

Intro

AAM

* Advanced Air
Mobility

Smart
Logistic

Robotics

Hyundai Motor Group

SDx

* Software Defined
Everything

Hydrogen

PBV

* Purpose Built
Vehicle

2024

Knowledge Exchange Days

Hyundai Motor Company / Kia
Smart Factory **E-FOREST**
SMARTER PLANT

Presenter : Hyunchul Cho

E-FOREST Strategy Group

Performance

Environment

E-FOREST

Philosophy & Core Value

Development direction

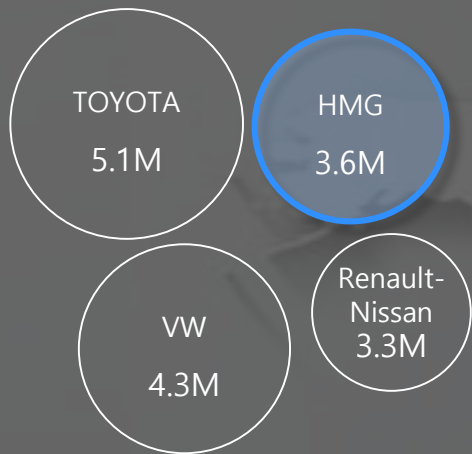
Use case

HMGICS

Expanded Deployment Strategy

HMG Performance in 2024 (first half of year)

Global sales Top 3



✓ On time - Supply of Best Seller though Production flexibility



✓ Optimizing Model mix considering customer needs



- TRIM A (Economy)
- TRIM B (Basic)
- TRIM C (Premium)



