

IoT83

# The Executive Smart Products & Applications Investment Paradox

Industry Guide



## Table of Contents

The Executive Smart Products & Applications Investment Paradox .....	2
Assessing the Transition, the Opportunity, and the Threat .....	3
Industrial Product Migration to Smart Solutions is Now Inevitable .....	4
Step 1: Unwinding the Paradox Through Understanding & Consensus .....	4
Step 2: Building a Plan for Transition – That Allow for Near-Term Success .....	6
Step 3: Finding the Right Partners and Tools to Streamline the Transition .....	7
The Meaning of Success – The Industrial Solutions Value Progression .....	10
Finally Breaking the Paradox – A New Long-Term Path to Success .....	12
The IoT83 Platform Application & Solution Creation Process .....	12
The Most Essential Advantage of the OEDC Approach .....	13
A Quick Tour of the OEDC Platform .....	14
Conclusion .....	15

# The Executive Smart Products & Applications Investment Paradox



In the current industrial marketplace, marked by continuous innovation and dynamic shifts, industrial OEMs are facing an unprecedented opportunity – and challenge – for long term differentiation. With enterprise customer demand for the economic advantages of Internet of Things (IoT) and Smart Product solutions now at full maturity, the Original Equipment Manufacturers (OEMs) that achieve strategic differentiation with such solutions can lock-in a long-term competitive advantage.

This whitepaper delves into the transformative power of IoT adoption for OEMs, exploring how it shapes their competitive edge.

Lee House, Founder and CEO at IoT83, lends his visionary insights to this exploration. With a track record of recognizing technology trends and delivering game-changing enterprise solutions, Lee provides OEMs with a pragmatic guide as to the importance of this IoT mega-trend and the alternatives available to OEMs move ahead of their competition.

Lee's leadership spans GM and VP positions at GE, IBM, 3Com, and various Silicon Valley companies, backed by an MSEE and MBA from Duke University. Lee's role as a thought leader in the IoT domain positions him to guide OEMs into a future where connectivity and innovation redefine the industrial landscape.

## **Lee House**

Founder & CEO at IoT83

Most Industrial OEM and Enterprise CEOs can see the writing on the wall—Namely, that a ‘Mega-Trend’ in Industrial IoT Digitization and Smart Applications is upon us. Leaders see this transformation as a huge opportunity—but also as a major threat. The opportunity is to capture the huge business growth coming from this change. The threat is not embracing these sweeping changes fast enough and being left behind.

With the transition from “Traditional Products” to “Smart Products” moving so quickly, OEM and Enterprise leaders understand that new competition can quickly emerge to disrupt market position, customer traction, once reliable revenue, and even threaten the very business itself. On the other hand, getting this transformation right can bring very big rewards.

In making this transition, many leaders find themselves in an “Executive Paradox”. The paradox is that while the opportunity and the threat are well understood, tight financial and resource constraints make mounting to this industry transformation, to put it mildly, hard. Answerable to their board or other business leaders, these executives need to sustain their existing P&L (the status quo), yet also launch a strategic plan to address this new opportunity and threat. Also implicit in this “Paradox” is understanding how far to go to meet the new digital revolution challenge, as well as how fast they may need to move from phase to phase in their implementation.

This “Executive Paradox” is understanding this urgent need for change while also solving the big challenges to make it happen. Given the hard reality of industry wide transitions to Smart Products and Smart Systems, finding an answer to the “Executive Paradox” is one of the most important issues facing industrial business leadership today.

## Assessing the Transition, the Opportunity, and the Threat

Historically, we have seen that wherever there is new value to be extracted, traditional products will transform into smart products whenever the tools and components are available to let this transformation happen. There are many examples to bear this out. PBX’s transitioned to software systems with far more features. Telecommunications equipment, once the definition of “big iron”, transformed into cloud-based software now providing voice, video, data transport, and a multitude of entertainment subscription services. Mainframes have given way to cloud computing. Cisco transitioned its huge network hardware business to provide intelligent distributed switching and associated services. Phones – the poster child for disruption - are now a combination of phones, hand-held supercomputers, and libraries in your pocket. Even books are now digital.

