FIELD SERVICE NEWS

Understanding The Next Phase Of IoT Evolution

How IoT Can Bring Benefits to Three Key Pillars of Field Service Operations: the Asset, the Engineer and the Customer.

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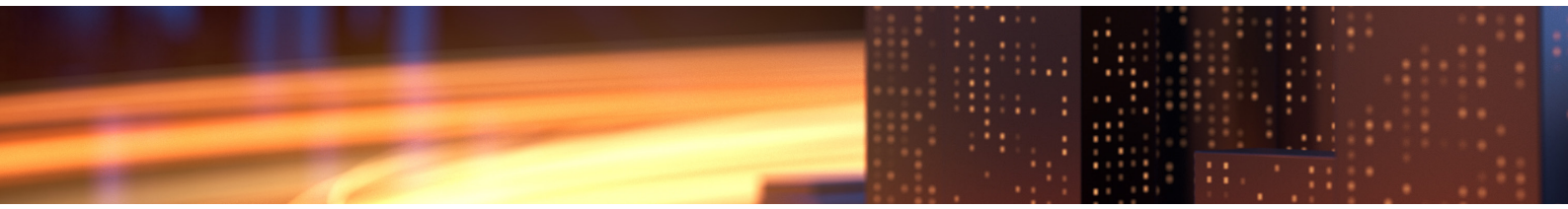


Are we ready for IoT 2.0?

A study by Field Service News Research in 2021 revealed that the field service sector, has now firmly embraced IoT. In that study, which had input from over 280 field service professionals, 76% of field service companies now had some connectivity with their install base.

It would appear the first phase of IoT adoption is getting closer to completion. Certainly the underlying infrastructure is largely established.

Indeed, we are also seeing signs of how this technological innovation can begin to reshape the field service sector. Another study hosted by Field Service Research, this one running also in 2021, identified that 65% of over 130 field service companies were leveraging remote diagnostics and IoT to develop a remote service offering.

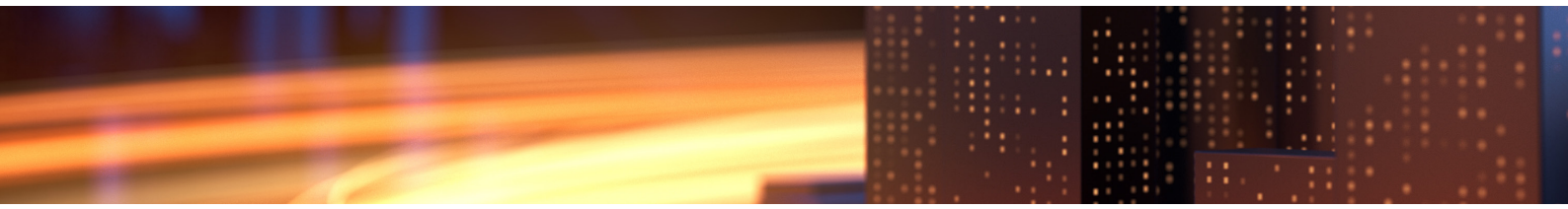
Yet, despite the recent acceleration of digital transformation within the field service sector, driven mainly by necessity during the pandemic, it could be argued that still these are just the embryotic days of a new era of IoT-connected field service.

With the foundations of an IoT infrastructure in place, we can begin to truly explore the potential of IoT within the field service sector, but what does that look like and how will that impact the way we manage assets, the way we manage our field workers and perhaps most importantly of all, how we help our customers towards success.

Across the following pages of this paper, we will take a forward look to a future that could be possible as we learn to leverage IoT.

This paper is not a deep dive into the technology itself, instead we will take a simplified example to outline what could be possible to help you facilitate the wider thinking and reflection of how such principles could be applied to your own business.

At the end of the paper you will find a series of reflection points to allow you to further refine how you could see the adoption of IoT enhancing your service operations in terms of asset management, workforce management, and customer success.



