Smart Manufacturing and the Clean Energy Smart Manufacturing Innovation Institute™ (CESMII)

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Overview

- What is Smart Manufacturing?
- Who is CESMII and what is our mission?
- What is the Smart Manufacturing Platform™ and how is Academia leading its development?
- How does the PI System enable the SM Platform to allow easy integration of advanced cloud-based tools?
- How can you get involved with CESMII?

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What is Smart Manufacturing?

- The Operational Business and Technology Practice of radically increasing the application of real-time data throughout the manufacturing enterprise and changing the operational structure

- The right data in the right form, the right people with the right knowledge, the right technology and the right operations, whenever and wherever needed throughout the manufacturing ‘enterprise’

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Clean Energy Smart Manufacturing Innovation Institute

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CESMII

- The Clean Energy Smart Manufacturing Innovation Institute (CESMII) is an Industry/Academic consortium, part of a network of Manufacturing USA Institutes.
- CESMII was created to increase the productivity and competitiveness of US manufacturing companies through improved data insight and by use of advanced analytics.
- Regional Manufacturing Centers are led by and located at major universities.
- CESMII is partially funded by the US Department of Energy.

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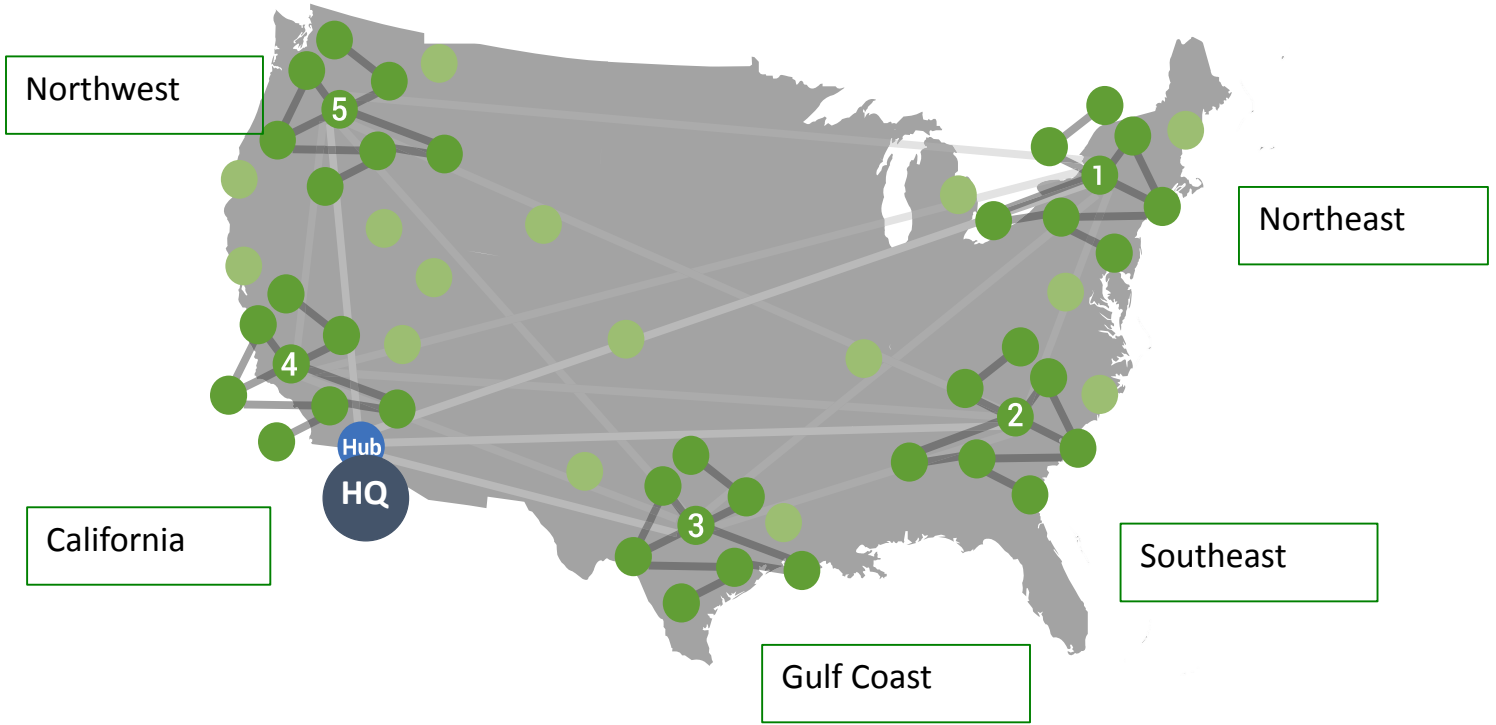
CESMII
A National Network of Capability Networks