And the catalyst for change – that is the various components to enable this transformation to smart industrial products and applications - they are all clearly available as well:



Global high-speed communications



The Open-Source Software Revolution



Ubiquitous Cellular/Wireless Access



Global Acceptance of E-commerce



Global Networking Solutions



Cloud Computing & Big-Data Analytics



Low-Cost Edge Computing



Business acceptance of SaaS solutions

With low-cost silicon to embed in products, ubiquitous wired & wireless connectivity, open-source software to speed smart product development, global acceptance of Software as a Service, and near-infinite compute resources in the cloud, the stage is set for a major upheaval in industrial markets. As a result, the transition from “Traditional” industrial products to “Digital” industrial products is not only inevitable, but already moving fast.

## Industrial Product Migration to Smart Solutions is Now Inevitable

McKinsey predicts that \$3.2 Trillion in new value will be created by IIoT alone by 2030. And this represents only a fraction of this new industrial value as these estimates don't fully take system-level application upheaval into account. All of this validates the urgency industrial executives feel to act now! So, the question is: How can leaders solve this Smart Products digital transition “Executive Paradox.”

### Step 1: Unwinding the Paradox Through Understanding & Consensus

The first step in unwinding the paradox is building the corporate will to take this on. Whether you are a CEO, GM, Product Owner, or Engineering Leader, building a common corporate will to embrace this new future is the critical first step. To emphasize the urgency here, executives should emphasize not only the opportunity, but also the very real threat of business disruption through inaction.

## The Opportunity – New Revenues, New Services, New Value

- Via Remote Monitoring, customers now have visibility for all asset performance.
- Via Performance Management, operational efficiency, uptime, and service is improved.
- Via Predictive/Prescriptive Maintenance, not only are operations streamlined, but capital equipment is protected from potentially catastrophic failure.
- Via Artificial Intelligence and Machine Learning integration, performance improvements to operations, uptime management, and new services offerings can go well beyond what was possible before.

And, with customer adoption, the value of these new digital solutions compounds:

- As adoption of the new Smart Products & Smart Applications increases, the OEM or Enterprise provider becomes far more central to operations, increasing account control.
- Service and support to customers not only increases in value but is cheaper to implement as the supplier knows what to service when, and why.
- Product performance knowledge gives suppliers insight on product improvement needs.
- And this same value provided to customers can be applied to the supplier's own operations in the production of industrial products for sale.

And all of the "Opportunities" above translate to real revenue in terms of increasing base product price, the sale of "premium" services, new licensed software revenues, enhanced services, as well as market share gains that result from a superior offering. Further, the above list does not even contemplate the specialized added value that a supplier can add to new services by embedding specialized know-how and expertise into the solutions – giving the supplier distinct competitive advantage in their vertical markets.

So, the case for increased revenue and profits through competitiveness in Smart Products & Applications is both impressive and clear. Regardless, often promises of future growth and market advantage are not enough to drive immediate action. But the Threat, or fear, is a great motivator when presented with clarity in the face of this rapidly changing market.

## The Threat – Lost Market Share, Gross Margins, and the Competitive Edge

To repeat the axiom: Wherever there is new value to be extracted, traditional products will transform into smart products whenever the tools and components are available to let this transformation happen. And these tools and components are definitely available now!

In almost every industrial product sector, we see these changes happening. Energy markets are adopting micro-grids, smart-grids, and smart meters. Oil & Gas and Water/Wastewater are transforming operational efficiency with a connected edge and smart monitoring solutions. Smart buildings are optimizing energy efficiency, security, and customer comfort. Smart cities are solving traffic congestion problems, emergency response, city service costs, and much more. Industry 4.0 is revolutionizing manufacturing. Every industrial sector is clearly on the move.

Ironically, the larger an OEM, the greater the threat of losing without the implementation of Smart Products and Smart Applications. Conversely, implementation can flip the situation from losing to winning with IoT. This is because larger OEMs often provide entire product solutions to customers that work in concert. And if such a “traditional product” with a significant interworking portfolio does make the Smart Products or Applications transition successfully, they will face major disruption from companies that do, and do this well.

