[WHITEPAPER]

From data to decisions: Enhancing Product-As-A-Service in industrial and energy sectors

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Yann Toutant & Stefano Butti

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THE AS-A-SERVICE EXPERTS

Introduction

Product-As-A-Service (PaaS) has gained widespread popularity as a buzzword, with different meanings for different people. Often discussed alongside concepts like leasing, rentals, and subscriptions, it is important to clarify what exactly as-a-service entails. This guide aims to provide a comprehensive explanation of the term, as well as practical examples to illustrate its significance in the industrial and energy industries. Additionally, we will explore the role of data in maximizing the benefits of this servitization model.

1. Defining Product-As-A-Service

At its core, Product-As-A-Service is a business model where customers pay for the utility or outcome of a product rather than the product itself. This model leverages the principles of the circular economy, promoting sustainability and efficiency by focusing on the product's performance and lifecycle rather than ownership. In a PaaS arrangement, the provider retains ownership and responsibility for the product, offering it to customers in a way that ensures optimal usage and minimal waste.

A. Distinguishing PaaS from similar models

- *Leasing:*

Leasing involves a contractual agreement where the lessee pays the lessor for the use of an asset over a specified period. While leasing and PaaS both emphasize access over ownership, leasing typically does not usually include the comprehensive services and performance guarantees inherent in PaaS.

- *Rentals:*

Rentals provide short-term access to products with flexible terms. Unlike PaaS, rentals are often temporary and do not focus on long-term performance or lifecycle management. PaaS, on the other hand, is structured to deliver ongoing value and service, integrating features such as regular maintenance, upgrades, and performance monitoring to enhance customer experience and sustainability.

- *Subscriptions:*

Subscription models allow customers to access services or products for a recurring fee. While subscriptions share similarities with PaaS in terms of recurring payments, they primarily apply to digital services or consumables (e.g., software, streaming services). PaaS extends this concept to physical products, emphasizing the delivery of tangible outcomes and sustained performance over mere access.

B. Key characteristics of PaaS

- *Performance-based pricing:*

PaaS models often incorporate performance-based pricing, where customers pay based on the actual use or outcomes delivered by the product. This aligns the interests of both the provider and the customer, as the provider is incentivized to ensure optimal product performance.

- *Lifecycle management:*

A defining feature of PaaS is comprehensive lifecycle management. Providers oversee the entire lifecycle of the product, from design and manufacturing to maintenance, upgrades, and eventual recycling or disposal. This approach supports sustainability and reduces the environmental footprint.

- *Enhanced customer experience:*

By focusing on delivering outcomes rather than products, PaaS enhances the customer experience. Providers offer value-added services such as regular maintenance, upgrades, and real-time performance monitoring, ensuring that customers derive maximum benefit without the hassles associated with ownership.

- *Sustainability and efficiency:*

PaaS promotes sustainability by encouraging the use of durable, high-quality products that are maintained and reused over time. This reduces waste and supports a circular economy, aligning with growing environmental concerns and regulatory pressures.

2. Adoption of PaaS in industrial and energy sectors

Industries with significant capital expenditures and complex operational requirements are increasingly turning to PaaS models. By shifting from traditional ownership to service-based usage, industrial sectors can enhance productivity, reduce downtime, and optimize resource utilization.

A recent 2024 study conducted by the Chamber of Commerce and Industry (CCI) of Paris explored the maturity of PaaS adoption across various sectors. The study found that the industrial and energy sectors are already quite advanced in their adoption of PaaS, with promising growth prospects.

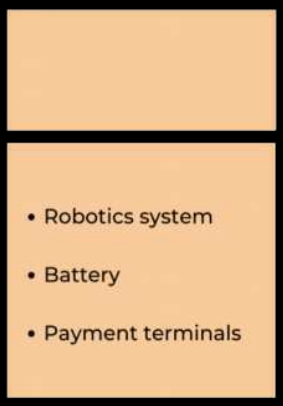
Specifically for the industrial and energy sectors, we noticed that:

• the HVAC sector has gained a great experience and can sometimes move on to more advanced models (e.g. Cooling-As-A-Service).

• handling equipment is in a consolidation phase and is showing promising growth

• machine tools and other industrial machinery are still in need of reinforcement, despite significant expansion in Germany, for example.

Degree of maturity of equipment for as-a-service models



** Among the criteria measuring maturity, anteriority, penetration rate in various user sectors, number of businesses offering these models, number of customers, etc.*

The representation of the industrial and energy sectors across these 3 PaaS maturity phases provides excellent examples to study the journey, best practices, and growth prospects. We will focus on other sectors in our upcoming whitepapers.

