



Academic Symposium Welcome

Presented by **John Matranga, OSISOFT**



TRANSFORM YOUR CLASSROOM
RESEARCH
CAMPUS





AM:
New to OSIssoft

EA Collaboration Lunch

PM:
Collaboration



2017 OSIsoft Academic Symposium

1:30 – 2:00	Welcome & Keynote: Clean Smart Manufacturing Innovation Institute Jim Davis, UCLA & John Matranga
2:05 – 2:35	National Instruments & OSIsoft Academic Program Partnership Roberto Piacentini, National Instruments & Dan Lopez
2:40 – 2:35	PI System in the Classroom – Improving Student Educational Outcomes via Cyber Physical Systems Connections with Industrial Challenges and Data Feeds Pratt Rogers, University of Utah & Erica Trump
Collaboration Break	
3:30 – 4:15	Panel Discussion: PI System for Data Science Research & Curricula Daniel Lopresti, Lehigh Don Paul, USC Juiliette Spinnato, Total Robert Mulla, Pepco Holdings
4:20 – 5:30	Workshop: Academia and Industry Collaboration - Innovation via a New Paradigm Introduction by Michael Wilson, Group NIRE



Magnitude.io
Powered by Curiosity

ExoLab: Lodi Unified School District



CESMII

Triple-Helix In Action at National Level
Joining Academia, Industry and Government

Presented by **Jim Davis**
CTO/CIO CESMII





Smart Manufacturing

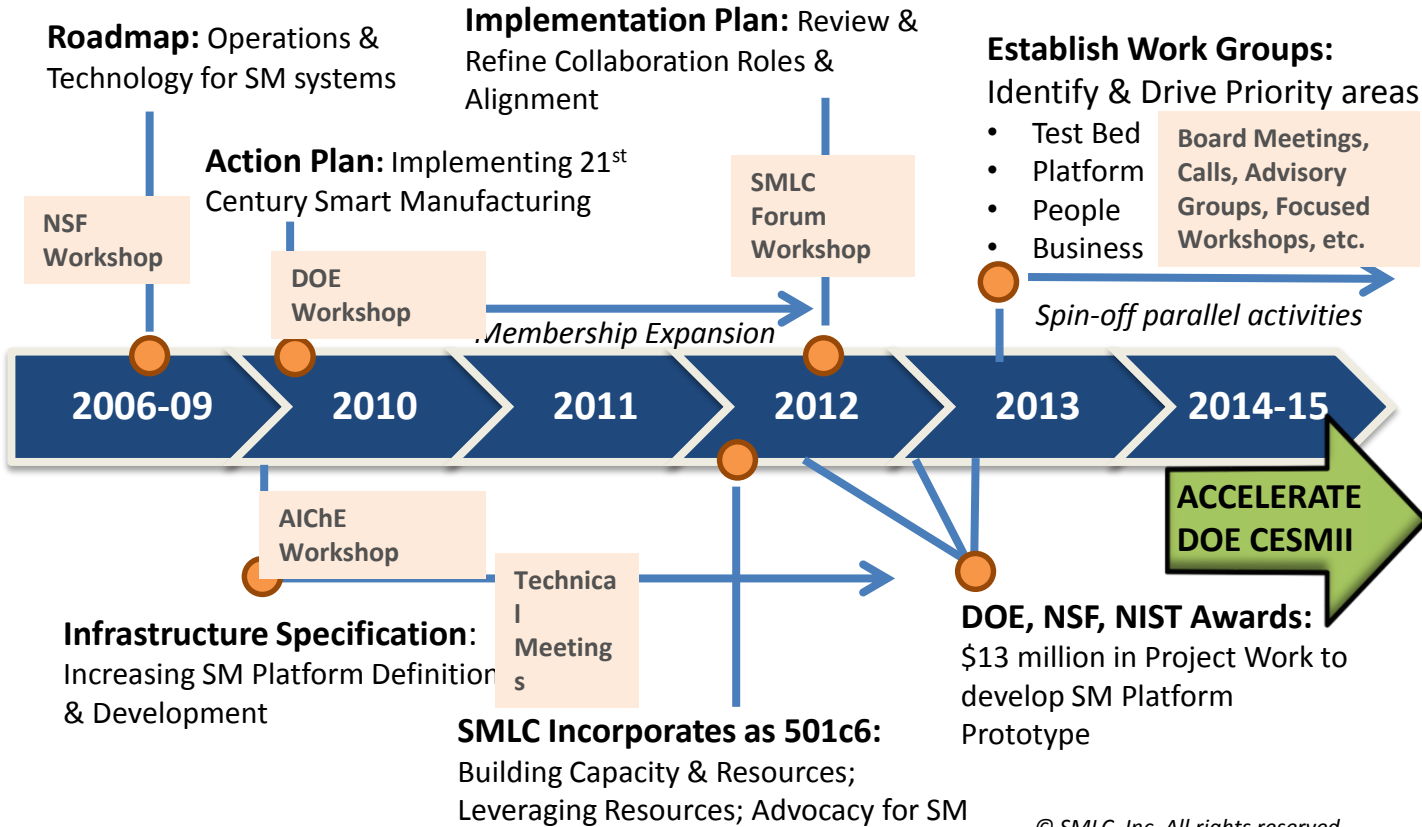
A Term of Practice

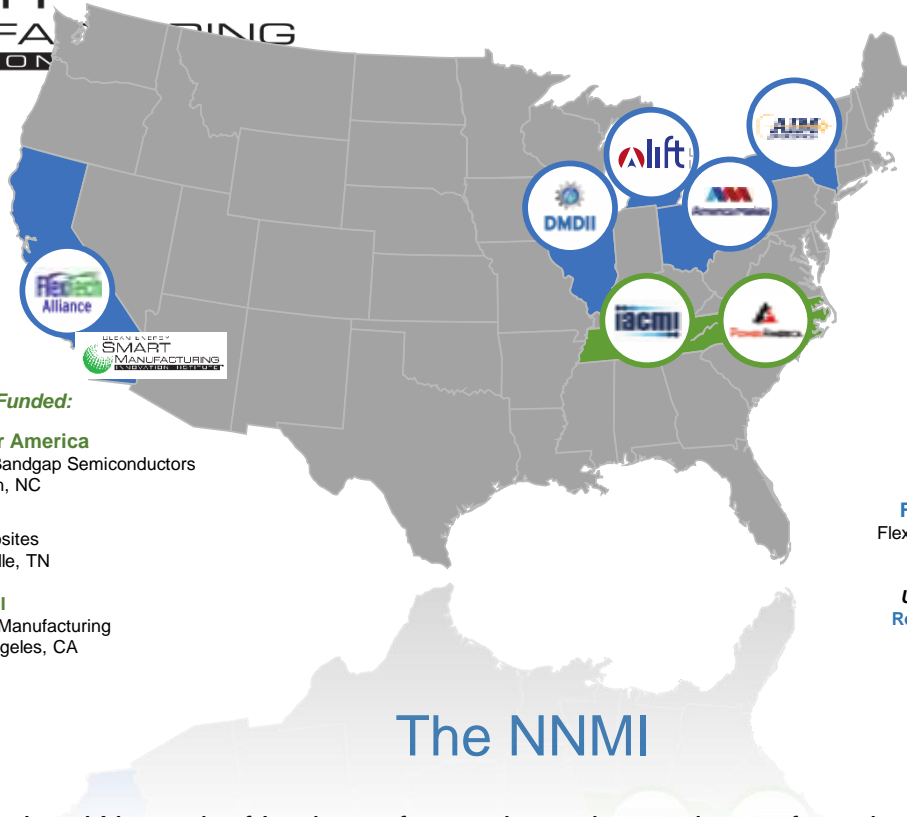
- Enterprise integration to realize untapped market , productivity and performance opportunities
- Real-time Data and Modeling to qualify materials, parts, properties, assemblies and drive real-time precision
- Operational intensification, virtualization, modularization and optimization to achieve value in an an increasingly customized product space and with accelerated demand dynamics