Connected Field Service: IoT and Improving Asset Management

There are several areas in which connected field service can change asset management for field service organizations in the not too distant future. In this section, we shall explore some of the potential benefits of IoT enabled assets...

Asset Self-Monitoring:

The traditional paradigm of field service has relied on an asset breaking down, a service request being submitted, an engineer being dispatched, and in an ideal world, resolving the issue in a first-time fix. Even when this process is undertaken with optimum efficiency, when everything goes perfectly, there is still a significant amount of downtime between asset failure and issue resolution.

Of course, many field service organizations introduced planned preventative maintenance (PPM) to help their customers avoid unnecessary downtime. However, helping in this first issue of reducing unnecessary downtime, a PPM based-approach results in unnecessary service calls, which can become an additional cost-line either for the service provider or the customer.

Despite PPM being often viewed as an improvement on the break-fix approach, the truth is that depending on the importance of the asset in the customers own revenue generation, either a break-fix or PPM approach may have been the best option within a service portfolio. However, ultimately neither are optimum.

In a world of connected field service, we can move beyond PPM and introduce true pro-active maintenance into a service portfolio.

To illustrate this, let us take a simple example of a hot drink vending machine with a failing boiling mechanism.

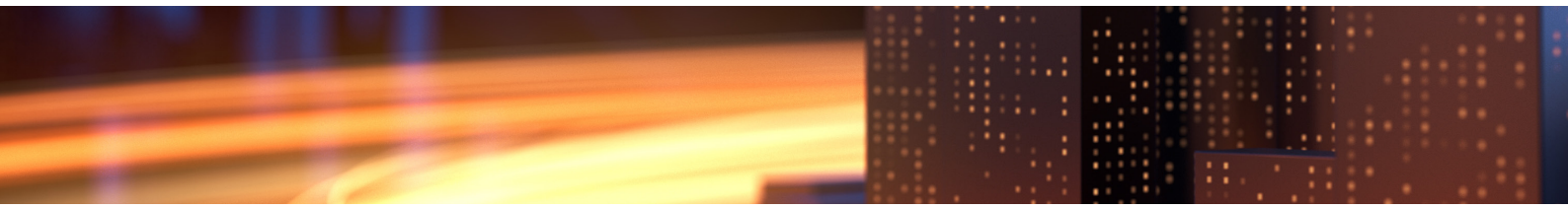
In the old break-fix model, the issue would be eventually noticed by a customer, who would report their cup of hot morning coffee wasn't piping hot. Eventually, a customer complaint would lead to the arrangement of a service call; the vending machine would be turned off, so no longer generating any revenue until an engineer could be sent to resolve the issue.

In a PPM environment, this fault may be picked up before it was reported by a customer, which could help mitigate unplanned downtime. However, it is not cost-effective to send a technician skilled enough to resolve the issue on an inspection call.

The alternative is for the field service organization to commit to sending a skilled resource to a series of calls where their skill-set is not being used to maximum effect (i.e. those calls where there is no fault to be resolved). Yet, of course, there is no benefit to the customer to pay for one set of technicians to undertake inspection calls if they cannot resolve any issues they may find.

While offering an enhanced layer of service to the customer, such an approach ultimately results in a bloated cost base for the service provider. However, IoT offers a far greater workflow by allowing the asset itself to, in effect, undertake that inspection requirement and then the service company only needs to schedule necessary maintenance as and when it is required.

In the example of our vending machine, the machine could have a sensor that monitors the temperature of the water when it reaches boiling point in the delivery of the coffee. If the average temperature of the water begins to hit outside of an acceptable parameter that indicates an imminent failure, with an IoT connected asset, an alert could be triggered automatically.



What Comes Next?

The above example allows us to see how even in just a very simple situation, how having just one data feed on an asset could have a significant benefit for both service provider and their customer alike. The customer benefits from proactive maintenance that can be primarily scheduled in off-peak hours where the impact of downtime is minimized. The service provider has a considerable reduction in costs as truck-rolls are minimized for efficiency.

