



WHITE PAPER



Servitization – Changing Nature of Product Focused Companies



Competitiveness in the manufacturing sector has reached new heights, with manufacturers finding new ways to improve their profitability and sustain their market position. Manufacturers have started adding the service component to their products to differentiate themselves in the market. This addition of services to supplement the traditional product offerings is known as servitization. With technological advancements and evolution of IoT, manufacturers are exploring ways to provide ‘Product-as-a-Service.’

This paper discusses the evolution of the servitization model, technology enablers for servitization, and how it helps manufacturers differentiate themselves from their competitors. It also focuses on the framework that is required for the transition, as well as the mindset change needed to increase the adoption of the servitization model.

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Changing Manufacturing Mindset

Manufacturers are focused on identifying new and reliable revenue streams to gain a competitive edge and increase profitability. This has contributed to a change in the manufacturers' mindset, wherein product development gradually shifts from a 'product-centric' approach to 'product and service-centric' approach, and later to a 'customer-centric' approach. In the first two approaches, manufacturers are predominantly focusing on differentiating their offerings through product/service development/innovation. In the 21st century, with the help of technological advancements in the area of Industrial Internet of Things (IIoT), artificial intelligence, 3D printing, etc., manufacturers are innovating new business models to serve customers.

Evolution of Manufacturing Offerings

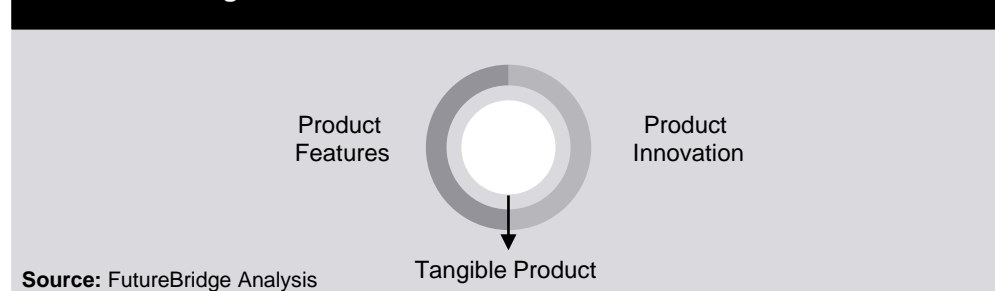
The mindset of manufacturers has continuously progressed over the decades resulting in the expansion of the organization's offerings and increase in customer value. The evolution of manufacturers, from being 'Part Manufacturers' to 'Benefits Providers,' has witnessed several transitions with respect to their offerings. The transition/steps witnessed during the evolution of manufacturers' offerings are mentioned below:

1. Product
2. Product + Base Services
3. Product + Base Services + Intermediate Services
4. Product + Base Services + Intermediate Services + Advanced Services

Product

This phase (refer *Exhibit 1*) was witnessed at the beginning of the industrial revolution when manufacturers were concentrated on selling only products. The focus was more on adding new product features, as most of the innovations were about adding new functionalities in the product and those which were getting readily adopted.

EXHIBIT 1: Tangible Product Phase



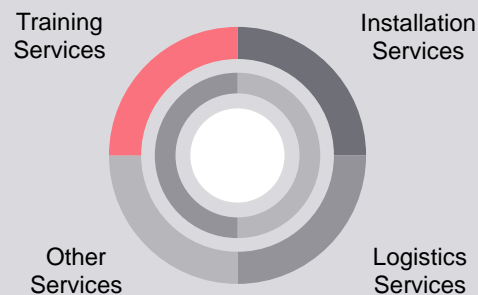
Source: FutureBridge Analysis

As product functionalities increased, the technicality in the product also increased, which compelled manufacturers to provide some basic services, such as installation service, training, logistics, etc.

Product + Base Services

With an increase in product complexity and competition, manufacturers have started providing basic support services as a differentiating measure to stay competitive in the market. Manufacturers are addressing customer concerns with respect to **'product provision'** in this phase. This transition is not entirely focused on customer-centric approach but on product differentiation (refer *Exhibit 2*).

EXHIBIT 2: Tangible Product with Base Services



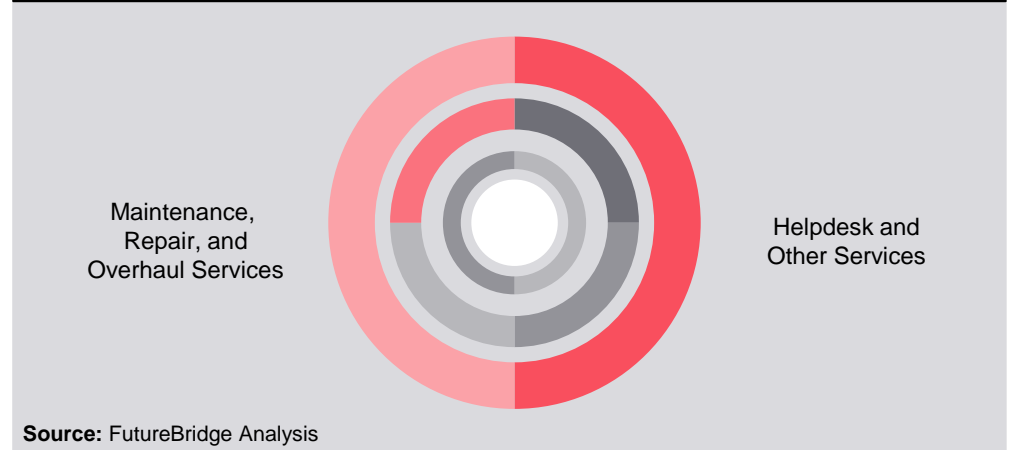
Source: FutureBridge Analysis

Basic services such as logistic services (wherein products are transported from the manufacturing location to the customer's location), installation services, training services, etc., are provided by manufacturers to differentiate their offerings.

Product + Base Services + Intermediate Services

As the next step in transition (refer *Exhibit 3*), manufacturers have started to shift toward 'product and service-centric approach,' wherein the focus is on 'product condition.' Services such as maintenance, repair, overhaul, helpdesk, condition monitoring, etc. are sold to customers in addition to the product to minimize breakdown and reap maximum benefits. This step provides additional value to customers in the form of services and not in terms of product features or capabilities.

