



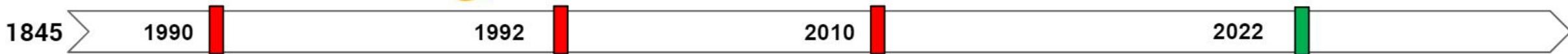
**Whirlpool**  
CORPORATION

**Lean, Productivity or Industry 4.0 ?**

# HISTORY OF POPRAD FACTORY



 Whirlpool  Whirlpool  Whirlpool  Whirlpool



 Whirlpool



# Key Factory Figures 2022

**AREA 70 000 sqm (120 000)**

- **Factory floor space = abt 55 000 sqm**

**PEOPLE = 1202**

- **Manufacturing**
- **GPO (Industrial Design, Laundry, Laboratories, Electronics)**
- **Operations Excellence, European Tool Shop, Central QC Pillar Leader, and Central Supply Chain**
- **GSS/Procurement**

**VOLUME = 1.9 M pcs.**

**CAPACITY UTILIZATION: 84%**

**SKUs = TOP 432 + FRONT 350**

**Managed codes 5000+**



# Factory Structure



## PRIMARY PROCESS

- STAMPING & FORMING – 16 lines
- PAINTSHOP – powder painting
- DECORATION – silk-screening & tampon printing



## LOGISTICS

- 46 vehicles (26x forklifts ( 9x receiving area, 7x warehouse, 5x line feeding, 5x primary processes), 14x tuggers, 2x battery change trolley, 4x el. stacker)
- Inbound 10 gates
- Outbound 7 gates



## ASSY LINES (4x)

### FRONT LOADER

- Code line
- Flex line

### TOP LOADER

- High Range
- Low Range



## SYSTEMS & DATA

- SAP Hana
- MES, MII, RTLS, DIG. TWIN
- Internally developed tools (Appsheet, ORS)



## CUSTOMER

- 227 customers worldwide
- Tested at customer condition 60k pcs/year
- AVG cycle time 24 sec / WM
- Lead Time avg 27,4 hrs / WM

# Our Portfolio



**WHY WE DO BUSINESS ?**



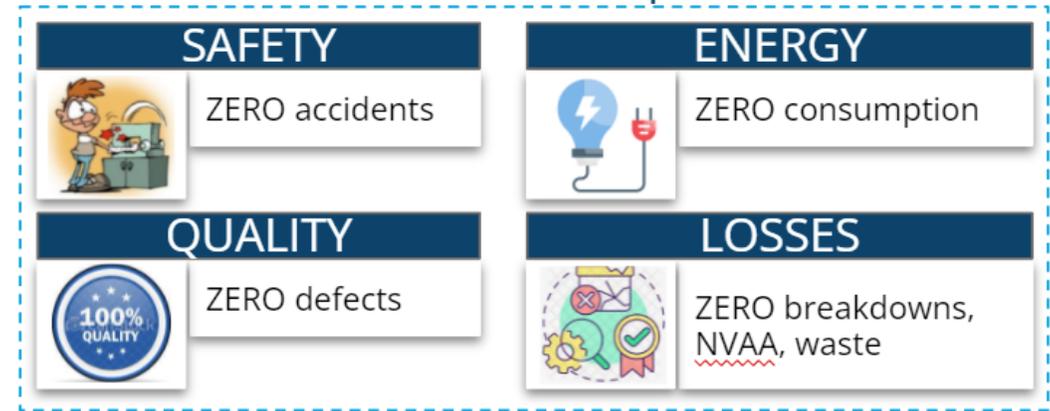
# IPS Principles

*"The ideal production system is a conceptual **BUILD-IN QUALITY**, with **MINIMAL COST** and **SHORTEST LEAD TIME**.*