Best Seller

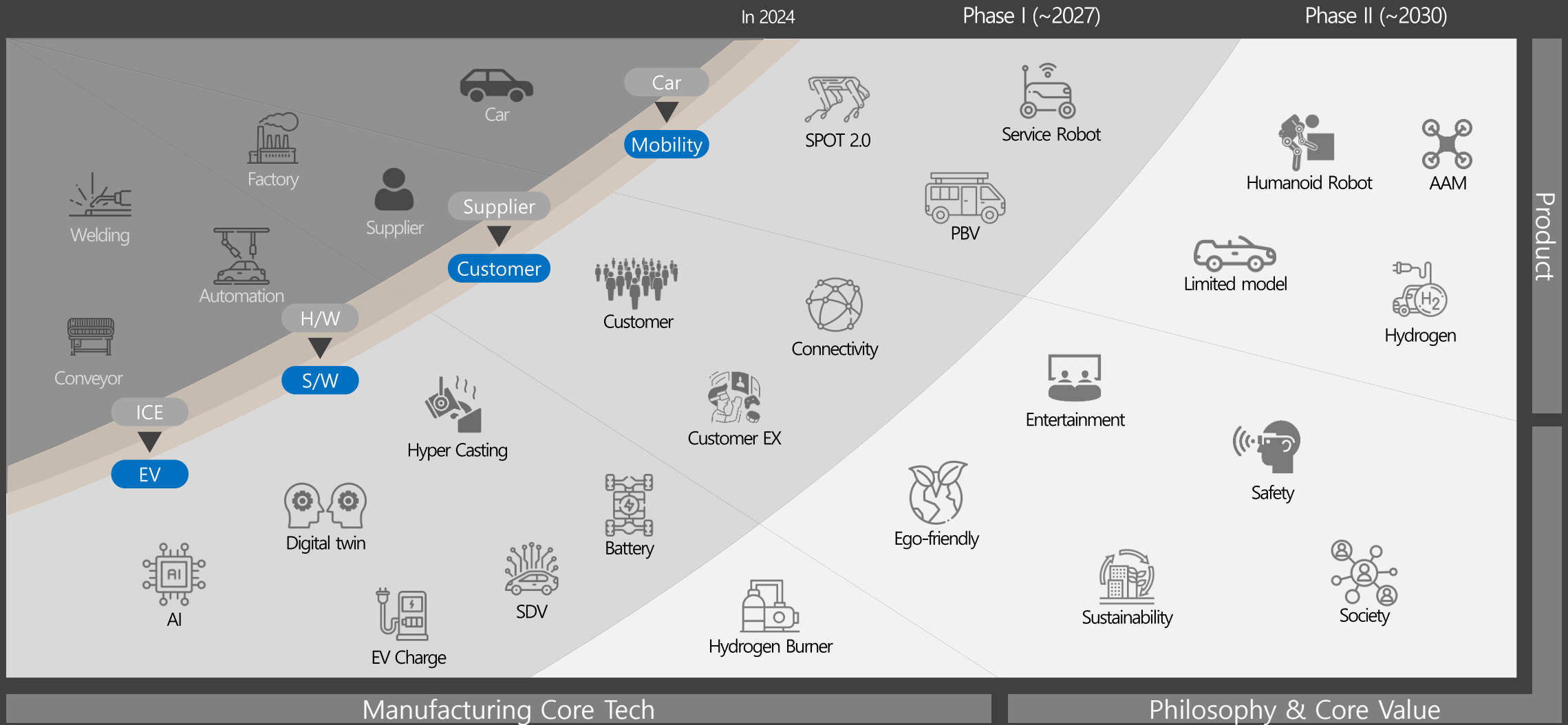
Expansion of local production

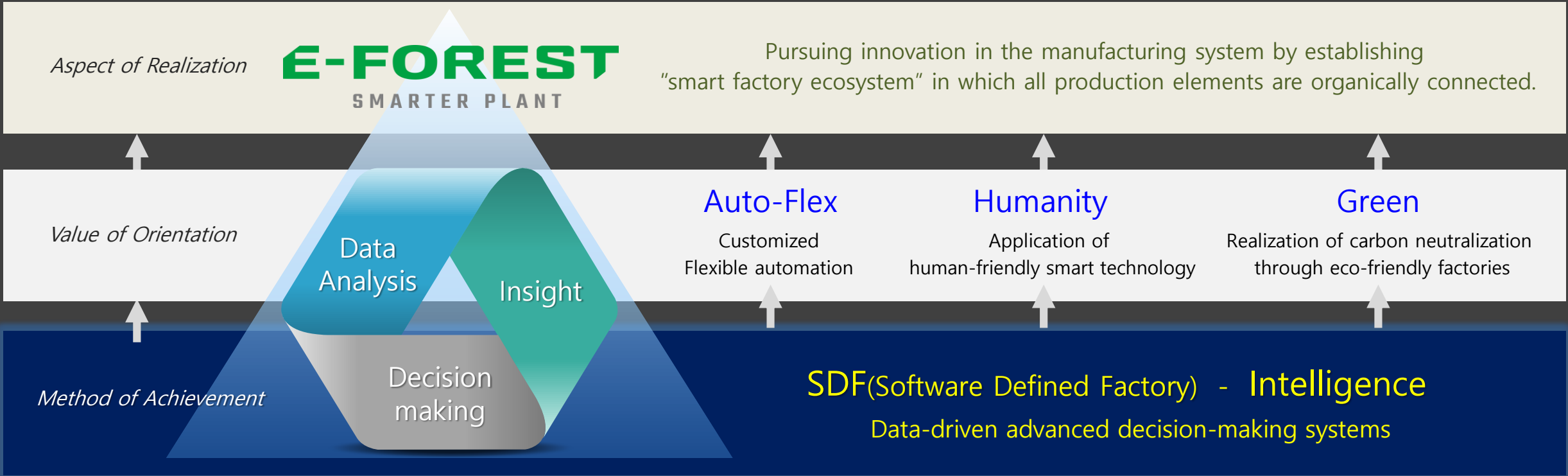
✓ Optimizing Model mix considering customer needs



- BASIC
- Derived Model N
- Derived Model N-Line

Environment





Customized Mobility Manufacturing Platform based on E-FOREST Core-values

Auto-Flex

- * Optimal solution / Adv. system for cell production
- * BBP (Block Based Process)

'25	Mixed production system for various models (Advanced cell work support system and algorithm)
'30	Flexible multi-model mobility production (Future mobility / robot / UAM, and etc)