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The Smart Manufacturing Platform™

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Every Company has an ECO System of “ STUFF”

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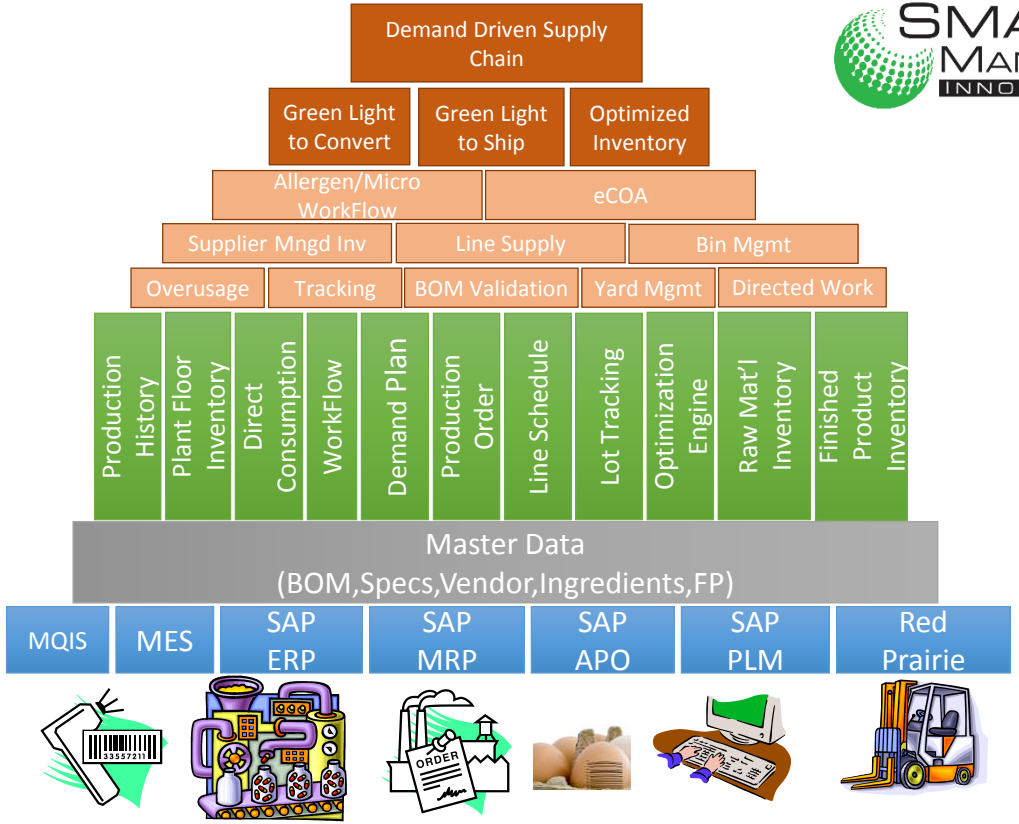
Value Creation

