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# Advanced manufacturing and Smart factory applications in Korea

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**Embedded SW PD**

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산업통상자원부  
MINISTRY OF TRADE, INDUSTRY & ENERGY  
MOTIE

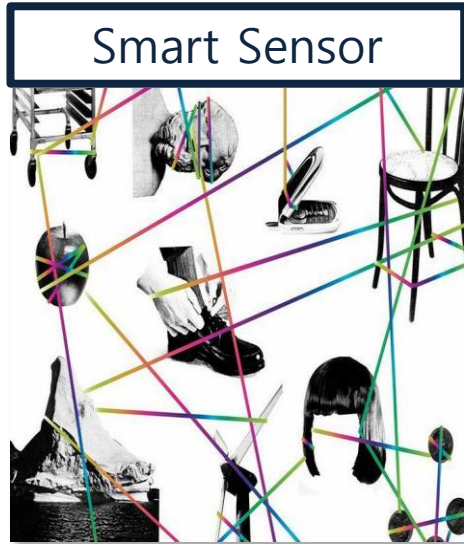


## MI 3.0

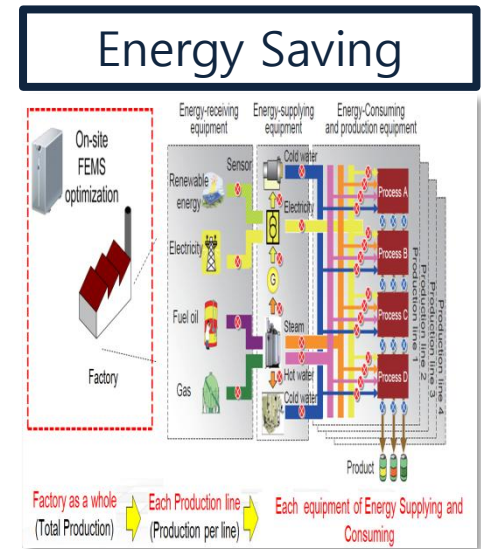
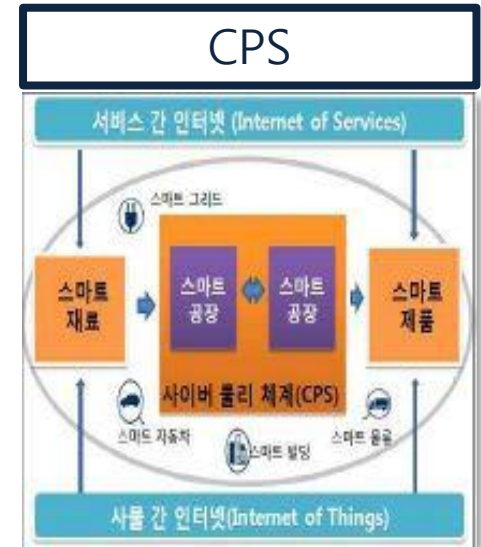
Korea has launched **smart factory initiatives** in 2014, the Strategy for **Manufacturing Innovation 3.0 (MI 3.0)** by the Ministry of Trade, Industry and Energy (MOTIE). The MI 3.0 aims at developing smart manufacturing technologies and facilitating evolution to smart factories **with key ICT technologies** such as IoT, Big Data and Cloud Computing.

- MOTIE defined the **MI 1.0** as pursuing mass production based on a physical factory from 1980 to 1999 in Korea
- The **MI 2.0** as pursuing a value production and service provisioning based on ICT via virtual spaces from 2000 to 2013
- And the **MI 3.0** as facilitating **creative economies** by integration between on/off-line and the industrial IoT, where the MI 3.0 is the national agenda to realize the Smart Factory.