Humanity

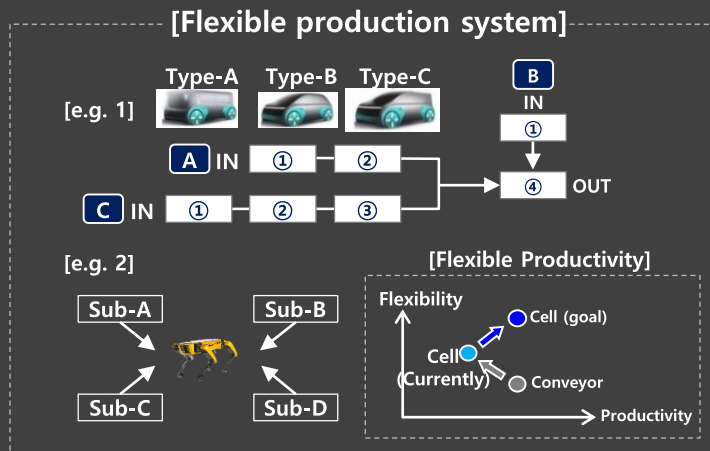
- * Human-friendly worker convenience technology

'25	Development of Ergonomics Smart Technology
'30	Application of cooperative humanoid robot

Green

- * Improve global environment through technology

'25	Expand carbon neutral technology (Smart Grid, Intelligent carbon emission management, etc)
'30	Net-Zero Factory



[Human-Friendly Technology]



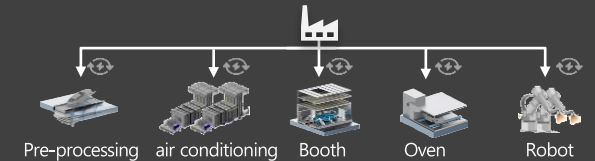
Wearable Robot Workload optimization system

[Automation By Robot]



Assembly (Atlas, Spot) Logistics (Stretch)

[Energy Management System]



[Eco-Friendly Technology]



Automation of Assembly (Automate assembly work by Using robots, vision, AI technology)

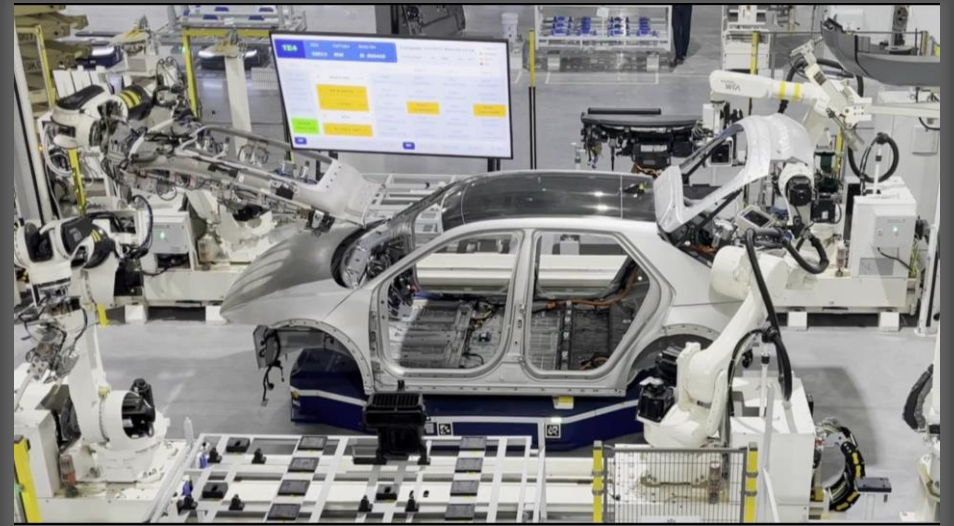
Automate wheel alignment adjustment

- Using co-robots/AI to simulate worker behavior
- Replacement of workers with precise adjustment (4 Person)



