FIELD SERVICE NEWS

think tank sessions

Executive Briefing: The True Value of Data in the Field Service Sector

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Introduction

The Field Service News Think Tank Sessions are a unique project where we bring together an intimate group of senior field service management professionals and pick apart some of the pressing issues facing the global field service industry across a days worth of detailed discussion and debate.

The topics are varied, in-depth and full of insight and Field Service News is proud to facilitate these sessions and share with our audience the learnings from these collaborations - which we present to you verbatim to ensure the insight from each panel of industry leaders comes to you undiluted and its essential form...

In field service, much like in every other industry, the central discussions in boardrooms, at industry conferences and across the trade press are all heavily weighted around the concept of digital transformation and digitization. Indeed, much has been written about the topic across the last few years as we have seen the use of newly emerged technologies such as the Internet of Things, Artificial Intelligence and Augmented Reality increasingly become common place within our sector- certainly, at least with organisations who exist within the upper echelons of best-in-class service delivery standards.

Yet there is still a feeling that we are only just really beginning to scratch the surface when it comes to the true potential of what being digital can mean within the field service realm.

So in this latest Field Service News Think Tank Session it was perhaps understandable that the discussion would naturally be drawn somewhat towards this hugely prevalent industry talking point. It was hugely insightful to see how the group held shared challenges and how they were able to bring their own perspectives, and outline the approaches that have worked within their respective businesses to overcoming these issues.

Yet, what was truly fascinating for me, was the different positive outcomes that these organisations had also discovered as a direct result of embracing digitalisation that go far beyond the often touted headlines we see. From building bridges between different departments, closing the skills-shortage, to adding competitive advantages there were a number of opportunities that one might not think of straight away when we think of digitalisation.

However, as we discovered towards the end of the session, the truth is that we are only just beginning to understand the true value of data and what it can bring to our sector.

Kris Oldland, Founder and Editor-in-Chief, Field Service News

Think Tank Session, Online, March 2020

In attendance:

Patrick Jansen, Manager Field Service, VBR Turbine Partners

Peter Deeming, Service Tools Manager, Varian

Jason Smith, Director of Field Service, EMEA, 3D Systems Corporation

Christo Roux, Director, Field & Workshop Services, Outotec

Eddie Storan, Head of Global Services, Domino Printing Sciences

Jan Van Veen, Founder and Managing Director at moreMomentum

Coen Jeukens, VP Global Customer Transformation, ServiceMax

Kris Oldland, Editor-in-Chief, Field Service News

Can Data Bridge the Generational Gap?

One of the major challenges facing many field service companies is how to balance their field service workforce in terms of the disparate generations of their older baby boomer service engineers, and the incoming millennial workers. The two generations have considerable differences in their general approach to working life, but they can also compliment each other well, with both sets of workers bringing a different set of skill and values to the table...

Coen Jeukens, VP Global Customer Transformation, ServiceMax

"If we look at the technicians we have in the house right now, particularly the older more seasoned technicians we have in our workforces, a lot of knowledge that they have and performance they have learnt in the old fashioned 'boomer' way as opposed to the knew 'millennial' way.

"They went to a class room and learned everything they needed to upfront. Also they are maybe still using the old technologies.

"Compare this to the younger generations. The millennials and now Generation Z are entering the workforce and they are learning in a different way. They want to use technology in a different way and so maybe when we start applying the technology we can take a way some of that tribal knowledge which is right now traditionally trapped inside the head of a technician by going to world that is more fact based and data driven."

Patrick Jansen, Manager Field Service, VBR Turbine Partners

"We do see a difference in how the older and younger technicians are able to utilise the data and newer tools.

"The younger engineers are able to translate the data that they are receiving to what is actually going on much better than the older engineers. However, we are also seeing that if these different sets of engineers work together, the older engineers learn a lot from the younger engineers, but also the younger engineers are learning a lot from the older engineers.

"In the past ,conclusion about the behaviour of an asset was really based on the experience of the field service engineer ,so what they had seen before. Now, we see that the younger engineers do not have the detailed understanding of the assets that the older engineers do, but they come to better conclusions because they are really fact and data based rather than relying on the knowledge that they have seen in the past in what might have been a different situation.

"The balance is certainly shifting, but it is not that one is bad and the other is better per se, but that the two different approaches between the generations are complimentary to each other."