What was the CESMII Journey?







DOE Funded:

Power America

Wide Bandgap Semiconductors
 Raleigh, NC

IACMI

Composites
 Knoxville, TN

CESMII

Smart Manufacturing
 Los Angeles, CA

DOD Funded:

America Makes

3D Printing / Additive
 Manufacturing
 Youngstown, OH

DMDII

Digital Manufacturing
 & Design
 Chicago, IL

LIFT

Lightweight Metals
 Detroit, MI

AIM Photonics

Photonics
 Rochester, NY

FLEXTECH Alliance

Flexible Hybrid Electronics
 San Jose, CA

Unawarded Institutes:

**Revolutionary Fibers &
 Textiles**

The NNMI

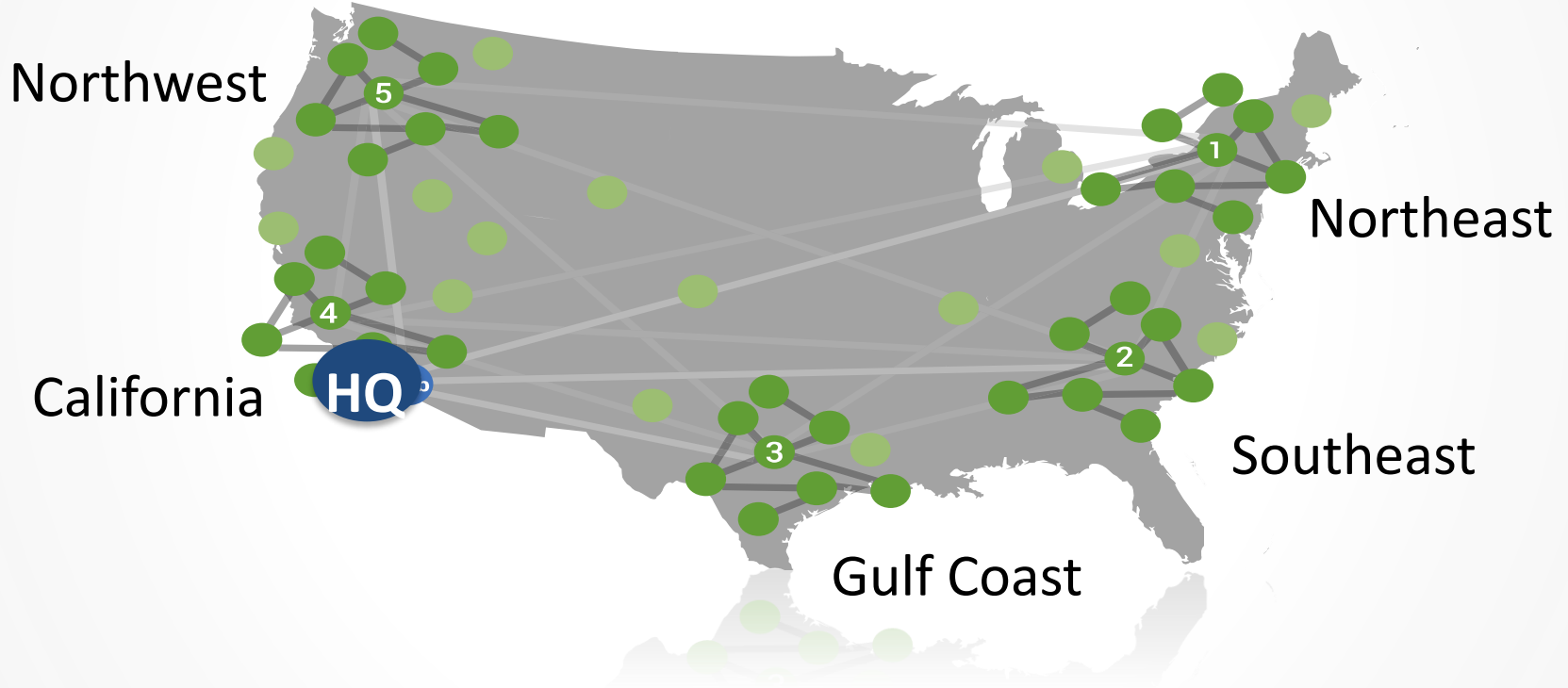
A National Network of Institutes focused on advanced manufacturing technologies

CESMII Objectives

CESMII's proposed measured goals include:

- Double energy productivity in US manufacturing every 10 years
- Halve the cost of deploying SM systems relative to state of the art in 5 years
- Increase the SM workforce in US multi-fold in 10 years
- Double the SM technology supply chain rate of increase in value and participation
- Reduce U.S. energy use in 10 years while increasing manufacturing competitiveness