# Development of 8 Smart Technologies<sup>1</sup>



## Production System Innovation





# Development of 8 Smart Technologies<sup>2</sup>



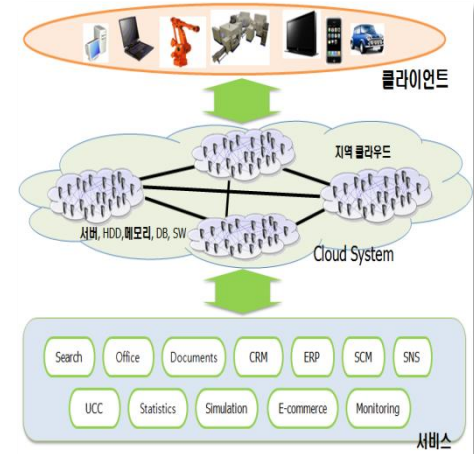
IoT



Big Data



Cloud



Hologram



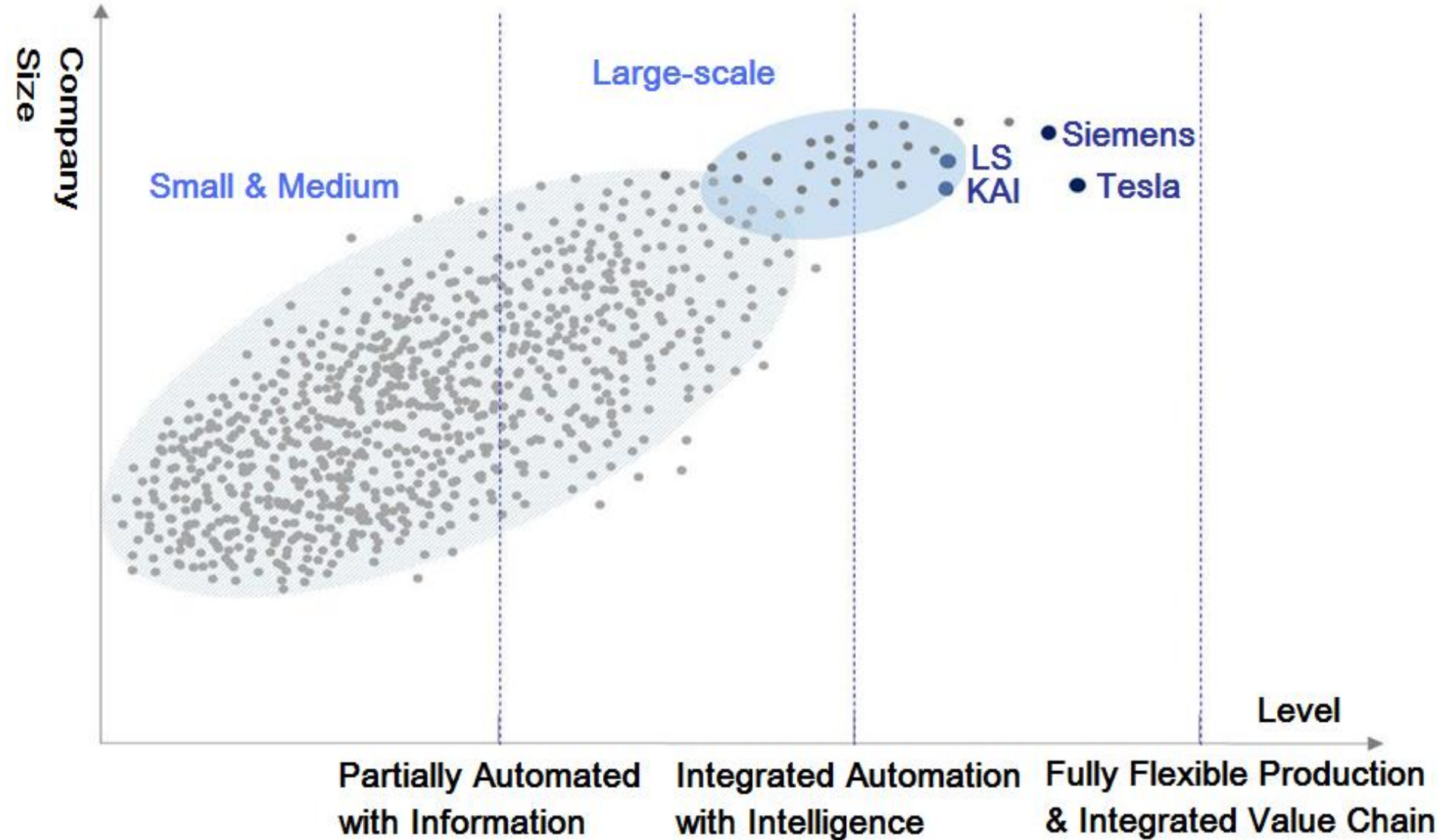
## ICT Innovation

# Levels of the Smart Factory



<b>Level</b>	<b>Description</b>
<b>Basic</b>	Automation of sub-processes using barcodes, RFIDs, etc.
<b>Intermediate-1</b>	Real-time management of manufacturing processes using IT technologies such as sensors and the Internet
<b>Intermediate-2</b>	Real-time automatic management of factory using IT and embedded SW technologies
<b>Advanced</b>	Customized and flexible manufacturing using IoT and CPS