But of course, smaller OEMs and Enterprises also face this threat of displacement and disruption. For any solution provider with any complexity in configuration, management, service, or operations, there is a very real threat of competitive disruption. This is especially true of high-dollar OEM products considered as capital equipment, because in this new world investments have to be protected by the “insurance policy” of “Smart Systems” via IIoT.

Each business will have to look at the competitive environment they exist in and assess the extent to which they are exposed to the threat of obsolescence or displacement. But the axiom holds: Wherever there is new value to be extracted, traditional products will transform into smart products whenever the tools and components are available. So, this self-reflection needs to be serious a serious assessment of the risks of inaction.

## Step 2: Building a Plan for Transition – That Allow for Near-Term Success

Once the “corporate will” for change is established, the funding and resources constraints of the “status quo” remain. So, from here, the best path forward is almost always to find paths to the planned “future state” where new revenues and profits track the transition investment funding as closely as possible.

This means that, for several reasons, large monolithic transition plans that only yield results after long execution schedules and investment are often a very bad idea. First, with high execution costs and a long time to value, such plans often never get off the ground anyway. Second, assuming such plans are funded, long implementation schedules don't allow for customer and market reaction testing or course correction, to say nothing of generating revenue and profits along the way.

For most OEMs and Enterprises, solutions that take fast but meaningful steps and build iteratively on that initial foundation are far more successful. Of course, such incremental approaches must include strategic thinking and a long-term view of architectures and operational execution. But by establishing meaningful and distinct achievable milestones that can be taken to market quickly dramatically improves initial, as well as long term success. Here, OEMs and Enterprises have a far shorter time to value, smaller costs for incremental milestones, and have frequent opportunities to receive market feedback for course correction. And while initial investment cycles may be a drag on revenues and profits – they are smaller and faster. And soon, intermediate investments cross a “break-even” threshold where the transition is already paying for itself. Finally, subsequent investments are easily seen to be driving new revenue, profit, and market value.

## Step 3: Finding the Right Partners and Tools to Streamline the Transition

Assuming the above approach, the next priority is to identify the right partners, tools, and platforms to enable this intelligent transition to Smart Products and Smart Systems. Still focused on solving the “Executive Paradox”, the solution must include the following:

1. The transition program must be affordable – allowing executives to balance investment in existing revenue generating programs with the new “digital products” future without breaking the bank.
2. Time to Value must be short – Many of the alternatives that a business might turn to assist with this transition simply have no credible means to deliver fast results and time to value. These alternatives should be avoided.
3. The requirements for New Skills must be manageable - Often industrial OEMs and Enterprises don't have “Big Data” / “Enterprise Application” development resources, and any solution that puts to great a burden on acquiring these resources is a big problem.

Building out the specific details for a successful transition plan requires tight coordination between C-Level leadership, Product Management, Sales, and Operations. However, the biggest cost driver in this transition is always the platform technology that enables this transition. This “platform” will have to



be scalable, cyber-secure, and highly reliable to meet the bar for “enterprise-grade” products and solutions - or it becomes more burden than benefit. While there are multiple alternatives for such a Platform available, these can all be broken down into a limited set of viable choices. Namely, 1) to build the technology from scratch (likely using open-source software), 2) to draw from IoTaaS tools from AWS or Azure (and accept the vendor lock-in), 3) to contract with a consultancy house (accepting the high on-going cost this drives), or 4) to use an Application Enablement Platform that actually meets long-term strategic needs. The following table compares these alternatives:

**Platform Alternatives To OEMs & Enterprises To Build “Smart Applications & Solutions”**

Technology Transition Options	Cost To Develop	Time To Market	Specialty Skills Required	Future Application Flexibility
Build From Open Source	Very High	Very Long	Very High	Low
Build From IoTaaS	Very High	Long	Very High	Low
Contract With Consultant Services	Very High	Long	Low	Low
Use Application Enablement Platforms	Low	Short	Low	High

As can be seen from the table, the cost, time to market, and number of specialty skills for both building from scratch (open source) or building from IoTaaS tools from Amazon or AWS are all more or less unacceptable for most businesses. While many businesses are initially drawn to the IoTaaS components alternative, it is important to understand that IoTaaS components are exactly that – components. These elements have to be first deeply understood (with long learning curves), and then constructed into an actual platform level solution. Only then can you build your actual applications! The alternative of using a consulting house may also seem attractive, but this path leads to very high costs with very long schedules, and results in being signed up for very expensive long-term commitments.