A National Network of Capability
Headquartered in LA





Lets Consider Some Examples



Full view of a CNC machine

Compartmentalization & Seams

General Dynamics *Scranton, PA*



Hot Forging

General
Shaping



Heat Treatment

Set
Properties



Machining

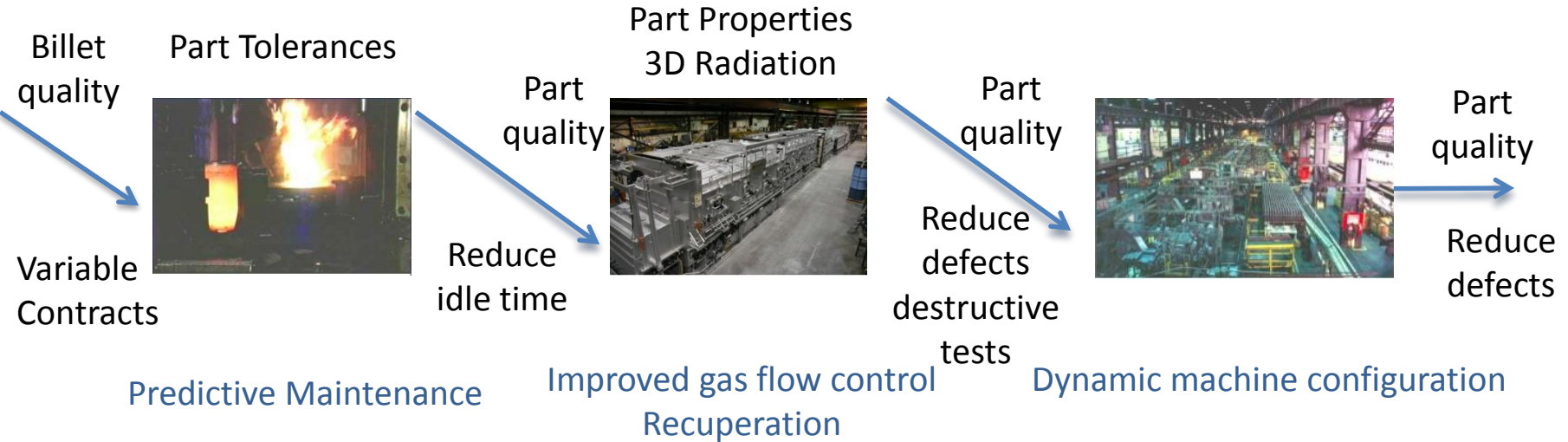
Finished
Part

Enterprise Value and Supply Chains

Production on Demand & Intensification

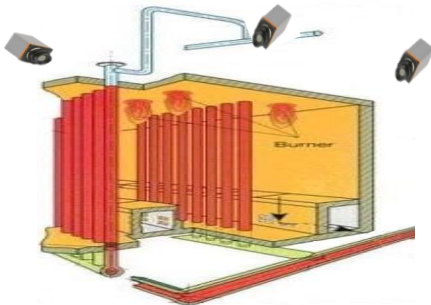
General Dynamics Scranton, PA

Integrated line management of part precision, materials/metallurgical properties, dynamic part movement, defect reduction, energy management →

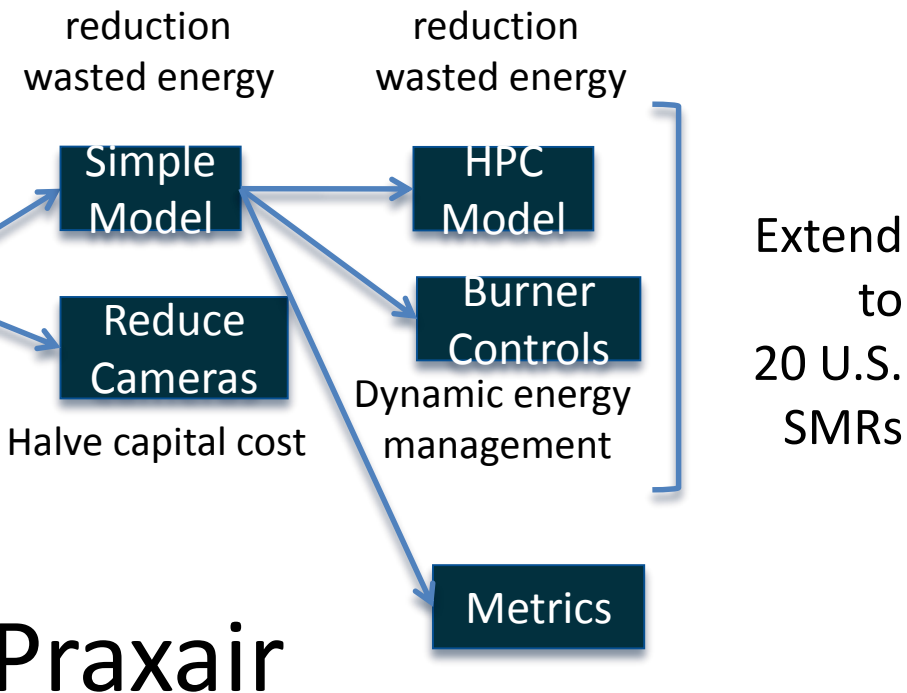


Intensification through Measurement & Operational Integration

First Steam Methane Reformer Furnace Port Arthur, TX

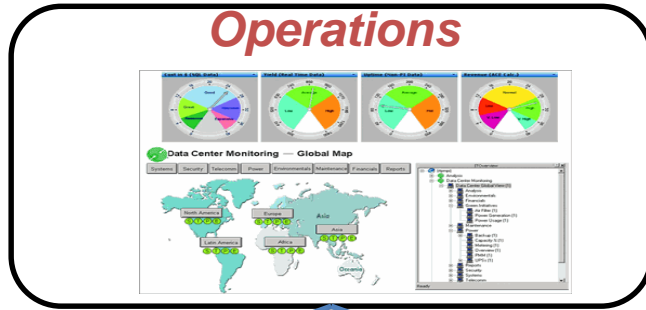


- Already efficient
- Distributed sensing
- Distributed actuation (96 burners)
- High fidelity model & reduced order models



Praxair

Business Virtual Enterprise & Distributed Asset Modularization

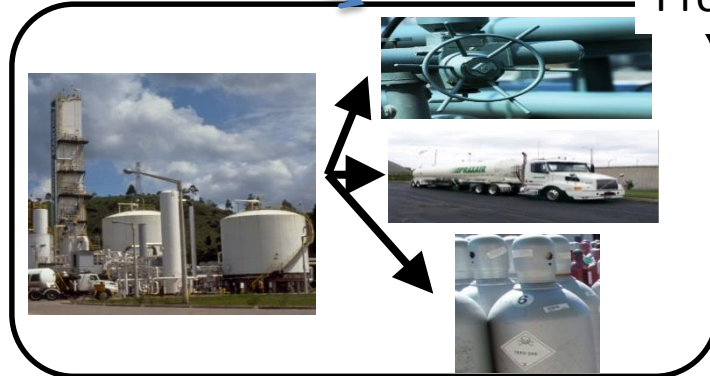
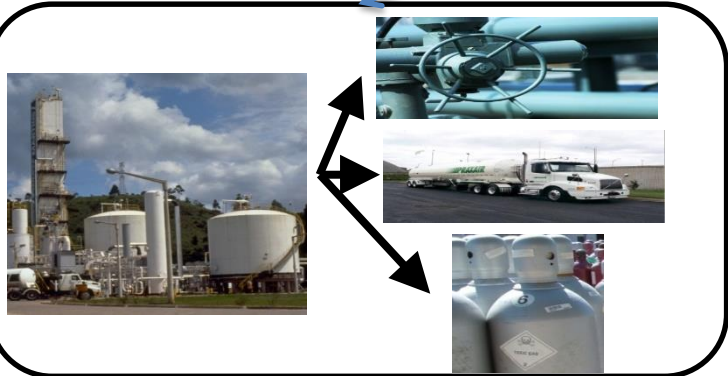