3. PaaS relevance in the industrial sector

- *Manufacturing:*

In the manufacturing sector, PaaS enables companies to access advanced machinery and equipment without the substantial upfront investment. According to a report by McKinsey, the global market for industrial equipment rentals and leasing, which includes PaaS, is expected to reach $59.5 billion by 2025, growing at a CAGR of 6.7% from 2019. This growth is driven by the need for flexible and scalable solutions that can adapt to changing production demands.

- *Construction:*

The construction industry benefits from PaaS by leveraging construction equipment and tools on a usage basis. This model helps reduce idle time and maintenance costs, allowing companies to focus on project completion. A study by Grand View Research indicates that the global construction equipment rental market, including PaaS, was valued at $92.9 billion in 2021 and is projected to expand at a CAGR of 4.9% from 2022 to 2030. The increasing adoption of smart construction technologies and the need for cost-effective solutions are key factors driving this trend.

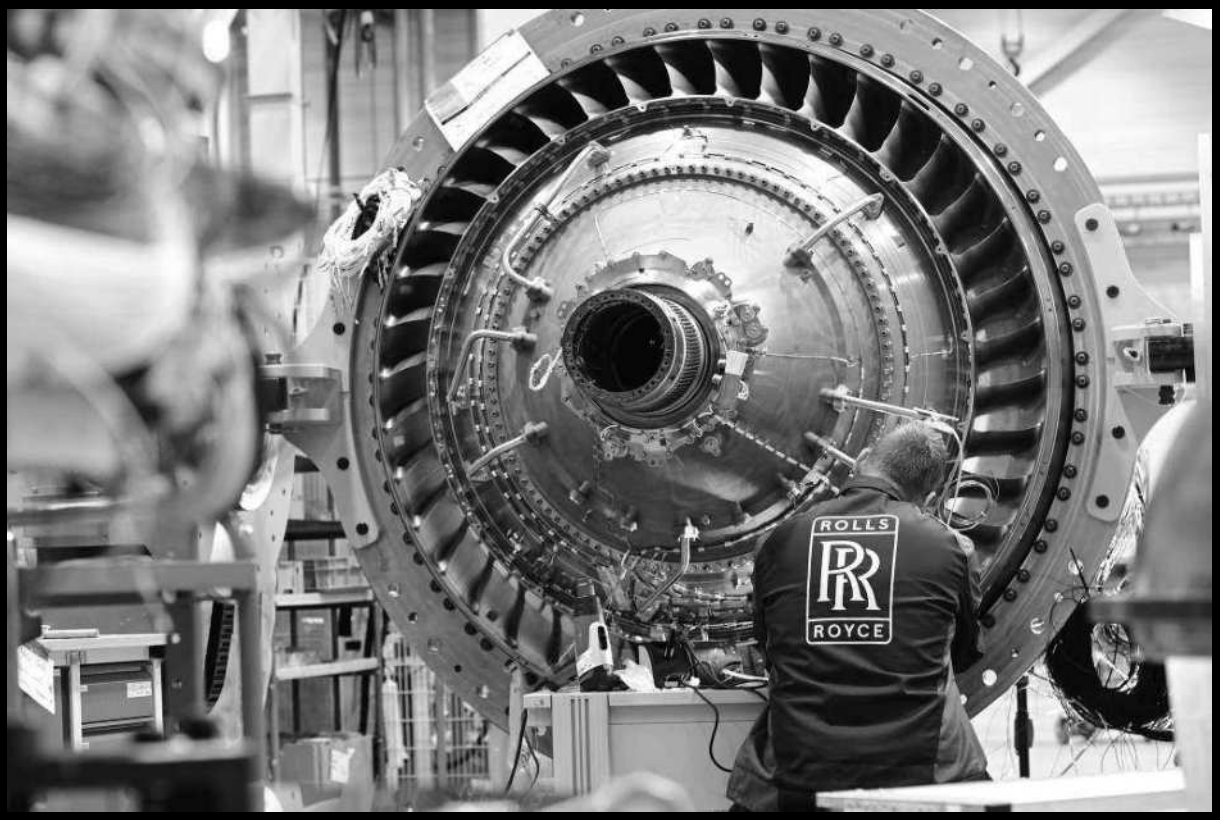
- *Transportation and logistics:*

In transportation and logistics, PaaS facilitates access to vehicles and fleet management services without the burden of ownership. This model improves fleet utilization and reduces operational costs. According to Allied Market Research, the global transportation as a service market is projected to reach $1.2 trillion by 2027, growing at a CAGR of 21.2% from 2020. The shift towards PaaS in this sector is propelled by the rising demand for efficient and sustainable transportation solutions.