Automate headlining assembly

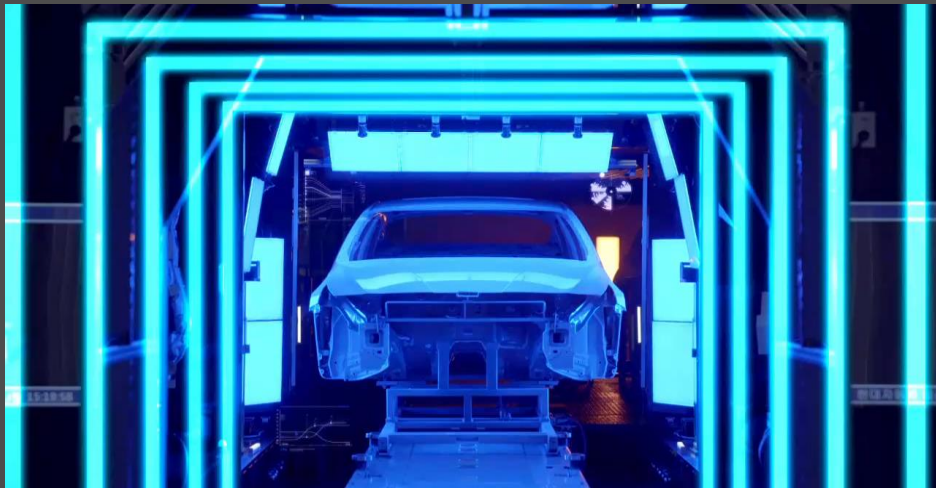
- Automate vehicle upper headlining assembly using robots and vision
- Simulating the operator's pressing behavior and respond to multiple models



Automation of Inspection (Automate inspection tasks by Using vision, AI, SPOT, etc)

Automate appearance defect inspection in painting

- Determinate defects (dust/oil) through vision inspection
- Automatically correct defective parts by sanding automation



Automate car body part gap inspection

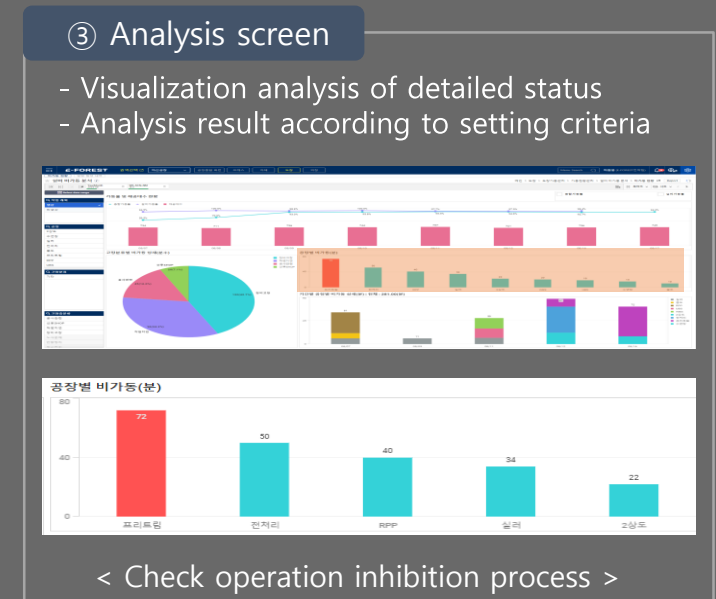
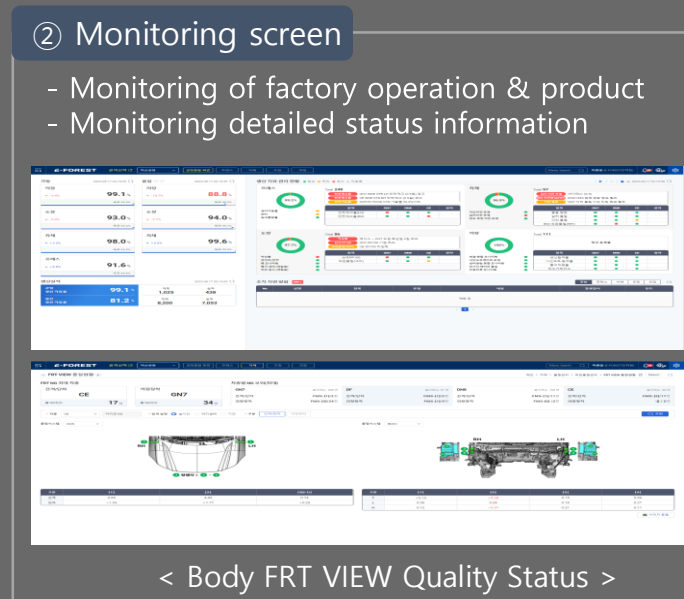
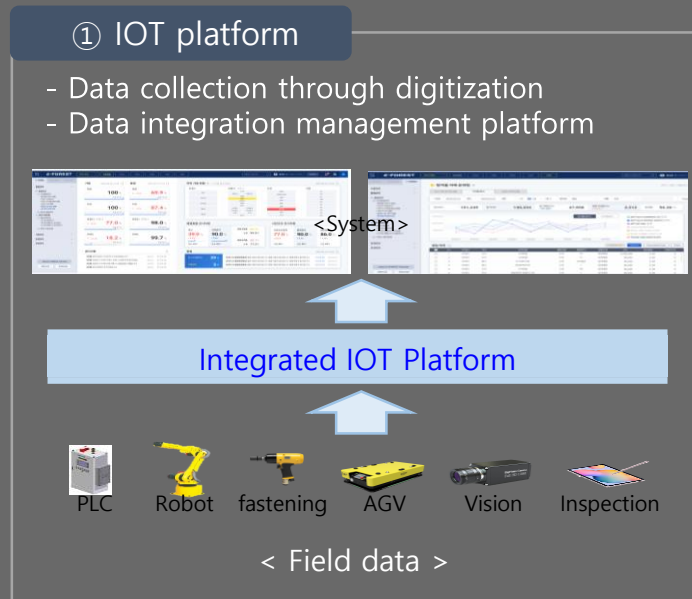
- Self-calibrating parts by analyzing algorithms based on data
- Prevention of defects through real-time full inspection and self-correction