However, we could also expand on this simple example in several ways to further leverage this IoT data feed to enhance the service delivery process.

Connection to Engineer and Parts Scheduling

The most obvious first step would be to schedule an engineer directly if sensor data crosses a threshold to trigger an action within an organization's FSM (Field Service Management) solution. The reality is that this chain of processes is precisely the type of mundane process automation that Robotic Process Automation (RPA) is designed for.

The rules could be fairly straightforward to make this happen. If the water temperature moves outside of acceptable parameters, then historic data can interpret that this is an indication of failure. To keep the example simple, let us assume a direct correlation between the degrees outside the defined parameters and the mean-time-to-failure. In a real-life scenario, the modelling may be more complex, but for clarity of the concept, let us just assume that as the water falls a couple of degrees below the accepted parameters, this is an indication of the asset failing within the next three weeks.

This provides us with a fairly routine set of requirements that we would want to automate. By leveraging the IoT asset data and data within our workforce management tools, we can begin to map this out reasonably simply.

- If the water temperature falls outside of standard parameters by two degrees, an engineer needs to be scheduled to provide a proactive repair within three weeks. *This is asset data provided by IoT.*
- Identify potential fault cause ahead of the engineer visit. *This is where the asset data can be filtered through a knowledge bank via Artificial Intelligence (AI).*
- Identify which technicians are local to this area, have the required skills-set and availability within the timeframe. *This is workforce data held within the relevant system of record.*
- Identify potential spare parts required and arrange for them to be delivered to the client site, engineer or drop off location ahead of a service call to allow the best opportunity for a first-time fix. *This is a trigger based on the output of the AI triage being fed into either a dedicated parts and inventory or FSM solution.*

All of this can be done and fed either directly to the customer themselves or potentially a customer service agent who can contact the customer with a list of potential solutions and times that a field technician can be dispatched to resolve the problem in the absolute minimum impact to the customer's business.

Facilitation of Self-Service Solutions

The above allows us to see how the use of RPA being fed by IoT data with a layer of AI can dramatically change how we approach field service delivery. However, in the above example, we could even take this a step further and look to utilize the same tools to facilitate a self-service approach to maintenance.

Let us for a moment consider once more the vending machine in our example and take into account another potential development into this mix, modular design. If the customer could easily replace the failing part, the process could be slightly reworked to allow for self-service.

The exact same processes could be leveraged to facilitate such an approach.

However, in the final stage of this process, the customer being contacted directly via automation or via a customer service agent could be given the opportunity to undertake the maintenance themselves.

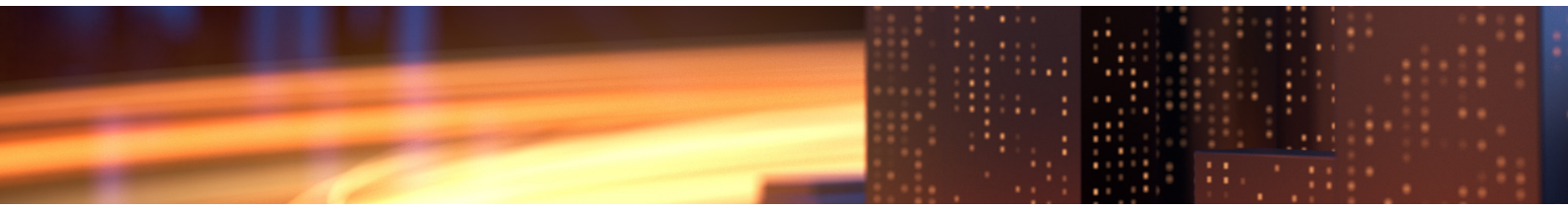
Clear instructions on the maintenance could be sent to the customer via the knowledge base digitally, and the required parts could be identified and dispatched to the customer directly.