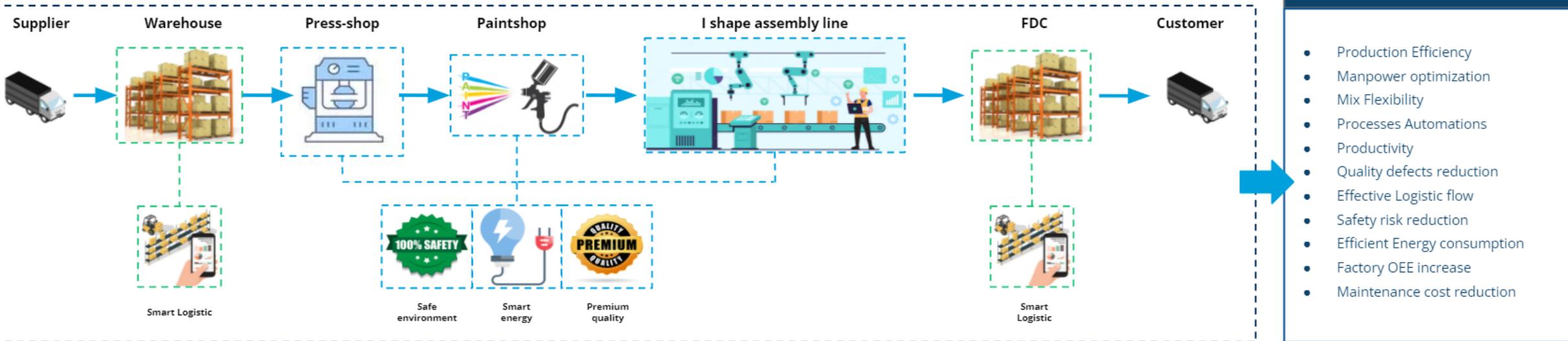
*IPS is the deployment of strategies, methods and tools to achieve **ZERO**."*



## ZERO concept



## Ideal Factory



PERFECT PRODUCTION SYSTEM, CHALLENGING HIGH QUALITY PRODUCT WITH MINIMUM PROCESSING COST AND MINIMUM LEAD TIME

# Business Strategy & Prioritisation



## COMPANY STRATEGY

**Why?**  
 Our Vision: Be the best kitchen & laundry company, in constant pursuit of improving life at home.

**What?**  
 Our Mission: Earn trust and create demand for our brands in a digital world.

**Strategic Imperatives**

- Deliver Product Leadership
- Revolve Total Process
- Win the Digital Consumer Journey
- Winnet the Virtual Chain

**How?**

**Leadership Behaviors**

- Passion for our customer
- Strategic talk
- Bias for action
- Lead with impact
- Accountability
- Serve - Listen - Build - Lead

**Our Values:** Integrity - Respect - Inclusion & Diversity - One Whirlpool - Spirit of Winning

**Performance Outcomes**

- \$30B REVENUE
- +10% EBIT
- +15% EBITC

### Consumer driven, Synchronized, E2E

**Future 5x Footprint**  
 Fully leverage our global footprint aligned with global excellence strategy

**Consumer driven E2E IC**  
 Transform the value chain to support consumer need to end strategy including near-shore to market

**Synchronized & Agile IC**  
 Achieve strong planning reliability in fast-turn and minimum support to end-user from business decisions

**WOM**  
 Deliver best service with ZERO INCIDENTS, ZERO DEFECTS, ZERO WASTE allowing to priority our brand

**Intelligent & Automated IC**  
 Leverage technology and capabilities where SPD when it makes sense

**OUR PEOPLE**

### Our 2022 Operational Priorities

- Managing health and safety of our employees
  - Coping with the Covid waves in a responsible manner
- Drive step function improvement in product availability
  - <100K Lates
- Deliver P4G across the business, despite inflation
  - \$100M+; excluding materials
- Defend and accelerate positive PMR impact
  - 8%-7% net pricing, including carryover



### Digital Transformation & Automation

**CUSTOMER**

- Drive Design Changes focusing on improving Product and Manufacturing Efficiency

**COST BASE**

- Improve production performance through Data-driven Mindset and Big Data Strategy
- Integrated Planning and Execution focusing on achieving a Flexible and Predictable Production