EXHIBIT 3: Tangible Product with Intermediate Services

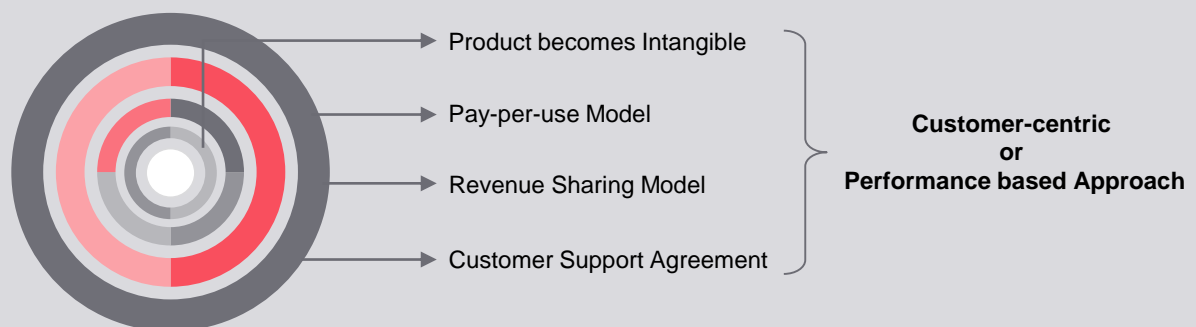


Services provided by manufacturers in this phase keeps evolving with the advancement of technologies. For instance, a few manufacturers started to provide remote maintenance services instead of field services to save time and cost. The emergence of predictive maintenance is another example wherein manufacturers used technologies to predict the status or health of the product/equipment or parts and offer necessary services to avoid a sudden breakdown of the product.

Product + Base Services + Intermediate Services + Advanced Services

The latest transition 'servitization' is offering a Product-as-a-Service, wherein manufacturers provide a complete solution to the customer's need or problem. This is the result of a customer-centric approach, wherein the focus is on the outcome and not on the product, its features, or capabilities. As per this model (refer *Exhibit 4*), customer does not need to make huge capital investment to own the product but pays only for the output realized from the product.

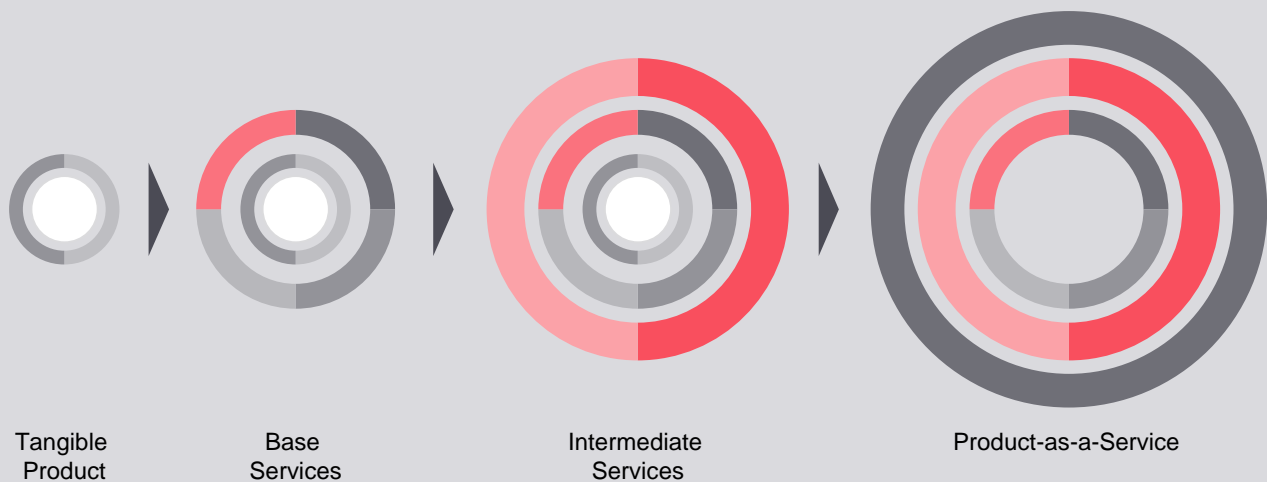
EXHIBIT 4: Advanced Services in the form of "Product-as-a-Service"



Source: FutureBridge Analysis

The product manufacturer owns the product/equipment covering all provisional and conditional issues with respect to the product, thereby ensuring zero downtime of the customer's business.

EXHIBIT 5: Evolution of Manufacturing Offering

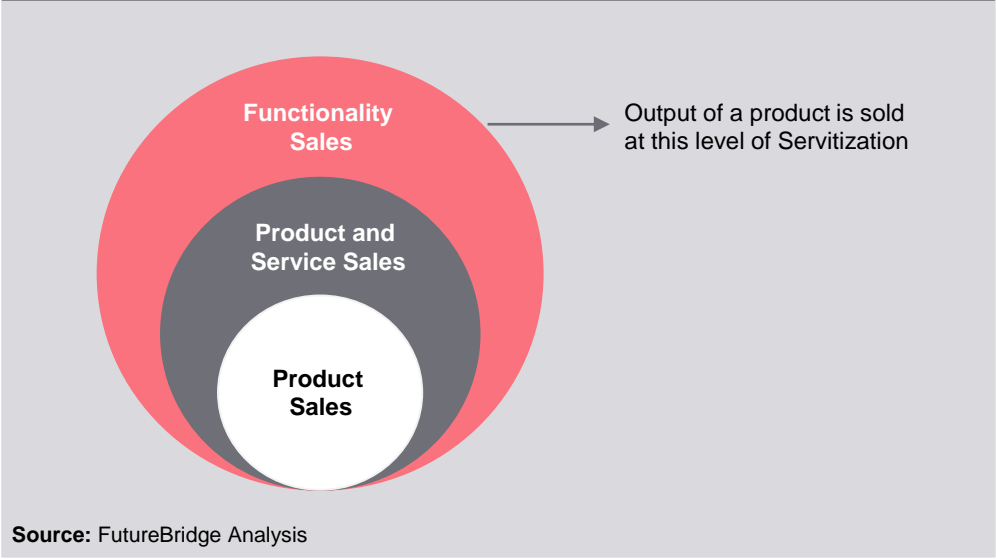


Source: FutureBridge Analysis

Servitization – A Strategic Differentiator

The continuous inclusion of different types of services (base services, intermediate services, and advanced services) along with the product to add value for the customer is known as “servitization of product.” When a product is fully servitized to the current level of offering – ‘product-as-a-service,’ the package will look more like a service and less of a product. At the current level of servitization, manufacturers are preparing themselves to offer product-as-a-service, which focuses on offering the desired output of the product as a solution to customers, thereby not being dependent on product features or specifications. The ownership of the product remains with the supplier, and only the functionality or output of the product is sold, which gives rise to a functional sales model. At this level, manufacturers focus more on understanding the customer problem/needs and resolving those problems without making them invest in the capital equipment. Thus, a complete customer-centric model is realized at this level of servitization.