Business Applications

Core Functions

Core Systems

Data Input



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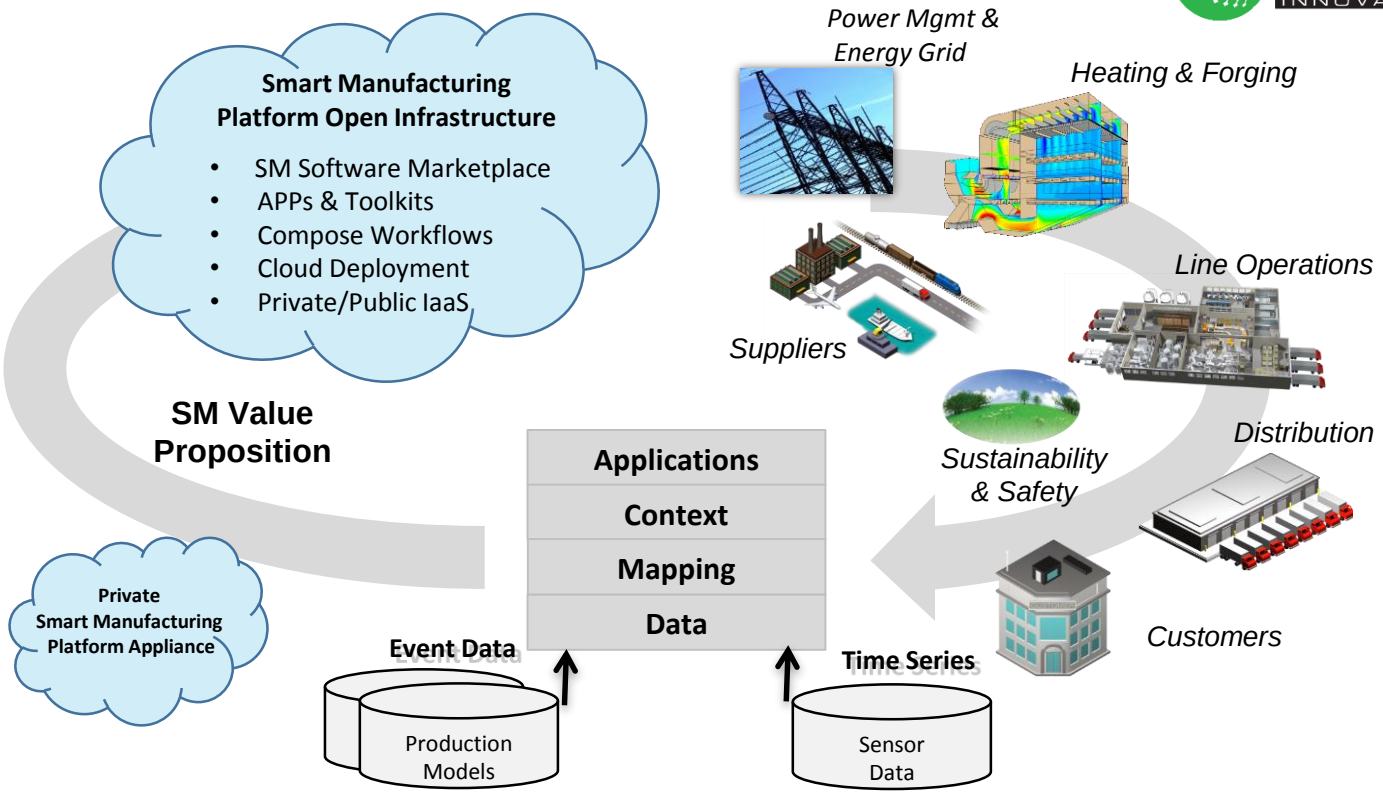
Courtesy of General Mills

Industry Needs a Platform



Traditional Manufacturing Automation Environment and Software Tools

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The CESMII Smart Manufacturing Platform™