**PEOPLE**

- Enhance the benefits of immediate loss attack through the technologies of IIoT and Digital Transformation
- Establishing the Digital Manufacturing Culture to creating and making the best use of knowledge

	2022	2023	2024	2025+
Automation Initiatives	Increase Robot Density			
Artificial Intelligence	Benchmark & Data collection & Systems platform connections		Expand Execution of Technology	
Automation in Assembly Areas	Assembly Automation Development	Acceleration of Assembly Automation		
Logistics flow automation	Pilot projects introduction	Full logistics flow automation by Artificial Intelligence utilisation		
Key resources to execute projects	Manufacturing Resources to Develop and Execute Automation Projects - NEW ENGINEERS DEVELOPMENT			
Automation Benchmarking	BMW, Honeywell, Stanley Black and Decker	Ongoing Best Practices Analysis		
People development	Change management & organization further new tools & knowledge development			

<ul style="list-style-type: none"> <li>Strong &amp; motivated Team</li> <li>Thinking out of the box toward new tools application</li> <li>Customer strong orientation</li> <li>Full range of products LOW to HIGH</li> </ul>	<ul style="list-style-type: none"> <li>Historically complex layout &amp; high utilisation of space</li> <li>Reliability of supply base &amp; capacity</li> <li>Other functions involvement into design for easy change over</li> <li>Low level of automation</li> </ul>
<ul style="list-style-type: none"> <li>Colocation of suppliers (30%)</li> <li>Benchmark &amp; Internal Whirlpool competition</li> <li>By high service level &amp; Quality level increase demand</li> </ul>	<ul style="list-style-type: none"> <li>Manpower availability &amp; Quality of Manpower</li> <li>Heavy cost increasing &amp; Inflation in all areas</li> <li>Seasonality in production up to 45%</li> </ul>

# POPRAD STRATEGY 2022-2025

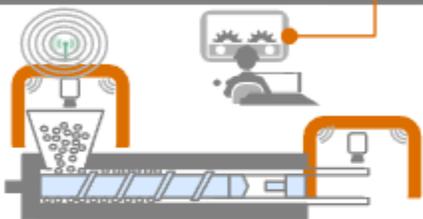
VNOT/SWOT analysis input	Factory focus	Actions
<ul style="list-style-type: none"><li>CUSTOMER</li></ul>	<ul style="list-style-type: none"><li>coping of demand volatility to assure products availability on time</li><li>flexibility in mix change towards demand</li><li>improvement of craftsmanship and design to improve customers quality perception</li></ul>	<ul style="list-style-type: none"><li>automatic measurement systems &amp; process stabilization</li><li>fast access to all data to speedup predictive actions</li><li>improve visualisation to gain involvement</li><li>reduction of response time to customer need &amp; lead time reduction</li><li>optimise and automatise logistic flows (limit touch points)</li></ul>
<ul style="list-style-type: none"><li>PEOPLE</li></ul>	<ul style="list-style-type: none"><li>NET ZERO strategy 2030</li><li>Safe place creation (Zero concept)</li><li>New tools &amp; methods implementation</li><li>Talent development plan based on 5YCD need</li></ul>	<ul style="list-style-type: none"><li>New engineers creation &amp; development</li><li>Utilisation of IDX as competitive advantage</li><li>Increase cross functional involvement</li><li>Clear logic for tools utilisation on all levels - continuous deployment of knowledge on the line level</li><li>SMART automation introduction</li></ul>
<ul style="list-style-type: none"><li>COST BASE</li></ul>	<ul style="list-style-type: none"><li>Data collection support immediate reaction to problem solving &amp; loss attack</li><li>Budgetary focus based on loss stratification to maximise B/C ratio</li></ul>	<ul style="list-style-type: none"><li>Digital transformation and online data collection &amp; evaluation</li><li>Agile self learning system introduction to online loss stratification and immediate attack</li><li>Automation introduction to increase flexibility and process stability</li></ul>

