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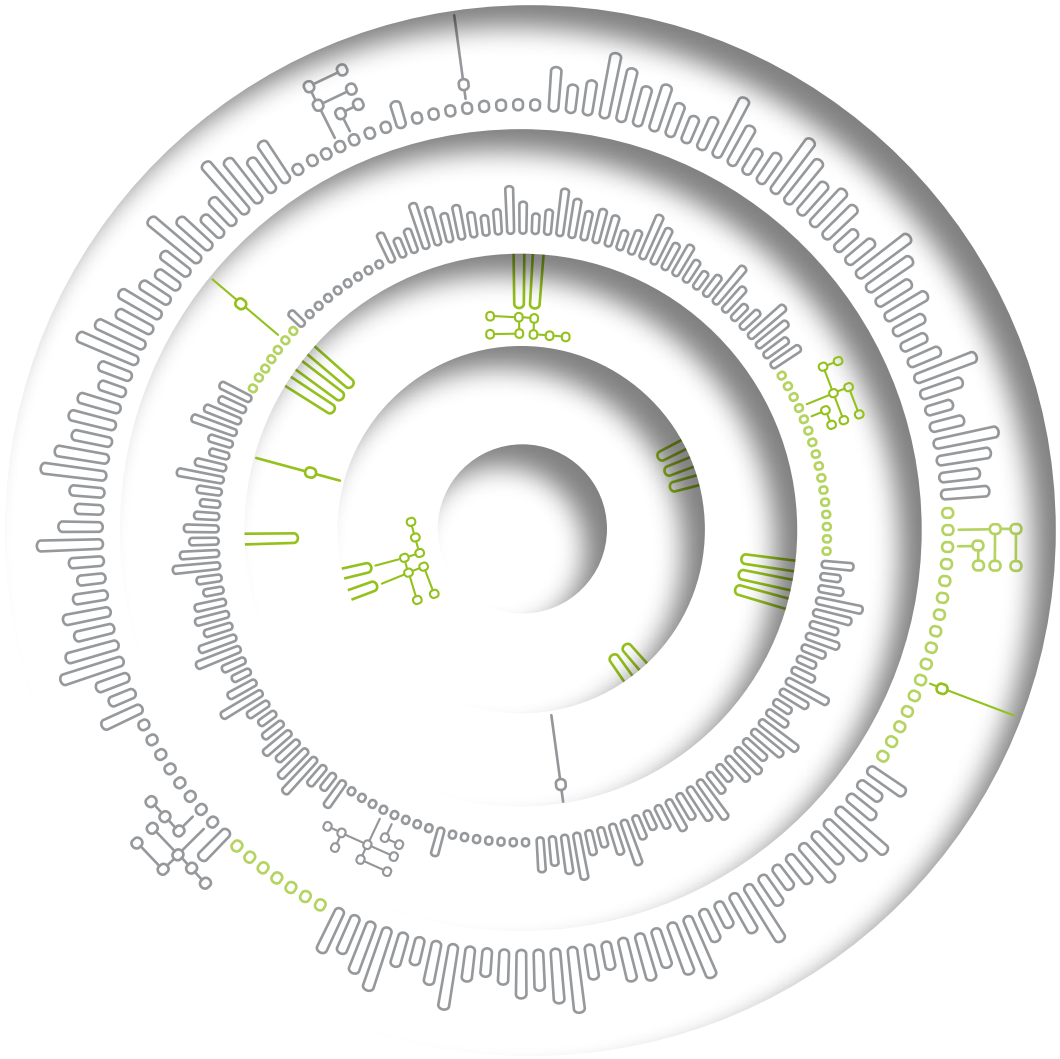

Equipment-as-a-Service

From Capex to Opex – new business models for the machinery industry

MAKING AN IMPACT THAT MATTERS since 1845

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Executive Summary

Subscription models, power-by-the-hour or outcome-based asset contracts – these are all terms describing different configurations of a business model that has been in the media spotlight over the last 12 months: Equipment-as-a-Service (EaaS). Driven by the meteoric rise of well-known B2C offerings such as Netflix and Spotify, today's industrial equipment buyers are looking to move the agenda from capital expenditure (CapEx) to operating expenditure (OpEx) in order to increase flexibility.

And though we are seeing various pilot programs emerge across different segments and companies, only a few organizations have been able to launch and also successfully scale an EaaS model. This Monitor Deloitte White Paper uses yet a sample of both successful and unsuccessful EaaS transformations as a basis to support industrial products manufacturers in setting the right priorities and reaping the rewards of this growing opportunity.

We will outline the capability OEMs should focus on in the following chapters, whether they intend to pilot an EaaS model or scale an existing offering and turn it into a an additiional and significant profit pool for their firm. The analysis focuses on the four most critical capability domains, which provide a decision-making framework for original equipment manufacturers (OEMs) reconfiguring their offering and go-to-market strategy.

"We have been talking about subscription models ever since Rolls-Royce pioneered it's power by the hour concept in 1962, but we didn't have the technology to scale XaaS models until now. But in the next decade we will eventually see "Netflix for Industry 4.0" take off – complementing the traditional sell, lease and rent models."

