Kaleido Intelligence

Daizy

Moving beyond the limitations of single vendor, single use-case IoT solutions

While IoT has begun to deliver on its forecasted benefits in terms of efficiency, safety, automation and actionable intelligence, the tendency towards verticalised solutions that solve a single use-case have resulted in a complex patchwork of solutions to address the growing number of use-cases across the Enterprise.

As IoT deployments move into the 10s and 100s of thousands, in this report we look at the pitfalls to avoid, and the opportunities presented by innovative new approaches to unlocking the true value of a more harmonious IoT ecosystem.

Everything Connected, Everything Separate

It's not unusual to find a single Enterprise with 5 or more isolated IoT solutions, each with siloed data, connectivity and device management. The challenge of managing multiple IoT solutions presents significant challenges for the end-customer and their suppliers, who are struggling with the operational implementation and lifecycle management as they try to move from PoC to large scale deployments.

At the core of this challenge is the interpretation and differing implementations of common standards in the IoT ecosystem:

- **Device management:** While device manufacturers often provide a device management platform alongside their hardware, these typically only support the manufacturers' own devices. The result is either 'vendor lock-in' where the customer becomes stuck with a single vendor solution, or the proliferation of multiple systems to manage the breadth of devices needed to address the customer's use-cases.

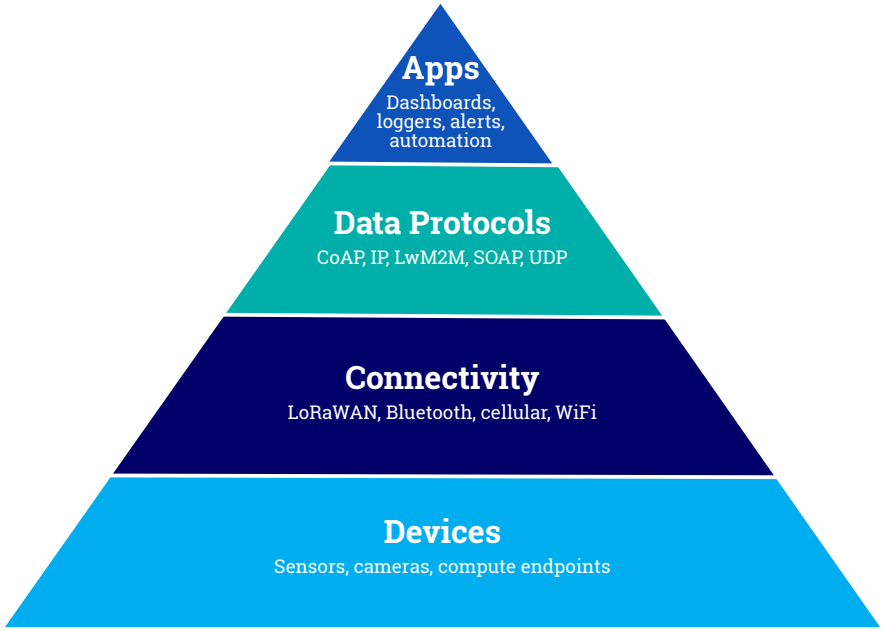
  The impact of this approach is felt not only by back-office teams, who have to manage all the platforms, but more critically at point of installation, where installers have to switch between tools and approaches to install sensors from different manufacturers. This often results in failed installations, returns to site and defaulting back to manual tracking to get the job done.

- **Connectivity management:** Kaleido's 2023 IoT Enterprise Connectivity survey, conducted among over 800 Enterprises to understand their connectivity needs, found that 65% of respondents with cellular-connected IoT devices also had non-cellular IoT devices, with each of these having an average of more than one additional connectivity technology in their device fleet. These need to be reconciled and unified at some point in the operations flow to bring them into the same transport and data flow.