# Elements Factory of the Future - Poprad

1

## Shop floor transparency

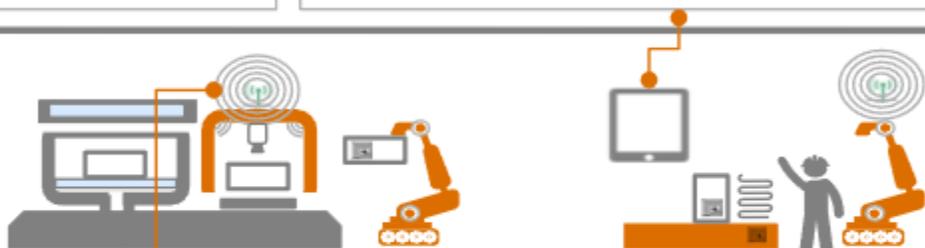
- Digital cockpit (process monit., connected assets)
- Intelligent production and logistics scheduling
- Process understanding / Cost deployment
- Energy consumption monitoring



2

## Quality data visibility and analytics

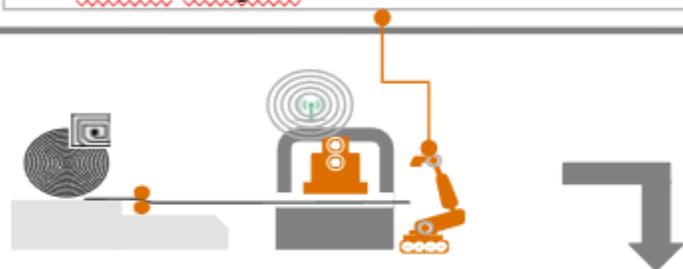
- Defect collection system
- Mobile devices with detailed work instructions
- Poka-yoke solution, human error avoidance



3

## Automated material flow

- Robots, e.g. for loading/ unloading
- Routing of autonomous guided vehicles
- Artificial Intelligence



7

## Test automation

- Vision systems for quality testing
- Automation of test parts



6

## Predictive maintenance

- Conditions base maintenance
- Predictive maintenance



5

## Automation

- Apply for quality/craftsmanship requirements
- Load/Unload line with components, e.g. maintain
- 60° zone for highest efficiency



