



information across the enterprise, on-demand as a service and in near-real time. All this while ensuring that PLM remains the foundational backbone for the product's lifecycle phases, from birth to launch to end of life.

The challenge, however, is that innovating with PLM is not easy. Due to PLM's product hierarchical structure and product relationship model, its integrity must not be compromised solely for the

sake of collecting, managing and applying product information across the lifecycle. Hence, any new approach must be built on top of foundational architecture.

This point-of-view paper discusses what we believe to be the three forward-looking PLM trends that promise to disrupt the PLM landscape. It also offers insights into PLM's evolving role in the digital economy.



# If data is the new oil, product data is the source of oil.



## TREND 1: PRODUCT DATA AS A SERVICE (PDAAS)

We are fond of saying, **“If data is the new oil, product data is the source of oil.”**

Organizations are deluged with huge volumes of product information that must be managed across various business functions. However, given the evolution of product information across lifecycle phases, and by business functions, the art and science of product data management has become exceedingly complex.

For example, engineering gives birth to a product while manufacturing brings it to life. Quality brings elements of product advantage and compliance, while sales and marketing take it to the end customer. Throughout the organization, product information grows as new metadata elements are added by each different business function. A product typically ends up with 120-plus attributes in PLM systems throughout its entire lifecycle. Imagine the level of insight that can be leveraged using these attributes? However, most organizations lack the ability to enable it.

**In fact, we have found that organizations today lack the technological wherewithal to derive informed analytics from product data attributes managed in PLM systems.**

## QUICK TAKE

# How PDaaS Eases Reporting, Facilitates Real-Time Product Analytics

For a leading high-technology manufacturer, on-demand reporting and near-real-time analytics on products was not possible using its existing PLM landscape. Product development was highly dependent on IT teams to provide required reporting and analytics thereafter, using back-end mechanisms. Moreover, response time was long.

The PDaaS approach we implemented for this client not only fulfilled its reporting needs but enabled users across functions to access data-driven analytics in real time. Decision-making improved significantly. Capabilities such as BOM extraction of 100,000 records, which was not possible earlier, can now be accomplished in just 45 seconds.

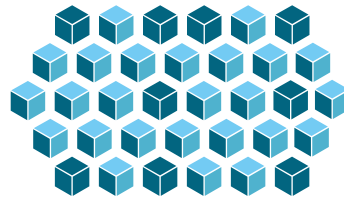
Ironically, even after years of evolution, PLM environments provide only a certain set of capabilities out of the box (OOTB). Most PLM technology needs to be customized to manage the full sweep of product information. Of course, the more a PLM application is customized, the less flexible it becomes and the more effort must be expended to maintain it. Moreover, for specific reporting and analytical requests, IT departments are typically asked to provide data using back-end queries instead of PLM user interfaces. Sadly, this is the nature of the PLM business today.

Fresh thinking is required to address multiple challenges: to satisfy the growing demand on product information, to reduce dependency on IT departments, to reduce the management effort applied to customization, and to raise operational agility and flexibility. This is leading some organizations to begin to bring product data from PLM into a new database system to function as the “big data PLM” – capable of managing not only the hierarchical data structure and relationships model for a product, but also to provide near-real-time information, on demand, to all respective stakeholders. This is achieved by leveraging REST-APIs in the new database systems and thus deploying product-data-as-a-service (PDaaS) delivery models.

A PDaaS approach can provide the following benefits:

- Faster decision-making due to on-demand and near-real-time information availability.
- Improved collaboration time because stakeholders can perform multiple scenario analytics.

- Shorter time to market for new product launches and changes to existing products.
- Reduced dependency on IT because product information is available now as a service.
- Reduced PLM package overload.



## TREND 2: MICROSERVICES ARCHITECTURE FOR PLM

PLM packages are built on monolithic architectures, some of which can be upgraded with minor and major releases to add new features and capabilities. This has proven to be a costly and time-consuming process. Moreover, architectural upgrades must be regression tested and then critically monitored to minimize bugs and outages across the enterprise. A single mistake in a production system can bring the entire machinery to a halt.