From the table, the Application Enablement Platform (AEP) path is shown to be the most attractive path. As a class, AEPs offer many benefits that drive the results in the table. For example, AEPs provide:

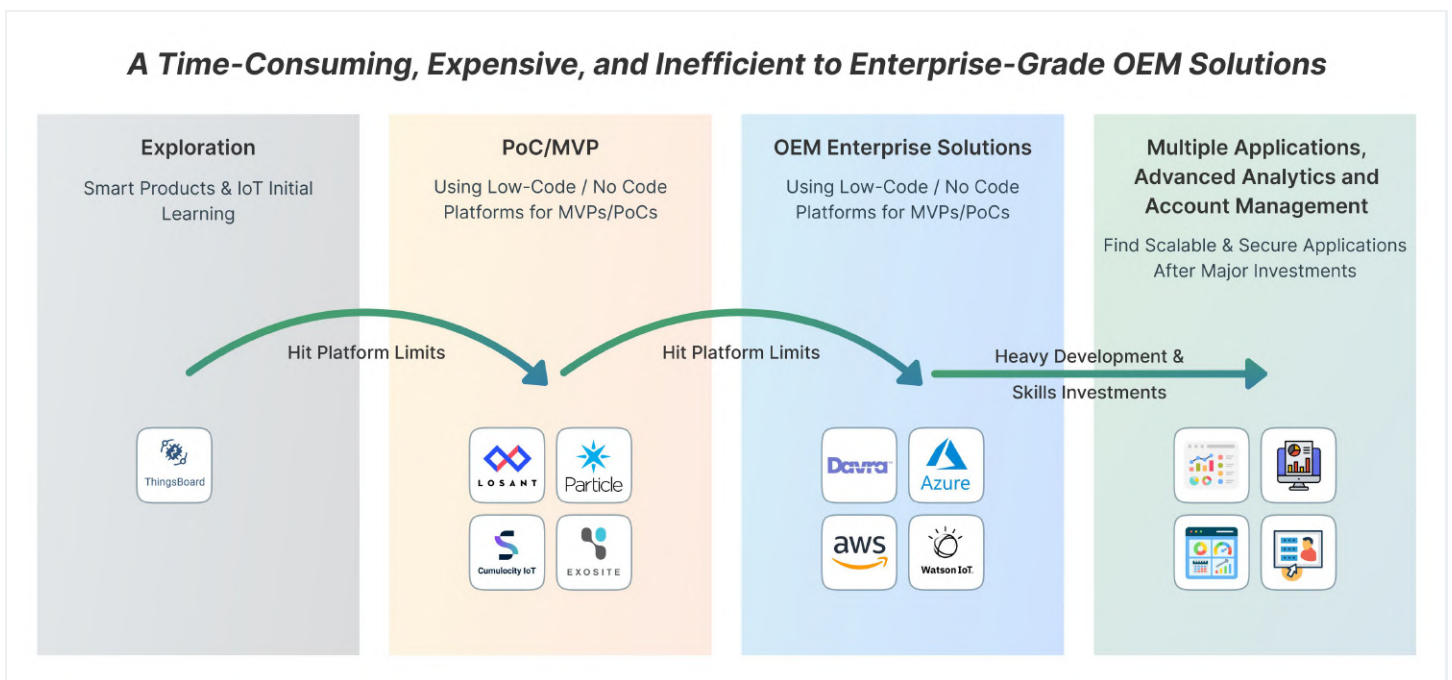
1. A Rapid Application Development environment that greatly accelerates results.
2. The development environments generally do not require “Big Data” specialty skills.
3. AEPs handle cyber-security, and reliability, but some AEPs scale better than others.

4. Almost all AEPs will streamline development for basic Smart Product and Application creation, but the most advanced AEPs also focus on providing the custom applications creation capabilities needed for long-term strategic differentiation.