Oliver Bendig
Partner and EMEA Machinery Sector Lead

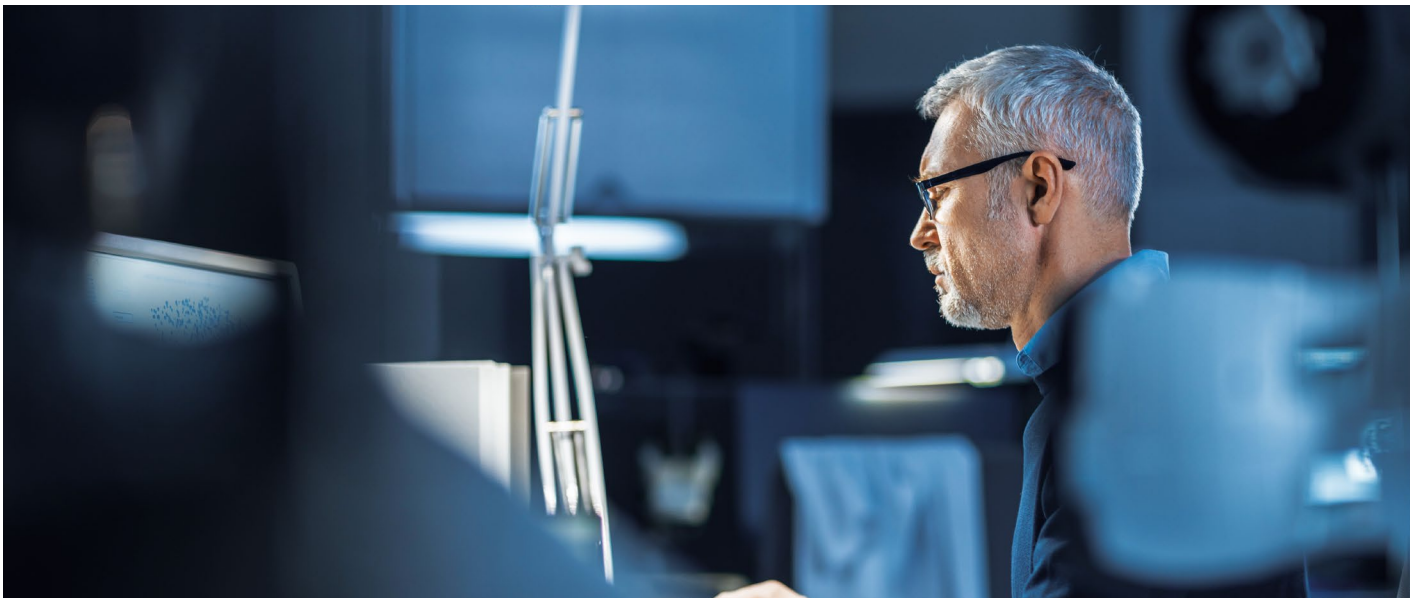
Service offering
As an equipment manufacturer, how can I help maximize my customer's OEE and what services do I need in my portfolio to achieve this?

Financing & financial model
How can I keep my financial flexibility without overloading my own balance sheet with equipment running in XaaS?

Operations & IT
What technologies do I need and what are the mission-critical systems, tools and processes that will enable me to offer EaaS in the first place?

Billing & invoicing
How (and with which partners) do I set up a usage or outcome-based billing system?

Our efforts to configure these four capability domains will depend on both the point of departure of the respective organization, but also the way it defines its qualitative and quantitative EaaS ambitions at the outset. EaaS models should never be offered just for the sake of offering them. Though they may provide a significant opportunity for growth, it is the "how" that will ultimately determine financial success.

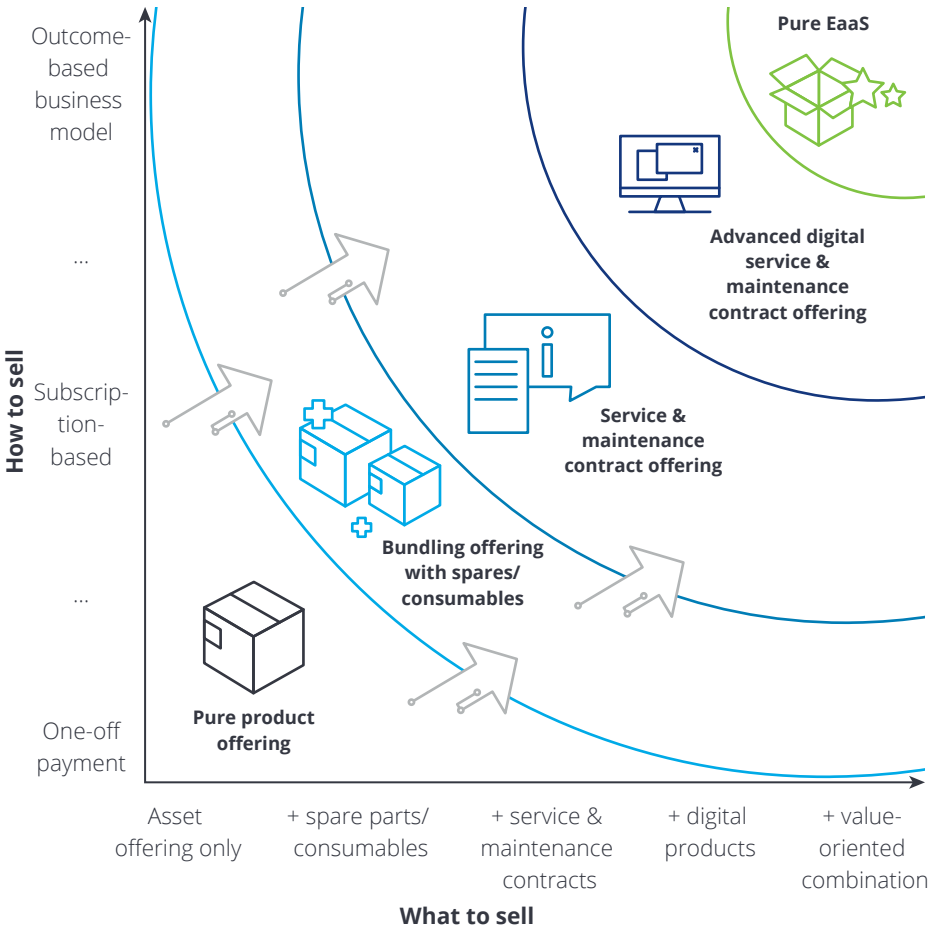


The WHY: Why EaaS is now moving from a niche alternative to becoming a strategic imperative for manufacturing companies

"The technology play"

For most industrial machine manufacturers, the term Equipment-as-a-Service (EaaS) is not exactly a novelty. The shift from one-off sales of capital goods (CapEx) to recurring revenue streams based on equipment usage or output (OpEx) has been a common practice in certain industries for more than a decade. These models may vary based on what a customer actually pays for (e.g., per hour of usage, per unit of output or based on the overall OEE (Overall Equipment Effectiveness)). One prime example is the much-touted Rolls-Royce model that has revolutionized the way the company sells aircraft turbines – typically referred to as "power-by-the-hour", as customers are only charged for each hour of actual usage.