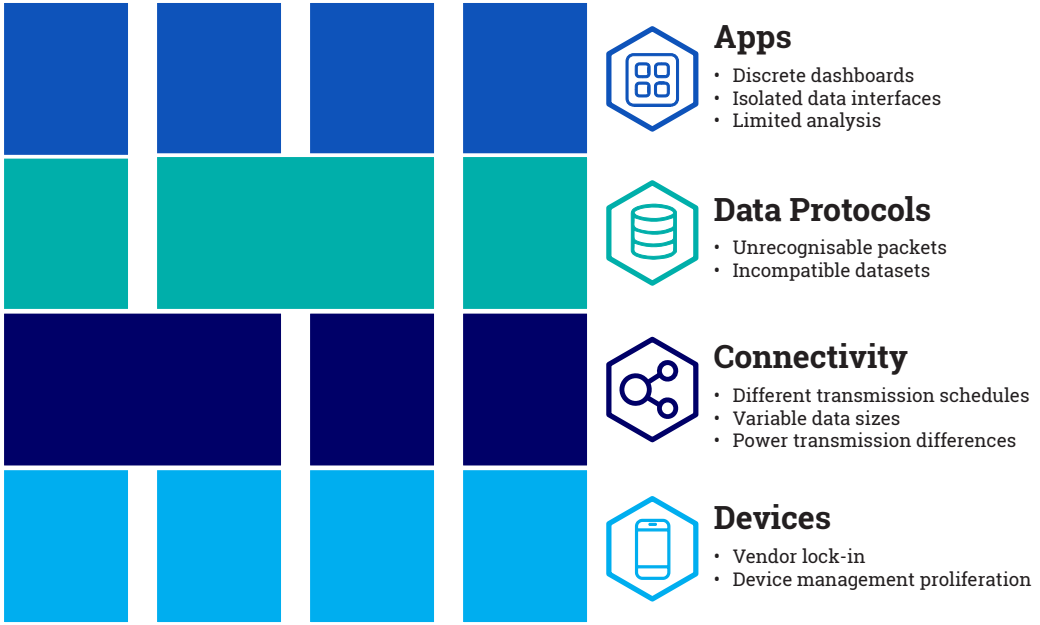
- **Application integration:** The value of IoT technology becomes truly transformational when the data generated can be converted into action – unlocking business transformation. The conversion of IoT data into action normally happens at the application layer, where data is combined with other data sets to produce insights that trigger actions. However, with data originating via a mishmash of solutions, the fragmentation of connectivity and device management can lead to highly compartmentalised data siloes, increasing friction and time needed to reconcile and combine data, if it can be done at all.

So, with these challenges in mind, for an Enterprise or their suppliers to gain efficient control and management across the entire IoT fleet requires a specific toolset that can not only incorporate these different technologies into the same system, but also provide a seamless integration into the customer's core business systems – only then can the data generated by IoT sensors become actionable.

Ideal IoT Deployment Information Flow



Reality of IoT Deployment Information Flow



Reconciling IT and OT

While IT (information technology) and OT (operations technology) are broadly understood across the Enterprise, IoT increasingly represents the convergence of these two concepts, with digitisation coming to systems that previously had manual processes, data capture. This creates several challenges to be solved:

- **Data overload:** As the number of IoT devices scales, so does the volume and range of data. This data must be captured, validated and then made available for onward use by applications and solution.