EXHIBIT 6: Evolution of Customer Engagement Model based on Servitization



With the new model of product-as-a-service, several manufacturers are currently adopting the role of service providers from being product manufacturers. The business model links revenue generation with asset performance and availability, thus transitioning from a transactional product sales-based model to a relationship-based model. Manufacturers offering product-as-a-service differentiate themselves from their competitors in more than one ways stated below:

- A long-term relationship with customers is created, as this is a relationship-based model and not a single transactional sales model. This model lets manufacturers ensure a continuous revenue stream.
- Customers do not have to invest in a huge CAPEX to buy products and services and face business downtime due to repair and maintenance issues.

The strategic objective of businesses, their value proposition, and financial models, act as key strategic differentiators for manufacturers offering product-as-a-service level of servitization.

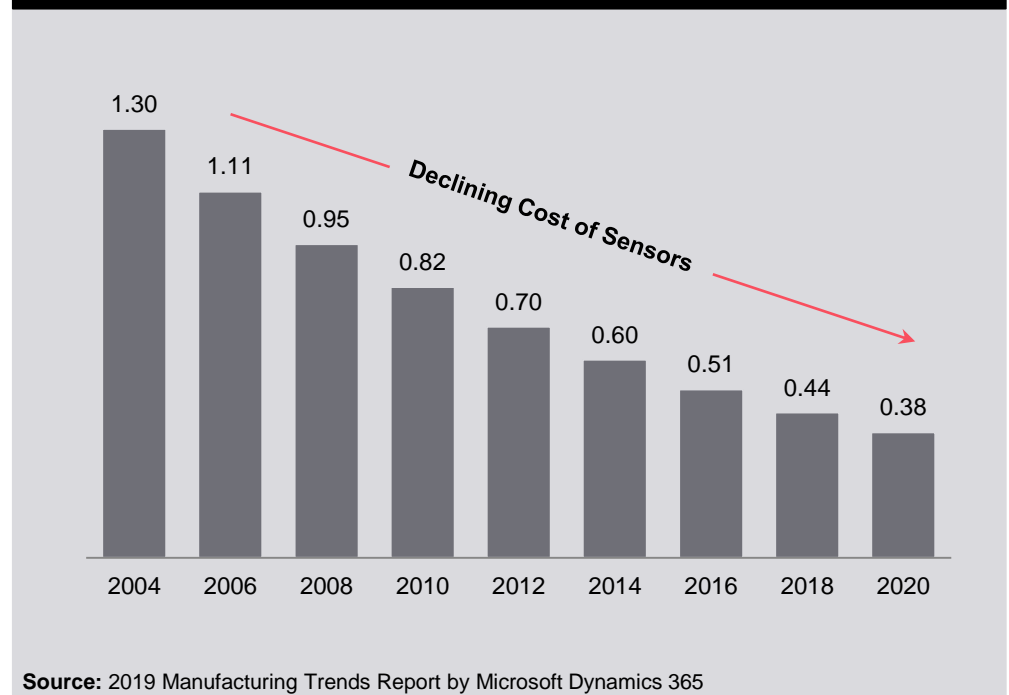
EXHIBIT 7: Servitization – A Key Differentiator

Key Differentiators	Product-Centric	Service-Centric
Strategy Objectives	Product Focus	Customer Focus
Value Proposition	Innovative Technology	Customer Experience
Financial Model	Transaction Value	Lifetime Value

Source: FutureBridge Analysis

Though servitization is not a new concept, the latest transition of servitization, i.e., product-as-a-service is a fairly new one. This transition has picked up pace over the last decade owing to rapid advancements in technology. Advancements in technology, coupled with the falling prices, have enabled manufacturers explore new horizons. For example, the cost of IoT sensors (refer *Exhibit 8*) reduced by 66% from US\$1.30 in 2004 to US\$0.44 in 2018. The cost is further expected to decline and reach US\$0.38 by 2020, which is helping manufacturers develop creative solutions to enable servitization.