4

## Material flow transparency

- Traceability and visibility of workflow
- Call of system
- RTLS system



8

## Workstation design

- 3D workstation design
- Advanced ergonomic analyses

9

## Operators development

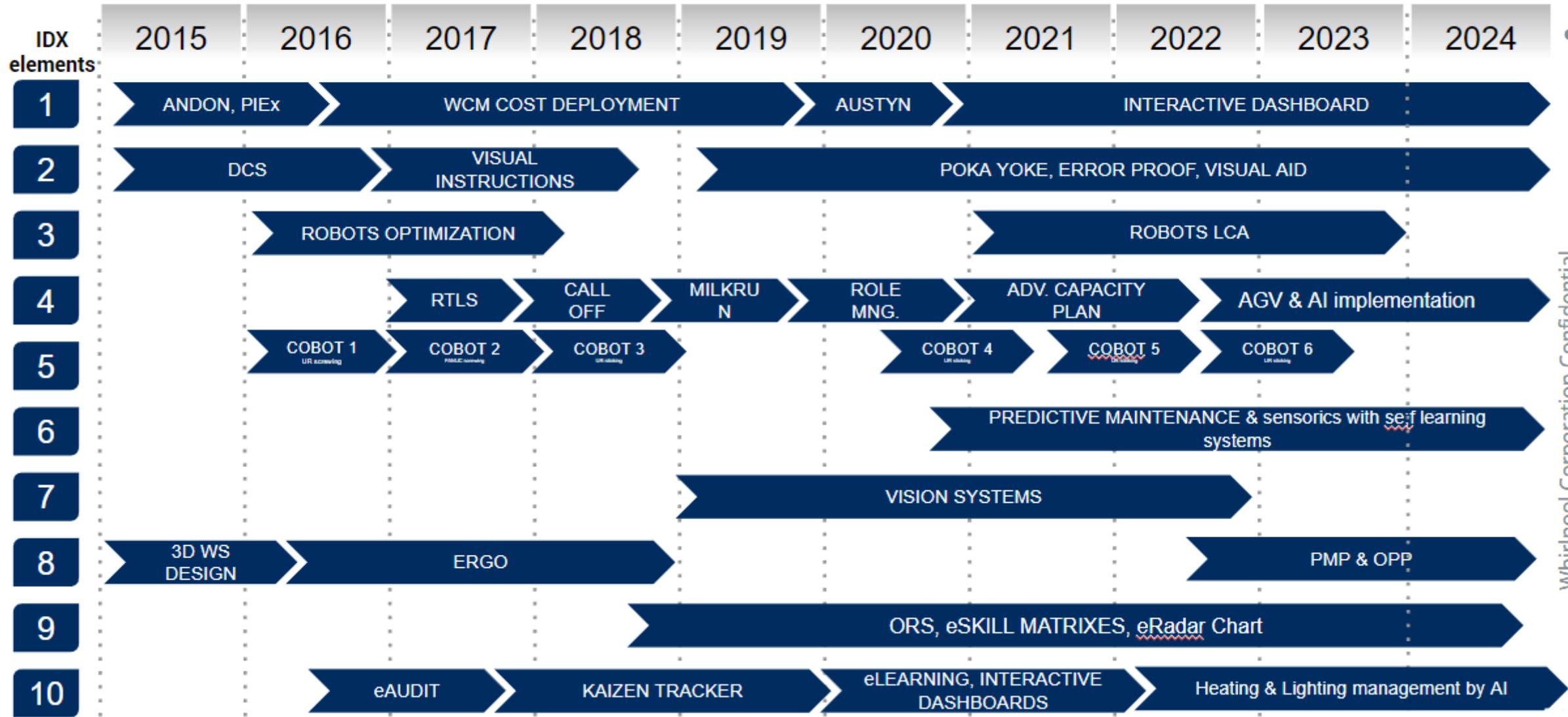
- Electronic skills matrix
- Mandatory job rotation

10

## Lean administration

- eAudits
- eLearning
- Meetings and reporting

# BUILDING ON GATHERED KNOWLEDGE



# GROUPS OF IDX INTEREST

## MAIN ATTRIBUTES FOR IMPLEMENTATION

LONG TERM SUSTAINABILITY

SPEED & PRODUCTIVITY

RESPONSIVENESS TO DEMAND

Focus on Losses ---> definition use cases into 4M

### MAN

- People management & development (skill matrix, trainings, certification, legal...)
- MTM 4.0 + Digital Operator
- Virtual & Augmented reality

### MACHINE

- Collaborative automation
- Process & Product Parameters (monitoring, control, simulations)
- Visibility & Parameters (OEE, ...)

### METHOD

- Vision systems - inspections
- Process Control (focus on quality & process stability)
- Derogation management