Case studies

Rolls-Royce

Rolls-Royce's "Power by the Hour" program is a prime example of PaaS in the aerospace industry. Airlines pay for engine power on an hourly basis, with Rolls-Royce maintaining ownership and responsibility for engine maintenance. This model has led to improved engine performance and reliability, resulting in significant cost savings for airlines.



"We have been talking about subscription models ever since Rolls-Royce pioneered its 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 Monitor Deloitte and EMEA Machinery Sector Lead.

CATERPILLAR

Caterpillar offers Equipment-as-a-Service through its Cat Rental Store, providing construction companies with access to a wide range of machinery on a rental basis. This PaaS model helps construction firms manage project costs more effectively and enhances equipment utilization.

4. PaaS relevance in the energy sector

The energy sector leverages the aaS model primarily through Energy-as-a-Service, enabling customers to manage energy consumption, optimize energy usage, and integrate renewable energy sources without the need for large capital investments. Driven by trends like decarbonization, urbanization and digitalization, this model leverages smart technologies to facilitate the adoption of advanced, low-carbon solutions, making it a key strategy for addressing these evolving trends.

According to the latest research, the global Energy-as-a-Service market size was valued at USD 91645.41 million in 2022 and is expected to expand at a CAGR of 15.06% during the forecast period, reaching USD 212602.26 million by 2031.

Renewable energy sources, such as solar and wind, are prime candidates for the "As-A-Service" model in the energy sector.

- For instance, through a "Photovoltaic-as-a-Service" model, consumers would not need to purchase solar panels or pay for their installation. Instead, they would simply pay for the energy they use. In this model, the upfront capital expenditures, including the purchase and installation of panels, are borne by the provider rather than the customer. Additionally, the provider manages ongoing services, such as maintenance, repairs, and the eventual replacement of panels with newer, more energy-efficient ones.

- Furthermore, in industrial settings, the concept of "Compressed Air-as-a-Service" is slowly gaining traction, offering manufacturers flexible access to compressed air without the burden of ownership.

This subscription-based model not only democratizes access to renewable energy but also offloads maintenance responsibilities onto service providers, ensuring hassle-free adoption for consumers.

5. The critical role of data to make PaaS work

Data is essential to the success of PaaS models. It provides insights into equipment performance and health, service delivery, and customer usage, driving efficiency and innovation.

Some concrete examples:

- *Measuring equipment performance:*
  A manufacturer of woodworking machinery offers performance-based contracts. The proxy measure of performance is the uptime of the machine. The machine status data is the basis for the calculation of the monthly invoice.

- *Understanding customer usage and providing performance advisory:*
  A wind turbine provider collects data on wind patterns and turbine performance to offer customized maintenance schedules and optimize energy output, enhancing customer satisfaction.

  An HVAC company offering "Climate-Control-as-a-Service" uses data from sensors to monitor and adjust temperature settings in real-time, ensuring optimal comfort and energy efficiency.

- *Improving service delivery through predictive maintenance:*
  A manufacturer offering "Machinery-as-a-Service" exploits operational data to predict failures before they happen, thus minimizing downtime and maintenance costs.

Data also mitigates risks by providing transparency and accountability, ensuring both providers and customers have a clear understanding of service performance and potential issues.

6. Enhancing value through data analytics

Data analytics significantly enhances the value delivered by PaaS models for both providers and customers through various means:

- *Product innovation:*
  Imagine a smart grid company gathering vast amounts of data from sensors installed across the grid. These sensors continuously monitor energy flow, grid stability, and consumer usage patterns. Data analysts then sift through this information, identifying trends and patterns. Through advanced algorithms and machine learning, they develop new energy distribution models. These models take into account factors such as peak usage times, renewable energy availability, and consumer behavior to optimize energy distribution, ensuring reliability and efficiency.

- *Service optimization:*
  Consider a fleet management service leveraging data analytics to meticulously fine-tune routes and maintenance schedules. By leveraging historical data and predictive analytics, they anticipate potential issues, such as mechanical failures or traffic delays, and take proactive measures to mitigate them. This ensures that vehicles operate smoothly, reducing fuel costs and minimizing downtime.

- *Customer satisfaction:*
  Picture a smart home company that collects data on user preferences and habits. By analyzing this data, they can offer personalized experiences, such as automatically adjusting lights and thermostats according to the user's preferences. This level of customization enhances user satisfaction and makes everyday life more convenient.

