

Agenda and Prospectus

NIST Smart Manufacturing Workshop April 18-19, 2016

SM apps and service marketplaces

Abstract:

SM apps and service marketplaces: Chair – Dr. Jim Davis, SMLC/UCLA (jdavis@oit.ucla.edu), Co-chair – Dr. Thorsten Wuest, WVU (thwuest@mail.wvu.edu). The session is interested in exploring the potential of SM apps and service marketplaces. The aim is to work toward a shared, secure, open-access infrastructure rich in functionality for easier system integration and composability and a marketplace that can drive technological capability beyond just products by integrating services on standards, uncertainty quantification, benchmarking, performance-use metrics, systems modeling, and many more. A special focus will be on current technological and other challenges as well as requirements from the stakeholders' (e.g., designers, providers & users) perspective.

Objective:

The objective of this 'SM apps and service marketplaces' breakout session of the NIST SM workshop is to bring together experts from industry, academia government to discuss current and future issues around the development, design and use of smart manufacturing apps and associated marketplaces providing access to these apps, information about their deployment and infrastructure for ready systems integration. Due to the novelty of the topic. the diversity of the applications and the extensive potential for information and supporting services, the workshop is designed open with an emphasis to bring together a comprehensive, yet stimulating group of individuals that will ensure that the topic will be discussed from various perspectives.

Workshop structure:

The workshop is designed around four moderated panel discussions of a small group of experts (10-12) from industry (users & service providers) and academia. The envisaged panels are:

1. *Functions, components and requirements of a Smart Manufacturing (app) marketplace*
(April 18th, afternoon session 1)
In this panel, the group will discuss the questions 'What constitutes a marketplace?', 'What essential components have to be included to achieve acceptance?' and 'Are there specific applications that are universally sought after in Smart Manufacturing?'
2. *Systems perspective within a SM marketplace*
(April 18th, afternoon session 2)
The importance and facets of the system connecting the individual service offerings of the marketplace will be discussed in this panel. This includes not only the market place as systems integrator but also useful services supporting the resulting integrated system. Differences for small, medium and large manufacturers also need to be accounted for including the needed (or desired) level of system level structure and emphasis of current marketplaces as well as the future development will be investigated in the discussion.
3. *Challenges and barriers of a SM marketplace*
(April 19th, morning session 3)

Building upon the previous two panels, the individual and systems level of a SM marketplaces, this panel focuses on the current and future challenges and barriers for a) users, b) developers and c) (service) providers. The identified challenges and barriers will be discussed and clustered, e.g., individual/system, current/future etc., to allow for a comprehensive overview.

4. *Standards – essential for widespread Smart Manufacturing adaptation?*
(April 19th, morning session 4)

In this panel, the importance of standards at a number of layers will be identified and discussed reflecting on the results of the previous panels. For example, what is required regarding standards for an individual (app) and systems configuration for composability? What standards are needed for multivendor interoperability? What standards are needed for a marketplace functionally? What standards are needed from an IT perspective including data connectivity, security, etc.? What standards are needed for interfacing with factory operations both machine and human and are there differences for small, medium and large manufacturers? What standards need to be market driven themselves.

Outcome:

The individual outcomes for each of the panels are summarized below:

- (1) Definition of the full scope of a successful SM app marketplace
- (2) Role of being able to drive behaviors, technologies and/or standards – what are desired and undesired outcomes of a Marketplace
- (3) Open issues (current/future), challenges and opportunities from the perspective of provider, user and research communities; existing research needs, knowledge gaps.
- (4) A better understanding of the need for standards for the Marketplace to work (Are there alternatives?) and the current status regarding available standards (industry/academia).
- (5) Outlook on the future development of a Smart Manufacturing marketplace

When the outcomes of the individual panel discussions are combined, there is an expectation of a consensus regarding the full scope of the market place, what is can drive, where there can be role conflicts and how to make it work. The intention is to summarize the findings in a state of the art / roadmap paper (depending on the outcome).

1. Panel 1 Functions, components and requirements of a Smart Manufacturing (app) marketplace

Ken Currie (WVU), Dave Kuhn (Corning), Denise Swink (SMLC); Shashank Priya (VT)

2. Panel 2 Systems perspective within a SM marketplace

Luca Berticelli (UTRC), Klaus-Dieter Thoben (Uni-bremen), Ming Leu (MST); Arquimedes Canedo (Siemens)

3. Panel 3 Challenges and barriers of a SM marketplace

Scott McWhorter (SRNL), Craig Dory (RPI), Yunsu Lee (Samsung); Mike Yost (MESA)

4. Panel 4 Standards – essential for widespread Smart Manufacturing adaptation

Filipe Lopez (NIST), Bob Graybill (Nimbis), Frank Riddick (NIST), Jim Barkley (DMDII),

Agenda:

Monday, April 18th, Afternoon session:

- **Welcome & Introduction** (1:30 – 1:45 pm)
 - Topical introduction SM App marketplace
 - Agenda items and organization

- **Panel 1 - Functions, components and requirements of a Smart Manufacturing (app) marketplace** (1:45 – 2:55 pm)
 - Panelists: *Ken Currie (WVU); Dave Kuhn (Corning); Denise Swink (SMLC); Shashank Priya (VT);*
 - Panelist statements (ca. 5 min each - 25 min total)
 - Panel discussion (30 min)
 - Brief summary of main results by each of the panelists (ca. 15 min)

- **Panel 2 - Systems perspective within a SM marketplace** (3:00 – 4:10pm)
 - Panelists: *Luca Bertuelli (UTRC); Klaus-Dieter Thoben (Uni Bremen/BIBA); Ming Leu (MST); Arquimedes Canedo (Siemens)*
 - Panelist statements (ca. 5 min each - 25 min total)
 - Panel discussion (30 min)
 - Brief summary of main results by each of the panelists (ca. 15 min)

- **Panel 3 - Challenges within a SM marketplace** (4:15 – 5:25 pm)
 - Panelists: *Scott McWorther (SRNL); Craig Dory (RPI); Yunsu Lee (Samsung); Mike Yost (MESA)*
 - Panelist statements (ca. 5 min each - 25 min total)
 - Panel discussion (30 min)
 - Brief summary of main results by each of the panelists (ca. 15 min)

Tuesday, April 19th, Morning session

- **Recap Panels 1-3** (8:30 – 8:45 am)
 - Topical introduction SM App marketplace
 - Agenda items and organization

- **Panel 4 - Standards - essential for widespread Smart Manufacturing adaptation?** (8:50 – 10:00 am)
Panelists: *Filipe Lopez (NIST); Bob Graybill (Nimbus); Frank Riddick (NIST); Jim Barkley (DMDII);*
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 - Panelist statements (ca. 5 min each - 25 min total)
 - Panel discussion (30 min)
 - Brief summary of main results by each of the panelists (ca. 15 min)

- **Summary session & Outlook** (10:05 – 10:30 am)
 - Summary of main findings of the workshop and Outlook (ca. 10 min)

- Q & A / remarks on the results (ca. 20 min)

Administrative:

The sessions will be recorded in order to being able to summarize the results correctly in the aftermath. However, the records will not be released (only the chairs will have access) and subsequently deleted after the summary is completed. If someone has objections regarding the recording, please contact the chairs prior to the session.