### MATERIAL

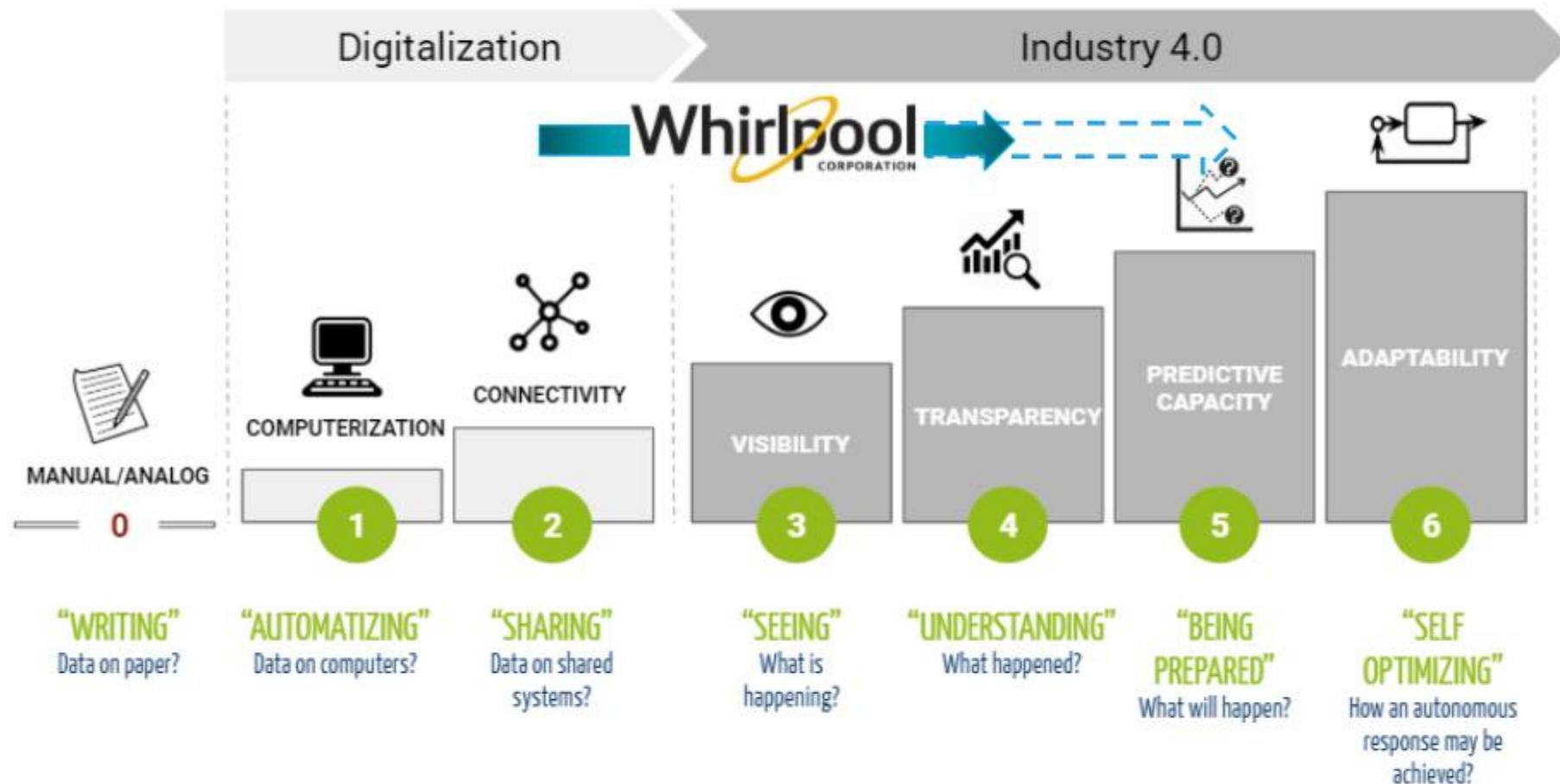
- Automation in Logistics (material delivery, storing, ..)
- Smart warehousing solution (signal navigation)
- E-kanban & production leveling

# Global IdX Ideal State| Acatech Reference Model



**level 0:** no computerization, manual activities

1. **Computerization:** isolated technologies
2. **Connectivity:** connecting technologies
3. **Visibility:** data collecting technologies
4. **Transparency:** data analysis technologies
5. **Predictive Capacity:** simulation of future scenarios
6. **Adaptability:** self-adjustment of the system, automation of the decisional process



# Global IdX Core Strategy & North Star



## Connectivity from the Plant Floor

Connect equipment and processes to provide real data

## Track the Product & the Process

Data should be connected to specific products and process parameters

## Visualize & Use the Data

Data needs to be captured and presented visually for easy consumption and use on the floor



## Combine & Analyze Data

Data needs to be integrated from multiple sources and analyzed to provide insights and opportunities

## Pursue the Opportunities

Regional priorities define what projects need to be implemented. Leverage new technologies to solve difficult problems.