# Current States of our Factories



## For Small and Medium Factories

Level	Description	Remark
<b>No ICT</b>	Operated and managed by hand and paper	Mass Production
<b>Basic</b>	Automation of sub-processes using barcodes, RFIDs, etc.	Existing ICT
<b>Intermediate -1/2</b>	Real-time automatic management of factory using IoT, Big Data, Cloud and Embedded SW technologies	Advanced ICT and Embedded SW
<b>Advanced</b>	Customized and flexible manufacturing using IoT and CPS	Goal

1<sup>st</sup> Stage Propagation 

2<sup>nd</sup> Stage Propagation 

3<sup>rd</sup> Stage Propagation 

 R&D for 2<sup>nd</sup> Stage Propagation: '15~'17     R&D for 3<sup>rd</sup> Stage Propagation: '18~'20



# R&D Categories



Category		R&D themes (examples)
<b>Operations Management (SW)</b>	Process Design & Quality Analysis	Quality analysis with production data analysis, Process design verification solutions, etc.
	Manufacturing Execution & Equipment Maintenance	Tracking management of products and materials, Manufacturing Execution Optimization Solutions, etc.
	Manufacturing Services	Web-based open manufacturing technology for personalized production, etc.
<b>Factory Automation (HW)</b>	Sensors and Networking	Data collection/processing, Multifunctional Universal Sensors, Highly reliable wireless devices, etc.
	Controllers etc.	Highly reliable & multifunctional controller, etc.





## Goal

**Advanced Development for Spreading Smart Factory**

## Direction

- ① Developing Smart Factory technologies that can be **applicable immediately to the sites**
- ② Making **Model Factories** in order to spread throughout the industry
- ③ Parallel **development of key technologies** for mid- to long-term sustainable advancement of Smart Factory



## **Establishing a Co-Roadmap for MI 3.0 with MSIP** **Setting-up a R&BD Strategy for Smart Factory**

- Finish the first MoTIE's strategy report in Jun, 2015

## **Creating a Smart Factory Technical Roadmap**

- Build-up the roadmap V1.0 in Jul, 2015
- Plan to be updated continuously
- Updating the R&BD Strategy and the Technical Roadmap Now!

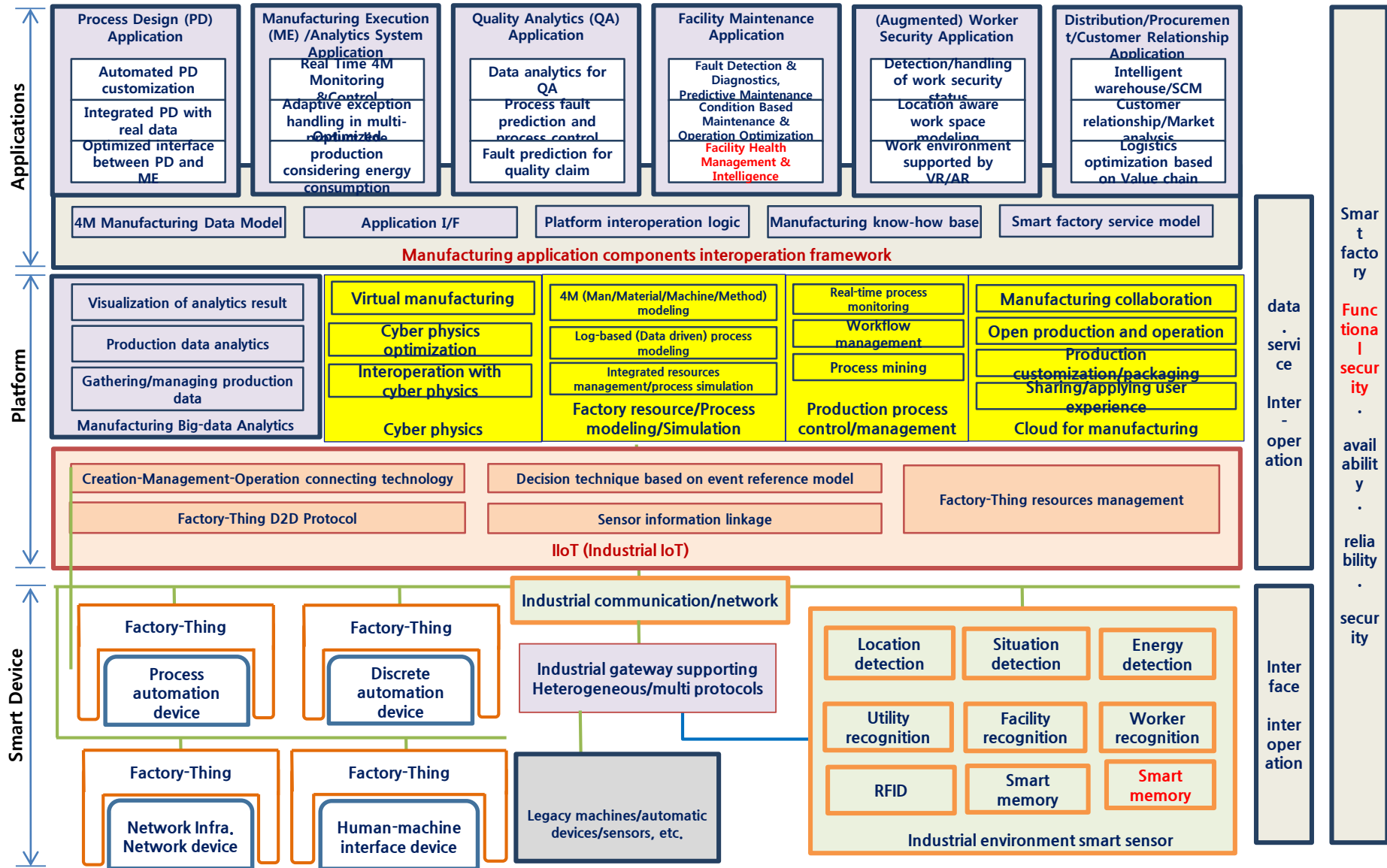
## **Advanced Technology Development for Smart Factory**

