



# THE ROLE OF PLM IN THE DIGITAL FUTURE: POSITION PAPER

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## Positioning for a Practical Approach

Almost every company that undertakes Product Lifecycle Management will be affected by, and will want to take advantage of, the new 'Digital' advances.

The scope and capabilities of PLM will be significantly extended by the impact of Digitalisation. At the same time, the principles and techniques of PLM are an essential part of any successful Digital Strategy.

PLM and Digital initiatives often exist in parallel, but they should be working towards the same future scenario. This Position Paper sets out the fundamental principles underlie any practical approach to harmonising them.

The aim is to establish an agreed point of reference for the PLM industry, and for product-oriented companies planning their future adoption of Digital technologies.

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## **1 INTRODUCTION**

Within many organisations, PLM and Digital initiatives are separate entities, and their inter-relationship is confused - despite the fact that the two must come together somehow in any strategy for the future.

This lack of clarity is a problem for PLM professionals (who need to equip themselves with the skill set for 5 and 10 years' time); and for Digital practitioners, who risk implementation failures if PLM principles are not understood.

The Professional PLM Initiative and Xlifecycle started the process of clarifying this area by publishing a joint White Paper on the subject in May 2020. This was followed by a detailed Industry Survey that ran in 12 countries in June.

The Survey generated extensive results, and the analysis has been used to create this Position Paper.

This Paper sets out a practical approach to aligning the role of Product Lifecycle Management (PLM) in the evolving Digital landscape, and for embedding PLM in any future Digital environment.

This Version 1.0 Position Paper is offered as the basis for an industry-wide discussion. Feedback is welcome from all PLM practitioners and leaders, in any role and from any part of the industry, via [positionpaper@plmig.com](mailto:positionpaper@plmig.com).

PLM Interest Group

[www.plmig.com](http://www.plmig.com)

Xlifecycle

[www.xlifecycle.com](http://www.xlifecycle.com)

## **2 CONTEXT**

### **2.1 Changes to Future Manufacturing**

The new wave of Digital technology means that the manufacturing environment in the medium and long term will be significantly different to that of the past decade.

Connectivity will increase data continuity from top floor to shop floor, joining the dots along the 'Digital Thread'. The scope, usage and target audiences for data and information will expand, aiding cohesion and possibly opening up new business opportunities. Platform integration (PLM-ERP, MES-MOM) will become important, and at the same time, architectures will become more flexible and platform diversity may increase.

This can have the effect of broadening the internal and external value chains, but it will also place more emphasis on data integrity, data quality, data cleansing and management of master data. Current capabilities will not be sufficient. Legacy data and platforms will be even more of an obstacle than they are now. More information will be "inside the machine", and new skills will be needed to manage this.

The 'Digital Twin' concept will crystallise into a range of constructs that suit each different industry; driving detailed technical integration in some (such as discrete products), and more light-touch integration in others (process, or raw materials). Once again, this will create new opportunities for product design and production: but will place new demands on quality, accuracy, and skill sets.

Senior management will become more aware of, and involved with, the operational effectiveness of the company through the drive to 'be competitive' and because of features such as enhanced dashboarding. This will be reinforced by business integration across enterprise functions along all parts of the lifecycle, resulting in increased responsiveness across divisions and geographies.

All of the above expands the current environment in terms of scope and power. The transformation, if it is achieved, will come from adoption of developments such as Industrie 4.0 and the Smart Factory, which are beyond the capabilities of current PLM (and of current manufacturing structures), and which are likely to require a wholesale reset of mindset and application.

## 2.2 Digital Future Survey

An Industry Survey was carried out in June 2020 into the *Role of PLM in the Digital Future*. The Survey involved respondents from 12 countries, producing 6 pages of detailed results. This Section reproduces some of the findings, which indicated significant confusion amongst PLM practitioners about how the two disciplines relate to each other. This is why the Position Statement in Section 3 is needed.

### 2.2.1 Relationship Between PLM and Digital

Respondents were sure that PLM and the Digital Wave will come together in the future. The scope of PLM will need to expand, become more digital to cope with new developments - and conversely, PLM itself causes some digital integration. This bottom-up convergence can be accelerated as the two disciplines share concepts and ideas.

### 2.2.2 Vision

Most respondents saw no clear Vision for either PLM or Digital in their companies, but felt that this could be seen as a management failure. Drivers that should bring the two views together could include data integration; supply chain integration; vendor software development; cloud computing; advances such as AI and machine learning; and the influence of business managers looking to keep pace with competitors.

### 2.2.3 Digital Twin and Digital Thread

Respondents generally viewed Digital Twins as a synonym or overlapping with PLM scope, with focus on the model-based definition of the product across its lifecycle. Several suggested that Digital Twins can help executive management understand PLM and break organisational silos. By reaching out to wider enterprise platforms such as ALM (Asset Lifecycle Management) and MES they contribute to the extension of the traditional scope of PLM. Like PLM, Digital Twins help plan and design better products, hence bring more intelligence to the product lifecycle.

It was a similar story with the Digital Thread, though there was much less consensus about what the term actually means. Overall, the terms is often used in a fairly broad and vague sense, pretty much as a synonym of 'data continuity'.

When considered accurately, the Digital Thread contributes to data connectivity, traceability and continuity across the enterprise. As such it reaches above and beyond PLM as a discipline and offers the opportunity to integrate PLM building blocks with other enterprise functions and platforms.

#### 2.2.4 Future Convergence

On the one hand, PLM should and must evolve from its current limitations in order to support and be part of the new Digital developments: but on the other hand, a significant number of respondents believed that PLM is already there, and covers everything that Digital needs.

Traditional PLM limits the speed of innovation, and must evolve to support IoT. Obstacles to PLM are now even more damaging because they impede Digital progress. PLM needs to break down silos before it can support Industry 4.0.

Good data is still critical for both PLM and Digital, and comprehensive data management and a digital backbone can provide the integration mechanism.

The ideas seem to offer a natural path to progression. Removing silos and other barriers from PLM is in line with the Digital 'connect everything' philosophy; and the suggestion of leveraging data, and data management, as a convergence mechanism will make use of one of the strong points shared by both disciplines.

#### 2.2.5 In Summary

The overwhelming picture is that we are starting from a point of confusion. People are keen to explore the subject, but talk about it in different ways. There is no clear or consistent view of what the relationship between PLM and Digital should be, and no clear Vision for either.

PLM is not well understood, and is difficult to explain. At the moment Digital wave is still in hype mode and because of its wide scope it makes it very difficult for the enterprises to really understand the whole digital business beyond the marketing jargon. As yet, no-one has devised any agreed definitions or standards in this area.

The gaps that continue to delay Digital, such as legacy platforms and ECAD/MCAD/BOM/Compliance functionality, are generally the same as those that delay PLM, so there is a business driver for an integrated approach.

These findings from the Survey are viewed entirely from the PLM perspective – it is unlikely that many purely 'Digital' practitioners will know what PLM is, let alone how to blend with it or leverage it. It seems, therefore, that any advance in this area has to come from the PLM side. Wider dissemination and discussion may serve to highlight the important role of PLM amongst the Digital hype.

### **2.3 Addressing the Survey Findings**

Given the confused picture, and the obvious inter-dependencies between PLM and Digital, there is a need for clarity.

If the enormous potential of the new approaches is to be fully realised, then businesses need a clear picture of where they are now, and a clear Vision of where they should be in 5 and 10 years' time.

The PLM-Digital Position Statement in Section 3 provides the starting point for this.

It can be shared by PLM practitioners and Digital proponents, at Board and at operational level, to agree the current scenario and to discuss what may be possible in the future.

### 3 THE PLM-DIGITAL POSITION STATEMENT

#### 3.1 The PLM-Digital Inter-Relationship

Any sound roadmap for integrating PLM with the new Digital Future should be based on the following premise:-

*For over 2 decades, PLM has been integrating and digitising the world of product development, building up a wealth of technical capability and business expertise.*

*The recent advent of technologies within the 'Digital Wave' offers new opportunities to advance the reach and effectiveness of PLM; and also offers brand new areas of opportunity that should be exploited in their own right.*

*The relationship between PLM and Digital should be symbiotic and harmonised. Considering this holistic landscape, PLM knowledge and techniques provide a sound and proven structure for "connect everything" integration that the Digital discipline has yet to learn; and Digital capabilities offer a path to extend PLM beyond its current boundaries.*

*For any product-oriented company, the most effective strategy for the future will be based on a genuinely integrated approach to PLM and Digital development.*

#### 3.2 Holistic Approach

To be successful, therefore, a company's Digital Strategy must incorporate the best elements of PLM capability and Digital potential. PLM and Digital specialists should work together to envisage the future solution.

#### 3.3 Clearly-Defined Vision

The impact of Digital advances on every company will be different, and subject to a wide range of factors that are specific to the product set, market position, operations, and value chains.

Every company will therefore need to evaluate and define exactly what its 5-year and 10-year scenarios may be, and refine these into a Vision of what will actually happen.

### **3.4 Evaluation of Benefits**

Scoping the eventual solution will involve enhancing the current environment and exploring new possibilities, including:-

- new platform strategies
- enterprise integration
- business intelligence
- product optimisation
- integrated data flows
- increased automation
- enhanced analysis
- inter-departmental feedback
- digital representation of the physical world
- lifecycle integration
- circular economy
- sustainable manufacturing
- smart products and factories
- Industry 4.0 enablement

### **3.5 Inclusive Roadmapping**

The reach of both PLM and Digital throughout the enterprise means that if the new possibilities are to be investigated thoroughly, it will need the involvement of stakeholders from all parts of the organisation.

### **3.6 Integrated Planning**

Planning the path to the Digital Future is not an add-on, but a necessity, and new plans will need to be integrated with the company's ongoing operational and business improvement planning.

### **3.7 Careful Use of the Internet**

Whilst the Internet can be the source of many good ideas, it is also host to a great deal of inaccurate, speculative and derivative material on the subject of 'Digital'.

The terminology and reasoning around a company's Digital Future should be actively maintained and managed in-house in order to avoid misconceptions and misunderstandings.