

Vendor Profile

Persistent Systems: Product Engineering and Operational Technology Services Profile – A Singular Focus on Software

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IDC OPINION

Product engineering (PE) and operational technology (OT) services providers are leveraging innovation technologies including robotics, Internet of Things (IoT), analytics, and AI/machine learning (ML) to differentiate themselves. In addition, growth rate and profitability will be determined by these services providers' ability to leverage domain-specific strengths in conjunction with these technologies. These strengths will enable customers to build hardware/software products faster, better, and cheaper with the right mix of people, process, and technology. Key takeaways regarding Persistent Systems' product engineering service offering and strategy/vision include:

- A clear understanding that software is key to all business
- Persistent leads with a discovery process for customers and partners with them to build software products and solutions that enable personalized and valuable experiences for internal and external customers
- The use of DevOps/Agile methodologies that entails working with customers' cross-functional teams that include design, product, supply chain, and other functions
- Investment in innovation accelerators such as ML, AI, IoT, and other emerging technologies to transform its own delivery process and customers' software product/solution

IN THIS VENDOR PROFILE

This IDC Vendor Profile analyzes Persistent Systems – a global software product engineering services provider. This document examines Persistent's company strategy, vision, service offerings, revenue, and infrastructure metrics as well as future opportunities and challenges. This Vendor Profile is part of a series that will include other global product engineering and operational technology services providers. This document is relevant to buyers of product engineering and operational technology services, financial investors, and other stakeholders that play a key role in the evolution and growth of these services.

SITUATION OVERVIEW

IDC defines the product engineering services (see *IDC's Worldwide Product Engineering and Operational Technology Services Taxonomy, 2018*, IDC #US43275418, October 2018) offering as the taking over of the research and development (R&D) of a product company's value chain (in part or full) by a third-party service organization. This flavor of outsourcing differs from traditional information technology (IT) services in that it focuses on the creation and sustenance of a product using third-party service providers. These services can range from developing and sustaining products across a range

of industries to building domain-specific products for industries such as medical electronics and aerospace design. These services need highly skilled engineering talent (such as electronics, aeronautical, mechanical, and electrical) that goes beyond traditional computer/software engineering.

As product life cycles shorten, cost of technology increases, and talent gets scarcer and expensive, an in-house customer product engineering team (at hardware and software product/technology companies) must invest in the required infrastructure and talent to manage multiproduct rollouts, integration, or upgrades. The intent to maximize R&D budget ROI often leads to partnerships with product engineering services providers that end up supporting customers with domain-specific skills and their knowledge and experience with emerging innovative technologies.

Product engineering and product development are synonymous, and the market uses both terms to describe the product development activities for software or hardware products. Services can include a small part of the entire product creation process or end-to-end services that range from design/discovery/product concept phase to end-of-life stages.

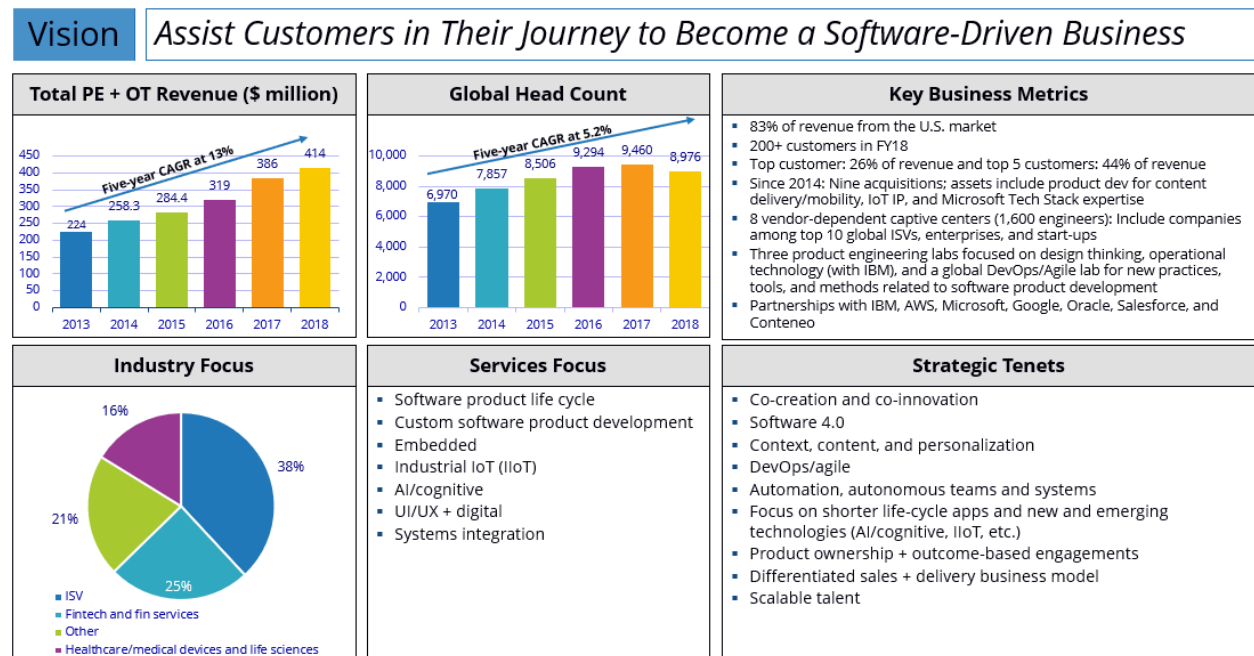
Technology competencies related to IDC's 3rd Platform and innovation accelerators enable engineering service providers to complement and enhance their PE and OT service offerings. These include 3rd Platform (big data and analytics, cloud, mobile, and social), Internet of Things, cognitive/AI systems, next-gen security, 3D printing, augmented reality/virtual reality (AR/VR), and robotics. Other key technology capabilities that also enable service providers to support these services include computer vision, blockchain, edge computing, and 5G.

Company Overview

Persistent Systems (see Figure 1) began offering product engineering services three decades ago, and software product engineering is core to everything at Persistent. The company is headquartered out of Pune, India, and its revenue has grown at a five-year CAGR of 13.2%. In the same period, head count has grown at a CAGR of 5.2%. Persistent provides delivery services from large delivery locations in India (Pune, Bengaluru, Goa, Hyderabad, and Nagpur) and the United States (Santa Clara) as well as 17 other global midsize and small centers.

FIGURE 1

Persistent Company Snapshot



Source: IDC, 2018

Notes:

Total PE + OT revenues are IDC estimates.

Global head count includes engineers from both product engineering/operational technology and IT services segments.

Company Strategy

Product Engineering and Operational Technology Services – Strategy and Vision

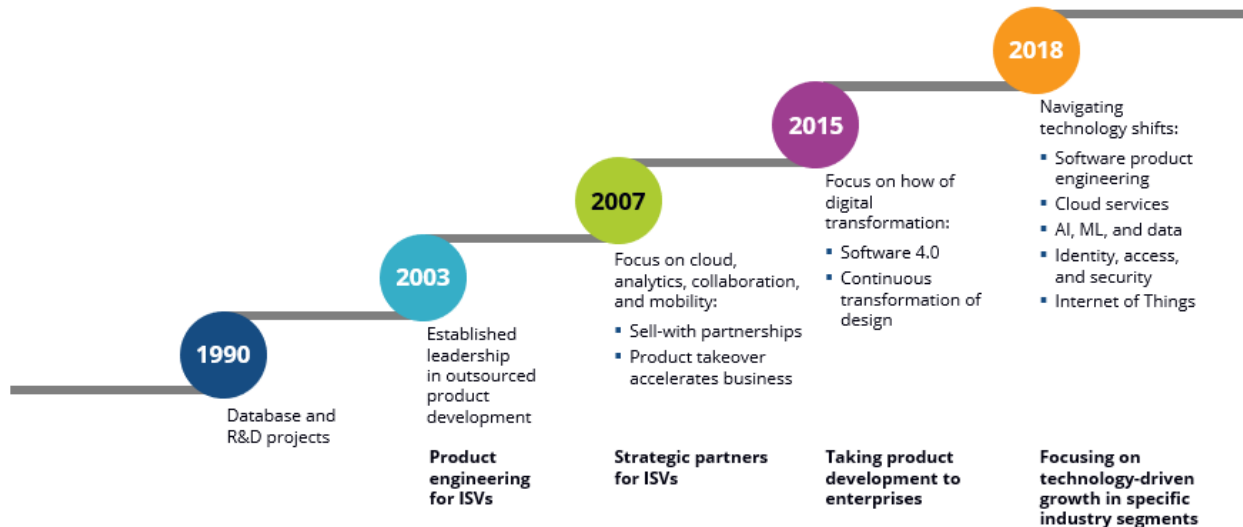
Persistent's go-to-market approach is based on:

- Providing end-to-end product life-cycle services targeted to software product customers
- Building software-driven businesses and experiences for customers that leverage software (digital) to transform their business (e.g., software in cars or commercial airplanes that enable higher operational efficiency and customer experience)

Figure 2 depicts the evolution of software PE + OT services at Persistent.

FIGURE 2

Evolution of Software Product Engineering and Operational Technology Services at Persistent



Source: IDC, 2018

Technology businesses are evaluating their product portfolios and how they go to market as business models evolve and the technology industry grapples with new software-driven disruptors. This market reality forms the genesis of Persistent's strategy as the company uses its strengths in software development (not to be confused with IT or application services) and combines it with Agile and DevOps methodologies to design scalable and interoperable product architectures.

According to Persistent, the new rules of developing and deploying software arise from the need for hyperscale personalized experiences that bridge the physical and the digital world. The resulting change in the software code is an ongoing process and aims to deliver robust software product quality, higher productivity, and shorter time to market.

Software 4.0

Persistent has coined its own term *Software 4.0* that captures the "how" of a software business and inspires how Persistent collaborates with its customers. For Persistent, Software 4.0 is not just about software. It outlines the mindset of driving the top line and improving the bottom line through software in every industry and business. This approach forms its current and forward-looking strategic direction and is based on the following core principles:

- The UI/UX software solution or platform should be context aware and content rich to continuously pursue the *next most valuable experience*.
- Personalization is a key feature to drive new *value in employee-facing or operational experiences*, and not just for customers or consumers.
- The software product or solution should be developed in *repeated cycles* (iterative) and in *smaller incremental portions* at a time.

- It is necessary to bring together culture, methods (e.g., agile), and architecture for *extreme responsiveness to the new and unanticipated or under-anticipated business or market developments*.
- The process should tap-in to the potential of technologies such as machine learning and process automation to *optimize or automate traditional ways*.
- To maximize the talent and infrastructure potential, it is important to architect for *autonomous teams and systems* inside and beyond enterprise boundaries.

The foundation for Persistent's Software 4.0 thinking is based on the following principles:

- Design for autonomy and interdependence
- Continuous optimization and automation
- Iterative and incremental by design
- Continuous personalization and value of experience

Software 4.0 components include design thinking, hackathons, DevOps, automation, scaled agile, software-defined architecture, and machine learning. According to Persistent, Software 4.0 thinking is by design. It intentionally focuses on effectively using combinations of proven methods and techniques such as design thinking, software-defined architecture, and machine learning rather than creating a proprietary set of tools or methods. Table 1 correlates these principles with Persistent's Software 4.0 components.