- *Automation and business process triggers:*
  Automated systems can use real-time data to trigger maintenance requests or inventory orders. This proactive approach reduces downtime, risk of mistakes, and ensures that production runs smoothly, leading to increased productivity and cost savings.

- *Performance advisory:*
  Think of an energy provider that uses data to communicate with customers about their energy usage patterns. By correlating consumption patterns with external factors such as weather conditions or time of day, they can provide personalized recommendations to consumers. This may include suggestions for adjusting usage habits to optimize energy efficiency or alerts about potential energy-saving opportunities. Through interactive platforms or mobile apps, consumers can access this information and engage in dialogue with the energy company to better understand their energy usage and make informed decisions.

These examples illustrate the transformative power of data analytics, paving the way for continuous enhancement and a more dynamic, responsive service ecosystem.

7. Challenges and solutions in data collection and analytics

Effective data collection and analytics are critical to the success of Product-As-A-Service models, enabling performance optimization, predictive maintenance, and customer satisfaction.

However, there are some key challenges and solutions related to data privacy, integration of IoT devices, analysis of large data sets, and managing large fleets to consider.

Data privacy

Challenge: Handling sensitive customer and operational data securely is paramount to maintaining trust and compliance with regulations.

Solution:

- Data encryption and secure storage: Implement robust encryption and secure storage solutions to protect data from unauthorized access.
- Compliance with regulations: Adhere to data protection regulations such as GDPR, CCPA and the EU Data Act to ensure legal compliance and customer trust.

Integration of IoT devices

Challenge: Integrating a diverse range of IoT devices and sensors across different products and services.

Solution:

- IoT ecosystem integration: Utilize cloud-based platforms and IoT ecosystems to streamline data collection, analysis, and integration (such as Servitly).

Analysis of large data sets

Challenge: Processing and analyzing large volumes of data generated by IoT sensors and devices.

Solution:

- Big data analytics: Employ advanced analytics tools and techniques (e.g., AI, machine learning, expert systems) to derive actionable insights from large data sets.
- Real-time analytics: Implement real-time analytics to enable proactive decision-making and predictive maintenance.

Managing large fleets

Challenge: Efficiently managing and maintaining a large fleet of products and equipment distributed across various locations.

Solution:

- Fleet management systems: Utilize fleet management systems to monitor performance, schedule maintenance, and optimize asset utilization.
- Smart and predictive maintenance: Implement smart and predictive maintenance strategies based on data analytics to reduce downtime and improve operational efficiency.

8. Best practices for integration

To successfully integrate data collection and analytics into existing PaaS offerings, organizations must follow several best practices that create a solid foundation for data-driven decision-making and service enhancement. Let's explore how companies can achieve this integration effectively.

Starting with infrastructure setup, an industrial equipment provider must establish a scalable and secure cloud infrastructure to handle the massive volumes of data generated by connected devices.

- Deploy a cloud-based solution that supports real-time data ingestion, storage, and processing and that serves the two sides of the service process: the end users and the service operators. By leveraging platforms like Servitly, manufacturers can harness the potential of IoT to deliver valuable connected products and services.

- Ensure that the infrastructure is both flexible and resilient, capable of scaling up during periods of high data flow and maintaining robust security protocols to protect sensitive information. This setup not only accommodates the immediate data needs but also future-proofs the business against growing data volumes as more devices and sensors come online.

Selecting the right tools is equally critical for effective integration.

- For example, a company offering predictive maintenance services can benefit significantly from advanced analytics software designed to monitor equipment health and predict failures. Use tools providing powerful analytics capabilities, utilizing machine learning algorithms to analyze data from sensors and predict when maintenance is needed. This predictive capability minimizes downtime and extends the lifespan of equipment by addressing potential issues before they become critical.

Training the team is the third cornerstone of successful integration. When a company uses a platform like Servitly to provide connected services, it is essential that their staff is well-versed in utilizing its features.

- Conduct workshops and hands-on training sessions focusing on how to interpret data dashboards, set up automated alerts for potential issues, and integrate customer feedback into service improvement plans.

9. Measuring success and ROI

When assessing the success and ROI of data collection and analytics within PaaS models, organizations must employ a comprehensive approach that encompasses various metrics, benchmarks, and tools to gauge performance effectively.

Key performance indicators (KPIs) such as system uptime, customer satisfaction scores, and cost savings are indispensable in evaluating the efficacy of data-driven strategies.