- Cloud based, providing best-of-breed analytics, data visualization, and modeling from CESMII members.
- Enables monetization of manufacturing data and creation of the “Connected Enterprise”
  - Takes advantage of existing/legacy investment
  - Leverage connectivity – IIOT enabled systems
  - Move from “Run-to-Failure” to “Reliability-Centered” operations through application of analytics
  - Business/Financial/Energy Optimization at the Enterprise
- Provides analytics capabilities without needing subject matter experts maintaining or retraining models and analytics

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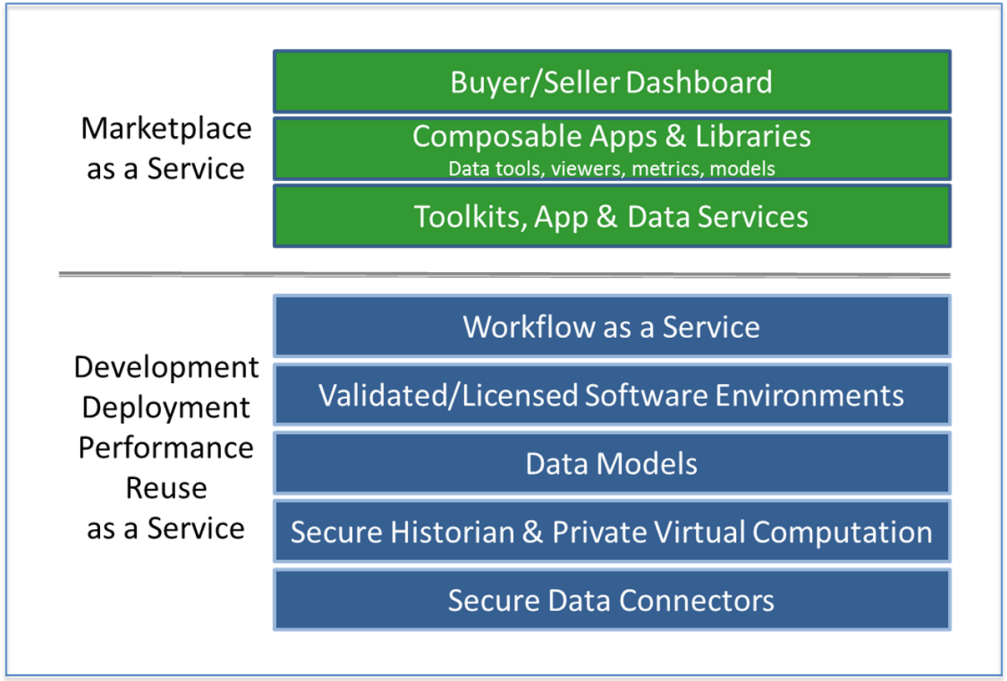
SM Platform™ Reference Model



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The PI System and the SM Platform

- Aggregation of customer process/production data
- Provide run-time analytics, data contextualization and intelligent data extraction for use by SM advanced analytics, models, and visualization systems
- Transfer of data (PI Cloud Connect) to the SM platform
- Provide a secure bi-directional data transfer between the customer and the SM platform suite of advanced analytics