Fig. 1 – Definition of Equipment-as-a-Service



Though the concept itself may not be new, we have seen a significant increase in the adoption of these novel business models over the past 24 months – and across various industry segments. Three essential drivers have led to the launch of numerous EaaS pilot projects and a general shift of mindset in many companies:

1

Customer demand: Customers are starting to explicitly demand EaaS models, making it very difficult for OEMs to avoid offering them, particularly when their direct competitors already do. In many cases, this stems from the simple fact that customers are also demanding greater flexibility and an end to fixed long-term volume contracts. They are in essence looking for ways to share risk with asset manufacturers – a core features of EaaS models. The profile of the typical customer is changing as well. Thanks to increasing consolidation and investments backed by private equity, "hard" KPIs such as OEE and ROI are moving higher on the agenda. That changes the sales conversation from "which equipment to buy at what price" to "which specific result, e.g., an output number, an asset can guarantee."

2

IIoT technology advances: Technologies such as IIoT, 5G, Cloud, Big Data and AI simply did not exist ten years ago in the way they do now. Given their maturity today, these advancements have given rise to many digital service solutions that are either improving EaaS models – or enabling them in the first place. A good example is the range of IIoT solutions that enable equipment to automatically share asset performance data and provide transparency on asset usage. After all, without this data, they would not be able to charge customers based on actual usage or production output.

3

Decline in equipment sales and margin: Most industry segments have seen a decline in asset margins as well as annual sales volumes, which has made Aftersales business the number-one profit driver in many cases. That means OEMs are actively seeking new opportunities to gain market share with offerings other than pure asset sales. Common examples here are those EaaS models that include the consumables manufacturers need to operate the equipment. Because OEM share-of-wallet in these markets is typically low, this area offers a lot of potential for equipment manufacturers.

Fig. 2 – Profit potential estimation of EaaS (illustrative example)

Approach Period: 3 years		Sales	Financing	Aftersales	Services	Remarketing	Sum
OEM	**Profit per contract**	€10,000	n/a	€6,000	€3,000	n/a	**Σ €19,000**
Sales €180,000 one-off	**Real. share customer expenditures**	◑	○	◑	◔	○	**Customer** Limited contact, pos. change **Product** No control over asset
OEM	**Profit per contract**	€5,000	€2,500	€7,500	€6,000	€2,000	**Σ €23,000**
"as-a-Service" €5,000 monthly		◑	●	●	◑	●	**Customer** Regular contact Possible extension/ upsell **Product** Coverage of further cycles

Fig. 3 – Roles of different EaaS players

In addition to these factors, product innovation has also been driving the surge in EaaS models. New equipment is increasingly focused on the customer's actual manufacturing process, not just the specific part targeted by the respective asset. We are seeing more laser manufacturers, for example, improve the overall process of the customer by extending equipment capabilities to drawing or sorting finished parts. This naturally shifts the focus to optimizing the overall flow instead of individual process steps. For the customer, this means a substantial improvement in process stability – not least because these IIoT advances enable vendors to expand these processes over time as they collect more performance data.

Even though we have seen an acceleration in all of these driving forces over the past 24 months, the number of organizations that have been able to successfully scale their EaaS business is still limited. Why is that?

In most cases, industrial equipment manufacturers still lack the confidence to fully deliver on the EaaS promise – or they fear it will come at a higher price than customers are willing to pay. That is why even organizations that have launched successful pilots are still careful when it comes to making large-scale investments in this area. After all, moving to an EaaS model is a big ask for most organizations – it requires massive transformation in a range of separate systems, some of which have been ongoing for years (e.g., service transformation, digitalization of processes, full supply chain visibility, ERP integration, etc.).

"There are two reasons why we are at a pivotal point towards more flexible business models today: (1) Clients want to make their cash flow streams more predictable and resilient to crises and (2) The technology that connects machines and turns sensor data into maintenance insights has finally made X-as-a-Service models a realistic option."

Josef Brunner, CEO relayr

However, if equipment OEMs wait until they have completed the transformation in every area, they will miss the window of opportunity by years. The number-one success factor for industrial goods manufacturers is to set the right priorities and focus on those capabilities that are most critical for piloting or scaling an EaaS model. The objective of this PoV is to give companies an overview of what is required to rapidly build and scale an EaaS model or to scale an existing business – and what can wait until a later date.

The WHAT: What the key requirements for organizations moving towards an EaaS model are

"The Netflix of Industry 4.0"
In order to identify the most critical requirements for building a successful EaaS offering, we must first understand the major components of these models as well as the most important players typically involved. We can build on the general definition provided in the previous chapter and outline how EaaS models integrate and combine the four following components:

Equipment
The actual asset, which was traditionally the core of the offering and sold in exchange for a one-off payment or through leasing/rental agreements

