIs for back-end integration
- Establish governance
- Pilot solution(s)
- Establish organization
- Assess skills

When moving along the Technical Capabilities axis from Basic to Intermediary or Intermediary to Advanced, the following activities tend to be relevant:

- Refine architecture
- Refine sourcing strategy
- Refine security requirements
- Review existing M2M service provider performance and suitability
- Refine middleware for integration and management including revisiting sourcing decision and delivery model
- Refine governance
- Scale solution(s)
- Refine organization
- Develop/acquire skills

When moving along the Vision axis from Basic to Intermediary or Intermediary to Advanced, the following activities tend to be relevant:

- Refine security requirements
- Refine vision through ideation and business enablement review sessions
- Refine governance
- Pilot solution(s)
- Refine organization
- Develop/acquire skills

Ensure the IoT Strategy Work Is Part of a Digital Business Strategy Initiative

It is difficult but not impossible to develop a stand-alone IoT strategy. IoT in and of itself rarely generates any tangible business benefit unless it is monetized by being an integral part of another product that is sold at a premium, or if the data collected by the IoT initiative generates transactions that are fed into a back-end system to generate billable events. A stand-alone IoT strategy adds considerable value initially but even more value is extracted over time when the IoT work is part of a companywide digital business strategy (see Note 1 for definitions) that helps organizations meet threats and opportunities in an increasingly digital world as part of the business strategy. IoT typically adds value in the "engage" part of the business model and may also provide the foundation to move a commodity product into a service offering with a very long tail. To successfully achieve this, IT and LoB need to be aligned and work jointly on the initiative.

Additional research contribution and review was provided by: Alfonso Velosa and Federica Troni.

Gartner Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

"Let's Get Digital: A Template of Digital Business Strategy"

"Survey Analysis: The Internet of Things Is A Revolution Waiting To Happen"

"Mobile Is a Critical Component in a Digital Business Strategy: Use This Framework to Identify Opportunities and Threats"

"Get Ready for Digital Business With the Digital Business Development Path"

"Master the Six Essential Elements of a Digital Strategy"

"Seven Best Practices Help EA to Support a Customer-Focused Digital Strategy"

"Uncover Value From the Internet of Things With the Four Fundamental Usage Scenarios"

"The Internet of Things Is Moving to the Mainstream"

"Build Your Blueprint for the Internet of Things, Based on Five Architecture Styles"

"Three Steps to Ensure Your IoT Project Is Driven by a Business Need"

Evidence

Based on a large number of Gartner client inquiries and client engagements in which Gartner has assisted clients in their IoT strategies and programs.

Note 1 Definitions

Digital refers to all electronically tractable forms and uses of information and technology. It is bigger in scope than the typical company definition of "IT" because it includes technology outside a company's control: smart mobile devices (in the hands of customers, citizens and employees), social media, technology embedded in products (such as cars), the integration of IT and operational technologies (such as telecom networks, factory networks and energy grids) and the Internet of Things (physical objects becoming electronically tractable).

Digital business refers to business created using digital assets and/or capabilities, involving digital products, services and/or customer experiences, and/or conducted through digital channels and communities.

Digital business strategy refers to the component of overall business strategy that answers the question, "How will our business, public-sector agency, government or country survive and thrive in an increasingly digital world?" The answers to that question are not limited to digital business decisions. Note that "digital strategy" means the same as "digital business strategy."

Note 2 Definitions

The Internet of Things (IoT) is the network of dedicated physical objects (things) that contain embedded technology to sense or interact with their internal state or external environment. The IoT comprises an ecosystem that includes things, communications, applications and data analysis.

Machine-to-machine (M2M) communication services refer to connectivity services that link IoT "things" to central or back-end systems, without human input.

Operational technology (OT) is enterprise technology used to monitor and/or control physical devices, assets and processes.

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