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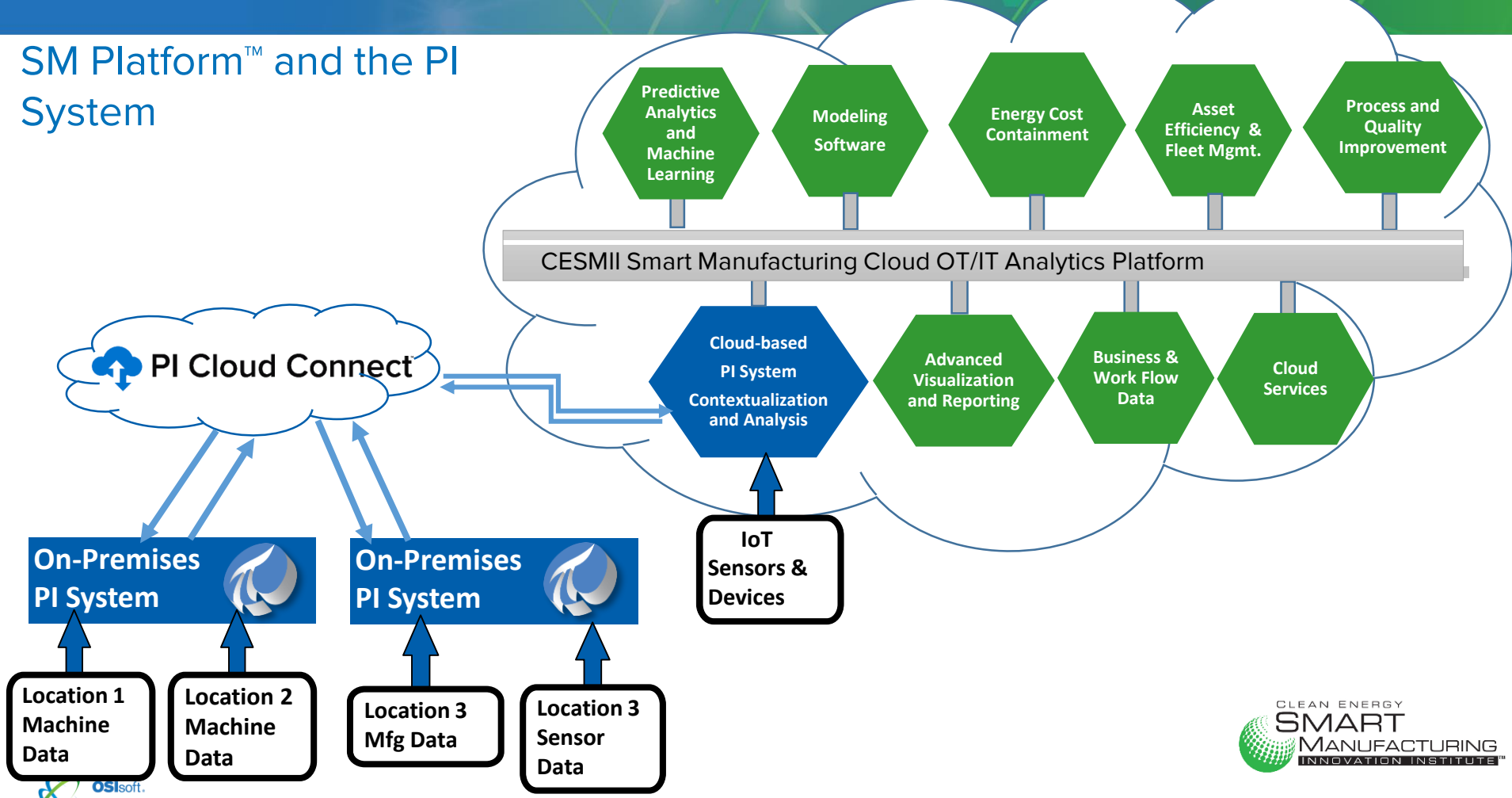
SM Platform™ and the PI System



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Gulf Coast Regional Manufacturing Center Platform and Testbed Development

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GCRMC Hosted by Texas A&M Engineering Experiment Station (TEES)

- Academic partners include University of Texas System, Lamar University, Louisiana State University, Tulane, and others.
- Facilities of TEES Institute for Manufacturing Systems used to establish PI System for testbed development
- Partner institutions (Academic and Industry) will create testbeds with links to TAMU PI System for data aggregation, contextualization, and integration into the Smart Manufacturing Platform