EXHIBIT 8: Average Cost of IoT Sensors

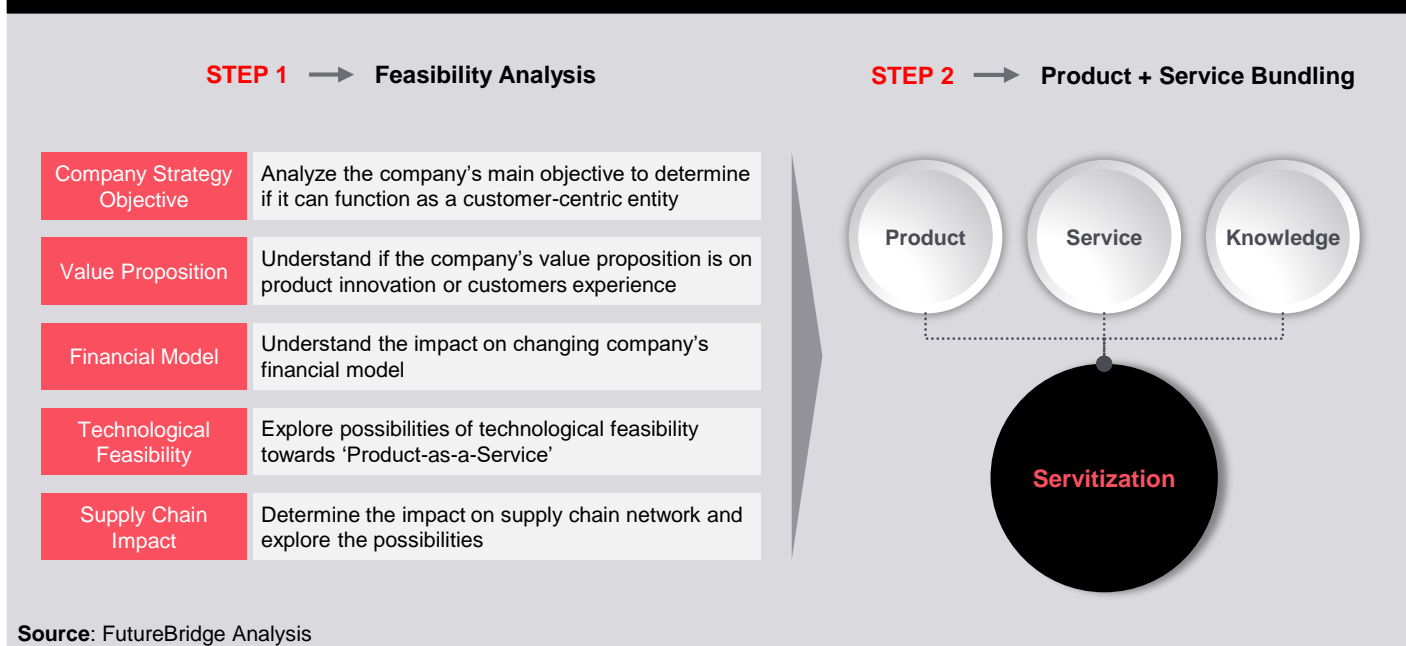


Servitization Framework

Technological advancements, decline in prices, and the need for strategic differentiation have compelled manufacturers to explore ways to offer product-as-a-service. However, there are several factors to be considered and scrutinized before they can offer servitization at this level.

Exhibit 9 below explains factors to be scrutinized, for a manufacturer to transit from product-centric to customer-centric organization.

EXHIBIT 9: Framework for Servitization



The framework shown in the exhibit is a two-step approach for achieving servitization at the product-as-a-service level.

STEP 1 is the feasibility analysis, wherein manufacturers need to examine themselves with their business objectives, value proposition, core competency, business model/financial model, technological integration, etc., to gauge the possibilities for this transition and its subsequent benefits. This is an important step for manufacturers to analyze if their current offerings can be servitized or not, and even if servitized, what would be its benefits. For instance, a product that does not demand a huge CAPEX does not necessarily offer benefits when servitized. Manufacturers also need to analyze the possibilities of technological integration with the product. Technology enables real-time data to be acquired from the product, which serves as the basis for product-as-a-service offering.

STEP 2 in the framework of servitization is ‘product + service bundling.’ Post the feasibility analysis, manufacturers need to work on solutions they can provide to customers. Traditionally, the solution has been the product, which is a one-time transactional sale process with reactive or proactive services provided at additional costs. However, this scenario changes at the level of servitization, wherein the solution is the service, which is the output from the product only and not the product itself. Therefore, manufacturers should find ways to estimate the cost of their offering and price it accordingly, which could either be pay-per-use method or subscription basis. In this step, manufacturers integrate their product offerings, service offerings, and their process knowledge to provide a complete customized solution package, thereby addressing customers’ problems or meeting their demands.

Re-imagining Business Mindset to Enable Servitization

Though servitization framework (discussed in the previous section) helps manufacturers assess the possibilities of offering product-as-a-service, the transition would not happen unless the mindset of manufacturers changes. The transition from product mindset to service mindset is one of the major challenges among manufacturers in adopting servitization.

EXHIBIT 10: Mindset Change to Enable Servitization



Source: FutureBridge Analysis

As shown in the *Exhibit 10* above, the success of servitization depends on the value given to clients, which is measured in terms of efficiency and effectiveness, rather than product features. Therefore, the focus of manufacturers should change from the performance and efficiency of physical products to the needs and goals of clients.

The four important parameters that manufacturers need to revisit to change their mindset from product-oriented to service-oriented are listed below:

Focus on Client Satisfaction

Manufacturers need to empathize with the client's pain points, needs, and goals, to shift their focus from product performance to client satisfaction. Research activities should be focused on providing a holistic solution to the client rather than focusing mainly on product performance.



John Deere, a global tractor manufacturer, equipped its tractors with technology that determines the quantity of fertilizers required for every stretch of soil, by assessing the quality of soil, thereby increasing the effectiveness of fertilizers used to increase productivity. The company was able to empathize with the clients' needs and goals, and thus, was able to provide a holistic solution for the client's need without focusing primarily on product features.

Product Usage: The New Value Proposition

The value proposition to clients is in the output of the product rather than its features or specifications. Generally, value for the client is created by optimizing or increasing the effectiveness of certain steps in the client's processes. Thus, value proposition should be created from the client's perspective rather than product perspective.



A French heating specialist offered temperature services that maintains agreed temperature on every floor space. The temperature automatically varies depending on the needs of the floor spaces, solving customer's problem of controlled temperature at different floors. In this case, the manufacturer directly provides value or the output of the product rather than the product itself, thereby increasing value to clients.

Focusing on Manufacturer's Capabilities: The Major Differentiating Factor

Most often, the capabilities of manufacturers such as product knowledge, skilled technicians, etc. are well-known in the market. However, these capabilities will not

be fully effective unless manufacturers offer a complete solution that adds value to the client. It is not the product alone that clients are interested in; they are also looking for consultative approach to resolve their problems. Hence, manufacturers need to identify the link that combines products with their in-house knowledge, experience, etc., to create a holistic solution that caters to the needs of clients.



Philips Lighting identified an opportunity of service offering with respect to lighting of office buildings. The company realized clients' pain points in managing unpredictable demands of energy at various times of office hours. Therefore, Philips offered a new service that included an intelligent technology, which predicts the amount of lighting required in a particular office space depending on the number of people in need of light. This helped clients optimize their energy demand by utilizing the capabilities of Philips.