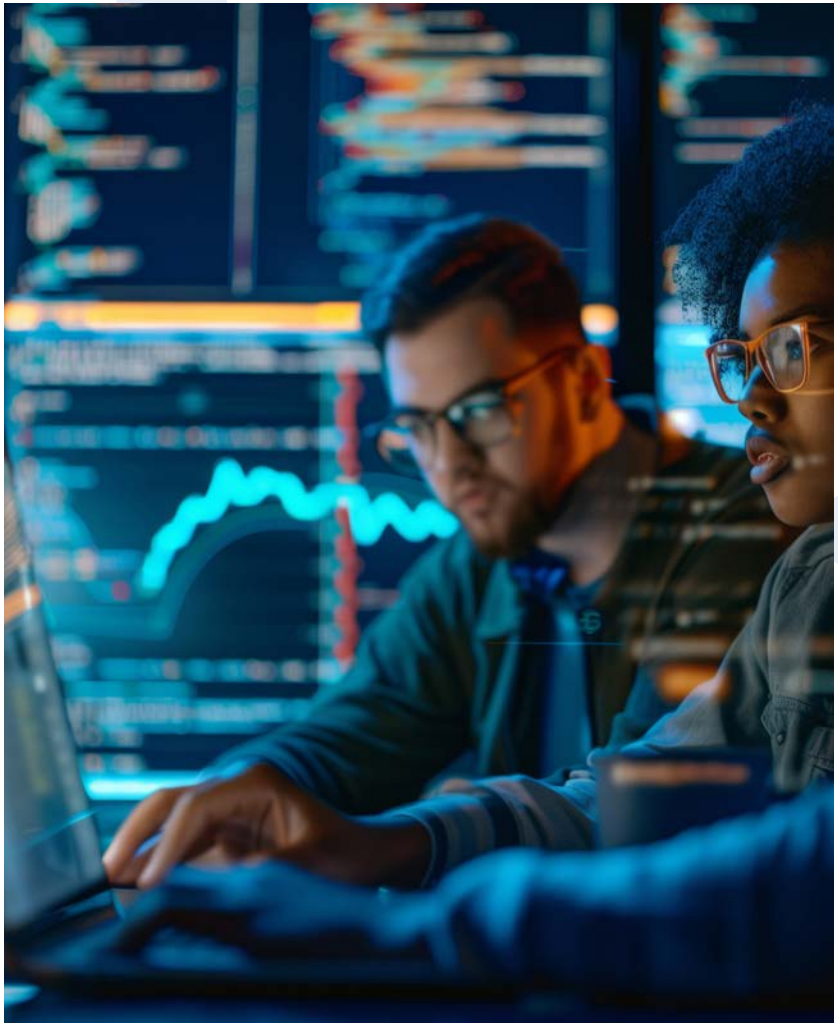
- **Device lifecycle:** Many of the standardised and mature tools used to install and manage more traditional IT equipment such as laptops are either specific to a device or solution in the IoT space, all lacking support for IoT.

  Without the right tools, maintaining a simple understanding of fundamental device attributes such as where the device is located, is it working and what is the status of its connectivity subscription can quickly become lost or may not be available from day one. That might be ok for a PoC with a handful of devices, but becomes unmanageable as soon as deployments are scaled up.

- **Rapid evolution of IoT technology:** While much industrial equipment is often expected to remain in place for a decade or more, digital elements and even the underlying standards and connectivity types typically have shorter lifespans. This means that OT professionals may be hesitant to digitise at all, unsure whether a change in standards will leave them unable to use their devices.

- **Security:** Systems designed to provide operational feedback are often made without security in mind, and so once digitised they can introduce vulnerabilities into an Enterprise's systems that a malicious actor can exploit unless extra steps are taken to secure the data.

The answer lays in two key approaches: The development of a single source of truth for IoT data, and an operational toolset that addresses IoT specific issues. Both need to interface with existing management systems such as asset management platforms or service desks. Coupled with the correct management processes (many of which will likely already exist via current IT and OT practices) the implementation and management of IoT becomes just another standard practice.



Integrating the Application Layer and exploring the possibilities of AI

As we have already identified, it is at the application layer that the true potential for IoT is unlocked, with different data being combined and analysed to generate action within the monitored system.

Accurate and easily consumable data also opens the door to the promise of artificial intelligence and machine learning (AI/ML), where large volumes of structured and unstructured data can be analysed for patterns that are typically unseen, and then fed back into the operational system for action to be taken. Without access to the large amounts of data to build a model, this cannot be done.

Although most closed systems will have alerts and similar functions built into their own data processing, the ability to read data across systems is needed for truly system-wide operational management.

While AI/ML can be directed to sort unstructured data, it cannot operate on data it cannot read. So, the challenges of operating disparate systems and siloed data, often stored in different formats could limit the ultimate potential of AI.

Decoding payloads

IoT devices in the Enterprise normally send data via scheduled 'messages', using NB-IoT, LoRa or another LP-WAN connectivity standard.

With connectivity standards and devices payloads differing between manufacturers, understanding the content of these IoT messages can get very complicated very quickly.

Systems and tools are now emerging to take care of this challenge, removing the headache of having to work out how to decode messages from newly supported devices while also ensuring that the 'single source of truth' approach to data and IoT management can be maintained.

