



Proposal of Smart Manufacturing Framework guideline (Garis Panduan)



Disahkan Oleh:



Dr. Mazlina Shafi'i
Timbalan Pengarah

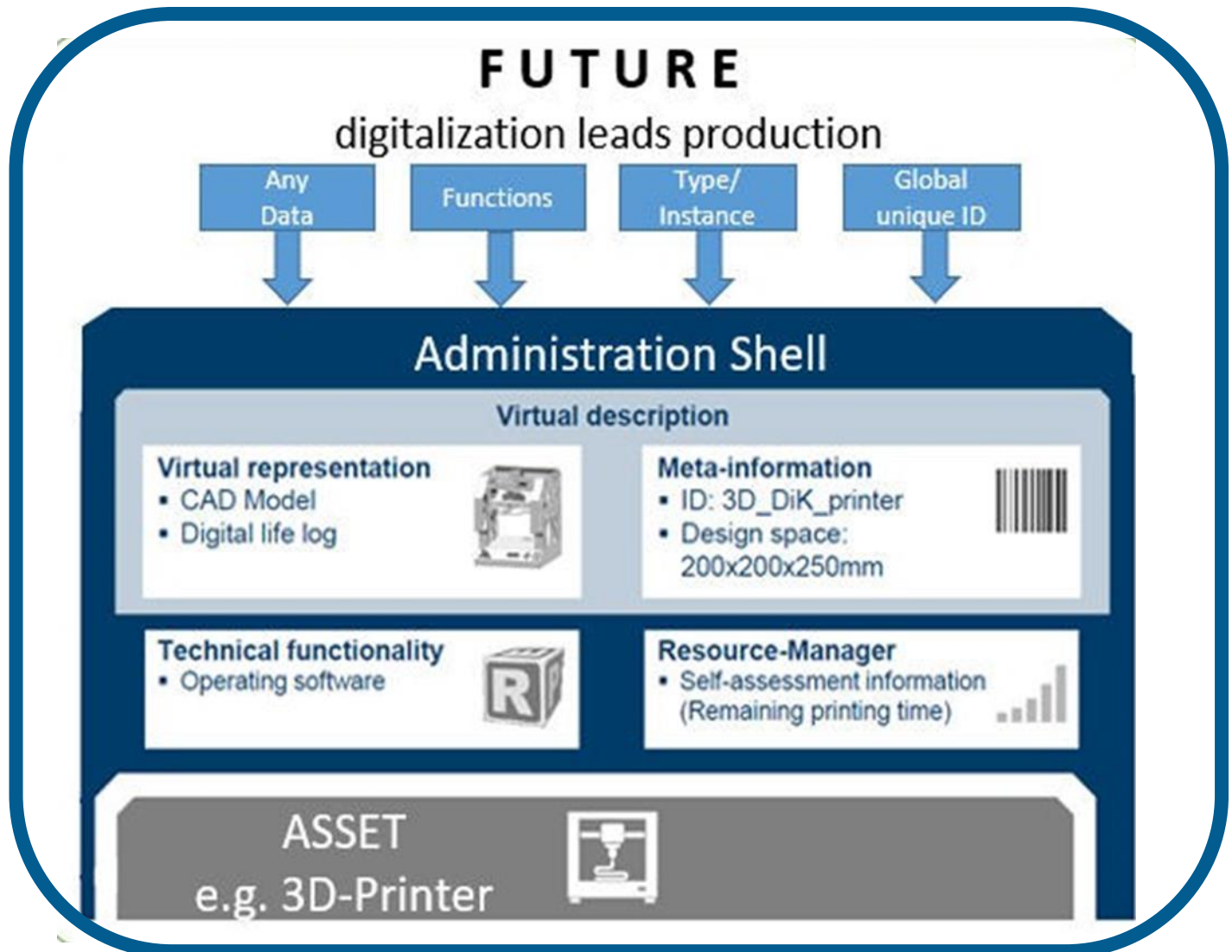
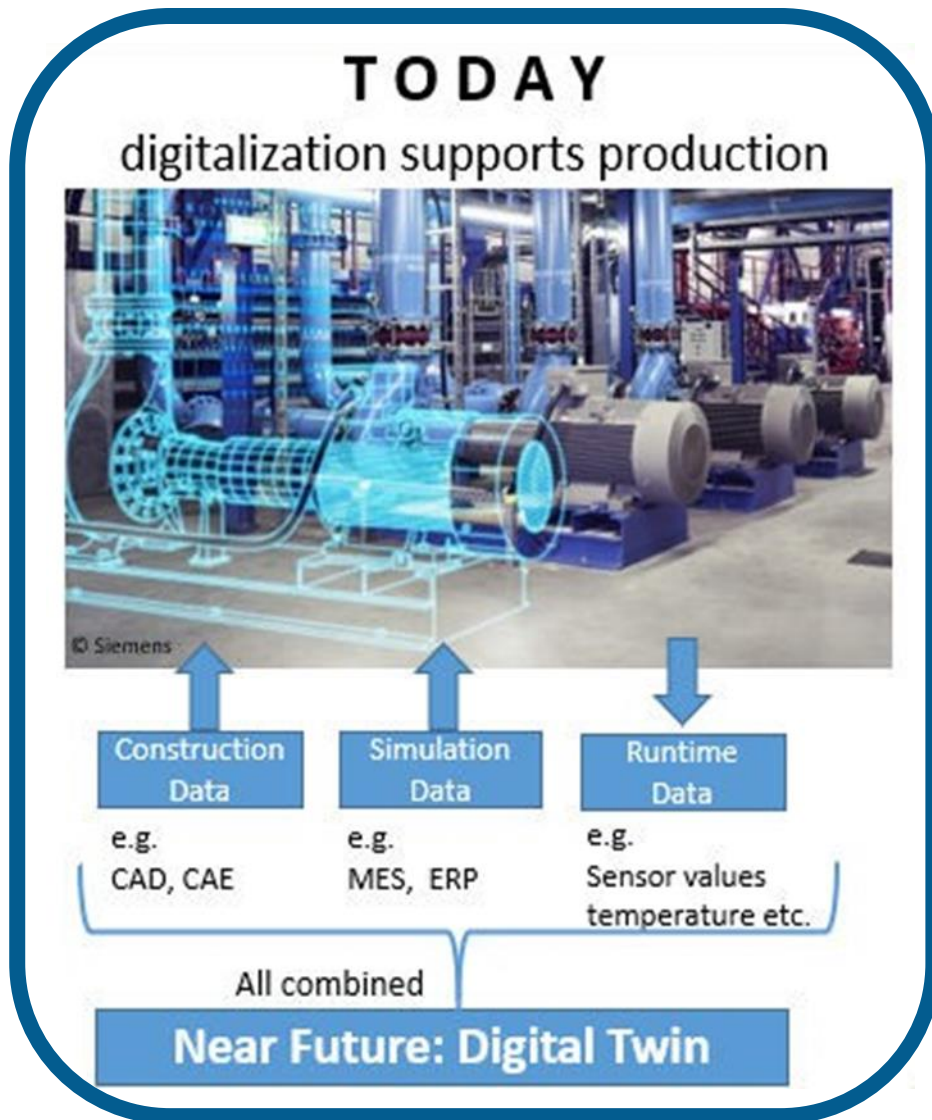