- Started 6 Projects from Aug, 2015 at first
- Started 5 Projects from May, 2016 at second
- Planning the 2017's Projects after the R&BD and the Roadmap

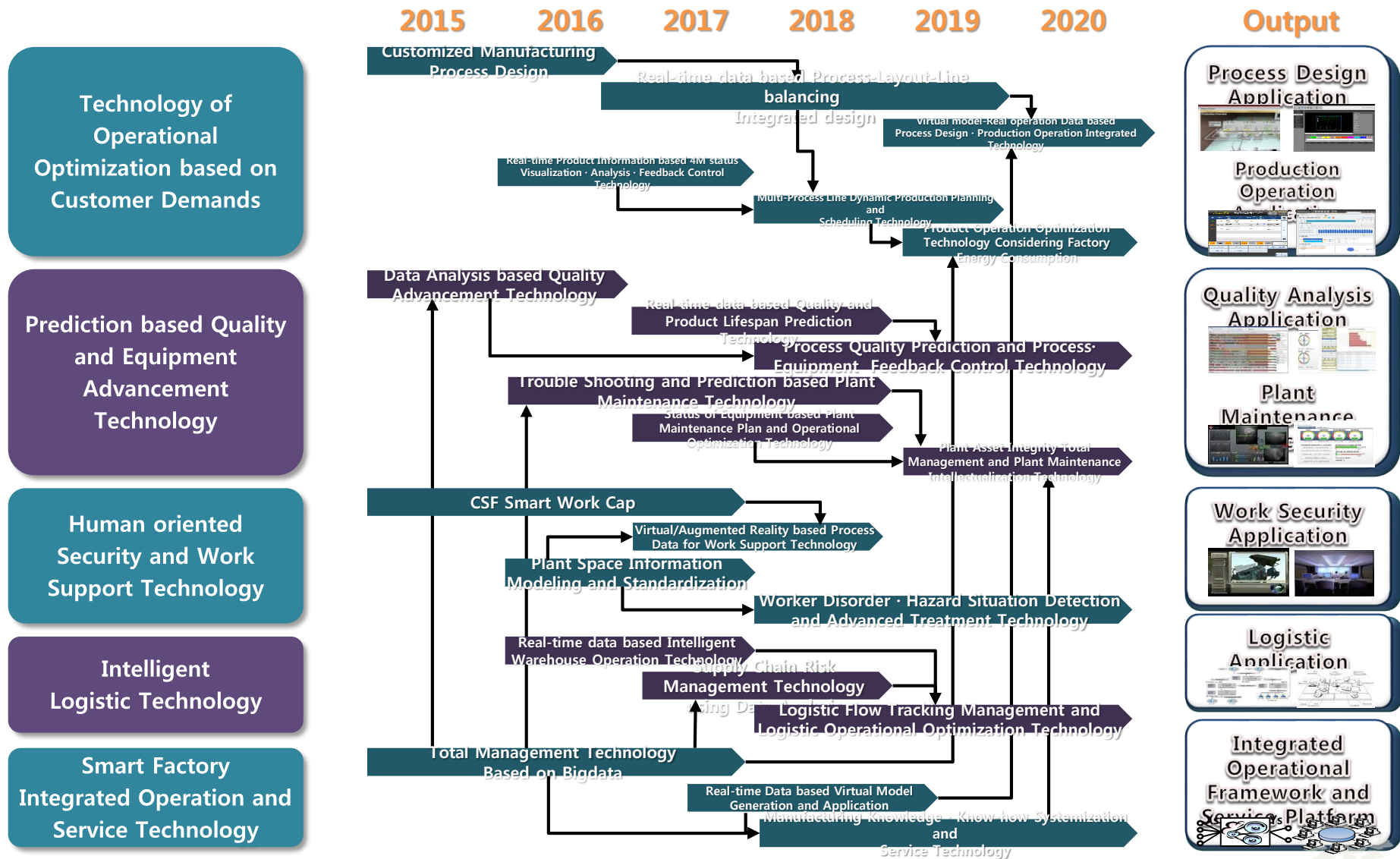
MoTIE: Ministry of Trade, Industry and Energy