TABLE 1

Persistent's Software 4.0 Components Aligned to Principles

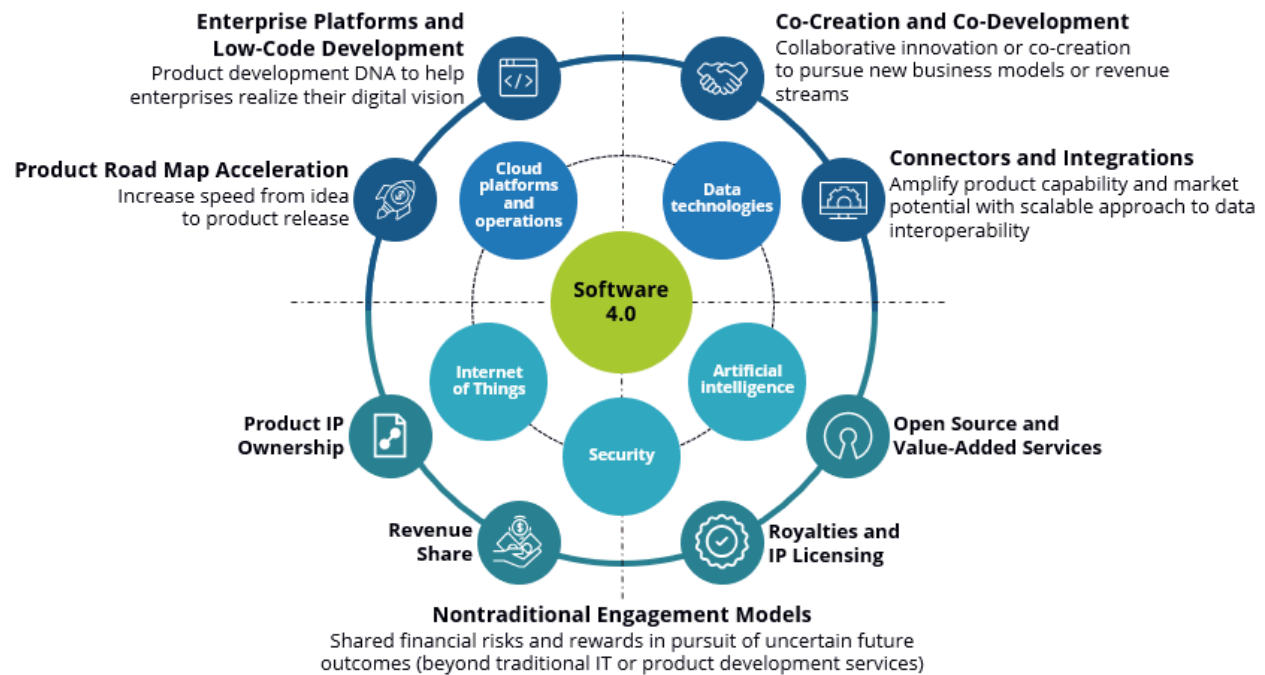
	Personalization for Continuous Value	Incremental and Iterative by Design	Design for Autonomy and Interdependence	Continuous Optimization and Automation
Design thinking	X	X	X	
Hackathons	X	X	X	
DevOps and automation		X	X	X
Scaled agile		X	X	X
Software-defined architecture	X	X	X	X
Machine learning	X	X	X	X

Source: IDC, 2018

Figure 3 highlights Persistent's value propositions and engagement models.

FIGURE 3

Value Propositions and Engagement Models



Source: IDC, 2018

The following summarizes Persistent's actions to deliver value to its customers:

- Focus on existing and emerging technologies (IoT, blockchain, ML, genomics, and intelligent automation) to drive new product development and act as a catalyst to drive growth in existing products and businesses.
- Focus on ever-emerging and evolving shorter life-cycle apps and underlying platforms (managed as a product) within an enterprise.
- Collaborate and co-innovate for new software product and platform development.
- Move away from effort-based engagement models and increase quantum of shared product ownership and outcome-based services partnerships.
- Business model (sales and delivery) is designed to win in a market that is witnessing rapid technology shifts.

Talent

Persistent currently employs close to 9,000 engineers. This includes engineers from electronics, software/computer, mechanical, biomedical, chemical, mining, metallurgy, and other engineering faculties. Persistent has about 8% of its workforce internally certified in agile, Scaled Agile Framework (SAFe), and Salesforce. Another 3-4% of engineers are certified in various low-code platforms, project management, QA/testing frameworks, and software products (Microsoft, IBM, and Oracle). The company partners with universities in the United States and India to shape curriculum, source talent,

find solutions to business and operations problems, and promote technology product and methodology learning.

Protecting Its Customers' Intellectual Property

Historically, IDC's research has shown that product engineering services customers are concerned about protecting their intellectual property (IP) and not losing their core competency. They expect their service provider/partner to implement various IP protection mechanisms. The following are key frameworks and processes that Persistent uses to protect its customers' intellectual property:

- **Contracting and non-disclosure agreement (NDA).** Persistent ensures a client's process, product, source code, and any other IP confidentiality by putting in place key security measures (passwords, hierarchical access) and asks each engineer to sign an NDA that is renewed every year.
- **Infrastructure.** Persistent ensures network security and logical separation for a customer's development team from other projects. Continuous monitoring and alert systems are in place to send text alerts, emails, or voice communication to relevant stakeholders.
- **Employee project transfer.** When a service provider transfers an employee from one customer's project to another, specific clauses can be included in the contract that prevent the employee from being assigned to accounts that are competitive in nature or in a similar domain.