Operating and scaling Multi-Device, Multi-Connectivity Ecosystems

The movement towards a solutions-based mindset in IoT holds some promise for bringing together these elements. The emergence of truly agnostic IoT management tools is enabling the Enterprise IoT ecosystem to shift focus from what technologies are used to what problems the technology can solve.

Managing many providers at once has become both a key pain point and an expected norm for IoT in the Enterprise. Kaleido's 2023 survey found that 67% of Enterprises using cellular IoT rely on more than one connectivity provider, and 99% of those preparing a cellular IoT deployment anticipate dealing with multiple providers to achieve their deployment goals. The expectation of dealing with multiple providers has been normalised, from connectivity to hardware management.

This will need a change in mindset for technology providers and Enterprises, with the following elements being top of mind:

- **One step at a time:** While digital operations can bring great efficiencies into the Enterprise, wholesale transformation is not possible. More gradual deployments with defined short term goals in place will bring more wins than trying to revolutionise deployments entirely.
- **Find willing partners:** While brownfield IoT deployments have been common for many years, the mindset needed to fully integrate with existing deployments is rare. The best IoT companies will work hand in hand with clients, becoming an extension of an operations team to solve operational problems and provide expertise based on operational needs, rather than simply presenting the technology itself as a solution.
- **Data interoperability:** Making sure that data can be transformed and securely transported across systems should be a prime interest, to ensure that multiple sources can be combined to create more complete pictures of operations.

APIs: Part of the solution?

With the rise of APIs in IoT, there have been some steps in the direction of cross-provider and cross-system data communications; many systems have some universal compatibility (at least visually) using APIs, webhooks and other elements that allow data from one system to be displayed as part of another. The challenge is translating the underlaying data into a standard format that can be consumed in business systems and applications.

Thankfully, some IoT management platforms are emerging that can remove this headache and replace it with a single API or integration. However, with the approach of integrating at the API level, support for every new device or connectivity medium creates more work, more complexity and more to manage in the future.

As such, APIs can begin to converge the data in a useful fashion, but are not the end of the journey.

A Future of Platform, Data and Metadata Reconciliation

Solutions that want to reach true comparability of data to fully unlock the promise of the IoT need to move beyond the side-by-side integrations and basic queries of APIs and provide a harmonised approach that understands both IoT data and metadata, incorporating device lifecycle management, application data handling and standardisation. Having a toolset focused on bringing hardware and software, connectivity, IT and OT together for a unified IoT operations function can then be a solid foundation for further applications and insight development without the complexity of managing multiple device types and technologies in isolation.

With the emergence of agnostic IoT management tools comes the potential to deliver IoT at scale, efficiently and with the ability to truly focus on the Enterprise's goals. These systems can then move beyond examining a single element of the operational stack and provide the end-to-end visibility and management of IoT deployments that are needed, regardless of technology or vendor.

Case Study

Powercor and Simble partner with Daizy to deliver energy monitoring solutions at scale

Martin Saberton
VP Growth
Daizy

Powercor, specialists in lighting, electrical services and sustainability monitoring, and smart energy Software-as-a-Service (SaaS) company Simble Solutions, are partnering with Daizy to accelerate the rollout of energy efficiency and monitoring solutions.

With an increasing demand for energy monitoring, Powercor needed to implement a scalable, cost-effective and future proofed solution that could grow with their business. To find out more, I caught-up with Chris Wright, Technical Director at Powercor.

I started by asking Chris what has driven the need to implement a new energy monitoring solution. "We've been doing energy measurement and verification for a very long time. With the increasing focus on the drive to net zero, we've seen demand not only accelerate, but also diversify – the range of data points we need to collect is broadening, and we needed a solution that could scale at significant volume, and cope with the range of devices we're deploying at our customer's sites."

With the increase in carbon retrofit work across many sectors, the demand for monitoring has been motivated by the need to demonstrate an ROI on any upgrade work conducted. Chris explained that the cost of running monitoring equipment was becoming too onerous for Powercor. "Before partnering with Daizy we were using a single type of energy meter, each with an individual GSM SIM. The costs were sky rocketing and we needed to find a more cost effective solution."

"Simble, our energy analytics partner, was already partnering with Daizy, and it didn't take long to realise that they would be the perfect partner for our needs. By adopting LoRaWAN to provide coverage throughout the customer's premises, we've been able to drive down connectivity and hardware costs, while also expanding the range of metrics we can capture."

