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PRODUCT LIFE CYCLE IN THE AGE OF IOT

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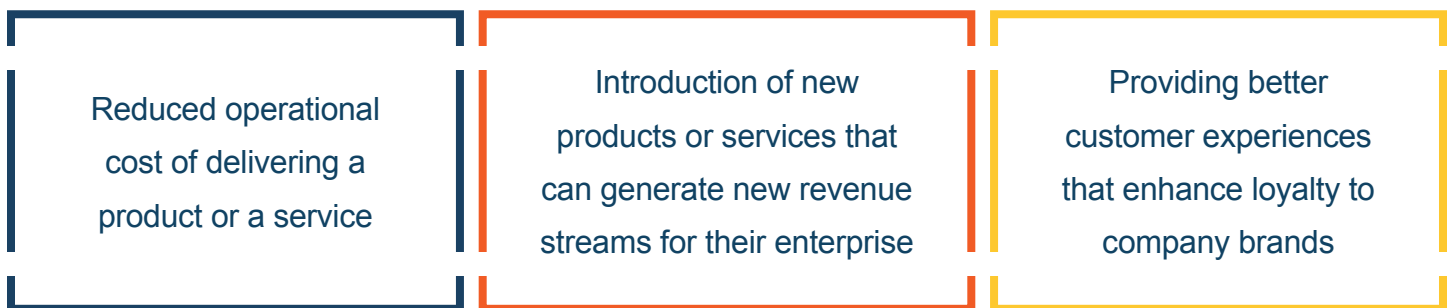
EXECUTIVE SUMMARY

By now, companies big and small have heard of the possibilities that the Internet of Things (IoT) brings to their business. Collecting data from sensors and devices, and using smart analytics to turn the data into information that can be used to provide a new service, or optimize the efficiency of the existing products and services has been shown in many proof-of-concepts, and pilot deployments for the past few years. Massive ROI projections from IoT deployments have caused people to claim that “data is the new oil.” Although the excitement around the potential economic value that IoT will bring is warranted, these returns can only be achieved if companies can deploy and manage these IoT platforms and systems at scale throughout their life cycle.

Developing products and services for IoT poses unique challenges for industrial companies whose forte may not be in developing software solutions. IoT-enabled industrial and commercial devices are expected to perform in the field for many years, therefore, OEMs have to plan support for their entire life cycle from deployment to end-of-life in their IoT strategy.

UNDERSTANDING THE CHALLENGE

Commercial and industrial companies – from manufacturing to transportation to healthcare – have become intrigued by the value of integrating IoT into their offerings. There are many examples from a wide range of industries where OEMs have used machine and sensor data to unlock value like never before. Value for these enterprises typically come in three flavors:



Most development teams are under pressure to develop and deliver IoT applications quickly to stay competitive. At the same time, IoT applications are very complex, as developers need to consider challenges posed by an “always connected” application. In the past, developers had to only consider hardware, embedded software, user experience, packaging, documentation, and warranty before a product was ready to ship. Once the product was developed and launched, the developers didn’t have to interact with the product any longer.