Suppose we include a remote service support solution within the technology stack of the field service provider. In that case, the customer could even be given a link for real-time support as they undertake the maintenance.

The question of utmost importance in this instance is what is in it for the customer? The answer would be in 2 of the most precious commodities of the 21st century: time and convenience.

Self-service allows the customer to have their asset up and running without the wait for an available engineer. Self-service allows the customer to ensure the maintenance is undertaken when their own customers are not present.

Of course, such an approach may not be suitable for every situation. However, it is certainly something that is capturing the attention of many in the field service sector. Such an approach is made infinitely more seamless as we look to build upon the current use of IoT-based asset data.



The Question of Data Ownership

While there are undoubtedly as we have seen many opportunities for IoT to drive consistent improvement in asset management, the one area we must also address in this conversation is the challenge of data ownership.

This has been something of a critical and often contentious topic of conversation as we move into a new era of field service and indeed business at large that is driven by data - the great resource of the twenty first century.

The conversation is particularly complex - does data generated by an asset fall within the protection of patents so remain with the manufacturer? Or is the data created through use so generated by the customer and as such the output of their own work and something they own?

It is one of the big discussions that we will collectively need to resolve as we move ever onwards in our data-driven digital transformation journey. Yet, in some ways a focus on the granular debate of data ownership should and must make way for the macro discussion of how we can leverage the data for the benefit of the customer.

As Tasker Generes, Global Head – Strategy and Information, ServiceNow explained on the Field Service News Digital Symposium "The question of who owns what data is a thorny issue that we are currently in the middle of trying to really get to grips with as an industry."

"However, I believe the discussion ultimately comes down to the fact that customers want it to be really easy to engage with any company they are doing business with. Frankly, if it is not easy to engage, they are going to leave because they have options. When you are looking at data, it is really necessary for those who need to know to understand the inner workings of what goes wrong, but customers more often than not just want the service or product they use to work."

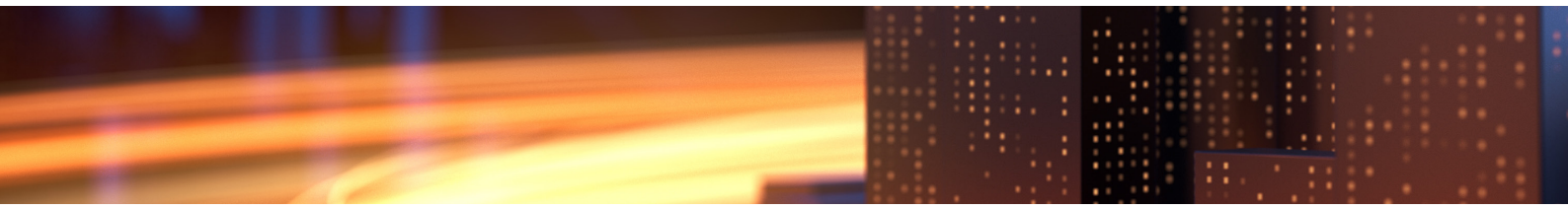
"The real challenge is determining what is and what isn't needed within the data set. It is identifying how do we really become proactive and help prevent the issue. In order to do this we cannot look at IoT as a standalone; it has to be viewed with additional context of other variables relevant to the specific situation. It is imperative that the service provider is able to get the data into a position where it offers actionable insight. IoT can offer us so much data, but to be able to have those brilliant insights, it has to be tied to the action."

"We have to understand as an industry that going forward this market is massively evolving. These changes we are moving through currently will bring with them complex questions over privacy, data and ownership and data stewardship. With Industry 4.0 and the current digital trends, access to data is going to be required to deliver the customer the great service they expect."

"However, as service providers we now must understand that customers whether it is in the B2B or consumer verticals, don't want to be 'on the grid' and let people learn everything about them through their data."

"So the critical question service providers must consider is 'how do we create the ability to learn from the data in a set rather than for the individual?'"