Enterprise thinking: virtual enterprise model that incorporates physical assets as components to execute production

Port Arthur TX

2nd Location

Customers
Production on Demand



-  Steel
-  Energy
-  Bio/Pharma
-  Electronics
-  Healthcare

Production and Delivery

Production and Delivery



Infrastructure for Data and Model Based Operational Intensification, Modularization & Optimization



Market based SM Platform

SMART MANUFACTURING PLATFORM MARKETPLACE

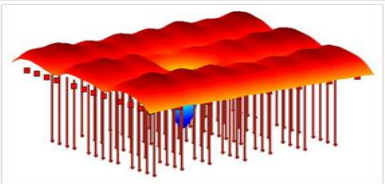
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App Store My Apps My Workflows

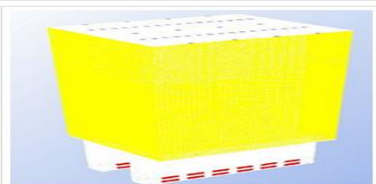
Available Apps

Build Workflow

Upload App




EC-SMR Furnace Model



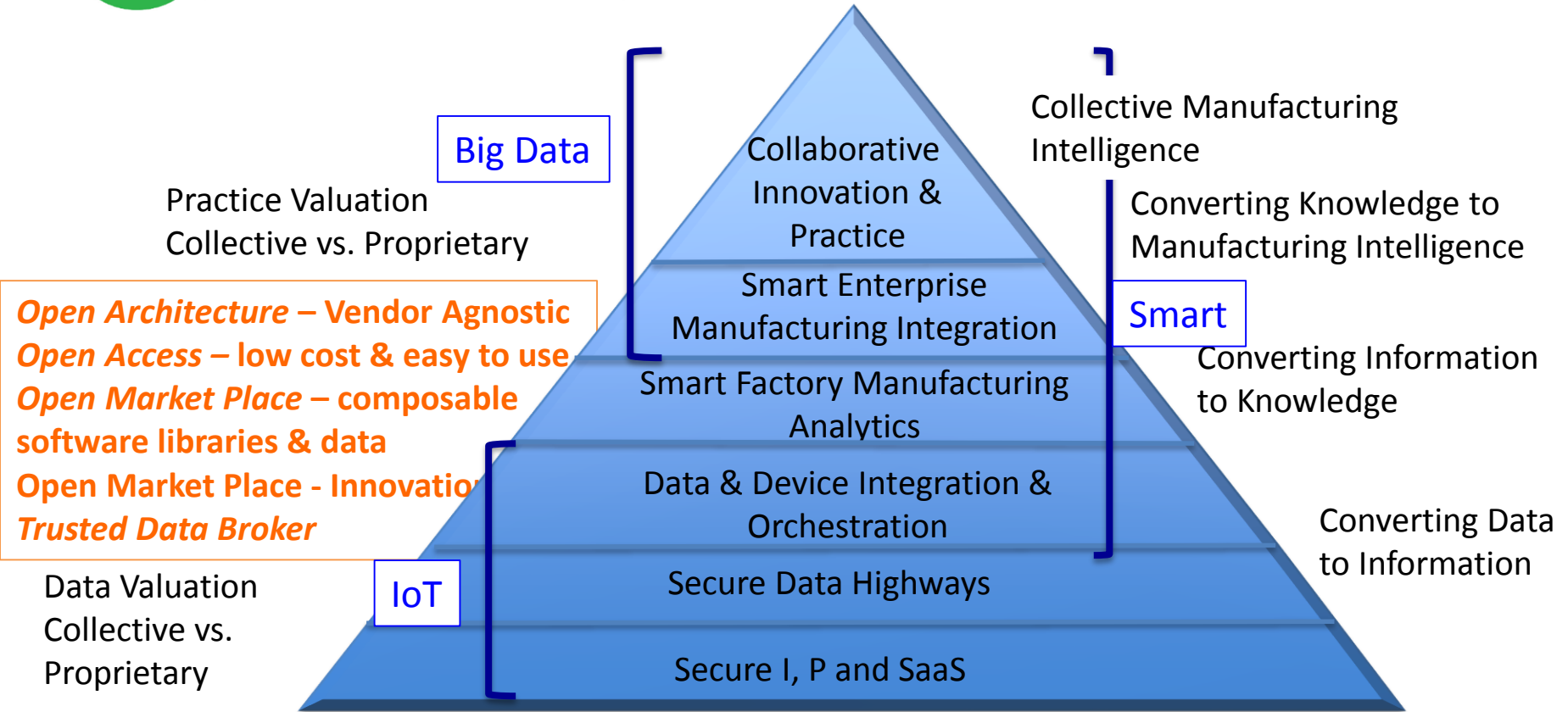
Furnace CFD Model

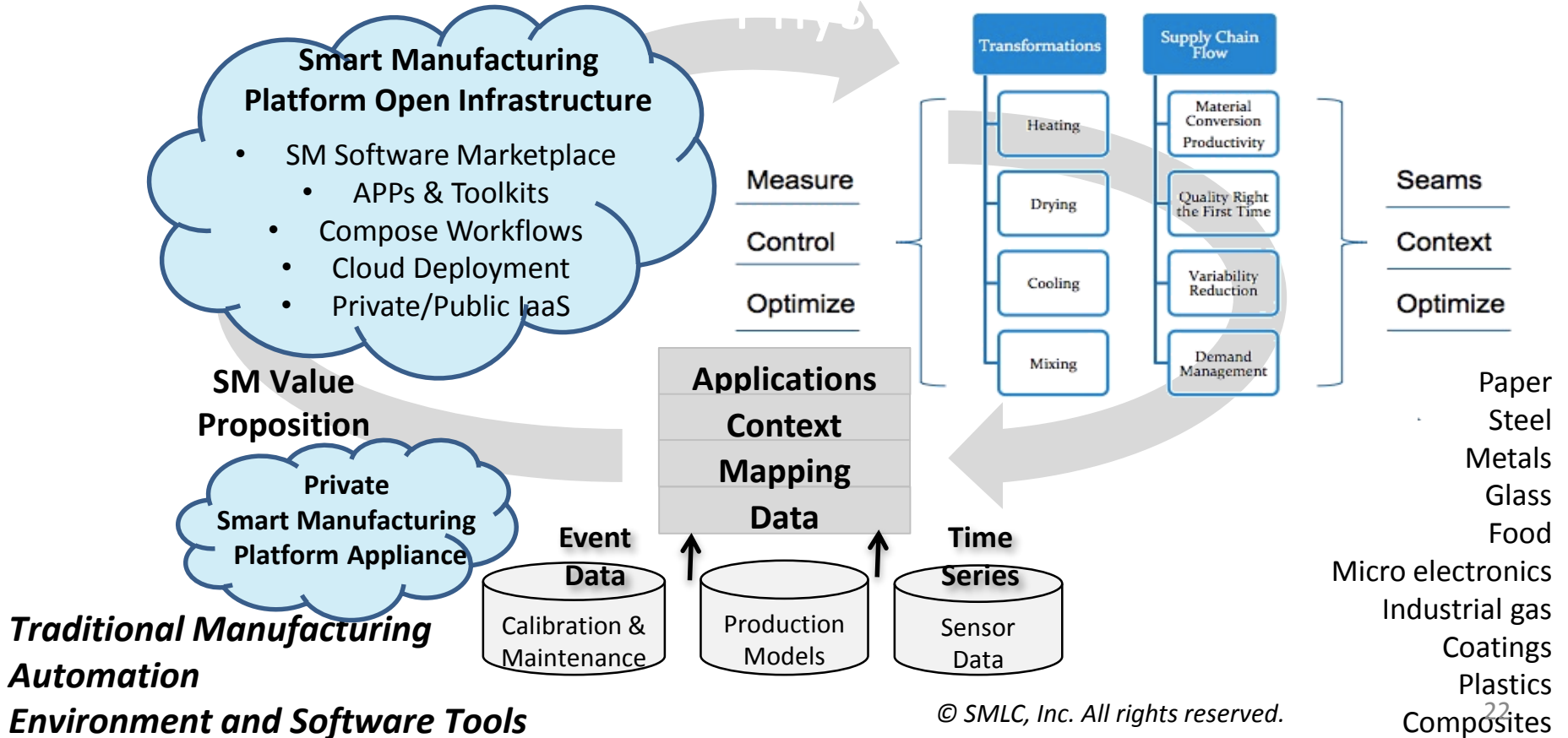
- Properties
- Customize
- User Manual



Furnace Balancing Solution

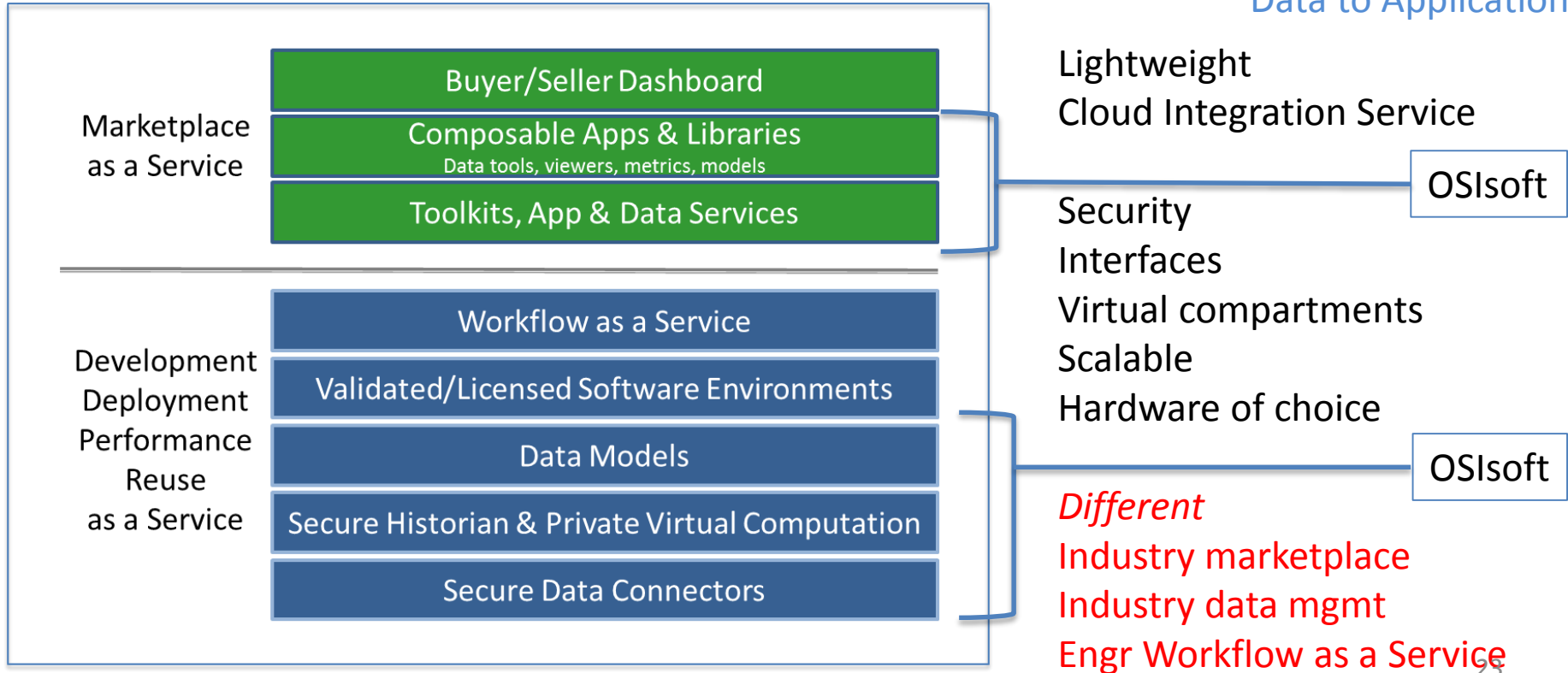
- Certified app ‘configurations’
- Compose and reuse
- IoS for manufacturing
- DevOps for manufacturing
- Data to Applications
- Trusted Data, Marketplace, End-to-end State Services