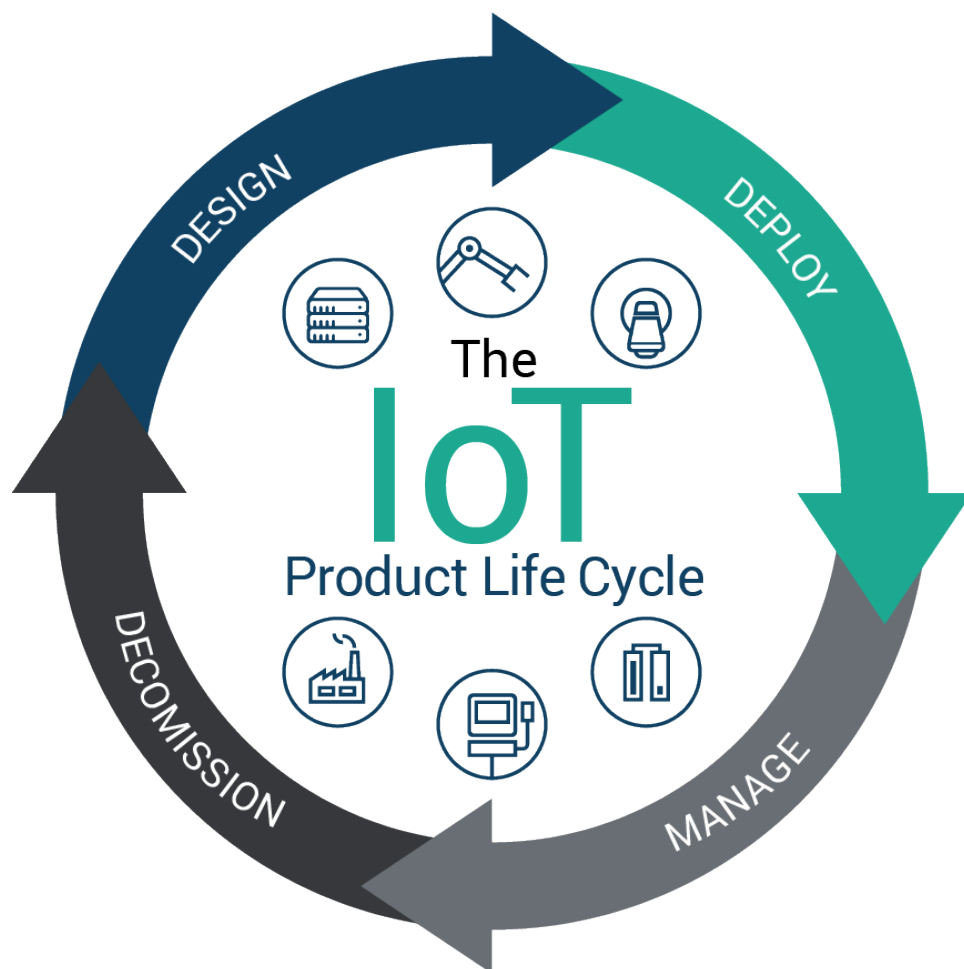
Industrial and commercial customers expect their IoT products to be in the field for many years, during which time they have to maintain and upgrade these products to enable new use cases, adhere to new standards, and optimize the product’s performance. Developers need to anticipate what these connected devices require in the future and have to plan for the life cycle of the products from the initial product development, to integration with other systems and platforms, to deployment in the field at scale, to maintenance and upgrades, and to eventually decommissioning of these same products.

The IoT life cycle management is complex, as designers have to consider new requirements such as security, scalability, hosting, and manageability, which in the past were rare considerations for an “unconnected” product. What makes this even more challenging is that most OEMs have to develop plans for supporting the life cycle of their new “connected devices”, while also servicing the existing “brownfield” legacy equipment in the field. In fact, the majority of OEMs consider support of their existing brownfield equipment a priority as it gives them access to an installed base of users which they can monetize. Brownfield devices typically have not been developed with connectivity in mind, and adding connectivity to a legacy device requires more than just add-on connectivity hardware but also consideration of issues such as security and remote manageability of the device.

Developers have to also consider the ease of provisioning of these devices. Even the smaller IoT deployments for an end user will typically involve thousands of devices, and therefore, commissioning and provisioning should be quick and painless. In many cases, multiple entities, such as system integrators or solution providers, are involved in the deployments of the solution, and they need to have the right level of access and authorization to ensure a seamless experience.

THE IoT PRODUCT LIFE CYCLE

There are four stages to the IoT product life cycle. These are Design, Deployment, ongoing Management, and Decommissioning. Let us walk through each stage.



Design is the first stage of the life cycle but likely the most important one. As discussed above, in this stage, the developers have to consider requirements from the next three stages of the product life cycle to ensure that the product can easily support each stage. In many cases, the product is not brand new, and instead is an enhancement to a previous generation product. Therefore, developers have to consider

how to best bridge new functionalities and the existing code base without compromising performance and security. Developers have to also carefully weigh “make versus buy” considerations. While many OEMs are starting to lean towards the “buy” scenario to speed up time to market, this path isn’t without its own set of challenges. In a noisy IoT marketplace filled with many options for both hardware and software solutions, OEMs must be discerning when it comes to selecting the right partners.

Deployment is the second stage of the product life cycle, and itself can come in a few phases such as proof-of-concepts, pilots, and commercial roll out. Deployments of IoT solutions are much more complex than traditional products, as there are many more stakeholders involved. For example, a deployment at an electric utility may involve the OEM, the utility provider, a systems integrator, an independent software vendor (ISV), and the public utility commission. They may all have the need to have access to the product at the various phases of deployment; as such, the right level of user authorization needs to be provided. Initial provisioning and configuration of the platform in the field needs to be quick and seamless. Modelling the deployment and activation after smartphones and other consumer products can ensure ease of use and deployment at scale.

Ongoing Management is the third stage of the product life cycle, and likely the longest one. During this stage, multiple stakeholders may need to access the device to be able to monitor its status, provide maintenance, provide updates, and optimize its performance – all without sending someone on site. In fact, for many industrial customers, one of the most critical drivers of the value in IoT is the ability to use a device’s data to make decisions regarding its performance.