MSIP: Ministry of Science, ICT and future Planning

# Smart Factory Technical Roadmap<sup>1</sup>

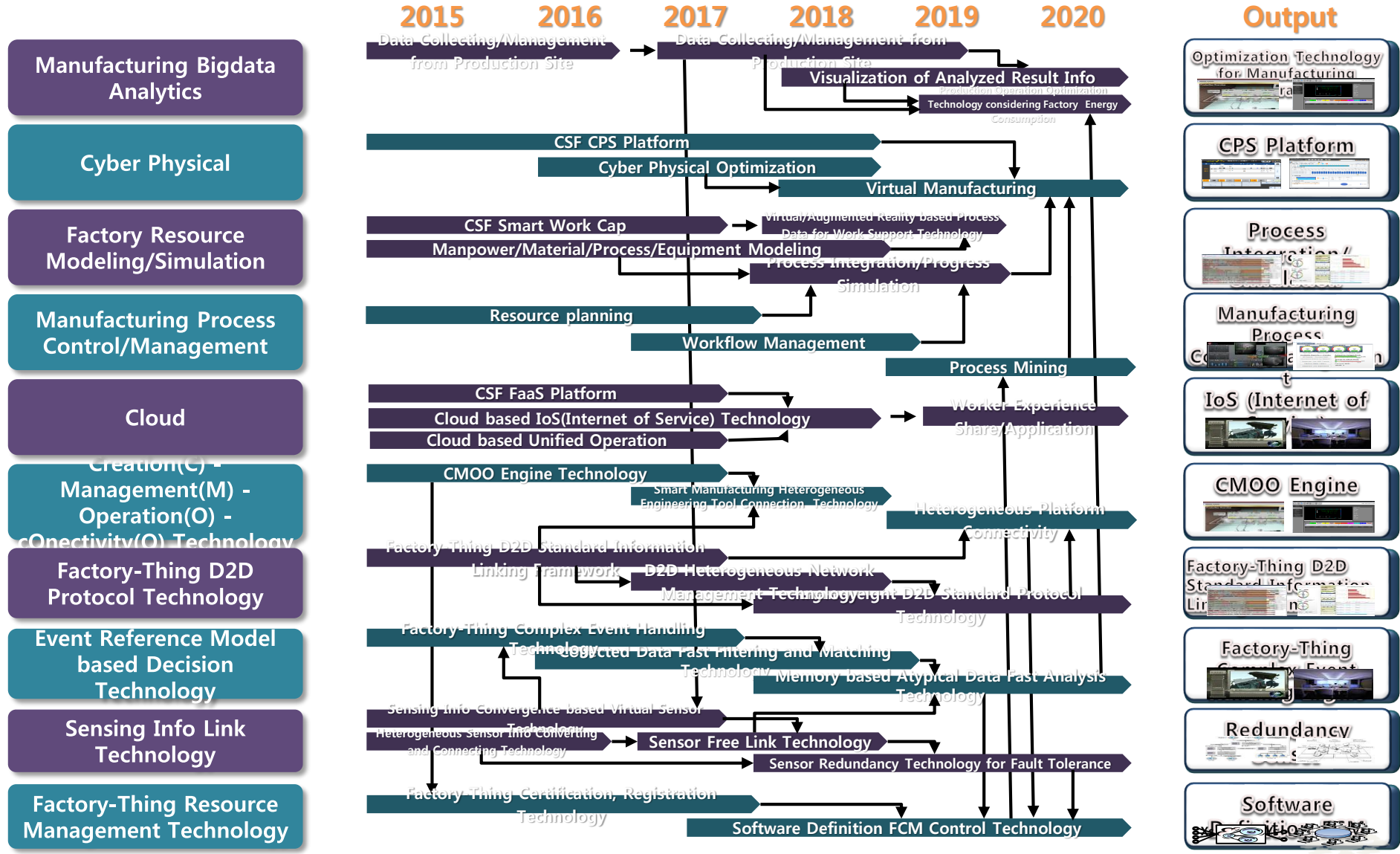


# Smart Factory Technical Roadmap<sup>2</sup>





# Smart Factory Technical Roadmap<sup>3</sup>



# Smart Factory Technical Roadmap<sup>4</sup>

2015

2016

2017

2018

2019

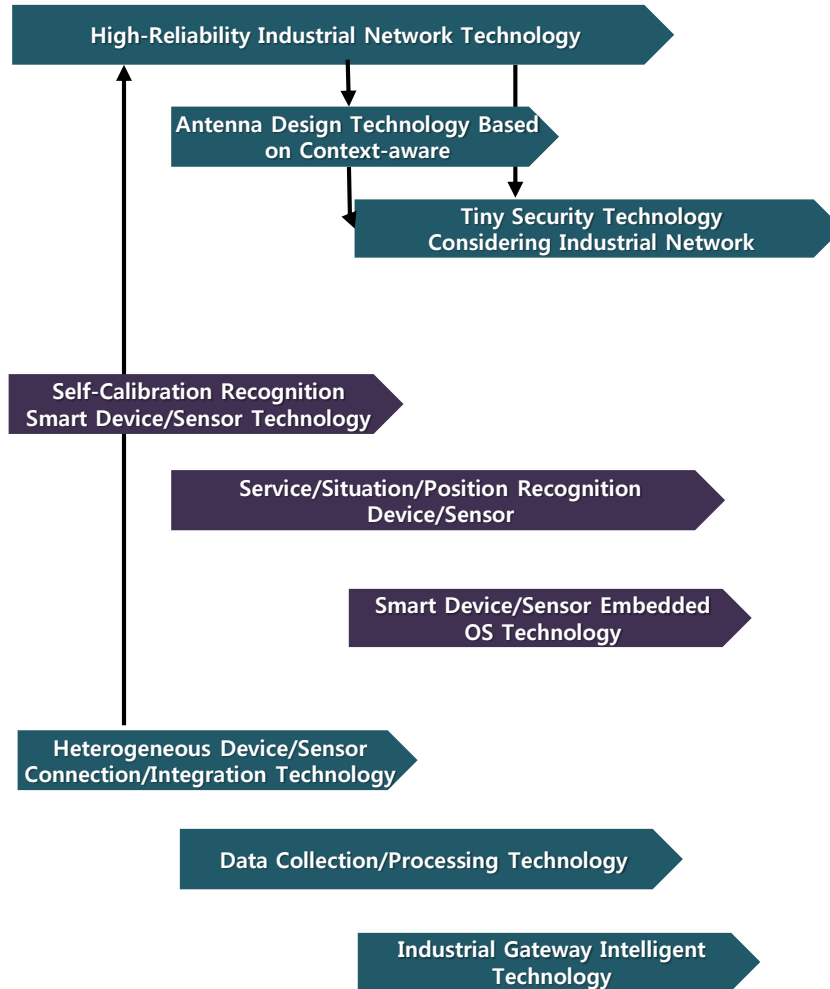
2020

산출물

Smart Manufacturing Industrial Network Technology

Recognition Smart Device (Sensor) Technology

Heterogeneous Industrial Gateway Technology



High-Reliability Industrial Network

Tiny Security Module

Self-Calibration Recognition Smart Device

Position Recognition Smart Device

Industrial Gateway

**Thank you!**