What is Smart Manufacturing ???

Related Technology ??

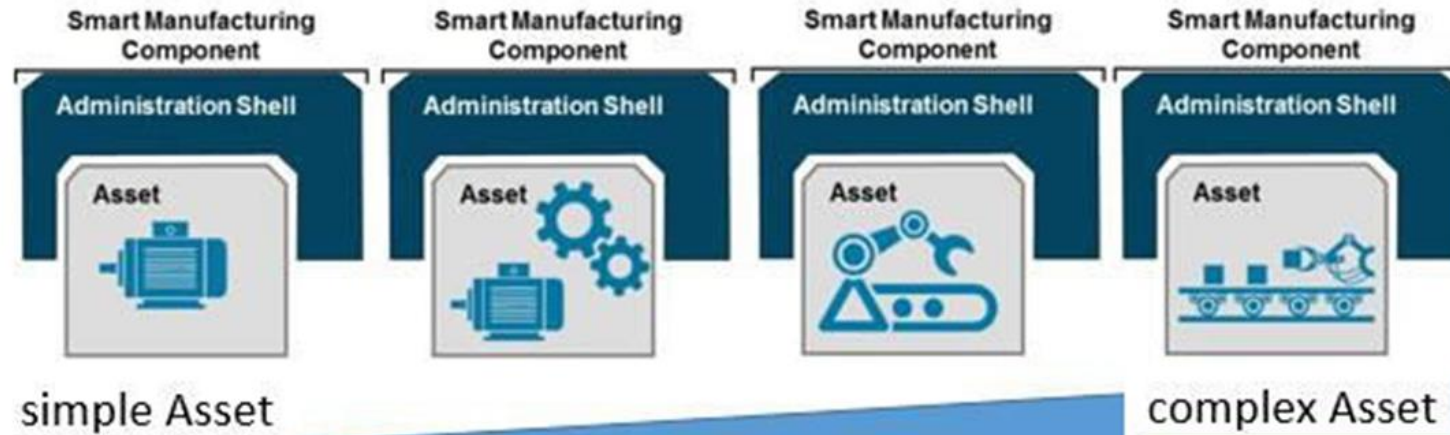
Got Guideline ??