Finally, the last stage of the product life cycle is Decommissioning. This stage is typically overlooked in many product designs. OEMs need to carefully consider and plan for the product’s end-of-life at the design stage. End users and other stakeholders have to be able to quickly and securely remove a device from service and onboard a new one. While it may seem counterintuitive for an OEM to develop a design for making it easier for an end user to decommission their product and move into a newer model, this has been done very intelligently by companies like Samsung and Apple. By making it easier for their customers to transition from one product model to another, they have created another reason for their customers to continue to invest in their products time and time again.

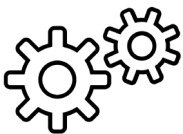
SIMPLIFYING IoT PRODUCT LIFE CYCLE DEVELOPMENT

Although the IoT product life cycle can be described in four distinct phases, it is important to think of it holistically. The key capabilities for managing the product throughout its life cycle need to be integrated.

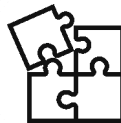
Many OEMs focus on developing machine connectivity and user experience, with most of today's IoT platforms only focusing on leveraging the data acquired. We believe management of deployed IoT devices is an underserved but vital element of the last three phases of the product life cycle. For OEMs, adding device management capabilities to their smarter IoT offering provides several benefits:

- Extends engagement with key stakeholders (solution partners, system integrators, end-user customers) beyond initial deployment to one that spans the entire product life cycle and can create greater brand loyalty
- Enables faster and more cost-effective delivery of support at scale
- Creates a “zero-hassle” end-user/partner deployment experience by allowing for OEM-created automation of routine maintenance and support steps

The challenge for many OEMs in creating this experience boils down to three considerations:



**Engineering and
Financial Resources**



**Complexity and the
Necessary Skills**



Time to Market

This is why so many OEMs today have created connected machines that are still serviced by a “traditional/old-school” model. Whereas, the traditional OEM product development model sees post deployment product life cycle experiences such as device management and decommissioning as add-ons, the smarter connected OEM product development model sees all the phases of the product life cycle as opportunities to embed the OEM’s brand value into their stakeholders’ psyche.

The success of the smarter connected product development model has already been proven by the evolution of mobile phones to smartphones. Purchase a smartphone today and it already includes all the tools and services you need to manage it from deployment to decommissioning. Maintenance and support – whether for the device itself or applications residing on the device – are typically automated and require minimal user interaction. Enterprises can remotely and securely deploy new policies to their user base. Ready to decommission your current smartphone and transition to a new one? There’s a tool for making sure that your contacts, photos, phone, and other preferences can all be ported over to your new “machine” with minimal hassle, and that personal information on the old phone is completely wiped out.

When it comes to IoT deployments (which often involve thousands of devices), having the same type of experience throughout the product life cycle can translate into more than just a better user experience – OEMs can create significant value and ROI for themselves and their partners on a much broader scale. The challenge in getting there is that creating this experience is significantly more complex for the OEM to develop on their own.

One way for OEMs to leap ahead in this and get to market faster with their next generation connected products, is by using a commercially available IoT application development and deployment platform.

OEMs should consider the following when seeking the right IoT platform solution to complement their IoT project:

- What ready-to-use management applications are already incorporated or can be deployed?
- Does the platform provide the ability to create multiple custom portals and enable multiple levels of user hierarchies?
- Is the platform compatible with any existing applications the team has already developed and invested in? How much time will the team have to invest to integrate this platform with existing solutions and/or business models?
- Does it allow for both on-premise and/or public cloud-based hosted environments?
- What microservices or core capabilities are built-in that can help me accelerate development of my own web-scale applications? Are they customizable or extensible?
- Does the platform use industry standard protocols?
- Is the platform designed as a modular “pay for what you use” service or am I required to make an “all or nothing” commitment?

The Internet of Things provides many opportunities for creating new streams of revenue and value in the marketplace. Industrial and commercial OEMs who create user experiences that embed their value proposition throughout all stages of the product life cycle – Design, Deployment, Management, and Decommissioning – are the ones most likely to achieve a competitive edge and enhanced value in the marketplace.

ABOUT LANTRONIX

Lantronix, Inc. is a global provider of secure data access and management solutions for enterprise Internet of Things (IoT) and IT assets. The company is the developer of MACH10™, a multi-dimensional IoT application development and deployment platform that dramatically simplifies the process for OEMs to deliver web-scale applications. To learn more about Lantronix and MACH10, go to www.lantronix.com/mach10/.

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