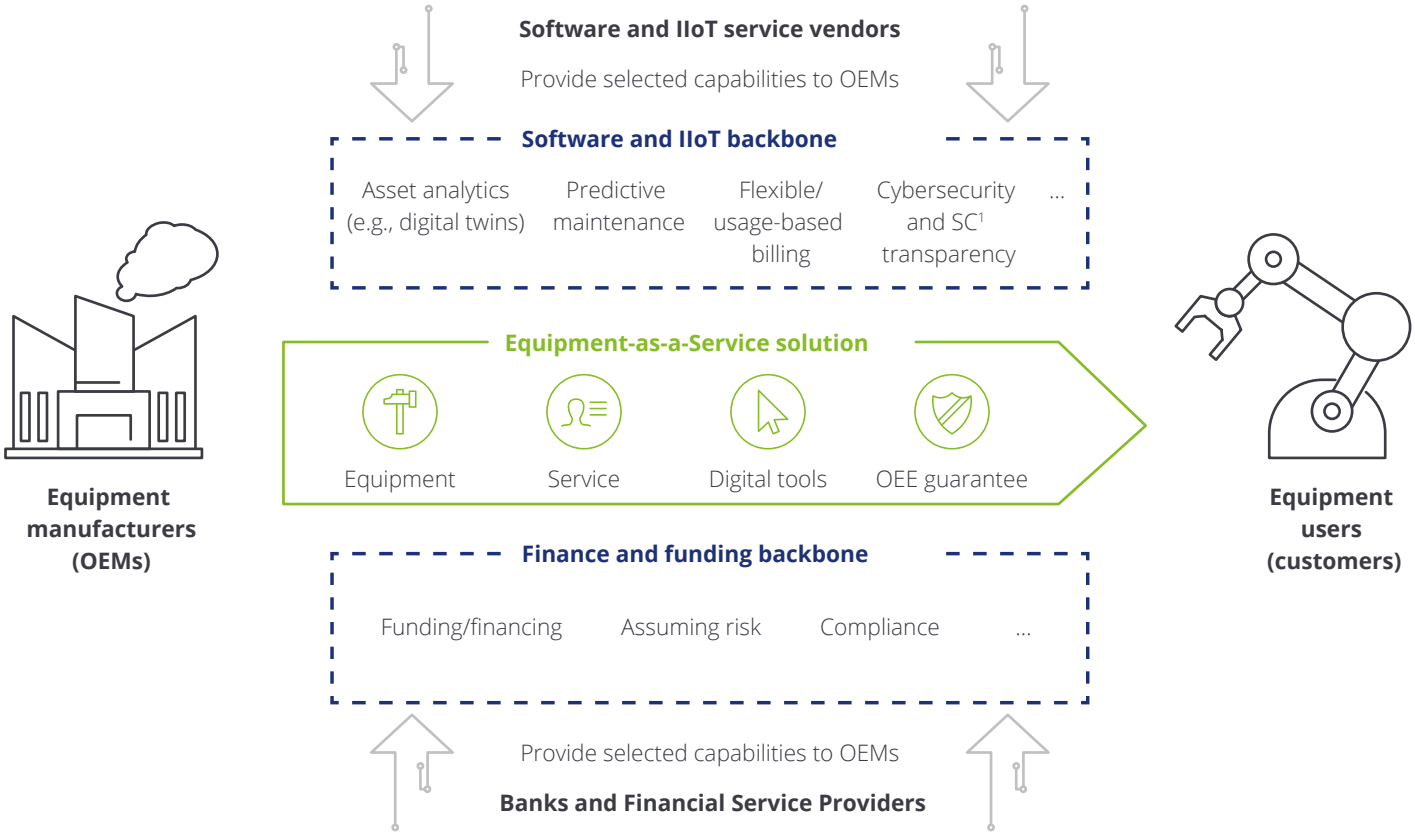
Services
All of the services required to operate the equipment and perform any required maintenance (e.g., spare parts, consumables, technician time, recalibration of settings)

Digital tools
Many of these tools are not designed to do something completely new, but rather to perform existing tasks significantly better than their analog counterparts and improve operations performance considerably. We should absolutely handle these tools as a separate category, as many organizations have only just begun to build their offering and have not yet achieved scale (e.g., smart operator training, predictive maintenance, digital twin technology)

OEE guarantee
Though OEE-based contracts have been used in many industries, a lot of sectors are new to the concept of basing an entire offering around them. OEMs typically assume full responsibility for guaranteeing a specified OEE as part of an EaaS model.

While these four elements seem rather straightforward, most industrial equipment manufacturers will find it difficult to fully deliver on their EaaS promise across all components. Some of them may have the physical infrastructure in place to execute services rapidly, but they are still lacking the digital tools to take performance to the next level. Others that have both may find it isn't feasible to provide OEE guarantees and keep the assets on their balance sheets given the size and available funds of their organization. In summary, these organizations are either missing the required "Software and IIoT backbone" or the "Financial and funding backbone" – both of which are mission-critical.

Fig. 4 – Driving forces for EaaS models



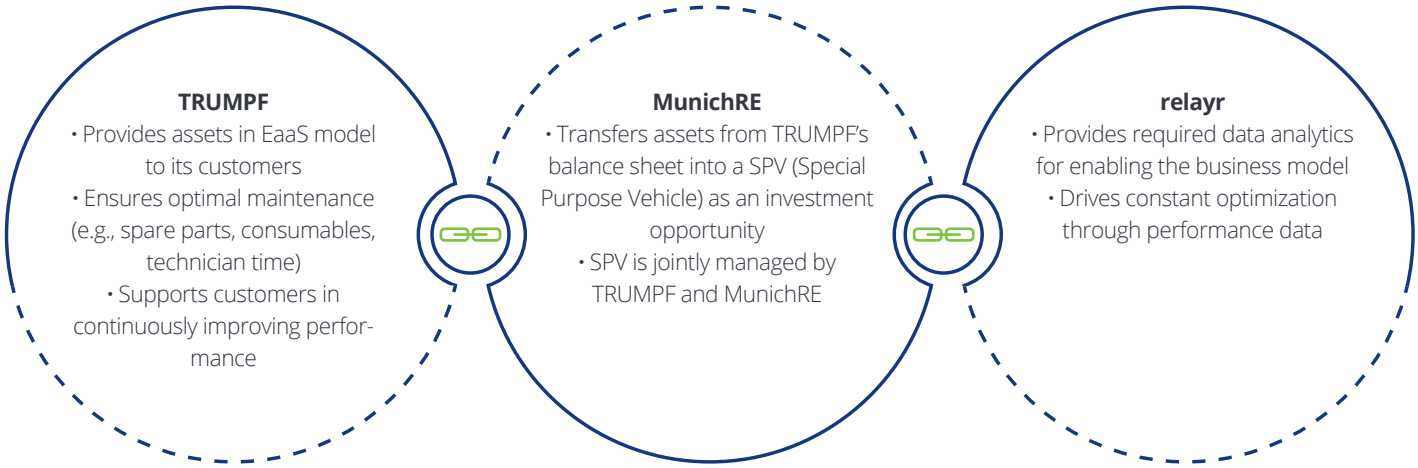
[1] SC= Supply Chain

Because it is virtually impossible for most OEMs to build each backbone by their own within an acceptable timeframe, we are seeing an entire ecosystem evolve in the market to bring together three parties with mutual benefits:

- Original equipment manufacturers (OEMs)
- Software and IIoT service vendors
- Financial service providers

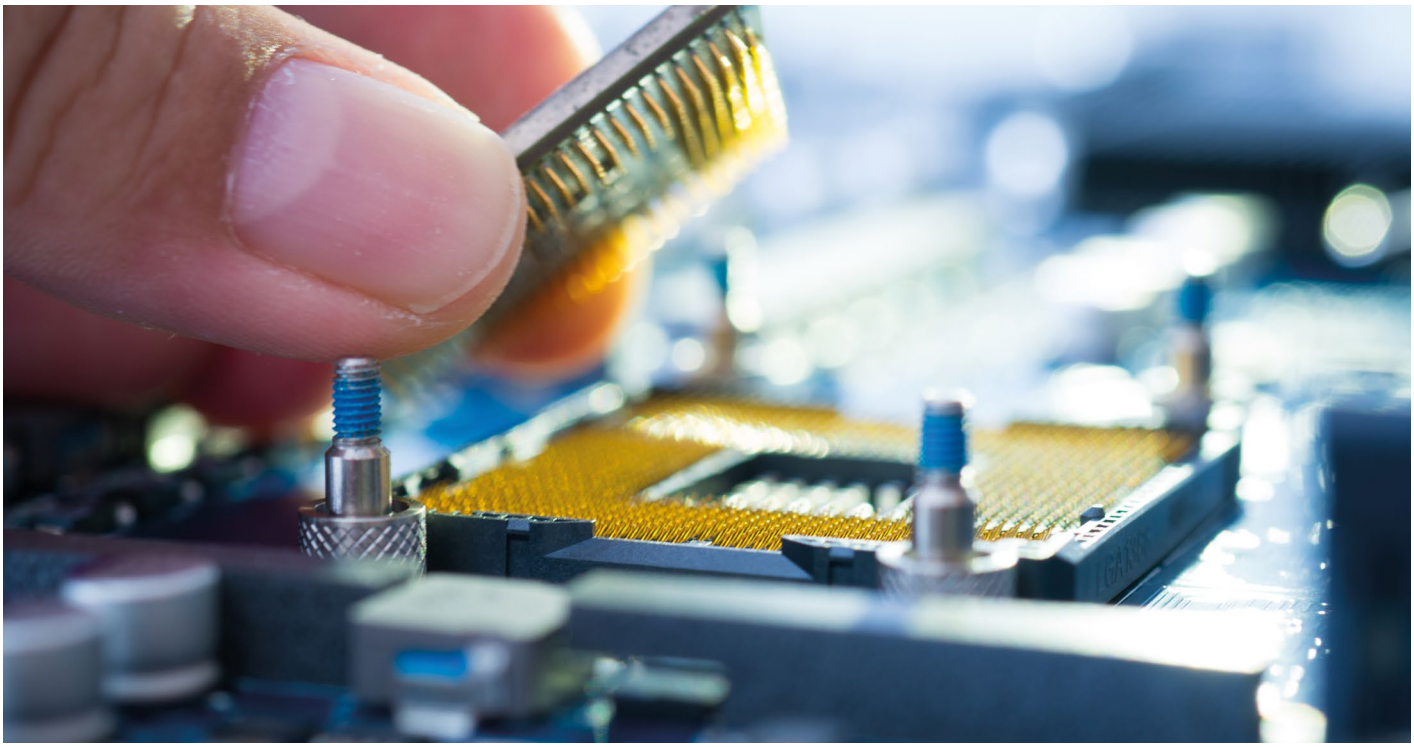
Each player brings a unique set of capabilities to the table, which are all critical for an EaaS offering – and each one of them has their own incentive to take part. Financial institutions, for example, are exposed to significant risk of losing a secure source of revenue from asset financing. If customers no longer have to pay up front, they will no longer need loans for the initial payment. Banks and insurance companies have therefore started to team up with original equipment manufacturers when it comes to risk sharing and taking assets off the OEM's balance sheet.

Fig. 5 – Case Study TRUMPF



"EaaS = Industry 4.0 meets Insurance 4.0"

Oliver Bendig
Partner and EMEA Machinery Sector Lead



Software and IIoT service providers, on the other hand, provide the much-needed transparency on actual machine usage and areas of improvement. This, in turn, enables financial service providers to design equipment-specific insurance programs against production loss. There is an entire ecosystem evolving in which each player develops specific additional capabilities to maximize the overall customer benefit.

Ultimately, OEMs need to be very thoughtful about which elements of the EaaS model they intend to develop in house (which consumes valuable time and effort) and which ones they plan to provide in collaboration with external partners (which in many cases may be the only feasible option). It will be essential for equipment manufacturers to take on the role of orchestrating these capabilities in the best interest of the customers – and with the aim of protecting their own market share.

These decisions must factor into the core requirements of any organization looking to build a successful EaaS model and the key areas where OEMs are working with external partners – across the two backbones described above:

1

Software and IIoT backbone

- Equipment analytics (e.g., digital twins)
- Predictive maintenance
- Flexible/usage-based billing
- Cybersecurity and supply chain transparency
- ...

2

Finance and funding backbone

- Funding/financing
- Risk taking
- Compliance
- ...