Smart Manufacturing Framework guideline (Garis Panduan) as a architecture & related technology and functions for smart manufacturing



Smart Manufacturing Framework guideline (Garis Panduan) as a document reference of architecture & related technology and functions for smart manufacturing

As a flexible framework able to address all assets ...



... able to consider a vendor independent complexity, as a composition of Assets...



What is Smart Manufacturing?

JWG21-TR-SMRM-N05-v14_2018-09-19

Technical Report: Smart Manufacturing Reference Model(s)

CONTENTS

1	Introduction	5
2	Normative References	6
3	Terms and definitions, abbreviations and acronyms	6
3.1	Definition of smart manufacturing	6
3.2	Terms and definitions for JWG21	7
3.3	Methodology for term and definition selection	10
3.4	Abbreviations and acronyms	10

"Set of methodologies and technologies for making goods and providing services with manufacturing systems that are designed with learning capability and operated based on product/service requirements so that it can respond in real time to meet changing demands and conditions in the factory, in the supply network and in customer needs, and can improve itself continuously."

"This is obtained by the intensive use of digital technology (including IoT) to integrate products, production systems and business activities through their life cycles and value chains, and increasing decentralized decision making."

"Manufacturing that improves its performance aspects with integrated and intelligent use of processes and resources in cyber, physical and human spheres to create and deliver products and services, which also collaborates with other domains within an enterprise's value chains."

Note 1: Performance aspects include agility, efficiency, safety, security, sustainability or any other performance indicators identified by the enterprise."

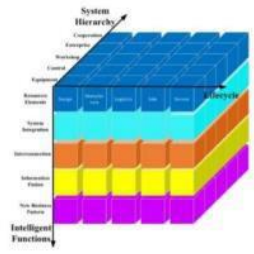
Note 2: In addition to manufacturing, other enterprise domains can include engineering, logistics, marketing, procurement, sales or any other domains identified by the enterprise."

"Smart manufacturing is extending manufacturing. It is characterized by independent actors sharing standardized information. The actors can pro-actively and re-actively act upon the information. The actors collaborate dynamically in network structures. This collaboration occurs among and within lifecycles, on both strategic and operational levels, providing added value for organizations. The scope is to develop a reference architecture for smart manufacturing."

Note: examples of actors are companies, products, assets, processes and parts."

Related Standards for smart manufacturing

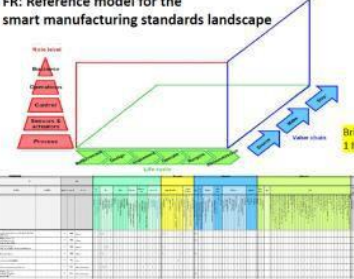
IEC TC65 & ISO TC184 JWG21
CN: Intelligent Manufacturing System Architecture



Ding Lu
1 hour

China

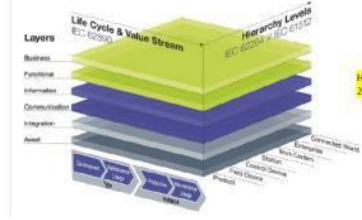
IEC TC65 & ISO TC184 JWG21
FR: Reference model for the smart manufacturing standards landscape



Strat
1 hour

France

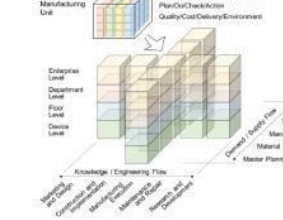
IEC TC65 & ISO TC184 JWG21
GE: IEC/PAS
Reference Architecture Model Industry 4.0 (RAMI4.0)



Hoffmeister
2 hours

Germany

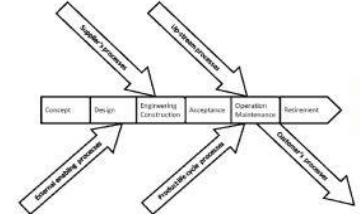
IEC TC65 & ISO TC184 JWG21
JP: Industrial value chain reference architecture (IVRA)



Ogura
1 hour

Japan

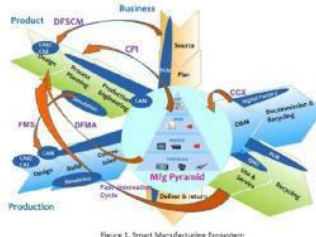
IEC TC65 & ISO TC184 JWG21
JP: A proposal of Smart Manufacturing reference model



Yoru (Kp)
1 hour

Japan

IEC TC65 & ISO TC184 JWG21
US: NIST: Smart Manufacturing Systems: Standards Landscape & Reference Models



Yan Li
1 hour

USA

IEC TC65 & ISO TC184 JWG21
SE: Thomas Lundholm 2017-07-05

I could briefly present some smart manufacturing results from and initiatives in Sweden regarding:

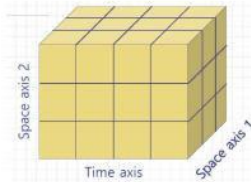
- LISA (line information system architecture)
- tweeting machine
- the Engineering innovation factory
- model-driven process and quality planning
- digital twins for efficient tool usage in manufacturing
- digital manufacturing infrastructure
- Swedish/German testbed for smart manufacturing.