Build a SM Reference Model

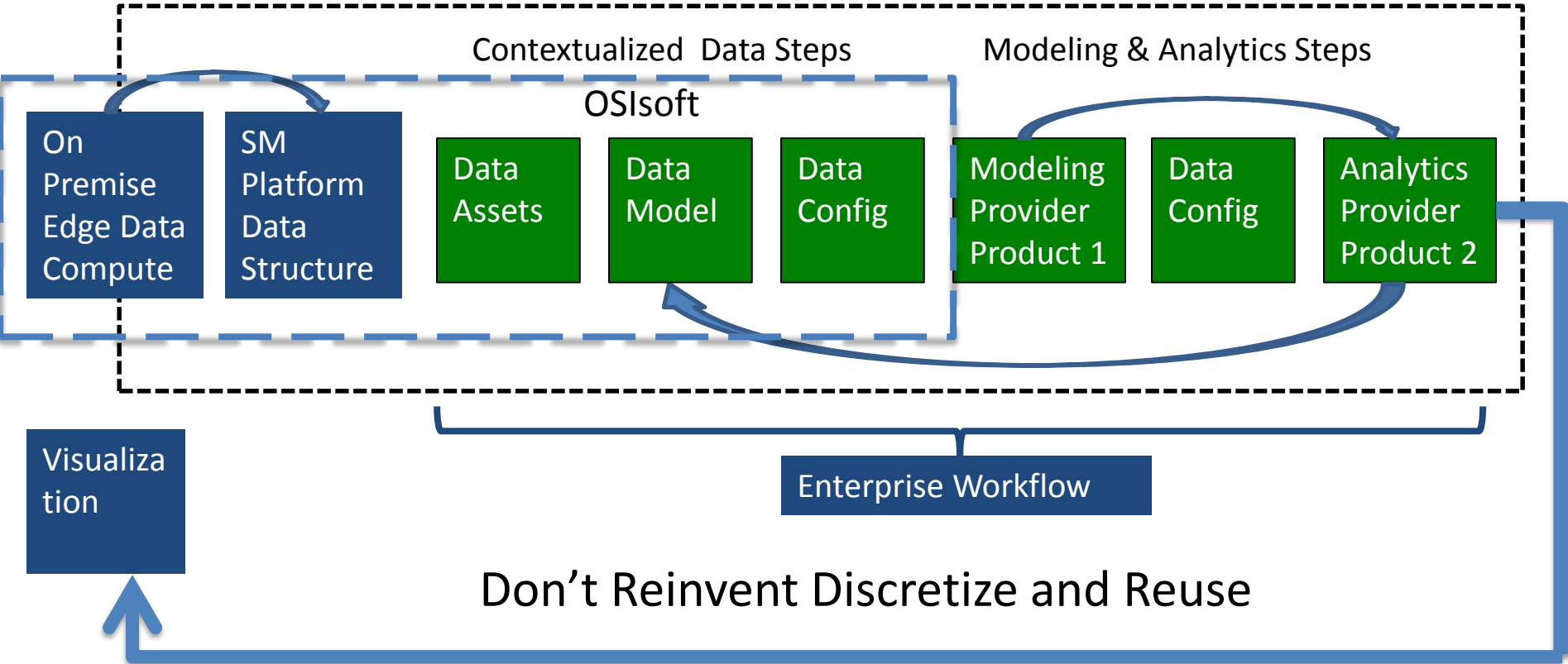
Bridging Seams Extending the Real Time Infrastructure
 Data to Applications