> "We have to understand as an industry that going forward this market is massively evolving. These changes we are moving through currently will bring with them complex questions over privacy, data and ownership and data stewardship..."
>
> - Tasker Generes, Global Head - Strategy and Transformation, ServiceNow



Connected Field Service: IoT and Improving Workforce Management

Having identified how embracing IoT from an asset management approach can benefit field service organizations, let us look at how such an approach can bring significant benefits to the next of our three pillars of field service operations – the field service workers themselves...

An Improved Work/Life Balance:

When the millennial generation first came into the workforce, much was made about the fact that this was the first generation that, in consistent polls, had placed personal values such as gratification and happiness above pure financial remuneration. While before this point, the positive benefits of a good work/life balance were important for employers to consider. Now they are essential if a company is going to be an attractive destination for future employees.

However, the traditional life of the field service engineer or technician can be hard. Long hours on the road and often in stressful environments can take their toll – perhaps that is why so many field service companies have struggled for so long to find a reliable source of recruits to replace an increasingly ageing workforce. However, for those field service organizations that embrace IoT, the engineer's working day can be radically different.

Firstly, the engineer is likely to be far more informed when they arrive on site. Data from the asset itself will already have been analyzed (either by AI or a human in a dispatch center) to identify the most likely fault as per the example in our previous section.

Similarly, with predicted fault diagnosis, the relevant parts required for a first-time fix can already be with the engineer ahead of the service call.

In this situation, our engineer will be as well prepared as possible as greater amounts of data mean more effective triage and fault diagnosis. This includes health and safety factors, as again, the better prepared our engineers are, the safer the environment they are working in.

This is hugely important as, by definition, the engineer's environment is not one that the service organization can ever have complete control over. Hence, every slight improvement in this area is essential.

Also, as this maintenance has been proactively scheduled ahead of failure, the service call is likely scheduled for a convenient time for the customer. This alone can allow the engineer the space and time to complete the task without interruption. All in all, such an approach provides our engineers with a far less stressful environment.

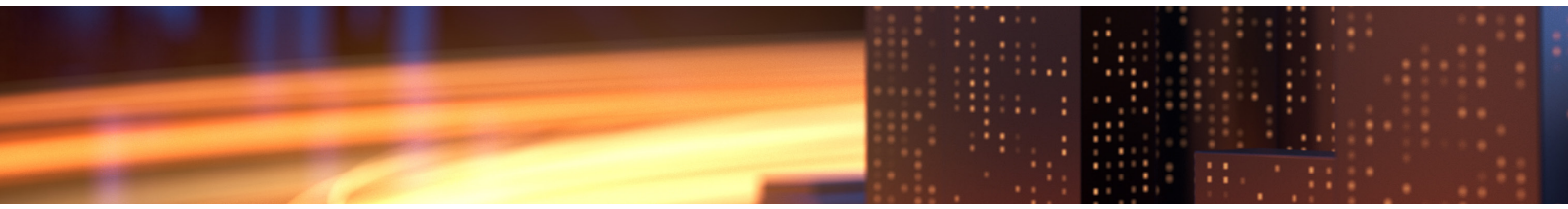
Let us also consider the engineer's utilization rates – one of the most critical KPIs within field service management. Scheduling jobs in advance and ahead of failure gives the scheduling team the opportunity to potentially group jobs in a more effective route across a geography. This is, of course, a win-win for both the engineer and the field service organization themselves as less time behind the wheel is good for the engineer, and more productivity from the field workers is good for the company.

Finally, once again, let us consider the continuing trend of remote service and guided self-service.

The introduction of such an approach to service delivery offers further options when exploring how this can benefit the workforce.

As we mentioned above, the ageing workforce is an issue many field service companies face currently. Still, the opportunity to work from a central location (or even from home) to provide expertise remotely may be an excellent route to keeping these seasoned engineers in the workforce for longer.