The Drivers Behind Adopting Remote Services

The trend towards adopting remote services has been one that many field service organisations have been embracing, even more so during the Covid-19 pandemic which forced the hand of many organisations to turn to remote solutions as a means of keeping service delivery moving. But outside of such turbulent times, field service companies who adopt such solutions find significant benefits...

Peter Deeming, Service Tools Manager, Varian

"One of the key things that I try to do in my organisation, being responsible for servicing and software tools, is to fill in one of the principal holes in the triage process by leveraging machine data. Typically a customer will phone up and explain 'my machine is broken' which doesn't help too much with fault identification!

What adds to the problem is that they are not talking to the service engineer directly. They typically will talk to a customer help-desk centre and the customer help-desk agent is not necessarily an expert on the particular product the customer is calling about. So by the time it actually gets to the engineer on top of everything that has been said you've also added Chinese whispers.

This can mean that the engineer really doesn't have much to go on when they are dispatched. So we use our remote diagnostics tools to try and get some facts from the machine directly.

We can look at the log files we can see what has actually happened and we can get a pretty good description of the fault that has actually occurred on the machine. Which means that the engineer then goes to site with a far better idea of what they are going to face when they get there."

Patrick Jansen, Manager Field Service, VBR Turbine Partners

"We we have done is to create our own IoT system which we divided this across two systems. One is for remote assistance so we can log in to help a customer via remote solutions and we also use Augmented Reality as part of this process as well. The other thing we do is remote diagnostics. This is where we gather data from the assets and then use machine learning technology to diagnose the issue.

So we enable not only our field service engineers but also our customers to diagnose an issue before we a service visit. This helps for the first time fix rate and in reducing the downtime of the assets, but additionally, it also helps reduce the training period of our field service engineers because we can send out relatively inexperienced engineers confident they can handle the job.

Compared to how we used to operate, which was to train people for three years before we could send them out alone, has really shifted the way we work."

The Challenges of Connecting Legacy Machines

While the race to full connectivity and occupying our place within Industry4.0 is on the top of almost all companies operating a field service division, the reality for many OEMs is that they have large existing install based of legacy assets being used out in the field that remain unconnected...

Coen Jeukens, VP Global Customer Transformation, ServiceMax

"When we attend the various service industry conferences, when we are listening to the people on the stage, the focus is always about service excellence. We are always looking to the future and the outlining the service nirvana we are aiming for.

Yet, many of us have a lot of legacy products out there that don't have all the connectivity capabilities, if any. So one of the key questions we need to address is 'how do we incorporate in a service model in which we can deliver a consistent level of service across both the newer generation of assets, while still maintaining the older assets in our fleet as well?"

Jason Smith, Director of Field Service, EMEA, 3D Systems Corporation

"The first thing we have done in this area is to make sure all current production models are enabled to be connected. With the older machines, then that is the next project. With all our new production machines now covered, we are now starting to look back to what machines can we connect that are legacy product.

"For us the key questions are which assets do we have the biggest install base of and also after factoring in end of service life where is the most potential?

"Once we have established this then we can get a payback. However, even then we do get some push back on connecting legacy assets. Some of our customers, particularly the bigger ones in industries such as automotive and aerospace, are very protective of their network so that is an issue we need to overcome.- even though we have excellent security protocols in place."

Christo Roux, Director, Field & Workshop Services, Outotec

"Some of our equipment is close to seventy or even eighty years old so we've got lots of legacy assets, but we also have a lot of new equipment that is either connected or ready to be connected. Our issue is getting the signal off of the site. Even thought we have best-in-class security protocols and are using the Microsoft Azure platform, a lot of customers are still very restrictive about that- especially when we are connecting to their own networks. So we are finding more and more we are having to provide our own connection off of site whether that be connecting with 3G or putting a satellite out there .

"So from my experience connecting to our customers networks, be it with new installs or connecting legacy assets is extremely challenging."

Connecting the Assets in the Field

While the benefits of a connected world are not only well documented but also increasingly promoted as the 'way of future', the reality is that for many service organisations and OEMs achieving asset connectivity is more challenging than it perhaps should be. However, one potential solution lies not within the technology but more simply within allowing customers autonomy...

Patrick Jansen, Manager Field Service, VBR Turbine Partners

"We were also finding the same challenges as Christo has discussed, in terms of what customers would allow to sit on their networks.

"Our solution was to make ensure that the system used for log in by our customers was kept completely separate from the system used for our diagnostic tools. This is because anyone logging into a system of a customer is a potential hazard for them and IT teams don't particularly like having what could be seen as a vulnerability added to their network.