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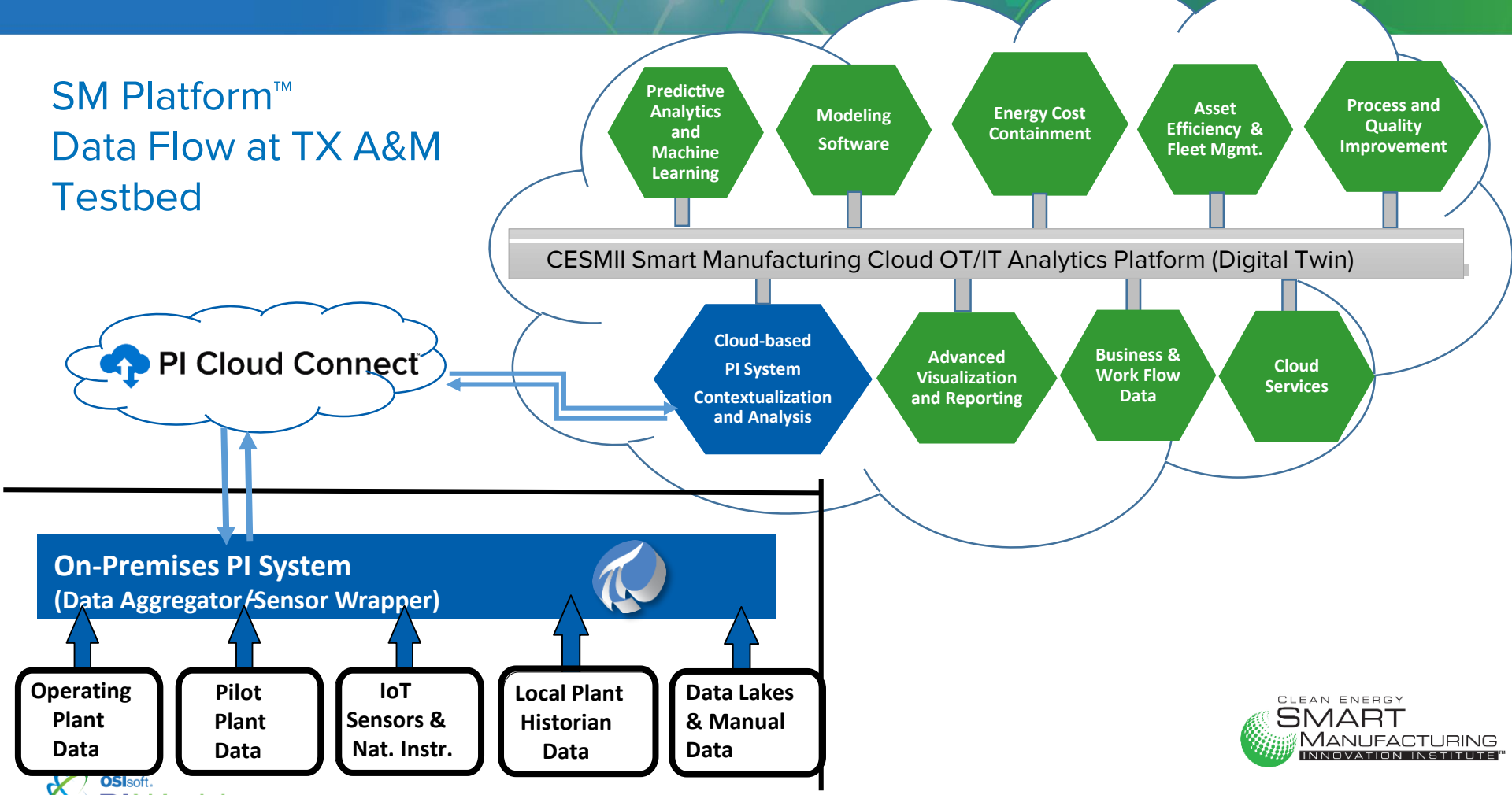
SM Platform™ Data Flow at TX A&M Testbed