So, while AEPs are the obvious choice for OEMs and Enterprises, not all AEP provide the same level of Smart Product & Application flexibility in the creation of new applications, solution scalability, cyber-security, deployment versatility, as well as support for business Intellectual Property ownership. So, even after deciding to go down the AEP path, care is required in choosing the right alternative.

For example, many AEP / RAD solutions provide customers only with a no-code / low-code path to new Smart Product / Application creation. While this makes solution creation simpler, the resulting solutions are always limited. With no-code platform tools, a user can “click to configure” elements of the solution. And, even with these low-code platform tools, the user has the ability to add some degree of customization to the solutions. But in the end, these solutions are inevitably more short-term than long-term. They enable near term results, but OEMs & Enterprises using them soon realize their limitations and lack of flexibility in building truly differentiated Smart Products & Applications. And, as it is simply not in the business model of these solutions providers to provide OEMs with the core platform changes that would make this possible, this can become a costly dead end.

As a result, many customers find themselves moving from platform to platform as they discover platform limitations. As they move through PoC or MVPs they find one set of limitations forcing a switch. As they attempt to scale, they find new limitations and migrate again. This churn leads to replication of work, and increases in cost and lost time to market:



In the end, what OEMS and Enterprises need from a platform can be summarized as follows:

- Enterprise-Grade Security, Reliability, and Scalability Applications that will meet CIO audits for deployments – or these solutions can never be used.
- Rapid Application Development (RAD) and the Customization Flexibility for multiple OEM products, customer, and vertical market solutions to enable long-term success.
- Application Deployment Flexibility to serve various OEM go-to-market alternatives – without AWS, Azure, or other cloud provider vendor lock-in.

These are all essential but challenging requirements, and the low-code “RAD” platforms discussed simply cannot provide them.

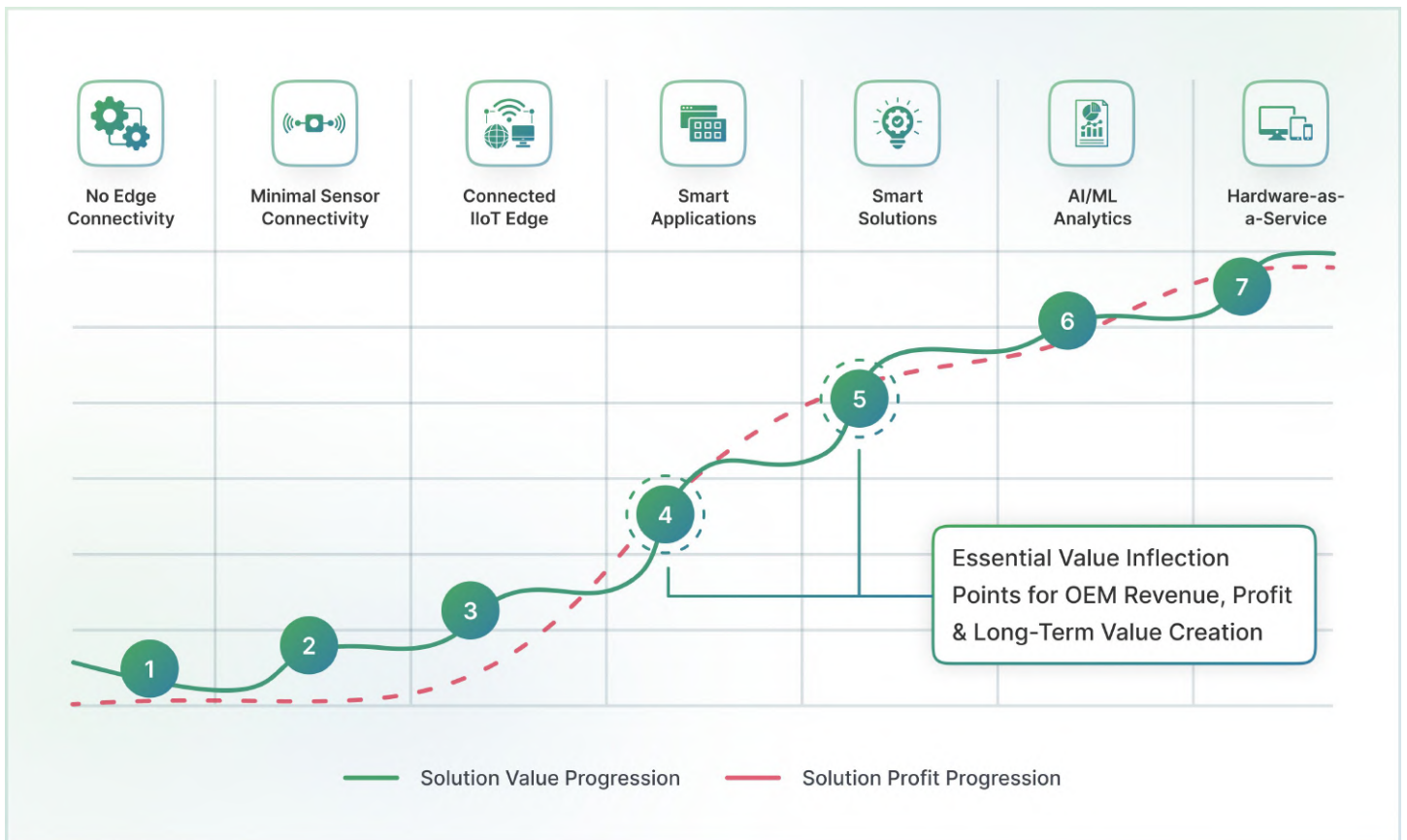
## The Meaning of Success – The Industrial Solutions Value Progression