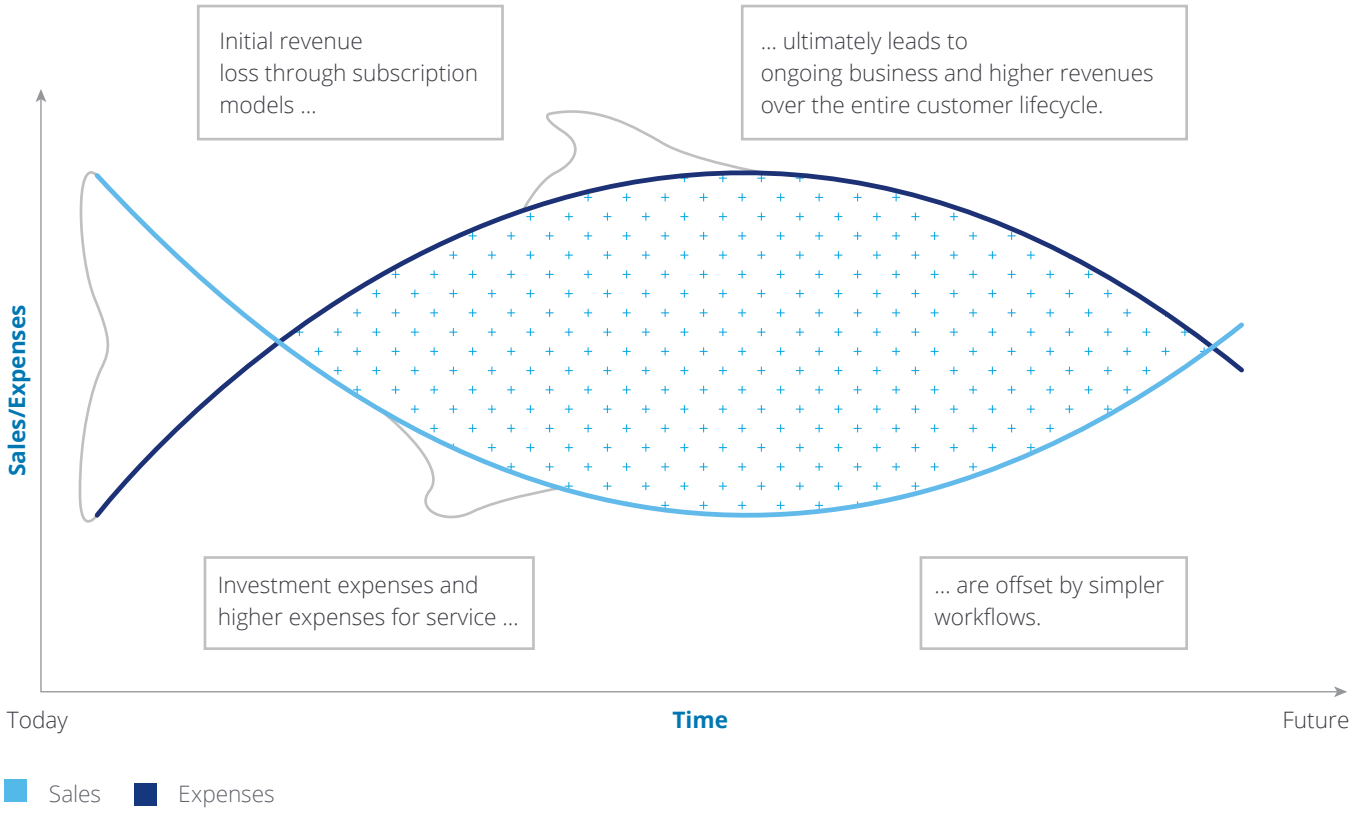
"EaaS is a key business model of the future and will bring us to the next stage of Industry 4.0. Technologies such as AI, blockchain and processing information with learning systems will help us to make the manufacturing process more efficient and ensure that our products remain competitive."

Oliver Bendig
Partner and EMEA Machinery Sector Lead

Despite all of the benefits outlined above, organizations should be aware of one well-established financial impact: industrial machine makers looking to switch to these models will initially "lose" some of their revenue from new machine sales. They will eventually make up more than these losses for these losses over the life of an after-sales service agreement, but there is no getting around the "dent" in the balance sheet they can expect for the first few years. Since cash inflows from new machine sales are lacking, most machinery manufacturers find it beneficial to start early with an initial subscription pilot project and to then increase the share of this business gradually over time – provided they are convinced by the experience and the results of the pilot project.

Having established an understanding of why organizations should move towards EaaS models, who they need to partner with and what financial implications they should expect, the next chapter will focus on HOW we can drive this transformation forward and take it to scale.

Fig. 6 – Fish model theory



Source: TSIA, Technology-as-a-Service Playbook: How to Grow a Profitable Subscription Business (2016)

The HOW: How industrial equipment manufacturers can kick-start their transformation and take it to scale

"Industry 4.0 meets insurance 4.0"
There are numerous industrial equipment manufacturers that have successfully introduced EaaS models and are often cited in studies and as examples of best practice (e.g., Kaeser Compressors, Pratt & Whitney, Rolls-Royce). There is, however, a significantly larger number of companies that has been unable to achieve their financial and strategic ambitions in this area. The underlying reasons for this vary from company to company, but thanks to our evaluation of a large set of EaaS transformations, we have identified the five most common mistakes:

- Overestimating an organization's maturity in terms of the service offering and its transparency on end-to-end costs. Contracts with an OEE guarantee are typically received extremely well by customers, but can be very expensive for an OEM if there is no a priori end-to-end transparency on all associated costs over the equipment lifecycle.

- Maintaining the status quo in terms of organization and the go-to-market approach. EaaS models work end-to-end, which means breaking down functional silos, reorganizing existing teams and realigning incentive structures. If it is not more beneficial for the sales force to sell EaaS contracts over individual equipment assets, they will simply not do so.

- Expecting customers to use individual EaaS equipment exactly the same way they use assets purchased conventionally. Think car sharing: who doesn't have a different and slightly more carefree attitude towards driving in a vehicle you don't own or lease? In the manufacturing context, risk sharing will always require mandatory guidelines and a training strategy for equipment operators.

- Neglecting to prepare service technicians for their new role. In an EaaS model, the technician has an entirely new set of responsibilities. Instead of fixing specific, well-defined problems (either at cost or as part of a maintenance contract), they are now charged with continuous oversight of the entire asset to identify any problems or potential areas for improvement. This may start with simply looking "left and right", but it typically also requires a new training curriculum for service technicians to enable them to detect opportunities across assets.