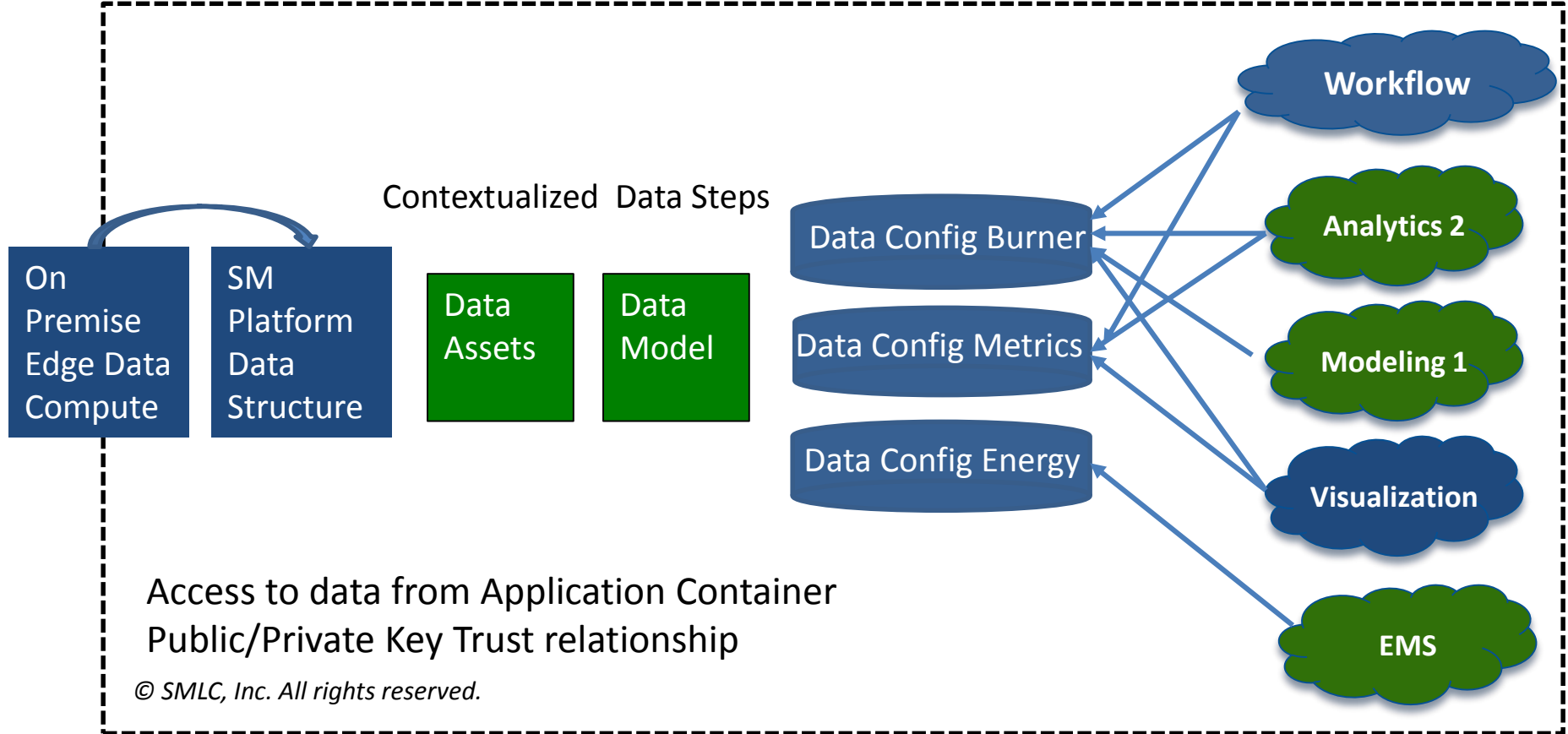
Span Heterogeneous Environment

On-premise – Off Premise – On Premise

Maintain State



Spin Up Multiple Projects Reuse Data & Application Configurations





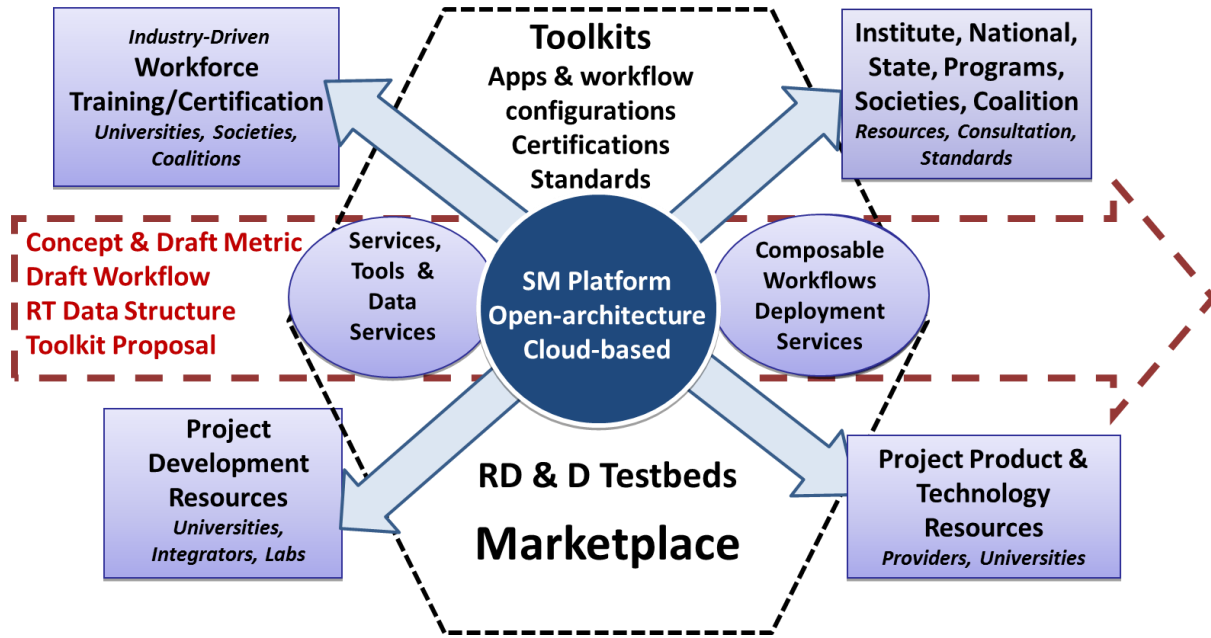
How Do We Build a Project Partnership



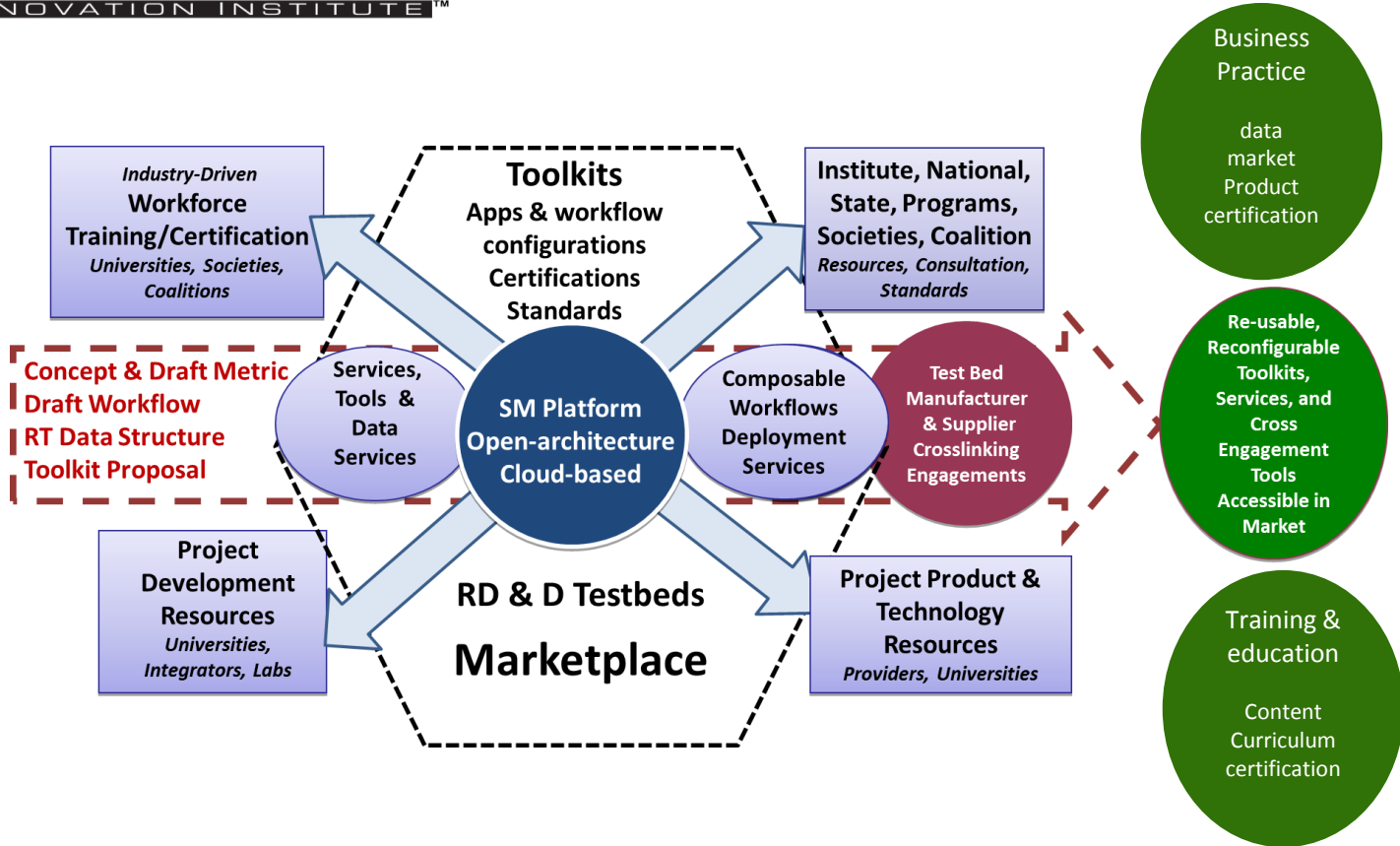
Fullen View Leadership Footer

March 31, 2017

Industry Driven Test Bed Project Partnership

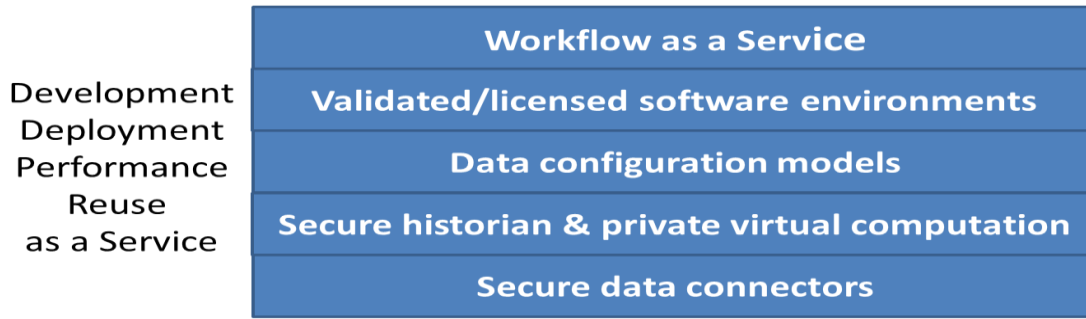


Industry Driven Test Bed Project Partnership



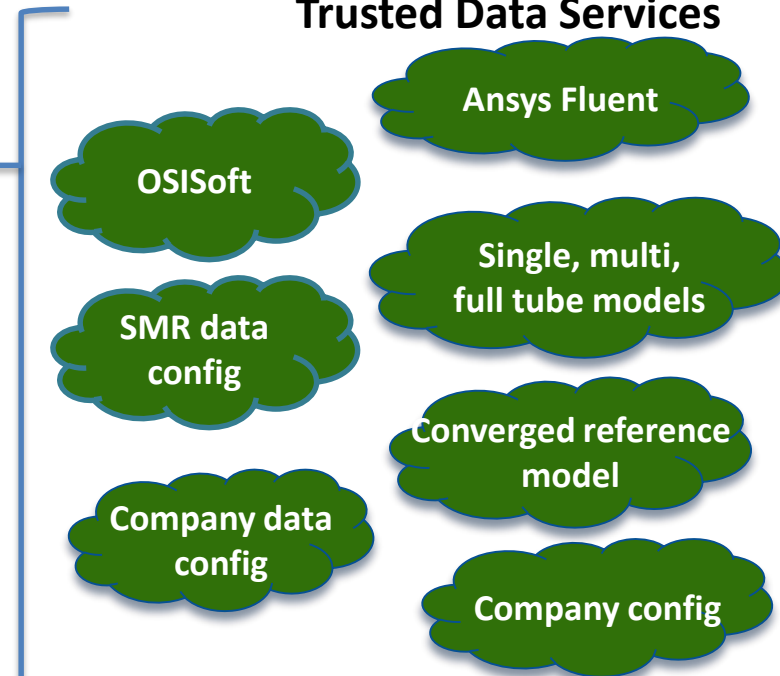
Build a Marketplace

Reusable Configurations
 Core Deployment Services
 Trusted Data Services



Cloud Integration Services

Security; Machine & Human Interfaces;
 Virtual Compartments; Interoperability; Standards



Industry Marketplace;
 Reusable Configurations;



Putting My University Hat On?



Fullen View Leadership Footer

March 31, 2017

- UCLA interests
 - Research funding reallocated to institutes like this one
 - Public private partnership
 - Value of data and algorithms
 - Tech transfer
 - Test, evaluate and productize University IP
 - Commercial data with which to develop university IP
 - New pathways to productization
 - Researcher/capabilities discovery and cross linking
 - Integrated infrastructure
 - Training, education and STEM in data, analytics, and data sciences