Industrial IoT

Persistent leverages its partnerships with IBM, Microsoft, Google, and AWS to provide the following services:

- IoT-driven digital experiences for industrial manufacturing
- Leveraging data for cognitive and predictive learning
- IoT product engineering for connected devices and continuous engineering

Success Stories

- **Smart Cities – Leveraging IoT to transform residential neighborhoods:** Three Phase Electric is a provider of electrical services to homeowner associations (HOAs) in residential communities across Southern California. Partnering with Persistent, Three Phase Electric rolled out Common Sense Smart Community Internet of Things service for HOAs, which enables the monitoring and maintenance of residential amenities that include lighting, swimming pool water quality and temperature, and irrigation systems. This solution offers quick and transparent reporting, saves costs, and takes the inefficiencies and delays out of the maintenance process. This is an ongoing partnership.
- **Predictive maintenance of factory robots:** The client wanted to predict robot failures "few days" in advance for predictive maintenance. Persistent ensured that it was able to detect 70% of the failures one day in advance, resulting in 30% fewer failures. Persistent used ML frameworks to design a solution and this was a short-term project.
- **Prevent unplanned downtime during bearings manufacturing:** The client needed real-time data availability on unplanned breakdown, rejection, and cycle time – to move from isolated machine intelligence to a state of collective intelligence and proactive machine health monitoring with root cause analysis of breakdowns. Persistent played a consulting role apart from solution design and development. This ongoing relationship is in its second year.

- **Machine vision-based quality control-bearings manufacturing:** The client wanted to reduce dependence on manual quality inspection and resulting errors and eliminate manual repetitive tasks. Persistent developed an image classification algorithm based on bearing images. The solution classified bearings with 99.9% accuracy for the most prominent defects. This ongoing relationship is currently over 6 months old.

FUTURE OUTLOOK

Product engineering and operational technology services providers will continue to grow their revenues by assisting their hardware and software customers with improving time to market and product quality by taking real-time feedback from internal stakeholders and end customers as they go through product iterations using DevOps and Agile methodologies. Those product engineering services providers that invest in and use innovation accelerators including computer vision, AR/VR, AI/ML, and blockchain will gain more business as they disrupt the way their customers build and take their products to market. In addition, investments in talent, partnerships, labs, and captives will be key to reaching or maintaining leadership in this market.

ESSENTIAL GUIDANCE

Persistent's Strengths and Weaknesses

Strengths

- Domain and business focus
- Software 4.0 approach/methodology
- True partnership strategy in building or supporting its customer's product life cycle

Weakness

- Range of innovation accelerator capabilities in conjunction with industry coverage
- Dependency on the U.S. market
- Percentage of project-based contracts is high

Advice for Persistent

Persistent understands what it takes to provide value to its software product customers. The company needs to keep the following factors in mind as it aspires to become a dominant player in the software product engineering services business:

- **Focus on revenue growth.** Make a push to increase growth rate to 20%. Persistent should:
 - Invest in a stronger sales engine and increase marketing activities to improve branding.
 - Acquire niche technology companies in the design/discovery and innovation accelerator categories.
 - Increase depth of partnerships with technology providers.
- **Set up centers of excellence (COEs) closer to its customers or ecosystem locations.** Examples include:
 - Leverage AR/VR to highlight competencies in delivery locations.
 - Showcase platforms or technologies at COEs in North America. This will ensure a quicker sales cycle and decision timelines.

- Focus on building or buying innovation accelerator competencies such as computer vision, robotics, and next-gen security.

LEARN MORE

Related Research

- *IDC's Worldwide Product Engineering and Operational Technology Services Taxonomy, 2018* (IDC #US43275418, October 2018)
- *Market Analysis Perspective: Worldwide Product Engineering and Operational Technology Services, 2018* (IDC #US44295118, September 2018)

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