Although it may take a while before PLM package vendors begin embracing new architectures on which to build or extend their platforms, leading manufacturing organizations are exploring alternative approaches to address their new demands. One such approach is to build a microservices architecture that could manage complementary services separately. For example, security services, auditing, metadata services, etc. can

**Security services, auditing, metadata services, etc. can be managed independently and individually as modules on a microservices architecture.**



## QUICK TAKE

# How PDaaS & Microservices Enable Operational Flexibility

For a leading discrete manufacturer, integrating PLM with various enterprise applications was a headache. Any upgrade to the system required approval from multiple business functions. This significantly affected time to market for new product development and launches.

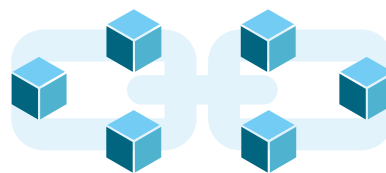
With PDaaS as a foundational approach, our client embarked on a microservices architectural journey wherein it first created a new database system to function as the big data PLM. Second, it moved all database pointers to the big data PLM. Third, it built key services such as auditing, metadata, security, business services, etc. individually and independently of each other on the big data PLM.

This helped the company to reduce the integration overload from its existing PLM. Moreover, microservices helped it infuse flexibility and agility into product operations.

be managed independently and individually as modules on a microservices architecture.

The benefits of this approach include:

- Faster resolution when a capability fails.
- Speedier introduction and upgrading of new capabilities.
- Improved system uptime for business activities – as taking down the entire system is not required when one module goes down.
- Improved scalability because services can be deployed on multiple servers.
- High system flexibility because each capability is independent.



### TREND 3: PUTTING PLM ON BLOCKCHAIN

PLM is known for its “single source of truth” view of product information as a result of the trust accorded to a centralized administration team. The challenge within an enterprise with various business functions collaborating to develop a product is that each business function ends up having its own version of truth, too. At many organizations, trust among business functions becomes the prime driver for creating the single

source of truth. But in reality, multiple vendors and suppliers also participate in the product development cycle, and hence trust is shared with them, too. As a result, product development is enabled through the “shared trust” among multiple stakeholders, both internal and external to an organization.

This is similar to the founding principles of blockchain, which pivots around shared trust and transparency. Participants in a blockchain network (in a manufacturing context, for example) – product designers, suppliers, production shops, 3-D printers, logistics partners, sales and customer service – work on a shared infrastructure, without a centralized authority, thus reducing time and effort.<sup>2</sup> A secure, distributed ledger infrastructure accessible to multiple parties enables a new level of real-time transparency and efficiency for transactions involving

the transfer of anything of value – ideas, money, product provenance or ownership, etc.

While blockchain could enhance product data management for PLM, as an enterprise computing foundational technology it is in an embryonic stage of development, with numerous technical hurdles still needing to be addressed. The early signs indicate that blockchain could reduce multiple instances of truth with respect to enterprise product data management. (For more insights, visit the [blockchain section of our website](#).) As manufacturers move toward a shared and distributed model, business leaders can consider four questions when evaluating readiness:

- Where in the value chain, internally and externally, is your organization overpaying for effort or the lack of agility? (For more, read [“How Blockchain Can Help Manufacturers Slash the Trust Tax.”](#))

## QUICK TAKE

# Applying Blockchain Thinking in the SAP World

The SAP Leonardo Blockchain Co-Innovation program<sup>3</sup> provides SAP users and partners the opportunity to explore applications including registering events to blockchain from product inception and design to the manufacturing and logistics phases for product tracking and tracing.

The program also addresses parts serialization and order validation for inventory management and for product provenance and authenticity. SAP is also exploring digital supply chain scenarios where different suppliers submit offers directly to a blockchain platform to improve effectiveness across their business networks.

---

Given exploding volumes of data originating from connected devices, an as-a-service model will be paramount and performance enabling. PLM platform providers must wake up to the digital call before their customers seek alternative platforms to manage their product data.

---

- How does the availability of a digital product memory drive value for your company, customers and business partners?
- Which types of partners, in what geographies and with what expertise, could we work with if transaction costs and efforts were lower?
- Which information assets (e.g., manufacturing, maintenance, operational and usage data) about products can be monetized if there were a secure way to do so?

