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Whitepaper

Powering the Servitization of Manufacturing with Industry 4.0

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Servitization is undeniably one of the biggest trends to come from Industry 4.0 for the OEM (Original Equipment Manufacturer) industry. While the term 'servitization' is certainly not new (refer to Servitization of Businesses: Adding Value by Adding Services – Sandra Vandermerwe & Juan Rada, European Management Journal, 1988), the subject has been garnering increasing attention from the industry lately given its relevance to the digital age. Fraught with complex challenges such as the lack of capital and trained manpower as well as the inability to scale to keep pace with increasing demand, the industry has been steadily moving towards the integration of emerging technology in the form of Industry 4.0 to usher in transformations in the way it serves the market. This article takes a closer look at servitization specifically in the context of OEMs, its capabilities, potential pitfalls, and discusses best practices for its deployment.

Servitization – what's all the fuss about?

The servitization business structure espouses embracing a service-based model over and above the traditional product-based model, a transition that brings the customer squarely into focus while generating additional revenue streams for the manufacturer and differentiating its offerings in a competitive marketplace.

Servitization offers multiple benefits for OEMs. Besides increase of revenue, another important benefit another important benefit is the ability to obtain a deeper connect with consumers by providing them more value in the form of reliable and ongoing services. Consumers are expecting more and more, and with loyalty being a fluid construct in this day and age, businesses are needing to step up to the plate by making concerted efforts to engage them. Product and process innovations are a natural byproduct of foraying into adopting servitization.

From an industry perspective, servitization enables end customer to shift from a CAPEX (Capital Expenditure) to an OPEX (Operational Expenditure) business model which enables them to forecast better cash outflows and facilitates the redeployment of CAPEX for innovation and research & development.

The switch from a Product to a Product-as-a-Service (PaaS) model which occurs in servitization enables OEMs to sell a desired result as opposed to simply a product which in turn builds conscious and stronger relationship with consumers. Over a period, the data collected from consumers helps businesses further refine their offerings to cater to the demand, boosting efficiency and productivity while optimizing material usage and reducing unnecessary wastage. For instance, with the use of smart connected products whose health can be monitored continuously, OEMs can improve their service efficiency by boosting the MTBF (mean time between failures) and MTTR (mean time to repair) maintenance metrics. This enhances the delivery of a 'Right the First Time' service while reducing the cost of ownership and maintenance for end-users.

Servitization in action at Rolls-Royce

One of the better-known examples of the successful implementation is perhaps Rolls-Royce. It's solution allowed customers keep their engines generating maximum value for as long as they had them – with the added benefits of more choice and flexibility. One of the solutions under this portfolio had the option to rent out engines, so customers could pay an hourly rate for just the duration that the engine was in flight.

Common challenges with the servitization model

Implementation of the servitization model brings with it some fundamental challenges to businesses, the most common one being changing mindsets. It starts at the top with key stakeholders being vested in the need to bring about much-needed changes to gain the competitive edge which currently is synonymous with surviving and thriving. Moving from a product-centered sales mindset to a consumer-centered service mindset is crucial to the cause. Another common challenge is the actual process of moving to adoption. The scope and scale of technology required, and the need to upskill manpower to be able to make use of the new technology are concerns that can prove daunting to businesses.

The silo-trap is an all too real challenge to the implementation of the servitization model. Bringing together departments in strategic alignment through connectedness keeping the customer at the core. Smarter connected products result in the disintegration of layers such as 'distributor' and 'retailer', which in turn removes the inefficiencies in the supply chain. Another challenge is selling the benefits, especially of innovative service-based product lines, to the end-user. Consumers often need to be educated about the value benefits before they are open to the idea of purchase.

Best practices for servitization implementation

It is important to align processes, people and the technology to the new method of working in order to create a seamless experience for the end-user. The core benefits of servitization can be realized by bringing in end-to-end integration from product design to manufacturing processes, all the way through to field services, where these products are used. This convergence of smarter products and smarter manufacturing operations is needed to accelerate the adoption and value realization from the new business model.