For instance, an industrial equipment provider may track the reduction in machine downtime and maintenance costs attributable to predictive maintenance algorithms enabled by data analytics. By quantifying these improvements, organizations can demonstrate the tangible benefits derived from their investment in data analytics.

Benchmarks are also important in contextualizing performance metrics, allowing organizations to assess their progress relative to industry standards and best practices. Comparing performance against benchmarks provides valuable insights into areas of strength and opportunities for improvement.

A smart grid provider may benchmark their outage response times against industry leaders to identify areas where operational efficiencies can be enhanced. By aligning with industry benchmarks, organizations can strive for excellence and continuously raise the bar for performance in their respective sectors.

Utilizing appropriate tools is essential for effectively monitoring and analyzing data to derive actionable insights. Analytics platforms and dashboards offer valuable functionalities for aggregating, visualizing, and interpreting data in real-time.

A logistics company can leverage a sophisticated analytics dashboard to track fleet performance metrics and optimize routes dynamically based on traffic conditions and delivery schedules. By harnessing the power of analytics tools, organizations gain visibility into key performance metrics, enabling informed decision-making and proactive intervention to address emerging issues.

By systematically evaluating these metrics, organizations can refine their strategies, ensuring continuous improvement and maximizing the value derived from data analytics in their aaS models.

Conclusion:

PaaS is revolutionizing the way we approach ownership models. Its flexibility, scalability, and focus on delivering outcomes rather than products make it a game-changer.

Companies in the industrial and energy sectors are quickly embracing PaaS. Take Cooling-as-a-Service and Photovoltaic-as-a-Service as examples. These innovative solutions not only benefit the environment but also bring economic advantages.

Data plays a crucial role in the success of PaaS models. Through data analytics, predictive maintenance, performance optimization, and improved customer experiences can be achieved. However, challenges like data privacy, IoT device integration, and managing large data sets and fleets need to be tackled with expertise and robust technological solutions.

While PaaS models offer immense value, they require careful navigation. To implement them successfully, collaboration with experienced partners is essential. These partners can provide real-world insights and scalable solutions.

If you're looking for guidance on implementing and scaling PaaS strategies, reach out to Black Winch. They can help you embark on a journey towards service-centric success.

Black Winch

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Black Winch is the world's exclusive authority in As-A-Service solutions.

We are on a mission to empower intrapreneurs to achieve their As-A-Service ambitions by building and scaling their in-house recurring revenue models.

We take our customers through a holistic methodology focusing on strategy, sales, marketing, funding, finance, back office, ecosystem & circularity to master the subscription journey.

- We have 20+ years within the subscription market.
- We have experts specialized in As-A-Service challenges and solutions.
- We have a unique methodology to reach As-A-Service ambitions faster.

- We are not a traditional consulting firm, we are very hands on. We provide on-the-ground support, rather than focusing on theory.
- We generated $2,8bn revenue of As-A-Service business for our customers (2022).
- We donate 1% of our annual revenue (to REEFolution and Room to Read).

Black Winch supports organizations to create and/or improve their As-A-Service business model according to their objectives: feasibility analysis, improving profitability, securing the market share, improving customer loyalty. By turning and developing the product-based linear business model into an in-house subscription model, it will bring value to the end users, the stakeholders and the shareholders.

The Black Winch experts help organizations develop a successful As-A-Service business model through a proven methodology. With a personalized framework, Black Winch helps build or adapt an As-A-Service offer, find financial partners, train teams, and provide the financial engineering required to ensure the success of the project. Additionally, it opens the door towards the circular economy and sustainable development. Black Winch is proud to be part of the 1% for the Planet movement.

Learn more: https://www.blackwinch.eu/

Servitly

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Servitly provides configurable and modular cloud-based software that leverages data generated by connected products to support OEMs and service providers to:

- Create, deliver and sell effective digital services to their customers, such as remote monitoring and control, fleet management, assisted maintenance, troubleshooting and digital subscription management;

- Make after-sales services connected and smarter through remote diagnostics, installed fleet monitoring, and intelligent maintenance plans (usage-based or condition-based);

- Streamline and automate your consumables and parts sales with contextual e-commerce and machine customers;

- Evolve to advanced services with confidence thanks to data from connected products (Connected Outcome-based Contract or Connected Equipment as-a-Service).

Born in 2019, Servitly now manages more than 25,000 connected products for more than 40 customers in Europe, in the HVAC, Food & Beverage, Air, Water, Industrial Processing and Packaging sectors.

Learn more: https://www.servitly.com/

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