- Getting lost in additional add-on digital services for customers. While digital services are critical components of an EaaS offering to drive operation improvements, the initial focus has to be on the customer's top priorities: maximizing OEE by getting the usage and maintenance piece right and ensuring rapid availability of consumables, spare parts and service technicians when needed.

Building upon these four common mistakes as well several successful EaaS models in the industrial products space, we have identified four capability domains that should be at the center of any EaaS transformation.

Each one represents a larger area, in which OEMs will have to answer a variety of questions and configure their setup accordingly:

Service Offering

- What services should I include in the offering with what Service level agreement (SLA)?
- Should my offering have multiple tiers (e.g., bronze, silver, gold) with different SLAs and different pricing?
- How do I set up the service to ensure we can deliver on the SLA promises (e.g., spare part network, technician infrastructure, remote maintenance centers)?
- What tools can I use to get a transparent overview of all costs across the entire equipment lifecycle?
- Do the operation control centers require a centralized system to continuously monitor the entire installed base and support operators?
- ...

Leasing & Financing Model

- How do I set up a customer risk assessment process prior to signing an EaaS contract?
- How should I approach refinancing?
- What share of assets should remain on my organization's balance sheet and what should be moved to other entities (e.g., special purpose vehicles)?
- How should I manage the credit default risks of my customers?
- Which roles can and should be outsourced to partners and what can I do in house?
- ...

Operations & IT

- To what degree are CRM and ERP systems aligned in order to integrate the different components of an EaaS model (e.g., assets, spare parts, technician time)?
- Which new technologies should I use to increase efficiency (e.g., blockchain for tracking spare part provenance)?
- Is my cybersecurity and especially OT security setup mature enough to handle thousands of assets that are suddenly connected?
- Where do spare parts have priority over new equipment in the production process?
- ...

Billing & Invoicing

- Does my current system landscape allow for usage or outcome-based invoicing?
- Where do I need separate invoices (e.g., due to regulatory restrictions of bundling)?
- How can I perform in a compliant way and the services of third parties IFRS-compliant ?
- ...

The answers to these questions will depend on the respective organization and its target state as well as the ambitions defined by management at the outset. We can, however, give general guidance based on the actual maturity level of the EaaS offering.

In essence, there is one question that determines how each organization configures the four capability areas: Is the priority for the industrial equipment manufacturer a **pilot EaaS offering (A)** with the potential for subsequent roll-outs or **scaling (B)** an already existing EaaS business? The response to this question should help OEMs to set their priorities accordingly, with the following recommendations in mind:

(A) Industrial equipment manufacturers planning to pilot an EaaS model should…

Service offering

- Start with defining 3 to 5 value packages with a combination of the offering components that are most relevant for the defined target customer segment (e.g., a specific piece of equipment with x consumables per month, technician response time of x hours, SLA-level of x% and access to selected digital services)
- Focus on the most standardized equipment that already has a large volume of performance data available – this is essential, because every value package must include condition monitoring and predictive maintenance
- Provide cost transparency over the entire planned contract term as a basis for contract pricing – those firms that are unable to extract this information from their ERP will have to collect data manually from all relevant functions (e.g., operations, logistics, service)
- Design and execute a 2 to 3-day rapid assessment of customer operations to minimize risk of non-compliance with agreed usage rates
- …

Leasing & Financing Model

- Keep pilot assets on own balance sheet to remain indepedent and secure short-time-to-market, but initiate dialogue right away with financial institutions (e.g., banks, insurance companies) to discuss potential partnering options as part of scaling the business
- Develop a risk assessment process to screen potential customers before contracting
- Offer an EaaS model based on monthly usage or volume at a fixed price – but also consider adding a non-refundable one-time payment to act as a buffer during the pilot phase and cover sunk costs
- …

Operations & IT

- Validate the connectivity of at least the equipment chosen for the initial pilot and ensure a secure and stable cloud connection
- Ensure that integrated ERP data is available to track performance at least for the pilot equipment/area (e.g., accumulating all internal costs involved with delivery)
- Introduce an incentive scheme for sales reps that makes selling EaaS at least as important as selling one-off equipment deals (rely on existing best practices)
- If not yet available, introduce structured S&OP process for focus equipment with EaaS contracts (for spare parts and consumables)
- …

Billing & Invoicing

- Work with an IIoT partner focused on usage-based billing right from the start
- Work with tax and legal specialists to set up a new flexible billing system (if it does not yet exist)
- …

(B) Industrial equipment manufacturers looking to scale their existing EaaS model should…

Service offering

- Build an asset configurator tool that allows both customers and sales reps to see different value package combinations with pricing available immediately
- Integrate a full digital service suite into the EaaS offering (e.g., smart operating training, data sharing)
- Launch learning curriculum for service technicians with a focus on a) expertise on the end-to-end solution and b) building long-term customer relationships
- Roll out a predictive maintenance solution
- Give (future) customers rapid access to virtual demos on the web portal that highlight the benefits of different digital services
- Introduce automated part and consumable replenishment systems ("prescriptive maintenance")
- …

Leasing & Financing Model

- Leverage partnership with an established financial services provider and shift EaaS assets off the balance sheet, potentially into Special Purpose Vehicle (SPV) of banks/insurers
- Evaluate whether blockchain-based solutions would be useful to track which parts with which origin have been built into which machines globally
- …

Operations & IT

- Launch an extensive learning curriculum for sales reps on specifics of value packages
- Introduce digital twin solutions along entire equipment lifecycle and leverage as main source of information for asset performance improvement
- Drive cultural transformation initiative to enable shift towards an EaaS mindset (e.g., townhalls, newsletters, learning journey for leadership)
- Implement end-to-end cost transparency solutions that provide real-time information on expected costs for different contracts in different regions and countries
- Set up a company-wide portal to create transparency on equipment reusage options across division and regions/ countries
- …

Billing & Invoicing

- Expand work with external partners for flexible billing
- Enable "on-demand" functionalities that allow customers to book additional services online and use them straight away, with each invoiced separately
- Pilot a new range of billing models with customers (e.g., direct billing after usage, monthly billing, tiered billing)
- …

"While customer requirements slightly differ, industrial products OEMs can learn a lot from automotive OEMs when it comes to the infrastructure of EaaS models."