Factory – BI (Visualize manufacturing data in dashboard)

- Share information in real time → Manage unmanageable areas
- Development 125 monitoring system : Operation (58), Quality (49), Maintenance (18)

Factory-BI Components



HMGICS (HMG Innovation Center in Singapore)

The first open innovation lab in the world to revolutionize the total value chain
(R&D-Manufacturing-Business)



- Location : Jurong Innovation District
- Factory Size : Site area (43,977m²)

Building area (91,680m²)

2 basement floors / 7

ground floors



Key Achievements of HMGICS Phase-1 Development

Real-time synchronization of **Production Status** using **Virtual Factory** and **Data Connectivity** based on Innovative Manufacturing Platform

Advanced Automation

Logistics : 7 → 65%, Assembly : 14 → 46%

Automated Warehouse



Mobile Robots



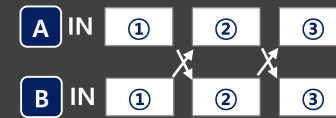
High-difficulty
Assembly automation



Flexible Production System

Cell-based flexible production (multi-variety mixed production)

Parallel flexible Cell



Intelligent IT System

76 number of Manufacturing Intelligent IT System

MES Scada



OEE Dashboard



Wearable device (XR)



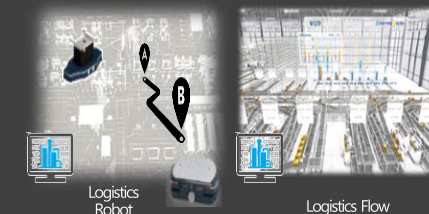
Meta Factory (Digital Twin)

Virtual-based Monitoring and Simulation Optimization

Monitoring w / Data Synchro.



Plant Simulation (Logistics + Production)



Expanded Deployment Strategy _ Automotive



 **HMGICS**
[Test Bed]



 ***HMGMA**
[Mother Factory]



 **GP**
[Genesis Innovation Factory]



 **Gwang myeong *EVO**
[HMG First EV Factory]



 **Hwasung EVO**
[HMG First PBV Factory]



H/K Global Factory
Remodeling



**Completely Autonomous
Factory In 2030**

"Called Dark Factory 247"

* HMEMA (Hyundai Motor Group Metaplant America), EVO (Evolution) 방법론에 따라 법적 보호를 받습니다.

Expanded Deployment Strategy _ New Business

25Y~



PBV

28Y~



Robotics

28Y~



AAM

30Y~



Hydrogen

E-FOREST
SMARTER PLANT

Smart Mobility Solution Provider

Thank you