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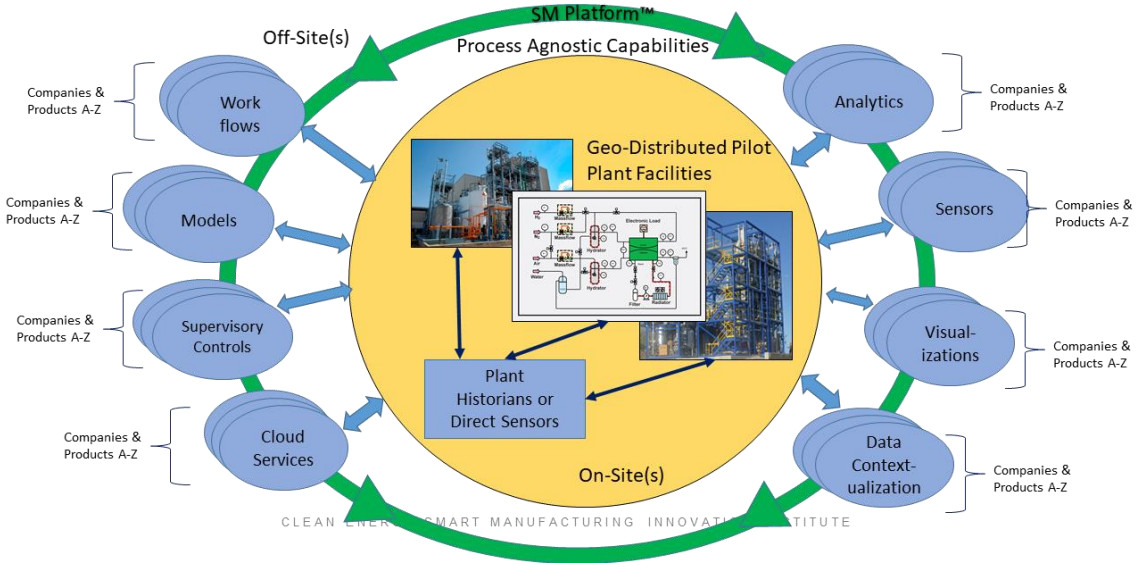
GCRMC Test Bed Planning

Test Bed Planning Groups

- Discrete Unit Manufacturing
- Chemical Process Manufacturing
- Polymer Reaction Monitoring
- SM Integration of Process Intensification Technologies
- SM Enabled Decision Support and Training
- Food Safety and Quality

Prospective Test Bed Functionality



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Get involved with CESMII

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Smart Manufacturing Product™ Development

- Find more information at www.cesmii.org
- Join an Affinity group to offer and/or access researcher/company subject matter expertise
- Work with regional partners to develop testbed project proposals
- Participate in Institute strategic planning activities at both regional and national levels – Work with the region and industry partners
- Subscribe to Institute and regional communications channels to stay up-to-date with opportunities

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CESMII Affinity Groups

- Human Systems Integration and Decision Support
- High Energy Unit (Discrete) Smart Manufacturing
- Cybersecurity for Smart Manufacturing
- Smart Manufacturing for Aerospace/Defense Systems Manufacturing
- Smart Manufacturing for Advanced Metals Processing Technologies
- Smart Manufacturing for Semiconductor Manufacturing
- Sensors and Wireless Communications for SM
- Smart Manufacturing for Chemical Processing
- Data Analytics for Smart Manufacturing
- Modeling and Simulation for SM Processes
- Energy Aware Smart Manufacturing
- Smart Manufacturing for Pulp and Paper
- Smart Manufacturing for Drying Operations
- Smart Manufacturing for Cement Manufacturing
- Smart Manufacturing for Food Quality and Safety

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Questions

Please wait for the **microphone** before asking your questions

State your **name & company**

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Merci

谢谢

Danke

Спасибо

Gracias

Thank You

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ありがとう

Grazie

Obrigado

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