Sebastian Pfeile
Partner Deloitte and Global Auto Finance Lead

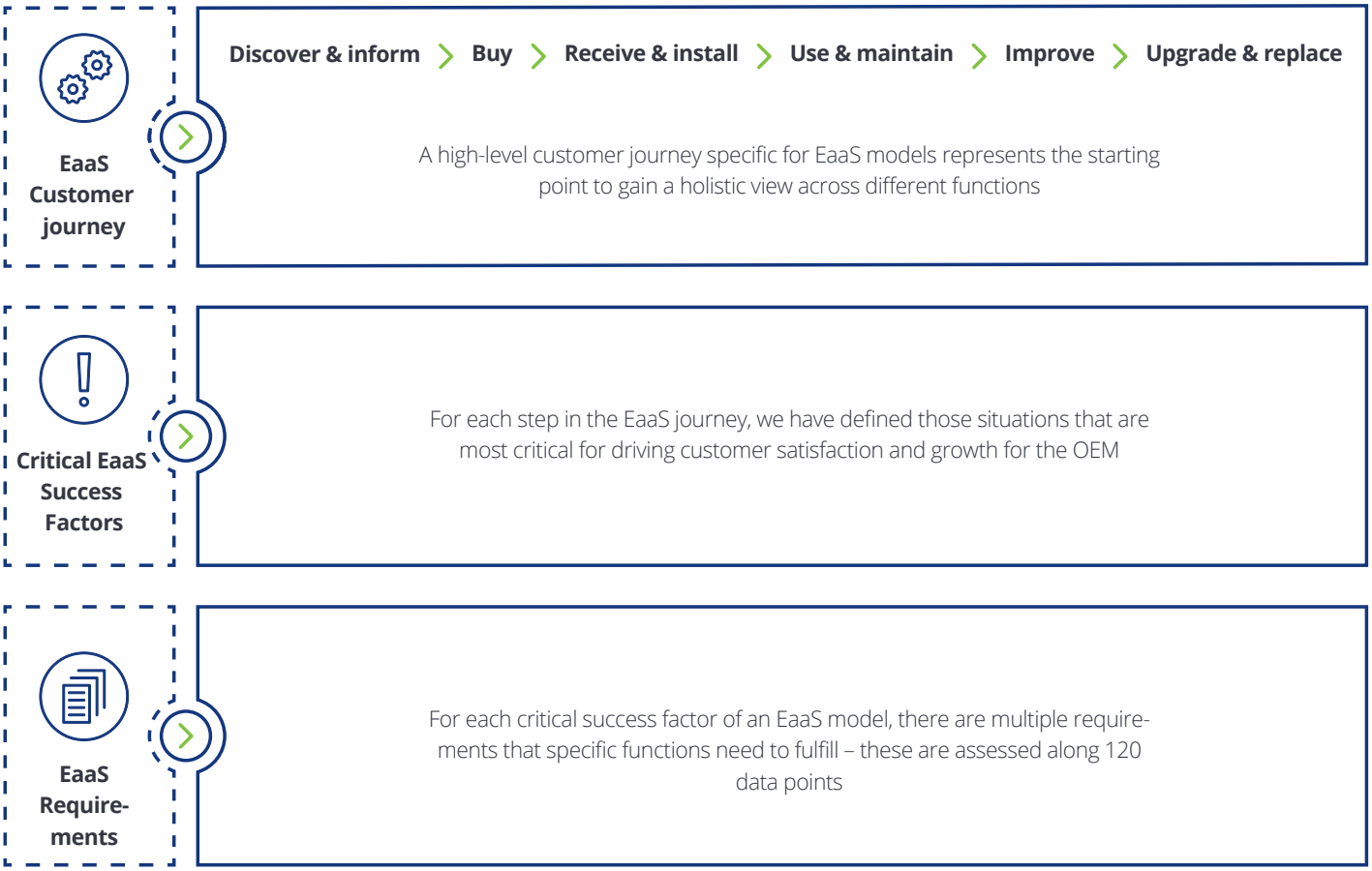
Conclusion

EaaS models are poised to fundamentally change the way industrial equipment manufacturers do business. While they may not be suitable for every segment and asset category (e.g., those with high customization and low volumes), these models offer great potential for growth in many domains (e.g., those with low customization and high volumes). To capitalize on this untapped opportunity, asset OEMs need to answer these three questions and they need to answer them fast:

1. What exactly is our current status globally?
2. What are our EaaS ambitions over the next 36 months?
3. Which have we defined as our priorities and how can we accelerate operationalization?

To support you on this journey, Monitor Deloitte has developed the Equipment-as-a-Service X-Ray service to rapidly determine an organization's current maturity level for EaaS transformation. We use 120 different requirement criteria along the entire customer journey to define the current status of each division and/or country organization. This helps us uncover the areas with the greatest potential for development.

Fig. 7 – EaaS X-ray based on target customer journey



On this basis, clients can then formulate their EaaS-specific ambitions, derive their key priorities and draft the associated action plan. Both the plan and its execution will be highly company-specific, though there are five key success factors that every asset OEM planning to tap EaaS potential should keep in mind:

1. Involve different teams and regions in your assessment of the current EaaS maturity level – after all, the initial X-ray is a great opportunity to promote your new EaaS model and build a powerful coalition of supporters
2. Work with your customers to develop your EaaS offering – it would be unfortunate to spend weeks and months developing the "perfect" EaaS model only to realize that you failed to address your customers' main pain points. Try Instead to win one of your most loyal customers as a collaborator and develop a joint pilot
3. Integrate initiatives with existing programs – most EaaS requirements also feed into other transformations and can be pursued on a joint basis (e.g., CRM integration)
4. Start involving partners from day one – there are specific capabilities that cannot be built in house and require extensive partnering, either now or in the near future (e.g., with IIoT-software players or financial institutions)
5. Recognize that the time to act is now – now that we have reached critical mass with the data from successful and unsuccessful EaaS transformations, companies ready to introduce these models right away will be well ahead of the competition in most industries

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