Clients – Active Co-creators

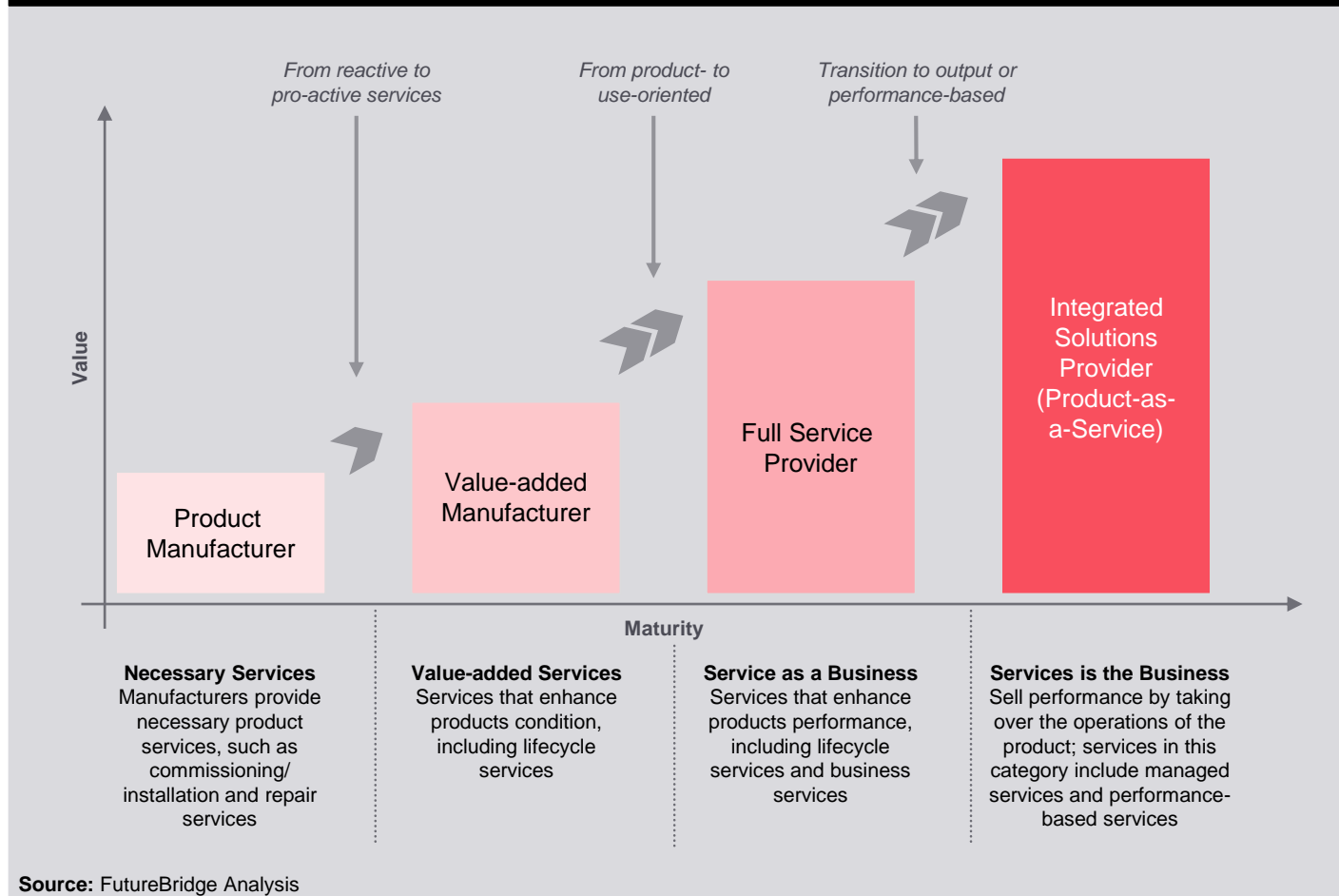
The success of product-as-a-service model depends on the product output used by customer rather than product features. Therefore, manufacturers need to consider clients as product co-creators, as the client's output and productivity depend on the solution provided by manufacturers. However, the level of client's involvement might vary significantly. In some cases, the client might just give inputs on product integration, whereas, in other cases, the client might work as partner in the entire development. It is essential to note that the role of a manufacturer will also shift from being a product seller to a solution facilitator.

Servitization Maturity Model

Servitization is a continuously evolving phenomenon that enables more and more value addition to customers. The servitization maturity model explains the need for mindset shift at each stage of transition. From offering bare necessary services related to product commissioning to making 'services' the core of business model, servitization demands a shift in the manufacturing mindset. Manufacturers transform from being a product manufacturer to an integrated solutions/benefits provider. At each stage of transition, the maturity level of manufacturers increases, which in turn, increases the value to customers.

The following maturity model depicted below explains the shift in maturity level at each level of servitization.

EXHIBIT 11: Servitization Maturity Model – A Strategic Path for Manufacturers



Servitization: Case Examples – Industrial Manufacturing

Some of the significant case examples for product-as-a-service in the industrial manufacturing sector and their reasons for the shift are mentioned below:

- To achieve a constant source of revenue:** Shrinking product-based profit margins due to increased competition is expected to spur the need for launching service-based business models. EBIT margin generated by service-based models is three to seven times higher as compared to new equipment sales. Moreover, unlike new equipment sales, Product-as-a-Service (PaaS) generates constant revenue for the manufacturer, even during an economic crisis or down-sizing scenarios. In the example mentioned below (refer *Exhibit 12*), Hilti, Construction tools and machinery manufacturer, increased its profit margins, and developed a continuous source of revenue by introducing a monthly, chargeable PaaS model.

EXHIBIT 12: Adoption of Servitization by Hilti



- Low margin due to a highly competitive market in China and Far East
- Growing importance of service options in an increasingly globalized growth segment
- Rising demand for customized solutions with the need for greater flexibility and simultaneous standardization

- Launched a fixed, monthly fee fleet management solution, wherein the focus was not on selling drill machines but holes
- Liquidity protection and outsourcing of administrative processes for customers demanding a more streamlined balance sheet
- In addition, peaks in demand no longer pose a problem as additional tools can be ordered any time

- Increased revenue and profit margins from monthly fee fleet management solutions
- Satisfaction of customer needs through customized solutions
- Competitive differentiation in a globalized market
- Leased more than 1 million tools to 100,000 different customers

Source: FutureBridge Analysis

- **To develop a long-term customer relationship:** Services have become an integral part of the proposition, playing an important role in the customers' purchase decision. PaaS models offer an opportunity for the manufacturer to establish long-term leasing contracts (5 years or more) and enable sustainable and stable customer relationships.