Similarly, it could be an approach to offer a rotation of delivering remote services amongst your field service engineers. This approach could provide variation in the role and a strong balance between the flexibility of working from home and the freedom many field workers enjoy by working on the road.



Connected Field Service: IoT and Improving Customer Success

As we have already seen so far in this paper, each of the three pillars of field service success - the asset, the engineer, and the customer - are intrinsically linked and can be improved through IoT adoption within field service operations...

We have already touched upon several ways the field service company can improve customer satisfaction and drive customer success by leveraging IoT connected asset data. So far, we have discussed:

- Reducing potential downtime
- Increasing the speed of issue resolution
- Delivering service in a more convenient manner

However, there are many other vital areas where customer success can be improved when a service provider embraces and fully leverages IoT. In this final section of the report, let us consider some additional areas where this could happen.

IoT Creates a Path to Servitization:

In a world of connected field service, where the service provider leverages IoT, the potential to introduce a servitized offering becomes measurably more tangible.

While the topic of servitization is vast and the subject of many articles and papers in and of itself *(for further information, a good start is to visit https://www.fieldservicenews.com/blog/tag/servitization-and-advanced-services)*, a reduced overview of the concept is "a blend of product and services is created to produce a holistic approach to meeting the customer's needs."

For the customer, this has multiple benefits:

1. It moves the service contract to one that is centered on uptime.
2. It moves the responsibility of maintaining an asset to meet these uptime agreements onto the service provider/manufacturer.
3. It allows the customer to focus on their core area of expertise (often selling the outcome of the servitized asset) rather than the operation of the asset itself.

For the service provider, servitization can lead to much more deeply engrained customer relationships, more extended service contracts and greater profitability across the long term. If undertaken correctly, the servitization model can offer a significant win-win situation for both parties.

In such a model, where uptime guarantees are the primary metric of success, the ability to track asset data in real-time via IoT is central to many successful servitized service portfolios.

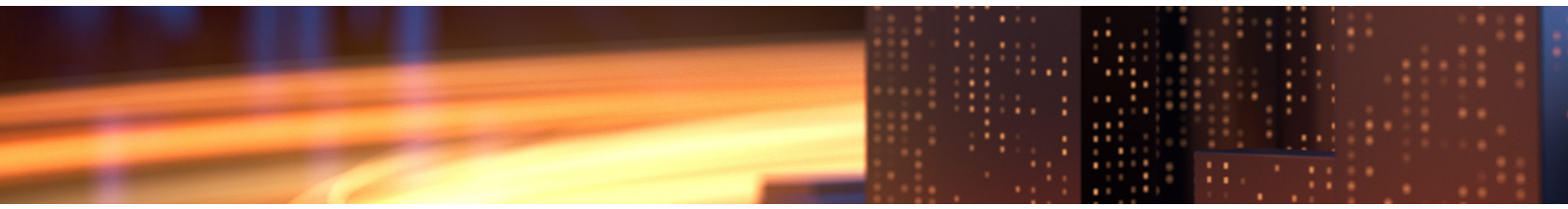
Greater Visibility = Greater Trust

Another major facet of using data for a field service organization is when it comes to building deep customer relationships that are built on a foundation of trust; the transparency that IoT data can provide is crucial.

One approach to enabling such transparency is building customer dashboards to see vital operational metrics of their asset.

The ability to surface the critical insights that IoT data can offer is an exceptional way to allow customers to see not only how their assets are performing but also to highlight the value of the service provided.

Such dashboards can also truly empower the field service engineer to outline the value of the service they have delivered when on-site. Such a tool can allow them to truly evolve into an ambassador role that can further cement the trust within the relationship between the service provider and their customers.



Optimization of Each Asset via Wider Install Base Data

One final significant benefit that can be introduced as we look at how we can leverage IoT-based asset data is optimizing individual assets by collating the comprehensive data of an install base and looking at the broader data to identify further efficiencies.

Again, let us use our earlier simple example of the vending machine as an illustration. Hypothetically, a water reservoir for the machine could be maintained at a set temperature.

The temperature water in this reservoir is kept at could hold several different variables:

- If the temperature is held at a higher temperature, then the speed it would take to produce a coffee would, of course, be faster.
- Maintaining the water at a certain level could mean less strain on the elements within the asset to heat the water to a point where it is suitable for serving drinks.
- Yet, maintaining the water in the reservoir at a higher level will consume more energy and lead to a higher operating cost.

By applying data analytics to the full manufacturer install base, an optimal temperature for the water in such a reservoir could be determined based on the balance between reducing energy consumption (i.e. reducing cost) and fastest production of the product (i.e. increasing productivity).

While this example is deliberately simplistic to illustrate the point, the concept can be applied to far more complex situations given the vast amounts of data available for analysis that an IoT-connected install base can provide.

The simple equation of reducing costs and increasing productivity is a compelling offering that a service provider who embraces IoT can leverage. In doing so they can seek to ensure longer, more profitable agreements with their client base.

IoT and Outcome-Based Service Models

The ultimate endpoint of a focus on customer success, it could be argued, is the outcome-based services model that has been gaining traction amongst manufacturers and service providers for some time now.

However, much as we saw in 2008 when an economic downturn became a key driver for service to move away from a cost center to becoming more widely accepted as a profit center, so to now. As we face ongoing economic uncertainty as the fall out of the pandemic continues, we see increased discussion of outcome-based solutions as an emerging force within service design as companies on both sides of the provider/customer equation seek to mitigate potential financial risk.

As Bulent Cinarkaya, GM of Field Service Management at ServiceNow, explained on the Field Service News Digital Symposium.

“There is a question of derisking that must be considered.”

“When you look at history, there are always economic booms and economic downturns. The critical question we must address is how do you protect your business when the times are tough?”

“When we look at customer behaviour during challenging economic environments, customers prefer to buy services rather than products.”

“Additionally, manufacturers are always researching and adapting to use more effective business models and the latest trend we are seeing is outcome-based business models.”

The reason this is important in the context of an ongoing economic downturn is threefold. Firstly, such models place customer success at the heart of their strategy and, in doing so, help support the business ecosystem and keep both service provider and their customers financially secure.

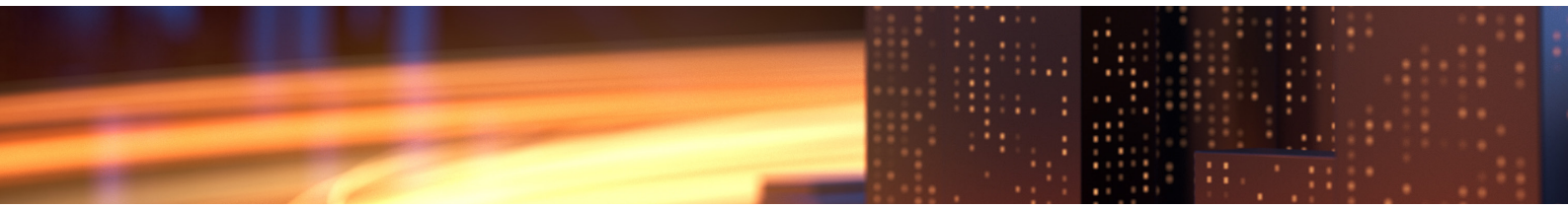
Secondly, it creates deeper, more robust relationships between the two parties. When cash flow is reduced, when cost-lines are critical, being an integral part of their client’s workflow is vital to protect you from the risk of being underpriced by the competition and losing that business entirely.

Finally, as Cinarkaya outlines, it creates an ongoing, reliable revenue stream that helps manage cash flow for their own business- however, the move to outcome-based models is not necessarily an easy one to make, particularly without IoT.

“With outcome-based service you can bring a steady stream of recurring revenue to your business, but it comes with a challenge of course.”

