

# Digitally Transforming Product Quality

## CIMdata Commentary

### Key takeaways:

- Trends like digital transformation and Industry 4.0 require rethinking the fundamental relationship between the product lifecycle and supply chains, thus pushing quality requirements to the forefront in the drive to deliver strategic and incremental business value.
- While product quality has always had an impact on a company's revenue, it was often difficult to measure the direct impact. With the shift from products to smart, connected products with embedded services, it will now be possible to directly link customer experience, satisfaction, and revenue.
- The Internet of Things (IoT) offers an unprecedented opportunity to proactively translate product data into knowledge leveraged across the product lifecycle. At the same time, the social web provides the ability to proactively monitor products' customer sentiment as news of missed customer expectations travels quickly across the global internet.
- Oracle PLM Cloud offers a unitary digital thread—their enterprise product record spans ideation through the entire product lifecycle—powering their suite's closed-loop quality capabilities. Oracle's cloud-based Quality Management is integrated throughout the Supply Chain processes and leverages IoT and social feeds to providing new opportunities to drive quality improvement, product enhancements, and new innovations.

## Introduction

The demands for smart, connected products have forced companies to rethink how they remain viable in their markets. A market offering increasingly requires a combination of the product, software, and services which provide differentiating value. Consistently delivering high-quality smart, connected products through global value networks has created new pressures for manufacturers. With social transparency as a barometer, Quality has become a key aspect of the corporate strategy and culture—one that is not defined as the responsibility of a single department—it is owned across each process spanning every stage of a product lifecycle.<sup>1</sup>

## Navigating a Smart, Connected World

Access to automation, the Internet of Things (IoT), data exchange, mobile devices, big data/analytics, and smart, connected products have fueled digital transformation and Industry 4.0 initiatives which, in turn, have forced a redefinition of the relationship between the product lifecycle and supply chains. The resulting explosion of data has companies searching for the best ways to harness that knowledge to benefit the product lifecycle and the company as a whole. Gartner defines digital business transformation as the process of exploiting digital technologies and supporting capabilities to create a robust new digital business model.<sup>2</sup> While CIMdata agrees with this definition in general, many companies hindered from adopting these new business models and failing to apply digital technologies to the product development lifecycle are running the risk of being left behind in their markets.

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<sup>1</sup> Research for this commentary was partially supported by Oracle.

<sup>2</sup> <https://www.gartner.com/it-glossary/digital-business-transformation/>

CIMdata recommends that product companies pursue their Industry 4.0 vision and digital transformation initiatives along-side of a robust sustainable strategy for connected PLM-enabling applications. To CIMdata, product lifecycle management (PLM) is not a solution that you buy, rather it is a strategic business approach enabled by a consistent set of enabling technologies and connected processes. While the PLM market space has promoted digitalization for nearly two decades, recent CIMdata research reveals that many companies remain stuck at product data management (PDM), the basic blocking and tackling of managing intellectual property, bills of materials, and engineering change and release processes. Digital transformation is the next level of evolution in defining a PLM vision and requires an effective balance of business strategy, enabling technologies, people, and processes to accelerate their business benefits.

This strategic transformation must support a digital thread, which is a communication and knowledge framework for an integrated and connected view of an asset's data (i.e., its Digital Twin) throughout a product's lifecycle and closing the gaps across what traditionally have been siloed processes and data. Using connected process knowledge can truly deliver results through the lifecycle optimization of multiple engineering and business metrics.

One major data source that can enhance the digital thread is the Internet of Things (IoT). Historically, companies have had limited access to key information about fielded products. There are returns, warranty claims, and repairs, but the data collected was about the effects of usage, not how the products were actually being used. Today, companies are looking to instrument their products to capture usage data for an unprecedented opportunity to understand how customers are using their products and, in turn, leverage that knowledge across the product lifecycle to enable successful product evolution, innovation, and predictive maintenance.

Much of a product's value is brand equity, an intangible asset that can go up and down based on sentiment in the market. The prominence of social networks allows consumers to provide ratings and research public commentaries on product and service experiences. In a transparent market, poor quality can quickly damage both product reputation and brand equity so it's critical to deliver quality products and services, starting at their market introduction, that both meet expectations and deliver continuous improvements to retain their customers' loyalty.

Many companies pursue digital transformation strategies to implement new business models and sources of revenue, like shifting from selling just products towards a focus on field service or product-as-a-service offerings. These new business models demand better product and service quality. You won't be profitable or have successful products if you are delivering poor, untimely product service. And you can't make money on your service level agreements (SLAs) if your products do not deliver against agreed-upon performance metrics. Most companies have a long way to go from their PDM reality to this digital transformation. It begins with a broader PLM vision and implementation which supports these new business models.

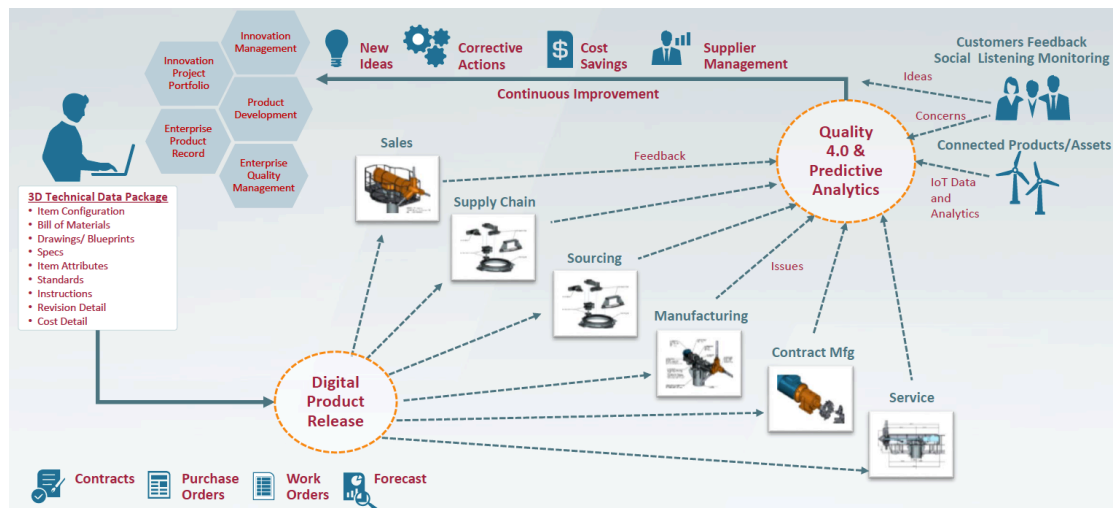
Achieving these quality expectations becomes more complicated in an Industry 4.0 initiative. Supply chains are being revamped and moving more toward a value network approach. Building new relationships while maintaining quality is an enormous challenge, especially without the advantage of a digital thread of connected processes and systems.

Oracle believes their fully integrated cloud is a big differentiator. Oracle PLM Cloud provides a connected, traceable end-to-end solution which tracks products from cradle to grave and is connected to all related supply chain and quality processes to help companies achieve their Industry 4.0 objectives.

## Optimizing Enterprise Quality with Oracle PLM Cloud

Oracle has been a leader in the PLM market since their acquisition of Agile in 2007. Their Oracle Agile, Oracle e6, and Oracle PLM for Process on-premises offerings are used by hundreds of customers and Oracle’s “Applications Unlimited” pledge has maintained a roadmap for these products (and many others in the Oracle portfolio). But Oracle Corporation, and the enterprise software market, are committed to the cloud as the means to deliver easy configurability of the latest innovations to customers without lengthy upgrade cycles. Oracle’s way forward in PLM is Oracle PLM Cloud which enables five connected capabilities including Innovation Management, Quality Management, Product Development, Configuration Modeling, and Product Data Hub. Oracle’s enterprise product record, their digital thread, natively spans more of the product lifecycle than many of their PLM competitors. One strength of their medical device heritage gives them a leg up on understanding the needs and depths of closed-loop quality.