Lundholm, Johansson
1 hour

Sweden

IEC TC65 & ISO TC184 JWG21
KR: Soonhung Han

- RAMI 4.0 + simplification proposal



Soonhung Han
1 hour

Korea

IEC TC65 & ISO TC184 JWG21
US: Dan Carnahan

- Enterprise Reference Architectures (ISO 15704 - Requirements for Enterprise reference architectures and methodologies)
- Enterprise-Control Models (IEC [ISO] 62264 - Enterprise-Control System Integration)
- Key Performance Indicators (ISO 22800 Manufacturing Operations Management - Key Performance Indicators)
- Open Technical Dictionaries (ISO 29002 - Exchange of Characteristic Data)
- Data Quality (ISO 8000)
- Open technical dictionaries (ISO 22743 - Application to Exchange of Master data)
- Oil & Gas Industry Interoperability (ISO/TC 184/WG 6, Project ISO 18101 - Automation systems and integration - Oil and Gas Interoperability)
- Other relevant ISO/TC 184/SC 5 standards

Dan Carnahan
1 hour

ISO Standards

IEC TC65 & ISO TC184 JWG21
US: Richard Martin

- Attached are:
- 1) a list of eight (8) questions regarding the JWG21 Terms of Reference (Several are naively stated to make sure I understand the intent of the JWG21 effort while others seek to clarify the guidance the Terms of Reference are to provide).
- 2) a spreadsheet based upon ISO 15704 - Requirements for enterprise-reference architecture and methodologies, with an assessment of several documents against conformance with ISO 15704, and
- 3) several articles highlighting aspects of the "smart manufacturing" concept.
- And some documents regarding smart manufacturing

No presentation planned

ISO 15704

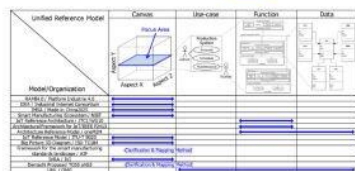
IEC TC65 & ISO TC184 JWG21
CA: Wally Leonard

- currently I have no issues, other than a few concerns that I am hopeful will be addressed by the forthcoming information package... these concerns stem from my initial take on the direction set by the ISO strategic business plan which defines a basis for manufacturing, smart automation and smart manufacturing as a means to extend the enterprise capabilities of a manufacturing organization... at the enterprise level, there are well defined principles and requirements to guide the development of enterprise reference architecture and use of methodologies... it bears my experience, that reference models do not become technical rather they break down the concepts of the enterprise into functional components enough to highlight the functional and cross-functional integration points where information flows must be managed to protect the integrity of critical data thru its life-cycle
- finally and most importantly, enterprise reference models provide direction to refine critical integration points to develop information transformations need/requirements that will maintain the asset, operations and maintenance interoperability...
- below, I highlight a complete list of the ISO standards that represent what I just summarized for your consideration.
- ISO N1749 -- business plan establishes the strategic needs and requirements of the ISO/TC 184 business environment
- ISO 15704 -- industrial automation systems, requirements for enterprise reference architecture and methodologies defines the key principles, design considerations and approaches to developing reference architectures/models
- ISO 15926 -- industrial automation systems and integration -- integration of life-cycle data for process plants including oil and gas production facilities
- ISO 18101 -- Oil and Gas asset management and operations and maintenance interoperability (OSI)

Wally Leonard
1 hour

Canada

IEC TC65 & ISO TC184 JWG21
• Canvas from JP



Nonaka
1 hour

Japan

**Smart Manufacturing Framework
Guideline
(2021)**



1、Overall Requirement

- ☐ Guiding ideology
- ☐ Basic principle

2、Construction ideas

- ☐ system structure
- ☐ Standard architecture diagram
- ☐ Standard system framework



**4.Organization and
implementation**

- ☐ Standardization Working Group
- ☐ Dynamic update mechanism

3、Construction Content

- ☐ Basic common standards
- ☐ Key technical standards



TERIMA
KASIH

*thank
you*

DigitalTC

Digital Transformation Consulting