"So we said internally 'OK if we want to sell remote diagnostics, lets make sure there is not an option for us to log in and also make sure the hardware is not their to facilitate that.' With the reasoning being that this then takes away quite a lot of risk from the customer. Prior to this we used to provide our customers with a piece of hardware to collect all the data from them, but we stopped providing that and now explain to the customer it is their responsibility to provide us with the data that we need to provide the remote services. Strangely enough this also takes away a big hurdle for the customer because their IT team is now in charge, so accessing data is often no longer a barrier anymore.

"Then in terms of real time data needs, for us it depends very much on the customer. Some of our customers have over capacity so if an asset is down for two days whilst they send data it is not a problem. For other customers the assets are critical and it is these customers who are more likely to set up a system with a continuous flow of data.

"It always comes down to acknowledging the fact that there is some risk, but also understanding what is the added value for them. If the added value is big enough for them, we find they will accept more risk and run regular or even real-time data feeds. That has been our approach to balancing this equation out- allowing ourour customers to decide. It is open for them, if they think it is beneficial for them to provide real time data, they can do so. If they see less benefit in our ability to respond as swiftly as possible and they would prefer to minimise their risk exposure they can choose that route instead."

Kris Oldland, Editor-in-Chief, Field Service News

"It is interesting because by providing the customers with a level of autonomy it can diffuse the conversation somewhat. By offering that degree of transparency, by giving them control it can disarm these common concerns around security and the perennial question of 'what are you going to do with my data?'"

Establising Service-Centric Revenue Streams

One of the most widely cited reasons for companies embracing IoT and connectivity is the increasing drive towards advanced services and adapting to an outcome based world. However, while in theory such moves bring great benefits to both the customer and the manufacturer alike, transforming a business from one that has been product centric to one where service is the primary revenue generator is a complex undertaking...

Coen Jeukens, VP Global Customer Transformation, ServiceMax

"We see that although remote service technology has been available for over 25 years there are still a lot of challenges in terms of getting data off site. In fact, even though remote services have been around for quite some time, the area is still seen as an emerging technology because it changes so often and certainly from an adoption perspective it is *still* emerging. I think that with all the conversations around cyber-security and data threats, all companies are revisiting each and every new technology out there.

"However, if or when we start using these technologies, the question is how do they tap into the service-centricity?

"When we start investigating these technologies should we be involving the people from our commercial departments who are creating the services portfolios?"

Eddie Storan, Head of Global Services, Domino Printing Sciences

"If you look at where we are going and our long-term vision - we are looking towards advanced services. With this in mind, we do involve other parts of the business as we work towards that vision. We have also run a number of workshops to try and gather the voice of the customer internally and we have now decided to go out to externally to determine and clarify exactly what is that voice of the customer as well.

"I think the biggest challenge we have is actually internally within our own organisation of people understanding of where we want to be in terms of advanced services i.e. outcome based world and service no longer just being a bolt-on to the sales and the overall operation it is going to be the revenue generator. We do involve commercial departments and together I think we are moving through the learning curve.

"One of the phrases used in the business quite regularly is that we are moving from being 'box shifters' i.e. selling capital equipment, to one of more solutions - and changing that mind-set is a big challenge within the organisation."

Establising Service-Centric Revenue Streams

Peter Deeming, Service Tools Manager, Varian

"In the medical industry our real obstacle lies in getting connection to our machines is GDPR and patient privacy. More and more we are finding customers are reluctant to allow access to our machines.

However, what is really interesting to me is that 25 years ago when we were rolling out remote connectivity with dial-up modems, we were able to introduce these services and were charging a premium for the connectivity as it meant we could reach our clients machines and initiate a resolution that much quicker. Plus at that time remote connectivity was very much seen as the latest innovation.

Today, the scenario is quite different, and what we are finding is that it is much easier for us to service equipment if we can access the data remotely- so we are now incentivising companies to allow us to do so. So in terms of revenue strategies the conversation around remote services for us really has come full circle."

Jan van Veen, Founder, moreMomentum

"As service providers and manufacturers we often tend to focus on just one or two aspects of innovation. For example, we have a technology such as IoT or connectivity and we start working on that technology and we are pushing it out to our customer base. Often it is the case then that the voice of the customer projects we run become more about how we can find the best hooks to further push the product out.

"In such scenarios, we can have a lot of blinkers when we are talking to our clients and often tend to only hear what we want to hear in relation to what we are looking for in line with the projects we have our internal focus on. The best practice here is in fact to combine our internal aims with and understanding of the problems are we solving for our clients and to which extent is that specific to a particular market segment or customer segment.

"For example, are we working towards something geared towards the Mom and Pop shops or towards large corporations? Is it a solution for the lean and mean companies or for very technology driven companies? Then we can start looking at what is the value proposition? What is the business model around it? How will the pricing model work? And ultimately, how do we start to sell it?

"When we start involving four, five or six tracks together we can start to see a viable solution emerge, because it is now one complete, marketable solution that is being developed. So the chances of hitting the mark and having a solution you can grow is now much bigger rather than if you just focus on one aspect. By doing this you will also have an automatic balance between pull and push. You will have technology, capabilities, processes and value pricing all in one innovation project.

"The other thing I think is quite important to consider here is that if it is quite new to the thinking of the core business of your company, or quite new to your clients, then it is advisable to establish a satellite team separate to the operating part of the organisation. This team should be tasked with finding the right market, understanding the needs, the proposition, the technologies etc and for them to bring it to the market. Let them find success without bothering the operating organisation.

"However, if the new project is quite close to the core business model, then a project team blended into the operating side of the organisation may work better. That is because in this case scenario pushing the development too far away from the core business can limit the chances to share synergies and learnings."

Different Service Needs of Different Customers

One of the big trends within the field service sector is the move towards adopting an advanced services or outcome-based service approach. However, it should be remembered that service is not a one size fits all category and it is important to understand the different requirements that your customers require and to offer a service approach that meets their needs...

Patrick Jansen, Manager Field Service, VBR Turbine Partners

"If you look at our call out services, some customers don't even want people to pick up the phone immediately-they are happy to just accept a longer response time. .

"Other customers really have an essential piece of machinery that for them is critical to their production. So if they have a problem they want you to pick up the phone immediately.

"It is quite a broad service level that we offer for our clients and it is really custom made. But the thing is we don't work with a huge amount of companies, we serve a niche market. We are not a Samsung serving a million mobile phones, we serve approximatively 60 to 70 assets a year, so our service towards them is also quite different from having to serve a lot of volume."

Jan van Veen, Founder, moreMomentum

"First of all remote capabilities are a capability it is not a value offering in and of itself. We can categorise value propositions in three categories. 'Do it with me', 'do it for me' or 'I'll do it myself'.

"There are quite a few manufacturers who are more in the do it yourself mode. They have their own maintenance department and they are building their digital capabilities as well. I even know a few manufacturing companies whose maintenance departments are bigger than their vendors. So who has the knowledge and the data and the capabilities in this equation?

"It could be that in your industry there are quite a few large segments who are not that interested in having all the data go to you and for you to solve their problems as they want to do it themselves. The questions then becomes how can you support them with some digital capabilities on board your equipment or with connectivity?

"I think it is good to be aware of these three differing types of value propositions, what is the current status looking at the most important clients you are working with and how could that change in time? For example in times of crisis such as now, some companies be looking to outsource the maintenance because it is so critical to keep them going.

"Others, may go the other way again because it has become mission critical, but their response is to bring things under their control."

Different Service Needs of Different Customers

Eddie Storan, Head of Global Services,
Domino Printing Sciences

"We are finding, because we are across five different industries, that we need to offer a mix across all different approaches for service.

"We have very large companies that we deal with globally and we how manage those accounts is very different to how we have to serve our customers at the other end of the spectrum. For example, one of our clients is a microbrewery. They brew a beer at a certain time on a specific date and they need to place a code on a product at that precise moment. Their expertise is brewing beer, not placing codes on different types of sub-straits.

"The challenge we are experiencing is that in the scenario of the microbrewery type customer, or to use the American phrase the Mom and Pop shop size businesses, these companies only want to run their production line for around three hours a day. It is very compressed and very seasonal.

"However if there is an issue, they want it resolved instantaneously and that is where we see the remote connectivity coming in where we can use our cloud-based services to support them. These types of customers generally tend not to be interested in data or analysis, they just want support at the times they need it.

"Yet, if we go back to the other end of the spectrum, the very large companies in pharmaceuticals, or electronics or food production, that's where there is a need for information, data and analysis.

"Also at this level, it is not just a requirement for that data and insight for one particular type of technology, but for all the different technologies we have installed on their plant and then additionally there are requests for us to try and compare that to their plants globally.

That is one of the challenges we are having currently, in a sense that our customers are saying we should have their data (and the analysis that brings on one hand, but on the other hand they are saying we can't have access to the networks. But then alongside that if there is a problem they also want us to be able to resolve the issue instantly. It is a tricky pendulum swing to try and get resolved."

Knowledge as a Service Differentiator

One of the outcomes of the over-arching trend of outcome-based service becoming a key revenue strategy is that field service has also become a battleground for competition as well. As we enter more fully into a society that is increasingly focused on an instant and on-demand culture, the ability to solve our customers challenges in a quickly and efficiently is a major benefit, and for OEM's data is perhaps the key weapon in their arsenal...

Jason Smith, Director of Field Service, EMEA,

3D Systems Corporation

"In previous companies I've worked at, when we have tried to push advanced services out to the market, one of the major challenges we faced was that there was little value in trying to convince customers, who didn't see the value in connected services as a solution. In fact, this is reflected in the approach we've adopted at 3D Systems. If a customer is on a maintenance contract and under warranty, then we will connect the machines for free.

As far as we are concerned, in terms of the connectivity, the hardware aspect of the equation, which is where people typically perceive as the value, actually has very little value.

What I discovered, certainly in my previous role, is that the value is in the data which is provided and the insight that provides- particularly when your offering is part of a system. Companies really have to separate the hardware from the knowledge because the value proposition is at opposite ends of the scale.

Hardware is worth couple of thousand dollars, but the knowledge is where the real improvements are. One project we did in my last company based around such a premise yielded savings to the customer of €2.5M a year. It is in the data and the insight within that data - that is where the true value sits. However, it is only by having case studies and actual data that you can quantify and describe this value."

Knowledge as a Service Differentiator

Peter Deeming, Service Tools Manager, Varian

"Reflecting on the three models Jan outlined of 'do it with us', 'do it for us' or 'we'll do it ourselves', I would add a fourth model into this in that a third party service contractor could also do the service work as well.

"In terms of service we see third party service companies as competitors and one of the edges the data gives us, is that we as an OEM can get data from our entire install base and a contractor cannot do that. This gives us a far greater depth of knowledge and insight that we can bring to the customer- something that gives us a distinct competitive advantage.

"This demonstrates that the value isn't in the hardware, or even getting the data from one machine. But when you can get the data from all of your machines and exploring the trending and apply some AI and get all of the analysis then you get some phenomenal insights and that is where the true value lies."

Christo Roux, Director, Field & Workshop Services, Outotec

"One of the things that we have found is that it is also about your ability to respond to your requirements.

"The speed in which we can get the equipment back up and running up is a massive differentiator to the third party service providers.

"We are an OEMs providing service to our own customers and we have a large portion of our install base that is legacy- it is literally thousands of pieces of equipment as we have a very large footprint across the globe. However, we are now starting to find a lot more insight within the internal data that we are collecting within our field service operation.

"This is largely the result of us having within the last two years moved onto a fully digital field service platform and the data that we are collecting from our visits, allows us to understand what we are doing on those visits because for us every failure or every operation has to be seen in context.

"Purely to look at the analytics coming from the equipment, we cannot always understand the operating context of a piece of equipment but we are find a huge amount of value in the information and data that we are colecting through our field service visits and adding this directly onto our field service management solution adds a layer of value that our competitors simply cannot add.

"So for us the value is not just regarding having connected assets but also connected people as well."

Using Data to Bring Departments Together

Often when we talk about data the conversation can become centred around the value of establishing a '360 degree view' of the customer. While this insight can be invaluable, data can also help establish an internal 360 degree view which can bring help harmonise internal conflicts between departments and get every one on the same page...

Eddie Storan, Head of Global Services, Domino Printing Sciences

"One of the challenges that we had when I first joined the company was that we had our Quality and R&D departments saying that field service doesn't provide us with enough information that we need. At the same time the field service department were pushing back asking for machines which they could fault find correctly. We ended up in this ongoing 'family debate'.

"One of the things that I did to resolve this, and again it is about the data, was to restructure how we were using ServiceMax. I sat down with the R&D team and we went back to the basics. We looked at how the alerts and error codes on a machine were created and developed by R&D. We than walked through that together with R&D and field service working together. So if we have alert A, how do R&D, suggest we fault find this scenario. Then we could agree as a group on a fault finding methodology and agree on an approach to a resolution.

"Taking those three areas changed how we use ServiceMax to the point where now when a customer calls in we alert the alert ID and the serial number of the machine. That then gives to the engineer a recommended approach to fault finding. We employ intelligent people so they don't have to follow it by script, they can select which recommend fault finding approach to use and then how they will resolve the issue i.e. software upgrade or part replaced.