#### LOOKING FORWARD

PLM must leave the trenches and embrace the digital technologies that are transforming the business. With some recalibration, it can still function as the proprietary source of product data information. Its evolution via PDaaS will enable analytics, on-demand results and near-real-time information sharing.

This means that foundational PLM architectures must be revamped to become nimbler, more flexible and more agile. Given exploding volumes of data originating from connected devices, an as-a-service model will be paramount and performance enabling. PLM platform providers must wake up to the digital call before their customers seek alternative platforms to manage their product data. This could create serious existential dangers to the industry's livelihood, a development from which they would be hard pressed to recover.

## FOOTNOTES

---

- <sup>1</sup> [www.fujitsu.com/global/about/resources/publications/digital-disruption-report/](http://www.fujitsu.com/global/about/resources/publications/digital-disruption-report/).
- <sup>2</sup> <https://digitally.cognizant.com/distributed-manufacturing-next-line-blockchain-innovation-codex3323/>.
- <sup>3</sup> [www10.mcadcafe.com/blogs/jeffrowe/2017/11/30/whats-blockchain-got-to-do-with-manufacturing/](http://www10.mcadcafe.com/blogs/jeffrowe/2017/11/30/whats-blockchain-got-to-do-with-manufacturing/).

## ABOUT THE AUTHORS

---

### Jagmeet Singh

Director, Connected Products Practice, Cognizant

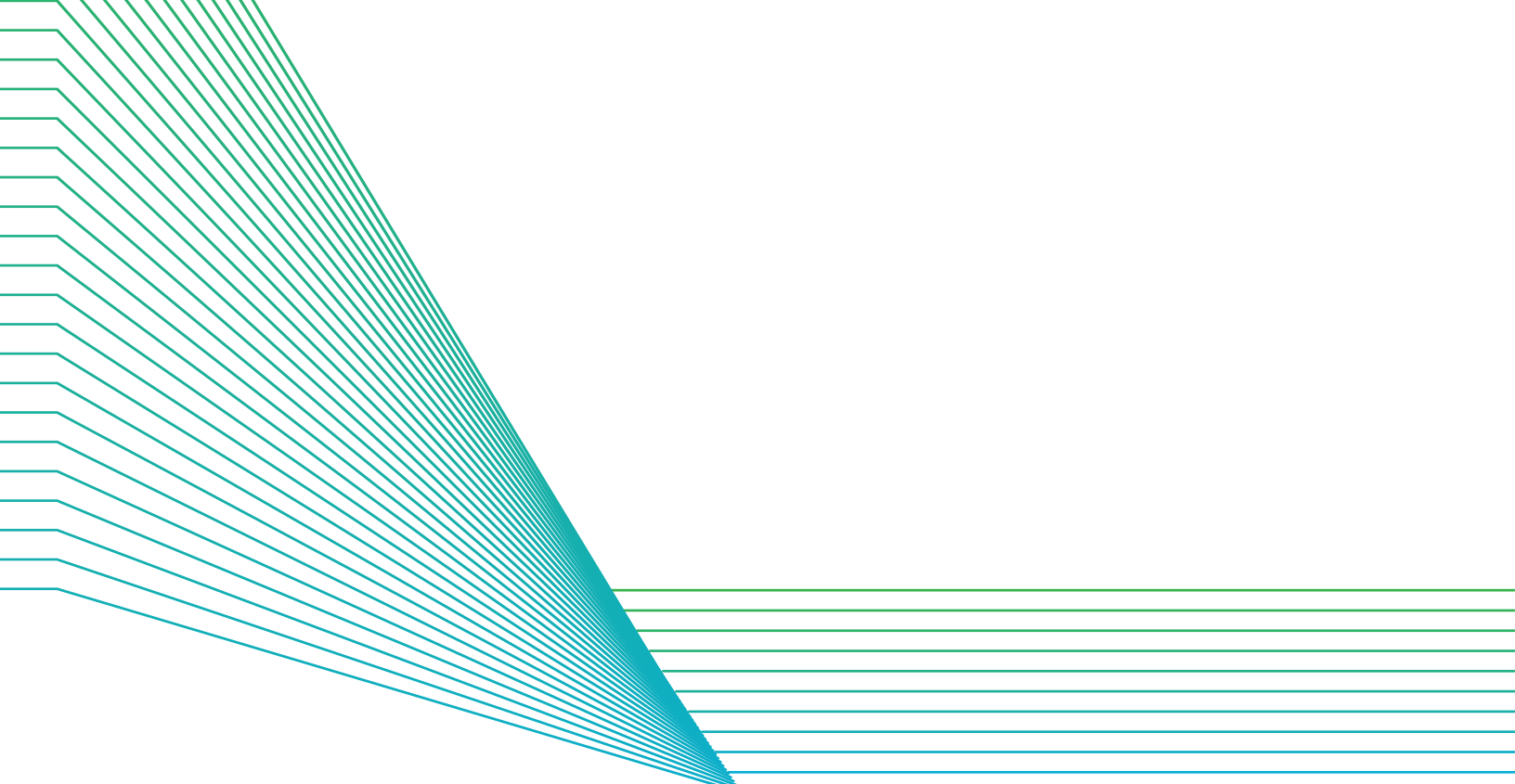
Jagmeet Singh is a Director within Cognizant's Connected Products Practice. He has more than 20 years of experience specializing in helping companies design and build digital solutions for their products, platforms and processes. Jagmeet has published and presented multiple white papers internationally and is an avid blogger with global experience working with senior executives. He is also top-ranked by Google as a leader in the product stewardship line of business. Jagmeet has a degree in automobile engineering from Gulbarga University, India, and is currently pursuing executive leadership education in corporate innovation from Stanford Graduate School of Business. He can be reached at [Jagmeet.Singh@cognizant.com](mailto:Jagmeet.Singh@cognizant.com) | [www.linkedin.com/in/sjagmeet/](http://www.linkedin.com/in/sjagmeet/).