Key aspects that need to be considered when integrating industry 4.0 for servitization are:

1. A tighter Product Lifecycle Management (PLM) process with integrated data management

2. Smart manufacturing processes, service operations leading to newer business models

3. Effective change management for people, processes, and technology

Tighter PLM with Integrated Data Management

Smart connected products manufactured in a smart/digital manufacturing facility are the essential elements needed to kick-start the servitization model as is the need for an integrated information process flow from "Design" to "Operate" in the product life cycle. The integration of systems and processes across the product life cycle right from engineering design, to the manufacturing of the product to supply chain management, and then finally to field service is a critical factor for developing effective servitization offerings. This digital thread i.e. 'as designed' vs. 'as manufactured' vs. 'as operated' facilitates a single source for data that can be leveraged and updated by different functions across the organization.

Servitization is facilitated by the usage of smart products for monitoring product operational parameters using the right sensors; and the transfer of this data to a platform for analytics and visualization. Hence, designing the product using optimized instrumentation and sensors is critical given that much of servitization use cases leverage the data collected by these sensors for sending accurate insights to the end-user. The information can additionally be transferred back to the design stage, closing the loop, and thereby enabling further enhancements to the product.

Smarter manufacturing processes and service operations

When the shop floor gains in efficiency, it enables the business to reduce the manufacturing operational costs. Besides the more obvious cost benefits, the improvements also help in bridging the gaps between the 'as manufactured' ecosystem with an 'as designed' and 'as operated' world.

Smart connected products have facilitated the OEMs to adopt newer business models and have longer warranties on their products. This business model can be successfully deployed as a result of the several digital enhancements that have been made:

- They can monitor operations and identify operating condition violations leading to warranty clause violations
- They can cater to more stringent SLAs on uptimes and MTTR KPIs
- They have better traceability of components through an integrated data and information management across the product lifecycle
- They can proactively address any faults through data and analytics contributing in a reduction of part recalls and customer complaints

It is important that all these dimensions – smart manufacturing, service operations and smarter products are considered in a holistic and cohesive manner. Re-vectoring the business model for smart manufacturing encourages innovation paving the way forward for the successful deployment of servitization across the organization.

Effective Change Management for people, processes, and technology

The servitization business model calls for effective change management factoring in people, processes, and technology. Joint change management involving all divisions within the organization enables the cross-leveraging and sharing of knowledge, best practices, and capabilities.

With people, it is fundamentally about redefining ways of working and have this filter down top-to-bottom creating an environment that is ripe for innovation. Encouraging employees to act as ambassadors of change and to take ownership for driving and embracing the changes is core to effective change management. In terms of processes, a closer look needs to be taken at adapting the internal structure of product development and innovation to ensure integration of the latest technology in terms of UX, data analytics, AI/ML, and device connectivity and solutions are delivered in a more agile manner.

Another aspect that the business has to consider as part of change management, from the technical perspective, is data security and privacy. Most of the products that are deployed by the business are integrated with the client's network and based on equipment type, will be also be part of the Operational Technology (OT) network. Exposure of information and data to external parties outside of the client organization poses risks to the network and the confidentiality of data itself. Based on the data compiled from use cases, it is also essential to make sure that the process data from the shop floor is correlated to the equipment condition data, and that the plant is not able to take this data outside the Process Control Network (PCN).

To summarize, product innovations in isolation are no longer a differentiator in competitive and crowded marketplaces where new entrants can oust established players. Servitization is increasingly becoming a must for businesses who want to stay competitive in a fast-changing and disruptive environment and bring about next-level differentiation to not just acquire consumers but also hold on to them for longer.

About the Author

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Kartik heads the delivery for IoT Practice across industry verticals. In this role, he is responsible for delivery of IOT transformation program for global customers. He has over 20 years of experience and has played sales, program and delivery management roles in different geographies. His areas of expertise include product design, industrial automation and Industry 4.0. He has helped multiple customers define and navigate their digital transformation journey by bringing in solutions on IT-OT convergence, factory visibility, condition monitoring, predictive maintenance, digital twins for process & asset, and digital thread.