 - Integration of research universities, CSUs and CCCs
 - Public mission around economic development, energy productivity and environmental sustainability

- Academic Interests
 - Not a Grant; Industry Driven
 - The value of real data
 - Requires inverse thinking
 - Connecting TRL 1 – 3 to TRL 4 - 7
 - Expertise on problems and data
 - Training and education in data analytics and sciences
 - Platform for training
 - Spin off research and development projects
 - Implementing new academic infrastructure
 - Faculty and students participating in projects
 - Avenue for tech transfer
 - Avenue for great student and faculty involvement
 - Access to real world problems

Smart Manufacturing Reinvestment Potential

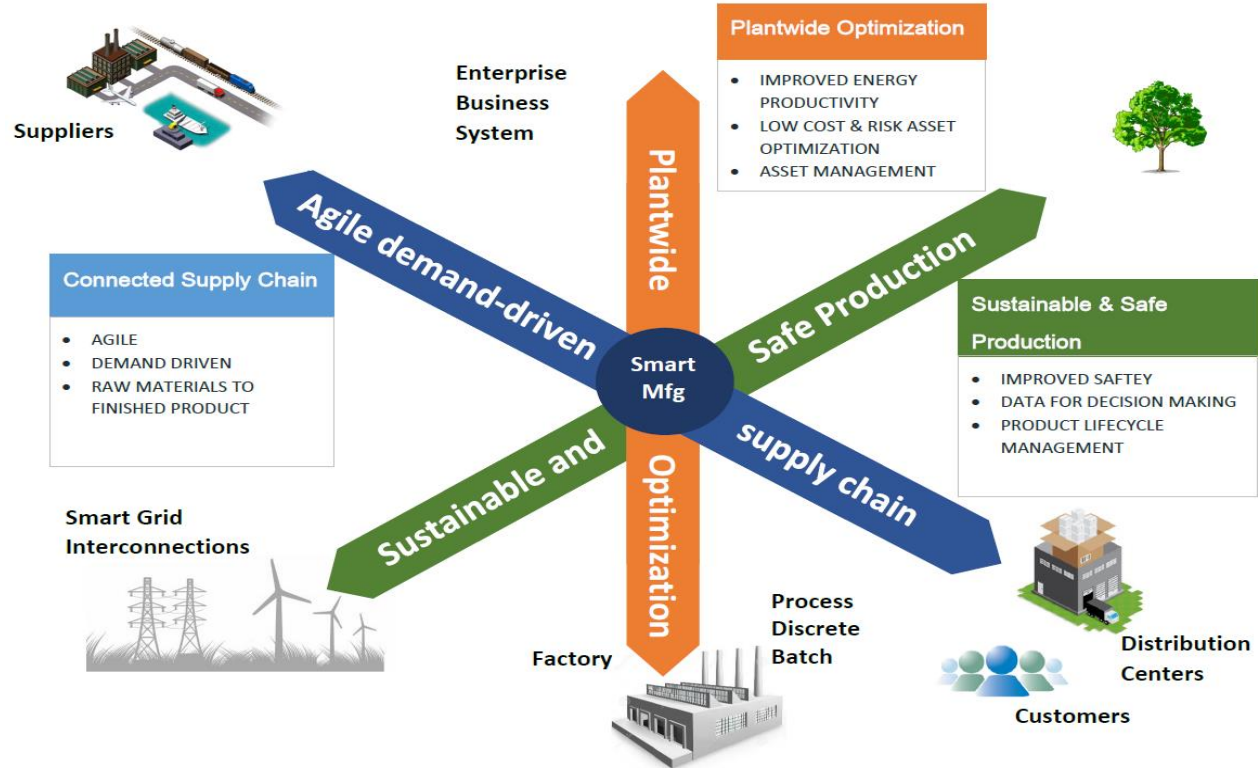
A Comprehensive Approach to Manufacturing

At the Intersection

- Workforce Productivity
- Business & Product Agility
- Supply Chain Agility & Optimization
- Asset Management and Risk
- Product Lifecycle
- Energy & Material Productivity
- Environment, Sustainability & Safety

Next Generation IT for Next Generation Manufacturing

- Make Data a Key Asset
- Advanced Real-Time Sensing, Controls, Platform and Modeling



Contact Information

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CTO/CIO

CESMII



감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado