**SMLC Overview**

**Smart Manufacturing (SM)** is integrating network-based data and information that comprises the real-time understanding, reasoning, planning and management of all aspects of a manufacturing and supply chain enterprise. SM is facilitated through use of advanced sensor-based data analytics, modeling and simulation in real-time. SM is manufacturing in which all information is available when it is needed, where it is needed and in the form it is most useful—infusing manufacturing intelligence throughout the lifecycle of design, engineering, planning and production.

Unfortunately, a cost effective infrastructure to integrate real-time manufacturing intelligence and active management across the control systems of an entire production operation does not exist today.

**Smart Manufacturing Leadership Coalition (SMLC)** is a non-profit organization comprised of manufacturing practitioners, suppliers, and technology companies; manufacturing consortia; universities; government agencies and laboratories.

The goal is to build a cloud-based, open-architecture platform that integrates existing and future plant level data, simulations and systems across manufacturing seams and orchestrate business real time action.

SMLC is committed to building a scaled, shared infrastructure called the SM Platform to significantly lower the barriers of cost and complexity for applying data analytics, modeling and simulation to manufacturing operations across the enterprise.

SMLC activities focus on comprehensive technology that no one company can undertake. SMLC’s industry-driven implementation agenda will achieve transformational economic impact, manufacturing innovation and global competitiveness.

**Benefits of Smart Manufacturing**

- Reduces time to market
- Leverages dynamic, demand-driven economics
- Drives higher export markets
- Provides global competitive edge
- Enables progress toward zero incidents and emissions performance
- Takes advantage of integrated energy management and the smart grid
- Moves toward enterprise sustainability
- Enables agile response to consumer demand
Without a modern industrial infrastructure, adoption of SM Systems is not economically viable. Process control and automation systems implemented in a piecemeal fashion will continue to limit innovation and capability.

SMLC enables stakeholders in the smart manufacturing industry to form collaborative R & D, implementation and advocacy teams for development of the approaches, standards, platforms and shared infrastructure that facilitate the broad utilization of manufacturing intelligence.

SM requires time, synchronization, and cyber-physical requirements. To effectively scale across small, medium, and large enterprises, SMLC has developed the specifications for a shared infrastructure (SM Platform). Building the SM Platform requires significant technical integration and cross industry collaboration, and includes technical and business risks that the SMLC will address.

Through the SM Platform, SMLC will help companies address manufacturing-related challenges across the automotive, food, military, materials, chemical, oil and gas, refining, pharmaceutical, information technology, process control and automation industries. SMLC also supports collaborative research, development and commercialization.

SMLC brings together a unique group of talented experts to identify gaps in technology and the manufacturing landscape today.

**SM Platform Capabilities**
- Rapid, Real-Time Qualification
- Interoperability
- Design, Planning & Prototyping
- Business & Operations Tradeoffs
- Risk Assessment & Variability Reduction
- Tracking & Traceability
- Performance Optimization
- In-production Integrated Computational Materials Engineering

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**SM Platform** is a shared, open architecture and software infrastructure that integrates components required to assemble customized SM Systems on a standards-based deployment infrastructure. SM Systems integrate data driven manufacturing intelligence in real-time across an entire factory and supply chain.

SM Platform will significantly lower the barriers of cost and complexity of applying core data analytics, modeling and simulation resources to manufacturing operations.

SMLC will address cross-industry enterprise integration practices; pre-competitive and competitive modeling and simulation assimilation; real-time syncing of virtual and physical models; and the development of at-scale demonstrations. SMLC test beds provide the basis for defining industry objectives and integrated performance metrics that make up the Platform’s scope and design.

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**Multiple Layers of Data Management across the Manufacturing Ecosystem**

**Customer**
- Macro Layer
  - Product Volume
  - Scheduling
  - Supply Chain

**Distributor**
- Meso Layer
  - Management
  - Machine Flow
  - Optimization

**Manufacturing Plant**
- Micro Layer
  - Sensors/Actuators
  - Control/Optimization
  - Automation

**Supplier**
Integrating SM Systems requires real-time dynamic interfacing across all levels of a production operation for multiple layers of data management and modeling.
How the SM Platform works

SM Platform allows manufacturers to assemble a combination of controls, models, and productivity metrics to customize modeling and control systems in real-time.

1. Data are collected and computational results interface with operating equipment and automation infrastructures.

2. Results are displayed in actionable timeframes to operators, engineers, and managers through dashboards while in production.

3. Integrating data and information around specific performance metrics makes it possible to anticipate, plan, manage risk and optimize performance in real-time.

4. SM Platform’s open-architecture allows entrepreneurs to develop and license their IP in a form that can be plugged into the platform.

Open-Architecture for Plug & Play

SM Platform’s architecture will construct customizable real-time data-driven modeling applications as Apps, which are assembled, scheduled and managed in a workflow framework.

SMLC Objectives

Lower cost barriers for applying advanced data analysis, modeling, and simulation in core manufacturing processes

Build pre-competitive infrastructure including network and information technology, interoperability, and shared business data

Integrate requirements of small, medium and large enterprises

Create and provide broad access to next-generation sensors, including low-cost sensing and sensor fusion technologies

Ensure multi-level cyber security and protection at a scalable level

Develop a standards-based reference architecture based on industry-driven collaboration with IT suppliers

Establish an industry-shared SM Platform that includes an open architecture software development framework

Implement R&D projects for joint investment and execution of SM Systems

Facilitate efforts to secure funding through public-private and private-private partnerships to address priorities

Operate industry test beds for Smart Manufacturing System concepts and make them available to companies of all sizes
Benefits

The SMLC will proactively seek external funding opportunities to leverage member investments. Members will conduct meetings at least every three months to define priorities and deliverables.

- **Gain access** to the “best and brightest” resources that are leading the SM industry.

- **Find opportunities to fuel innovation**—access a network of talent, knowledge and expertise.

- **Establish R&D implementation teams** for specific projects and funding opportunities.

- **Participate in the deployment of projects** and initiatives that address industry hurdles.

- **Form partnerships to pursue new commercial opportunities** and emerging markets.

- **Manage risks and uncertainties** of deployment through R&D and test bed opportunities.

- **Avoid high cost** development of one-off, local solutions.

- **Develop engineering standards**, define initial test beds, and target applications of prototypes

- **Gain insight into early market opportunities** and add commercial value.

- **Provide input and guidance** for the design of the SM Platform structure while it is under development.

Membership Levels:

The SMLC has three membership levels to address various needs and interests:

**Board Member**

- Participate as a voting member
- Serve on the SMLC Board to provide input for setting priorities
- Provide guidance for advocacy initiatives and commercialization activities
- Non-exclusive license to use IP developed under SMLC-funded projects
- Opportunity for involvement in SMLC projects
- Opportunity to pilot test emerging technologies
- Access to SM concepts, knowledge and resources
- Attendance at all events at reduced rates

**Project Associate**

- Non-exclusive license to use IP developed under SMLC-funded projects
- Opportunity for involvement in SMLC projects
- Opportunity to pilot test emerging technologies
- Access to SM concepts, knowledge and resources
- Attendance at all events at reduced rates

**Associate**

- Early knowledge of new, emerging markets
- Access to SM concepts, knowledge, resources, and reports
- Attendance at all events at reduced rates

**Size Standards:**

**Large** companies have greater than 500 employees.

**Small** companies have fewer than 500 employees.

**Affiliates** include universities, national labs, non-profit organizations and consultants.

Websites:

https://smartmanufacturingcoalition.org
https://smartmanufacturing.com

Social Media:

https://twitter.com/SMCoalition
https://www.facebook.com/SMLeadershipCoalition