"What that means is we now have packets of information, that are linked all the way to a serial number, which links back to the factory test results, to the alert ID and how it is fault found. Additionally, because the fault finding is as per R&D rules they are also now bought it. We put this in place nine months ago and we have seen a significant step change in terms of how R&D interface with service now and again it is all about good quality data."

Christo Roux, Director, Field & Workshop Services, Outotec

"There are often these silos between 'us' and 'them', particularly when it comes to Capex vs. Opex, i.e. the team that designed a piece of equipment and the team that is servicing it.

"We are working towards such a level of sophistication when it comes to reducing the friction between the two. Certainly having brought our field service technicians and our design engineers closer together through the data that we are providing in our field service management solution is a major step in this direction because now we can feedback directly to the developers saying 'these are the faults that we are finding.'"

Where Does the Value of Digitalisation Lie?

It is almost impossible to hold any business conversation for too long before the words digitalisation or digital transformation are uttered. There is much that such projects bring forward to a company, however, as service organisations, do we fully understand where the value of our digital transformation truly lies?

Coen Jeukens, VP Global Customer Transformation, ServiceMax

"What we are seeing is the data being produced by the system initially, is being used or requested to make service delivery more efficient. However, during the conversation today I am hearing many of you saying that in doing the operations and in mining the data we create during service delivery, we can feed that data so much more into other areas of the organisation. Engineering and R&D is prominently being mentioned as one of these areas.

"Another business function within this mix that is very interesting is the sales department. This is because they do not only want to know am I going to replace or try to do a cross or up sell when the economical life-cycle of the equipment is over, but also because we now have the data points we know how the customer is sweating the equipment.

"This can be especially important because if equipment is sweated then you might want to come to the customer with a commercial offering before the economical life-cycle of the equipment is over. Where as if the equipment is hardly being used at all, as we have seen in some of the examples in today's discussion, it might have a completely different profile to it- both from a service perspective but also from the commercial perspective when it comes such activities such as up-selling or cross selling.

"I often hear the words 'data is the new oil' and some analysts are already putting forward figures that indicate that the 'economy of data' is now surpassing the regular economy. While I do not know if this is 100% true, I think we do all understand that the data itself has a potential in creating the new offerings and also more usage for the voice of the customer."

Kris Oldland, Editor-in-Chief, Field Service News

"For me, I push back a little bit at the phrase data is the new oil.

"I've come to the conclusion that data is essentially valueless unless there is insight behind it. if we were to continue the metaphor data is merely the mechanism, it's the drill that allows us to get to the insight- which is where the true value lies."

Where Does the Value of Digitalisation Lie?

Jan van Veen, Founder, moreMomentum

"Data is absolutely important, there is no doubt about that. But the value is not in the data, neither is it essentially in the insight. What we are seeing is a number of different mechanisms kicking in that are all related to digitalisation. There are several of these.

"There is the disruptive element in how we are working, but also in the markets we serve at large.

"Some companies will follow the curve, others will be entrants into the market that drive us as a sector to work in a better way, and others will be unable to keep up and will fall away.

"Also, at some point we begin to see a type of de-materialisation. So we get less products being involved as some are taken out of the equation. For example we don't have generally have a need for a camera or a calculator anymore as our phones can handle both those functions.

"Another phase we will see is demonetization, where digital products become so prevalent that they become much cheaper and then finally alongside this we also see democratization where digital services become available for everybody at an affordable price point.

"We are in the early phase today as we talk about data coming from equipment and what we can do with that. But I think the real challenge is how are we going to turn it into value. Not insight, but services and value propositions using the data.

Jason Smith, Director of Field Service, EMEA, 3D Systems Corporation

"Everything has to be about data so we need the best data coming off the machine through the customer to get the right diagnostic in place. Industry 4.0 and connectivity is really helping with that.

"However, we still have a culture amongst engineers where they need to recognise that they are also responsible for the solution.

"What they have found and how they build up there experience is empirical- they've been able to build on that knowledge and telling others, that knowledge capture is key to the whole thing. It's not just what is wrong with the machine its what did you do to fix it and how can we put that back into a closed loop cycle so we are constantly improving and evolving the solution.

"We've touched on some of the tools to do that and Artificial Intelligence is of course one such tool but making sure that you have that closed loop in place and its not just one way traffic is the key to that culture change and so making sure engineers are part of it and recognise it I think is going to be key to improvement."

About ServiceMax

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