To build a better understanding of what it takes to win in this Smart Product / Smart Solution industrial transformation, the following chart shows the logical progression in making this transition, along with illustration of both value creation and profit impact curves moving through these stages.

Looking at the value creation and profit progression curves there are some very important trends that warrant explanation:

- First, in the face of this transition, “No Device Connectivity”, as expected shows a downward curve in value. Likely, the profit curve should be downward as well.
- With “Limited Specific Sensor Integration”, the high costs and lack of repeatability in this phase limits new value creation as well as new profits.
- In the “Smart Edge Connectivity & Sensor Solutions” phase, substantial new value and an uptick in profits are created, but this is limited without moving into the next phase where the value of this edge intelligence is aggregated into enterprise applications.
- Value creation and profits really take off in the “Data Integration into Smart Applications” phase because here operators and end users benefit from the integration of all of the edge data from the prior phase, now built into coherent solutions including Remote Monitoring, Asset Performance Management, Predictive Maintenance, Advanced Analytics, and more.

- The value and profit curves continue to rise dramatically as “Smart Applications” are integrated into enterprise-wide “Smart Systems” next phase. One can think of this as the “Network Effect” where the value of the integration of individual applications is far more than the sum of each stand-alone application.
- While the next phase “AI / ML Analytics Integrations” may be spread across the earlier two stages, in practice this normally comes later as deployments become more sophisticated. With the addition of AI & ML models, these “Smart Systems” now can detect anomalies and operational optimization deep in the data for new levels of value.
- The last phase shown here, “Hardware as a Service” may or may not be relevant to all industrial “Smart Systems” OEMs, but with the cumulative impact of all of this value, OEMs and Enterprises now have the opportunity to sell a “result” versus “hardware”. This can come in the form of “Hardware as a Service”, or in the form of ongoing software revenues or contracts for advanced services.



This analysis shows the key value creation and profitability inflections points and highlights the importance of first establishing the “table stakes” of intelligent and connected edge products. But this underscores the critical importance for OEMS and Enterprises to aggregate all of this edge data into Smart Applications and Smart Solutions, as this is the catalyst to new value creation and profits. Without this move, it is very difficult for OEMs to extract the value of Connected Smart Products as any data and intelligence they provide is stranded. In fact, without aggregating this data into Smart Products and / or Smart solutions, the OEM is leaving this new value creation and associated profit to the next player in the value chain that actually integrates this all together.

## Finally Breaking the Paradox – A New Long-Term Path to Success

IoT83 has been working with many industrial leaders for years as they work their way through this transformation challenge. As discussed before, leaders are often attracted to a no-code / low-code path, seeking a fast time to market and low development costs. While good for PoCs, experimentation, or market testing, for all but the simplest applications, any significant application scope inevitably outgrows the constraints that such no-code / low-code platform can offer – leading to disappointment. No-code / low-code capabilities still have a place in IIoT applications, but they are best used for individual deployment tuning or operational end-user optimization tuning – not as a vehicle for building the Applications and Solutions themselves.