EXHIBIT 13: Adoption of Servitization by Kaeser



- Several operated production facilities are dependent on a continuous airflow, where an equipment fault can lead to a production halt
- Due to the increasing competition and shifting end user demand in the air compressor industry, the manufacturer decided to transform and expand its traditional business model

- Introduced a service-based operator model, under which end users need not purchase air compressors rather they pay only for the compressed air they consume
- Under the model, the manufacturer remains the owner of the air compressor, building, installing, and operating it on behalf of end users at their production facilities
- The manufacturer installed sensors on compressed air systems, which captured important performance metrics for predictive maintenance

- Development of long-term partnership with customers
- Reduction in service cost due to predictive maintenance of the air compressor
- Synergies in product development and innovation

Source: FutureBridge Analysis

In the previous example (refer *Exhibit 13*), Kaeser, a global compressor manufacturer, launched a service-based operator model by charging customers based on their compressed air usage.

- **Gain competitive edge:** PaaS models can be used by manufacturers to differentiate their equipment and achieve higher customer satisfaction. Offering a PaaS package enabled manufacturers to complement their core assets with services and protect their businesses from being disrupted by new aggressive competitors.

EXHIBIT 14: Adoption of Servitization by Packsize



- Retailers that utilize packaging are presently procuring standard-size boxes of different sizes in bulk quantities; not using the right-size packaging (based on the product size) often resulted in excessive corrugated consumption
- The world's largest office product company received consumer complaints regarding the wasteful amount of packaging used for shipping the company's products

- The manufacturer offered an innovative business model to the company, which claimed to save about 35% of cost by reducing shipping, excess packaging, product damage, and returns & disposal costs
- Additionally, the manufacturer offered the packaging machine free-of-cost to the company, only charging for its proprietary z-fold corrugated material used for developing corrugated boxes

- The company adopted the manufacturer's business model and announced to ship only boxes it had customized for each order instead of relying on thousands of identical boxes it had purchased from makers, such as Georgia-Pacific and Boise Cascade
- The business model allowed the company to reduce the average size of its cardboard boxes by 20% and reduce the use of plastic air pillows by 60%, resulting in a long-term engagement with the manufacturer

Source: FutureBridge Analysis

In the above example (refer *Exhibit 14*), Packsize, a packaging machinery manufacturer, offered an on-demand packaging solution to Staples, Inc., the world's largest office product company, to gain a competitive edge among traditional box providers.

- **Drive Innovation:** A few PaaS models allow manufacturers to outfit the equipment with sensors and monitor its performance. This allows them to gather invaluable performance metrics and alter designs of the upcoming models to address the changing requirements of customers.

In the next example (refer *Exhibit 15*), Caterpillar, a construction machinery manufacturer, servitized its business by offering a remote tracking and monitoring service to obtain equipment performance trends for using them for future innovation.

EXHIBIT 15: Adoption of Servitization by Caterpillar**CATERPILLAR****SITUATION****ACTION****BENEFITS**

- Manufacturer was not able to generate enough after-sale revenue due to the disappointing service contract renewal rates and unreliable delivery
- Additionally, the supply of cheaper non-OEM parts through aftermarket distributors accounted for 30-50% of the total spare parts affecting the overall revenue
- The manufacturer realized that after-services need to be standardized among dealers to save its business from third-party service providers and small local workshops set up by ex-OEM dealer mechanics

- Introduced a new growth strategy, under which the company committed to become a less product-focused and a more customer outcome-focused
- Reviewed the service quality in terms of customer expectations, delivery of services, and service design & standards
- Segmented customers based on their requirement of after-sale services and tested the model before final launch
- Adopted new technologies, including telematics, to monitor equipment performance and offer predictive maintenance

- Remotely monitored the equipment through telematics to identify performance trends that can be used to undertake better machine design decisions
- Expanded its after-sale offerings through integrated and differentiated solutions
- Developed a loyal customer base creating an intense relationship

