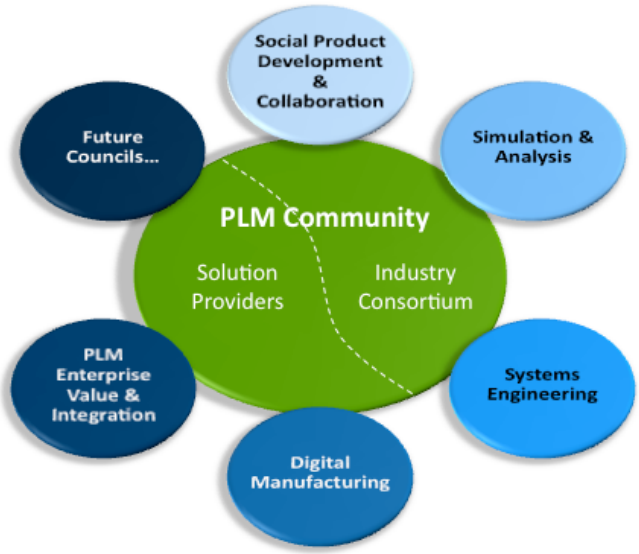
Digital Manufacturing Knowledge Council

Strategies to Support Manufacturing Systems Development

CIMdata's Product Lifecycle Management (PLM) Knowledge Councils conduct in-depth research for both industrial organizations and PLM solution providers. They emphasize strategic as well as practical, tactical options for companies to follow as they further adopt PLM. The research defines best practices for topics of interest to industrial companies who use PLM to support their ongoing product development business strategies and for PLM solution providers interested in understanding and defining their PLM strategies and directions.



CIMdata currently offers five PLM Knowledge Councils, as shown in the figure above. Council topics are developed from CIMdata's PLM Community as technology evolves and industry requirements dictate. Additional information related to CIMdata's PLM Community is located at www.CIMdata.com.

Digital Manufacturing Knowledge Council

Digital manufacturing (DM) embodies the processes and tools used to plan and simulate product production processes. The digital manufacturing approach seeks to integrate all the disciplines and specialty groups involved in a system's design into a team effort forming a structured production process. Digital manufacturing considers both the business and the technical needs of manufacturing, with the goal of providing a high quality product that meets the users' needs, and provides it in an optimal manner that maximizes an organization's return on investment.

The Digital Manufacturing Knowledge Council (DM Council) gathers and benchmarks best practices for integrating data, processes, tools, and people across the production environment. The program identifies and prioritizes requirements and capabilities for digital manufacturing strategies, best practices, and enabling solutions.

Council members include several of the world's largest manufacturing companies and a range of commercial solution providers. The active participation of these members enables strategic alignment between industry needs and currently available and future solutions.

DM Knowledge Council Member Deliverables

Digital Manufacturing Maturity Model

The digital manufacturing maturity model will seek to establish a framework of common terminology for integration and optimization of the diverse activities that fragment manufacturing production and design. The scorecard will cover a number of high level categories, each with specific criteria. These will be assessed during detailed discussions with manufacturing companies, to ensure a solid understanding of capabilities and utilization of digital manufacturing processes and technologies.

Digital manufacturing maturity models identify critical issues related to the integration, among other things, of products into the production environment—be that a machine tool, cell of tools, or a complete production line. Maturity models evaluate the maturity level of participating companies by leveraging a multi-level ranking approach applied to each of the model's criteria. Each maturity model investigates a separate set of criteria, which are established collaboratively by members of the DM Council and will evolve over time through active discussions and research. Measuring an organization's maturity is not only a way of ranking its current capabilities, but also provides actionable recommendations that will help the organization to improve its maturity. A digital manufacturing maturity model's results will reinforce the

critical need for companies to better plan their product production environments.

A ranking of maturity classifies company performance with a multi-level rating for each criterion. The low end rating represents little capability, often supported by ad hoc initial actions. The high end captures organizational management attuned to targeted optimization of activity, and continuous improvement.

Overall, this model will capture the maturity levels for digital manufacturing across companies and industries. It will identify gaps in early planning and upfront manufacturing system design. By implementing the best practices documented in this analysis, companies can transform their business by reducing costs and offering greater product variety.

The high-level topics covered in the maturity model include:

- Defining the manufacturing engineering problem
- Collaboration and integration between people and processes
- Manufacturing engineering solution processes
- Supporting tools and technologies

NC Market Analysis

An important part of the digital manufacturing world is the role of NC machines and CAM software. CIMdata has researched this important area for thirty years and has developed and publishes reports on NC software, it suppliers, and how it is used to improve product quality and productivity.

Materials from this research will be made available to the DM Council's members.

DM Workshops

CIMdata offers workshops and conferences to encourage and enable leading industrial companies and solution providers to discuss the major issues in digital manufacturing. With solution providers actively engaged, these workshops provide an opportunity for the solution providers to identify critical technology gaps that limit the benefits of their digital manufacturing solutions.

The DM Council supports a digital manufacturing framework—an integrated environment that provides tools to manage access to applications, data, and computing resources. The framework manages the complexity of digital manufacturing solutions within the larger PLM environment.

Knowledge capture, requirements management, process automation, and data management are necessary elements to support digital manufacturing, quality control, and production collaboration to support product optimization. The low level of PLM maturity at many companies presents a significant problem in defining, deploying, and integrating a digital manufacturing framework.

The DM Council focuses on requirements-driven design and validation of production systems. A detailed maturity model on requirements management assesses end-user needs and best practices, analyzing data from users within leading-edge industrial companies. A strategic, high-level review and maturity model of the offerings by leading digital manufacturing solution providers is also continuously updated. Case studies provide guidance on strategies for the utilization of digital manufacturing concepts in the product production process, and for successful deployment to overcome organizational resistance to change. The DM Council also provides highly regarded forums for face-to-face discussions between industrial companies and solution providers.

The DM Council is open to both solution providers and industrial companies through enterprise or individual memberships.

Under the guidance of collaborative members, the Digital Manufacturing Knowledge Council's current research agenda is concentrating on the following critical issues:

- ***Progress made and critical priorities for digital manufacturing:*** A detailed maturity model on industrial companies' capabilities, requirements, and benefits, updated with participation from leading companies in different industry segments. The critical requirements for users need to be clearly identified, prioritized, monitored, and continuously updated. Leading global industrial companies participate in CIMdata surveys to better understand the current context and priorities for collaborative, in-depth product design and production that help to shape decisions more effectively. The approach concentrates on those priorities that can be achieved in six to twelve months. The results are to be published in reports available to members of the DM Council.
- ***Digital manufacturing framework capabilities:*** A strategic, high level review and maturity model of the offerings by leading solution providers in digital manufacturing measures integration with other functional silos: PDM and CAD, simulation and analysis, test, and ERP. The results are applied in tracking the progress of the major product offerings from the leading solution providers.
- ***High-level requirements for digital manufacturing process management:*** Each provider has a specific approach to digital manufacturing data and process management, and different categories of providers are currently extending their offerings in this domain. The DM Council analyzes these approaches and highlight key benefits for the users.

2015 Events

- PLM Road Map™

Publications

- Archived publications and reports
- Additional publications from 2015
- Maturity model for Digital Manufacturing

PLM Presentations and Audio from PLM Road Map 2015

All presentations from PLM Road Map events are provided to council members.

Membership Levels

Corporations who sponsor the DM Council include both industrial companies and PLM solution providers. Two levels of membership are offered: Enterprise and Individual. The benefits for each level of membership are described below.

Enterprise Members

Enterprise members receive the following benefits:

- Two primary contacts who receive all DM Council deliverables.
- Four secondary contacts.
- Redistribution rights within the company of archived reports from past CIMdata PLM Knowledge Council research activities as deemed appropriate by the DM Council's Practice Lead.
- A one-hour web conference with CIMdata consultants to cover specific ongoing issues critical to the member company that CIMdata's collaborative analysis may effectively address.
- Each primary contact has telephone and email inquiry privileges to the DM Council's Practice Lead.
- Participation in surveys and discussions that help drive and shape the critical issues that are researched.
- Each primary and secondary contact has web access to reports issued by other CIMdata programs, where the DM Council's Practice Lead has determined they are of direct interest to DM Council members.
- Each enterprise member receives two registrations to CIMdata-organized DM Council events (e.g., PLM Road Map, DM Council workshops, seminars, regional briefings, and teleconferences). Additional registrations are available at a discount.

Individual Members

Individual members receive the following benefits:

- One primary contact who receives all DM Council deliverables.
- Redistribution rights within the company of archived reports from past CIMdata PLM Knowledge Council research activities as deemed appropriate by the DM Council's Practice Lead.
- Telephone and email inquiry privileges with the DM Council's Practice Lead.
- Web access to reports issued by other CIMdata programs, where the DM Council's Practice Lead Manager has determined they are of direct interest to DM Council members.
- Access to executive summaries from all PLM Knowledge Councils' research.
- One registration to seminars, regional briefings, and teleconferences scheduled at CIMdata's discretion, on timely topics of interest to DM Council members.
- One registration to the PLM Road Map conference.

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) solutions. Since its founding over thirty years ago, CIMdata has delivered world-class knowledge, expertise, and best-practice methods on PLM solutions. These solutions incorporate both business processes and a wide-ranging set of PLM-enabling technologies.

CIMdata works with both industrial organizations and solution providers of technologies and services seeking competitive advantage in the global economy. CIMdata helps industrial organizations establish effective PLM strategies, assists in the identification of requirements and selection of PLM technologies, helps organizations optimize their operational structure and processes to implement solutions, and assists in the deployment of these solutions.

For PLM solution providers, CIMdata helps define business and market strategies, delivers worldwide market information and analyses, provides education and support for internal sales and marketing teams, as well as overall support at all stages of business and product programs to make them optimally effective in their markets.

In addition to consulting, CIMdata conducts research, provides PLM-focused subscription services, and produces several commercial publications. The company also provides industry education through PLM certificate programs, seminars, and conferences worldwide. CIMdata serves clients around the world from offices in North America, Europe, and Asia-Pacific.

To learn more about CIMdata's services, visit our website at 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.