### Hardik Kansupada

Senior Director, Connected Products Practice, Cognizant

Hardik Kansupada is a Senior Director within Cognizant's Connected Products Practice. He has over 22 years of experience in product development, innovation, PLM, quality management systems, product compliance and product portfolio management (PPM). Hardik specializes in helping organizations conceptualize and design digital solutions and bring them to reality. He has published multiple white papers and is an avid blogger in the space of digital product innovation. Hardik can be reached at [Hardik.Kansupada@cognizant.com](mailto:Hardik.Kansupada@cognizant.com) | [www.linkedin.com/in/hardik-k/](http://www.linkedin.com/in/hardik-k/).





---

## ABOUT COGNIZANT

Cognizant (NASDAQ-100: CTSH) is one of the world's leading professional services companies, transforming clients' business, operating and technology models for the digital era. Our unique industry-based, consultative approach helps clients envision, build and run more innovative and efficient businesses. Headquartered in the U.S., Cognizant is ranked 205 on the Fortune 500 and is consistently listed among the most admired companies in the world. Learn how Cognizant helps clients lead with digital at [www.cognizant.com](http://www.cognizant.com) or follow us @Cognizant.

---



**Cognizant**

### World Headquarters

500 Frank W. Burr Blvd.  
Teaneck, NJ 07666 USA  
Phone: +1 201 801 0233  
Fax: +1 201 801 0243  
Toll Free: +1 888 937 3277

### European Headquarters

1 Kingdom Street  
Paddington Central  
London W2 6BD England  
Phone: +44 (0) 20 7297 7600  
Fax: +44 (0) 20 7121 0102

### India Operations Headquarters

#5/535 Old Mahabalipuram Road  
Okkiyam Pettai, Thoraipakkam  
Chennai, 600 096 India  
Phone: +91 (0) 44 4209 6000  
Fax: +91 (0) 44 4209 6060

© Copyright 2018, Cognizant. All rights reserved. No part of this document may be reproduced, stored in a retrieval system, transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the express written permission from Cognizant. The information contained herein is subject to change without notice. All other trademarks mentioned herein are the property of their respective owners.