Oracle believes in the critical value proposition of the digital thread and digital twins, CIMdata also promotes this as an imperative for industry to embrace and will be a baseline for companies embarking on transformation initiatives. Oracle is using visualization technology to support innovations and collaboration, but physics-based twins are not an emphasis, which makes sense given that Oracle does not provide design data authoring or engineering-oriented simulation tools. But the digital thread and digital twins are essential to their vision for “Digitally Connected PLM” as shown in Figure 1. Their digital thread extends from the fuzzy front end of innovation, all the way to fielded connected products/assets and back. In developing their Quality Management capabilities, Oracle brought together the quality management development teams from Oracle Agile PLM, Oracle E-Business Suite, and other Oracle enterprise applications to ensure that the new cloud-native offering could meet or exceed the capabilities of their existing on-premise solutions.



**Figure 1—Digitally Connected PLM with Oracle PLM Cloud**  
(Courtesy of Oracle Corporation)

To help direct their development team, Oracle relied on customer input to steer this new offering, with seven companies across a range of industries including a conglomerate, aerospace & defense, consumer goods, lifesciences, high-tech, semiconductor, and medical devices to help validate of the initial design and evolution, and to provide guidance for incremental innovations and additional integrations of the capabilities. Their release process

brings new features to the market quarterly and Oracle claims their roadmap is chock full of new innovations planned to fulfill their connected Quality 4.0 vision.

Oracle's Quality Management capabilities span across product development, and change management. They integrate with Oracle solutions for IoT, artificial intelligence/machine learning (AI/ML), inspection processes, manufacturing, project management, human resource management, supplier management, and monitoring the voice of the customer using Oracle Customer Experience Cloud. This helps Oracle deliver the connected digital thread from idea through life by capturing knowledge about both the voice of the product and the voice of the customer to drive continuous product and service improvement activities.

Oracle claims over 200 customers for their Quality Management cloud capabilities, including some well-known companies in addition to their own internal hardware organization. Oracle reports that long-time Oracle Agile customers looking to expand their PLM strategy and coverage are increasingly migrating to Oracle PLM Cloud to support connected business transformation. Oracle believes this will help customers gain a strategic advantage across all of their quality processes. As Oracle continues to expand the capabilities of Oracle PLM Cloud it will be more and more difficult for customers to resist the market advantages it can help provide.

## **Conclusion**

Product companies must evolve to survive in a world of smart, connected products. Readily available access to emerging technologies such as IoT, machine learning, and digital assistants are increasingly used to help companies deal with competitive pressures. The need to adopt digital transformation initiatives and Industry 4.0 strategies have forced a change in how these firms create and deliver value to market, requiring a fundamental rethinking of the product lifecycle and their value networks. Maintaining quality in this complex environment is more difficult and needs to take advantage of new technologies like the IoT and the social web. While very different, these two technologies combined provide visibility to more deeply understand product usage that can be leveraged to improve products and the value they deliver.

The Oracle PLM Cloud and their enterprise product record offer a broad lifecycle view that can power digital twins, helping optimize enterprise product quality. Their innovative use of IoT and customer experience data bring something new to quality management—a capability that seems to be drawing significant interest from Oracle's customer base and prospects. As companies finally decide to make the move to the cloud, the broad capabilities of the Oracle PLM Cloud offering merit some consideration.

## **About CIMdata**

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. To learn more about CIMdata's services, visit our website at <http://www.CIMdata.com> or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 734.668.9922. Fax: +1 734.668.1957; or at Oogststraat 20, 6004 CV Weert, The Netherlands. Tel: +31 (0) 495.533.666.