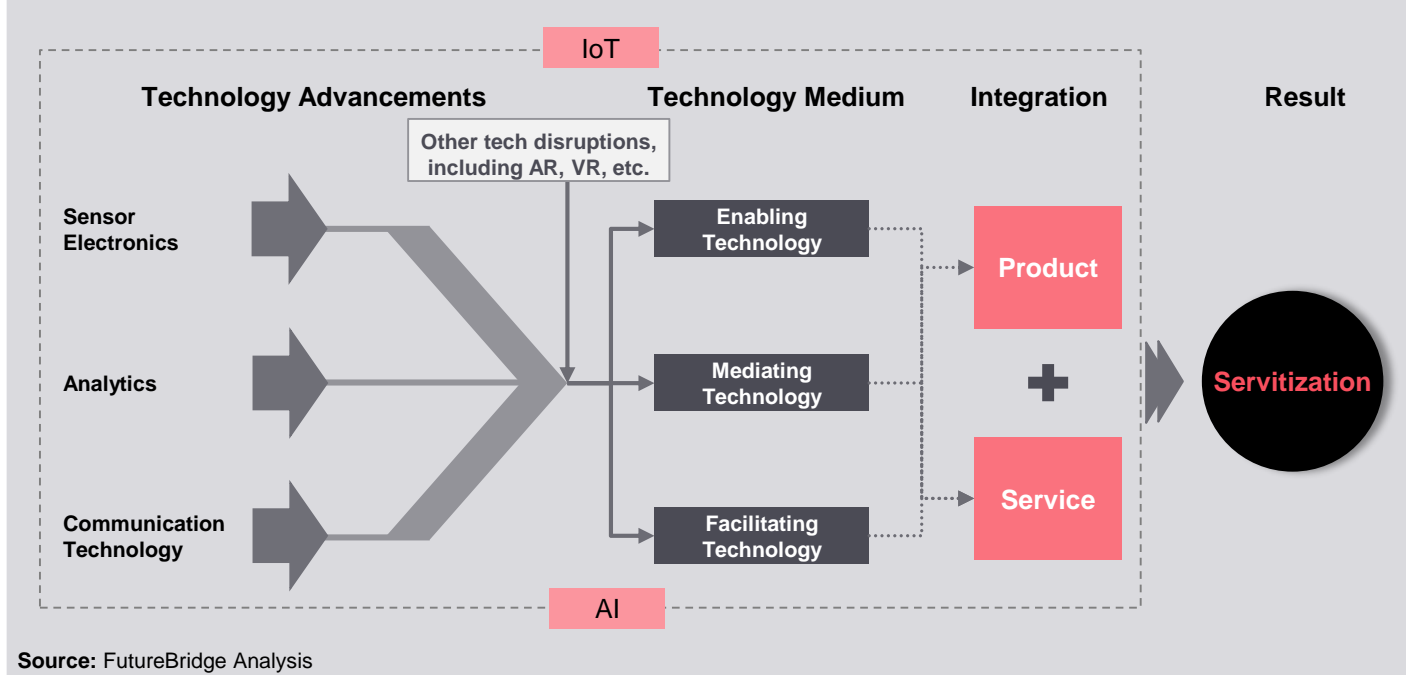
Source: FutureBridge Analysis

Technological Enablers for Servitization

The evolution of servitization is increasingly supported by the emergence of disruptive and pervasive technologies. Servitization at the product level offered as product-as-a-service is not achievable without technological advancements. Several manufacturers are currently exploring ways to integrate technology with their products and services to offer a complete solution package.

IoT and AI form the core of servitization model, especially at the level of offering product-as-a-service. AI helps machines perceive the world around it, decide the plan of action, and make decisions to execute the plan to achieve the desired goal. IoT helps connect different hardware, machines, sensors, etc., and creates an intertwined network of physical goods that allow manufacturers to freely exchange data among different product/equipment providers.

EXHIBIT 16: Technology Framework for Servitization



Technology Advancements

The *Exhibit 16* depicted above explains three important technologies, namely, sensor electronics, analytics, and communication technology, which are crucial for product-as-a-service model in servitization. These technologies act as enablers for servitization, as manufacturers depend on them to obtain and analyze product data.

Sensor Electronics: Advanced sensors have their own unique IP address, thereby making it IoT functional and enabling data transfer through wireless connections to allow mobility and other IoT scheme of things. Machines or products are currently equipped with advanced sensors, which monitor and control them.

Analytics: Advancements in analytics solutions, such as predictive analytics, prescriptive analytics, case-based reasoning, etc., play a key role in servitization. Manufacturers use these analytics solutions to determine the failure pattern and predict the causality of machines.

Communication Technology: Communication technologies are used for transferring data from machines. With advancements in communication technology, manufacturers are finding ways to communicate with different types of machines or products.

Apart from these major technologies, other technologies such as Augmented Reality (AR), Virtual Reality (VR), mobility, Blockchain, etc., are also being explored by manufacturers to enhance their solution offerings.

Technology Medium and Integration

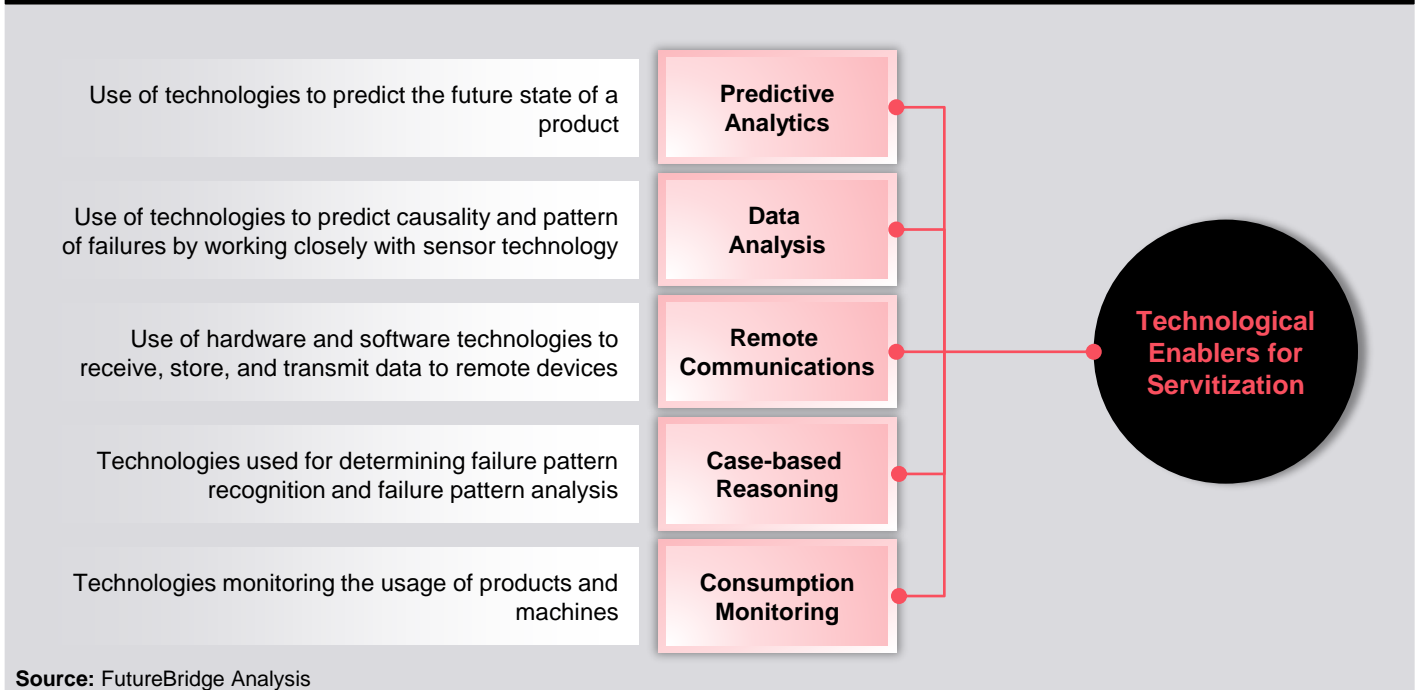
Technologies can be integrated with products and services in three different ways to facilitate servitization. These are mentioned below:

- **Technology as Enabler:** These are technologies that enable servitization and act as an interface between products and services. For instance, sensor electronics and communication technologies can be viewed as enabler technologies to enable product-as-a-service model.
- **Technology as Mediator:** These are technologies that integrate with products or services to add value to the product-as-a-service model. For instance, analytics technology could act as a technology mediator, wherein it analyzes the data from the product or machine, enabling manufacturers to add value to the model.
- **Technology as Facilitator:** These are technologies that facilitate the product-as-a-service model, either by integrating with the product or with the service. For instance, AR/VR could be the facilitator technology, which enhances the maintenance-related servitization model.