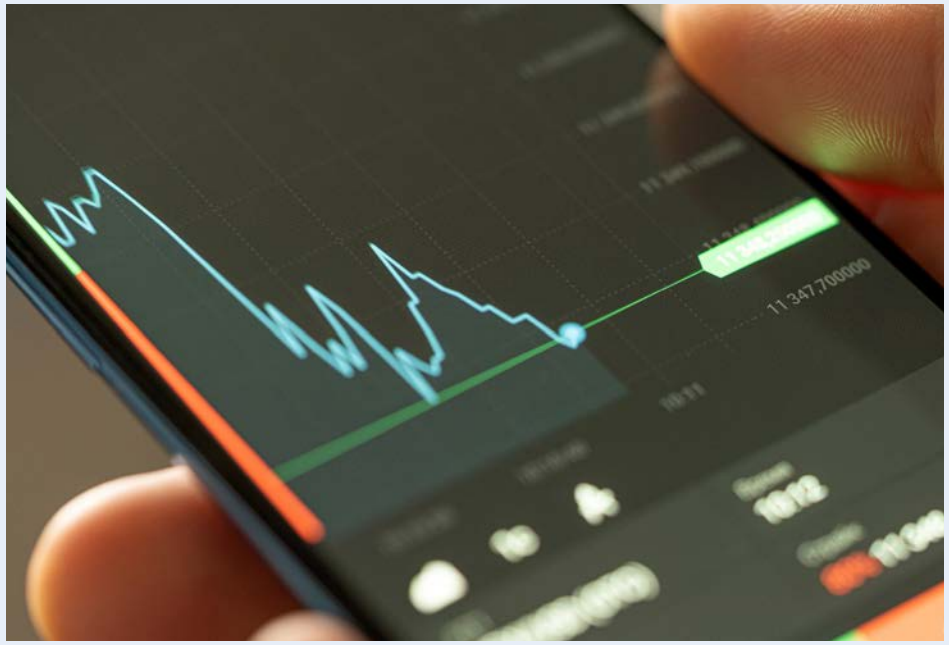
"We've been doing energy measurement and verification for a very long time."

Daizy

powercor

Simble

Case Study



“Now we have access to Daizy’s entire device catalogue and can draw on Simble’s expertise to choose the best sensors for our needs.”

“To verify the savings that we make as we decarbonise a customer’s site, we need to collect data at a granular level. Decarbonisation initiatives typically result in a higher electricity consumption – through heat pumps, air source, ground source, electrical kitchen equipment and so on. As a result, we need to be able to track where the electricity is being consumed.” Explained Chris. “We also need to measure the corresponding reduction in the consumption of gas and oil which requires additional hardware, datasets and analysis.”

I asked Chris about how his approach to implementing the monitoring aspects of his projects have evolved since partnering with Daizy. “We were quite restricted with what hardware and sensing metrics we had access to. Now we have access to Daizy’s entire device catalogue and can draw on Simble’s expertise to choose the best sensors for our needs. If we need a new device, Daizy can add that for us at very short notice.” Chris went on to explain that his initial nervousness of adopting a new solution soon dissipated. “If you’d asked me 12 months ago whether we’d be using LoRaWAN and other IoT technology with our key customers such as Charterhouse School, I’d have been much more reserved than I am now. The Daizy platform allows us to manage all of our sensors, connectivity and LoRa gateways in one place, and the process of deploying sensors using the Daizy mobile app couldn’t be simpler.”

Daizy’s standard integration with the Simble platform means that all sensing data is automatically available to view in SimbleSense. When new device types are added, Daizy decodes the payload and normalises the data, so there’s no heavy lifting for Simble to do – it just works.

I finished by asking Chris where he plans to go next with Powercor’s monitoring solution. “We’re seeing demand for solutions to new compliance and monitoring requirements every day. We’ve already started using Simble and Daizy to address legionella compliance, which is delivering huge ROIs for our customers.”

“The range of IoT hardware and solutions is growing rapidly – Simble and Daizy enable us to tap into the latest technology, and to realise the value it can deliver today and in the future.