This is why IoT83 has taken a more wholistic view of an “AEP Platform” from our inception. From the start, IoT83 has understood that the most powerful solution we can offer our customers is a highly streamlined path to construct context-specific solutions using our validated reference applications and libraries containing essential IIoT solution “Design Patterns” – all running on top of the IoT83 proven, scalable, secure, reliable, and cloud-portable core platform services. As we are now on our Version 6 of the platform, we have refined this flexibility beyond that of any other competitive offering.

## The IoT83 Platform Application & Solution Creation Process

Using the IoT83 Platform, customers start with the Asset Handler Application. This “generalized” IIoT application contains all the critical IIoT “Application Components”, including device connectivity, data transformations, database management, rules generation, alarm & alert handling, custom logic integration, analytics, notifications, event scheduling, IAM & RBAC user management, dashboarding, & much more. This Asset Handler is a “Catalyst Application” that streamlines an OEM’s path to iteratively build powerful specialized solutions using a measured strategic process of value creation.

Because this “Catalyst Application” is constructed using the IoT83 platform core services SDKs and APIs, each application component is relatively light because the underlying core services are do the “heavy lifting” for each application element. This all results in a very efficient path to the creation of specialized applications with very low quantities of new Line of Code – a major metric for any development program.

The combined solution of the Asset Handler Application and the Core Platform Services is the heart of the IoT83 OEM & Enterprise Cloud Domain Platform (OEDC). With the OEDC, OEMs and Enterprises are provided a complete working reference application that also includes all the essential IIoT “Design Patterns” including Remote Asset Monitoring, Asset Performance Management, Event Handling, Preventative Maintenance, Custom Analytics, and much more, all operational, scalable, secure, and flexible out of the box. And, by providing customer access to the underlying platform via the Core Services SDKs and APIs, IoT83 is providing a completely open approach enabling unparalleled application creation efficiency. This level of power and flexibility is only available from IoT83.

The OEDC is in effect an “Application Factory” and a direct answer to the need for OEMs to align Smart Product / Smart Application investments as tightly as possible with the market returns on these investments.

## The Most Essential Advantage of the OEDC Approach

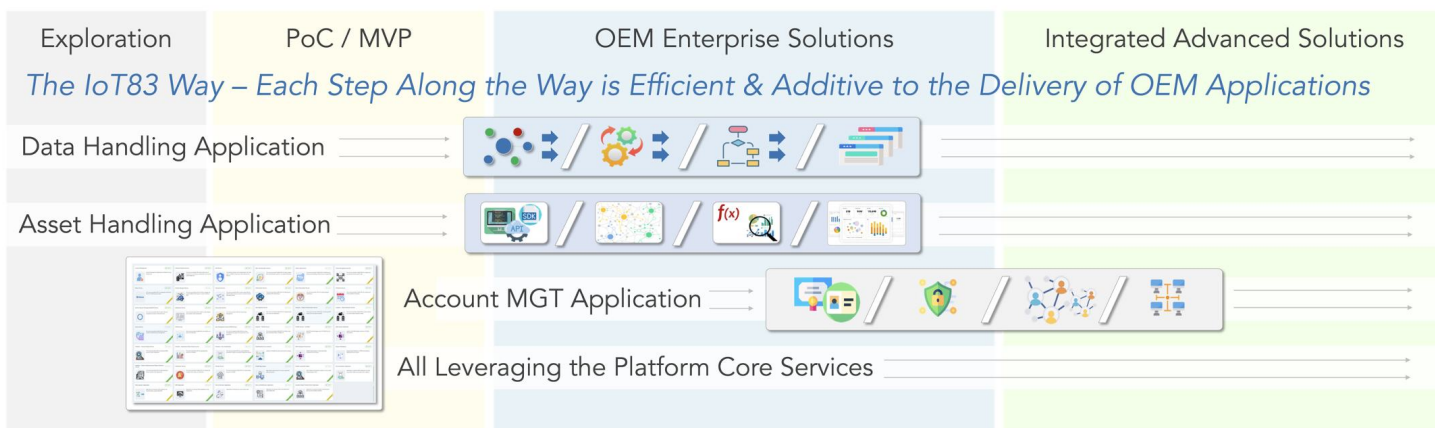
With the OEDC, OEMs and Enterprises are investing directly in the Applications and Solutions – not the underlying platform. Using alternative approaches, the creation of the underlying Platform and Platform Technology costs roughly 80% of an OEM or Enterprise’s investment and time. Yet, from the OEM’s perspective the underlying platform and technology is more or less a commodity, if not a necessary evil. Now, using the OEDC approach OEMs and Enterprises can focus roughly 100% on value creation only, and implementing the specialized know-how and expertise of their teams into unique Smart Applications and Smart Systems – building a moat of differentiation between them and their competitors.