“In an outcome-based model, you own the product. You’re not selling the product; you’re not leasing the product. You’re selling an outcome, which means that your contract terms come to the forefront, and you have to meet those terms.”

“That is where IoT plays a really key role. Without IoT, I’m not sure how you can achieve what you promise as an outcome, which is how you will drive your revenue. Without IoT, I’m not sure if you will be able to meet the demands of such agreements.”



Post Script: A Few Questions for Reflection on How IoT Could Improve Your Service Operations

In this paper, we have put forward a simple example of an asset with just one data point to illustrate how IoT could impact asset management, workforce management and customer success planning for field service organizations.

Of course each organization and each situation is unique, and there is no one size fits all approach to such a process. With this in mind, we have outlined a few additional questions for you as a service leader to consider against each key point of the paper to help you begin to reflect on how the ideas put forward could relate to your own organization.

#1: IoT has become an increasingly important part of field service operations and is set to become the bedrock of service operations in the future. However, without actionable insight, asset data is of little value. What is required in your organization to turn IoT-fed asset data into meaningful and valuable actionable insight?

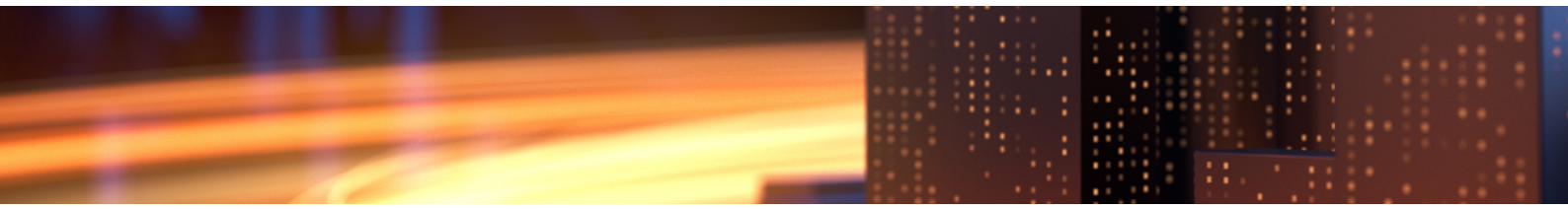
- Do you currently receive the right asset data into the systems where it can bring value?
- What is the asset data that can yield the most valuable insights to your organization and to your customers?
- Do you need to upgrade legacy assets to include connectivity? What would this cost? What assets would take priority?
- Which processes within the service cycle could be automated if triggered by an appropriate data feed?
- Could a self-service approach be applicable in any area of your service portfolio? If not, why? If yes, what is required to make this happen?

#2: It is often said that the most valuable resource of any field service company is its field workforce. Can the adoption of more sophisticated IoT-led service approach lead to better talent acquisition and retention?

- What does an average working day look like for your field service engineers and technicians? Do they have a good work/life balance?
- How does the shift towards proactive maintenance that IoT can facilitate impact their working day?
- Is the adoption of remote service something that would allow you to hold onto more experienced field workers for longer?
- Would the skill sets of your engineers or technicians be different if you adopted an IoT-led approach to service delivery? Would this be a positive or negative impact on your operation?
- Would an advanced approach to technology adoption make your organization a more attractive prospect for potential future recruits?

#3: Customer success has replaced customer satisfaction. It is now imperative that we work as partners to our customers to drive towards success together. Such an approach often requires more advanced layers of service thinking with IoT underpinning many such strategies.

- Is there an appetite amongst your customer base for a more sophisticated type of service offering such as a servitized or outcome-based model?
- Can you achieve success with such a model without adopting IoT?
- Are you able to drive transparency and trust in your customer relationships by open sharing of data? Does this apply to all data, or just some?
- How much would your customer base value data-driven insights and advice that can allow them to increase the productivity of their assets?
- Who would be an ideal customer/group of customers that would be prepared to be part of such a new initiative?



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