Technologies for the Future of Servitization

Technology plays a vital role in developing the servitization model at the current level of offering product-as-a-service, as it acts as an interface between products and services. Five major technologies required for the product-as-a-service model as per Capital Equipment Manufacturers (CEM) are mentioned in *Exhibit 17* below.

EXHIBIT 17: Five Major Technological Enablers for Future



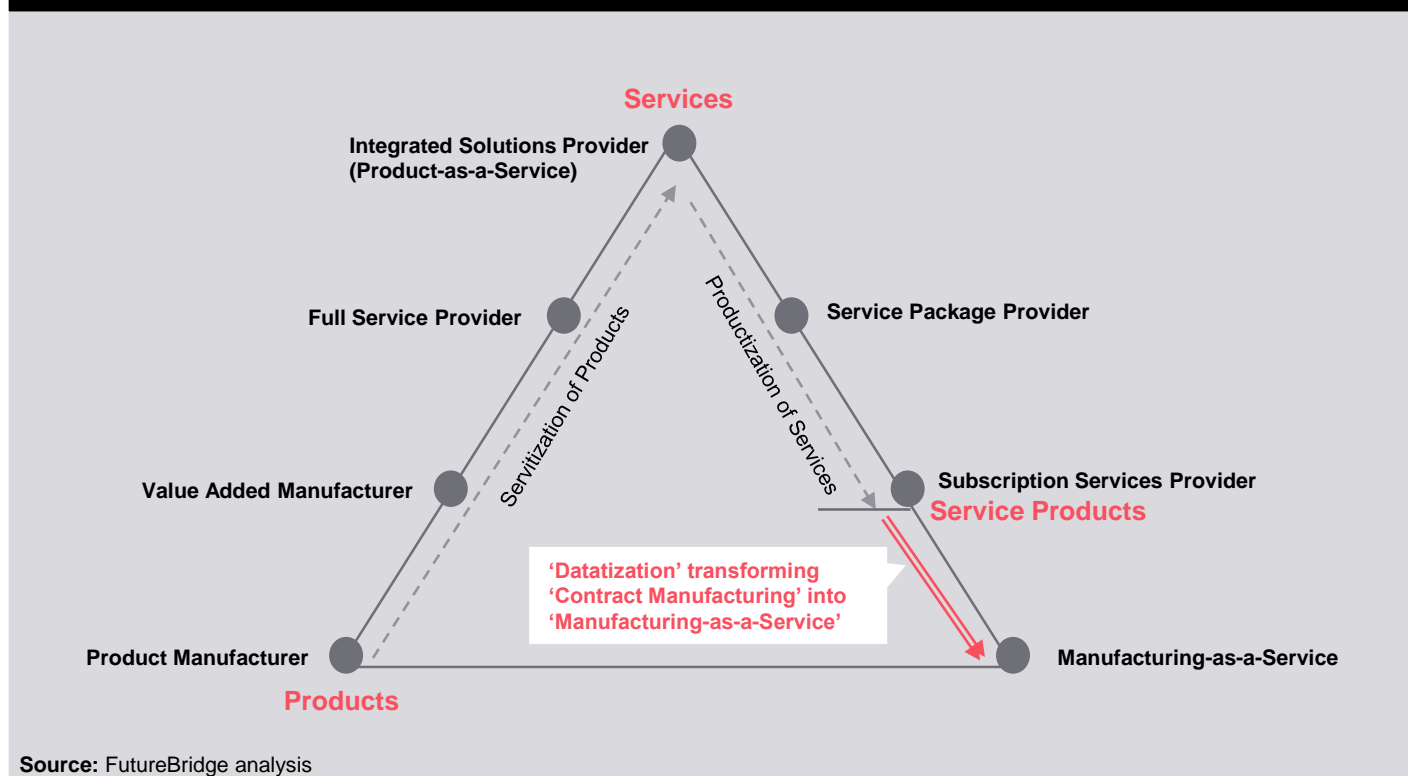
These technologies help manufacturers in the following ways:

- Gaining improved access to product information, usage information, etc.
- Receiving and storing data
- Performing data analysis to pro-actively maintain and monitor the product
- Improving product performance
- Improving maintenance efficiency and effectiveness

The Road Ahead – Future of Servitization

Servitization at the product-as-a-service level is still at its nascent stage, with manufacturers trying to explore ways to create a solution. However, with the increasing adoption of advanced technologies, the future is definitely moving toward product-as-a-service solution. For instance, the number of IoT connections worldwide was estimated at 14.87 billion in 2016, which is expected to reach 36.13 billion by 2021, registering a CAGR of 20% during the forecast period.

EXHIBIT 18: Future of Servitization



The future of servitization might give rise to the Productization of Services, as depicted in the *Exhibit 18*. Productization of Services refers to the creation of standard service packages based on identical needs of the group of customers. With servitization transforming the way product sales are taking place, Productization of Services will transform the way services are sold in the near future. Product manufacturers have been shifting toward becoming integrated service providers, which is currently at the level of product-as-a-service providers. Moreover, manufacturers have also transformed from being a value-added manufacturer to a full-service provider to reach this level.

In the near future, manufacturers at the level of integrated service providers, which essentially means offering product-as-a-service, are expected to become service package providers, where services will be converted to a standard package depending on the client's needs. Clients can use the package until a specific limit, and whenever there is a further requirement of services, clients will have to re-purchase the package. This can further evolve to the next level where these standard service packages are offered as subscription-based services.

Manufacturing-as-a-service is not necessarily an extension of Productization of Services; however, it makes use of datatization, which is the result of servitization of products and Productization of Services. Though contract manufacturing does not exist in the market, digitization and datatization have changed the way contract manufacturers are developing products. These changes have given rise to manufacturing-as-a-service, which allows manufacturers to share their business infrastructure with their clients. In addition to 3D printing and additive manufacturing, manufacturing-as-a-service is also expected to establish strongly in the future.

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