The diagram below provides an overview of the OEDC solution. At the core (#1 below) are the extensive platform services that developers can use to accelerate the creation of virtually anything. Above that (#2 below) is the Asset Handling Application, which is loaded with existing Smart Product, Application features, and capabilities. Above that is the Data Handling Application (#3 below) that provides “Data to Dashboarding” tools to enable operators to discover new insights to optimize operations. And finally, the Centralized Accounting Application (#4 below) makes it easy for OEMs and Enterprises to manage solution deployment to their customers. The flexibility and power of this approach is unparalleled in the AEP world.

# A Quick Tour of the OEDC Platform

	<p><b>Centralized Accounting Application</b> – Simplified customer tenant &amp; account management – handling customer access to OEM applications, solution deployments, &amp; license keys. (Coming Soon)</p>
	<p><b>Data Handling Applications</b> – A No-Code / Low-Code Application to connect any data &amp; build big-data transformations, rules, analytics, and dashboards.</p>
	<p><b>Asset Handling Applications</b> – An IoT Best Practices application that serves as an “83%” catalyst to build OEM-specific intelligent product solutions.</p>
	<p><b>IoT83 Core Platform Services</b> – This is the core of the IoT83 AEP, providing 40+ Enterprise IoT services. Delivered as application middleware, the platform services SDKs and APIs perform all the heavy lifting for custom application creation – cutting the new lines of code to a fraction needed using any other method.</p>

As a result, the path to building powerful solutions is streamlined and cumulative - from early work with PoCs and MVPs - through first office applications - and on to multiple high-scale, highly secure, multi-tenant applications. The OEDC provides all the tools and workflows to quickly build new applications – and then to extend them in virtually any direction as customer demand and the market evolves.



This approach truly breaks the Smart Products / Smart Applications “Executive Paradox”, allowing a highly efficient transition from the “status quo”, with an application development and deployment “factory”. Using the OEDC, IIoT transformation programs are both cost effective to run and enable near-term success via this fast path to new application deployment and revenues. Based on the proven scalable, secure, and reliable core services and applications, OEMs and Enterprises can quickly build solutions and realize near term success. And with the full flexibility of the underlying platform services, they can rely on the platform to deliver long-term and strategic success.

## Conclusion

The most important takeaway from this article is that all Industrial OEM and Enterprise leaders need to take careful stock of both the opportunities and very real risks to their businesses in this volatile time of transition from “traditional products” to “digital products, applications, and services”. Makers of nuts and bolts have little to fear. But where your product lines enter the domain where real value can be derived through digitization, the race is on, and both the opportunities for differentiation and growth, as well as the risk of displacement are very real.

At IoT83, we provide an unparalleled solution to support industrial OEM and Enterprise leaders to make this transition in a way that breaks the “Executive Paradox”. Our solution allows leaders to tightly couple investments with near-term results. And, with our innovative approach to building, deploying, and scaling new applications, the OEDC Platform is the best choice for both near-term as well as strategic long-term success. Finally, with our hands-on engagement approach, our team will partner with yours to ensure solid results in this challenging but rewarding transition.

## Speak To Us

To Book a Meeting: [Click Here](#)

Phone: +1 (650) 996 6650

Email: [contact-sales@iot83.com](mailto:contact-sales@iot83.com)

To find more, visit: <https://www.iot83.com/>