## Develop the Digital Culture

Upskilling the workforce, make systems user friendly, make the data easy to consume



**IdX North Star is the ideal state of 84 different items across 27 areas of the enterprise**

Adaptable & Agile systems

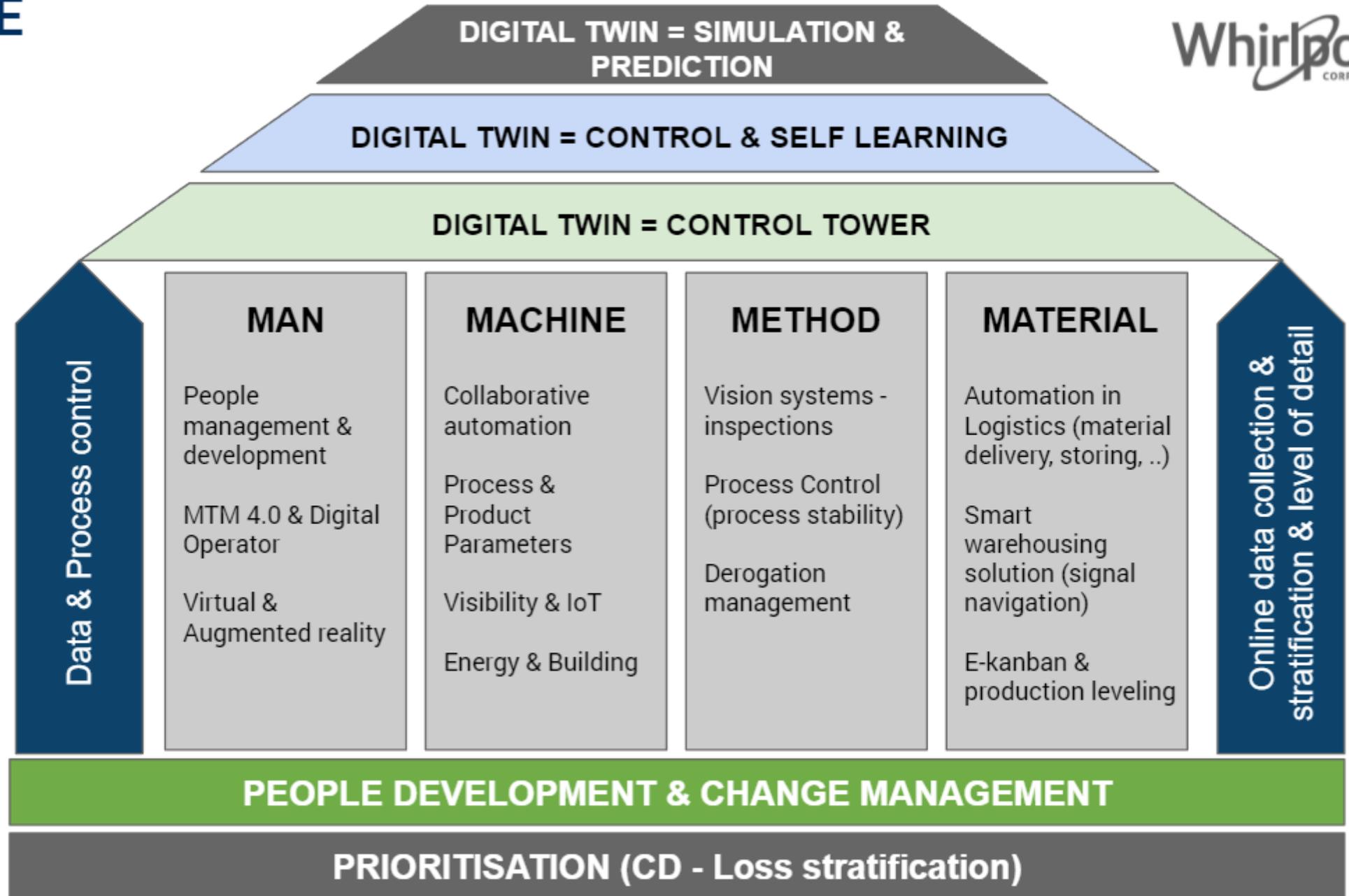
Predictive Capacity

Transparency

Visibility

Connectivity

Computerization



Whirlpool Corporation Confidential

# WHERE WE GO !?

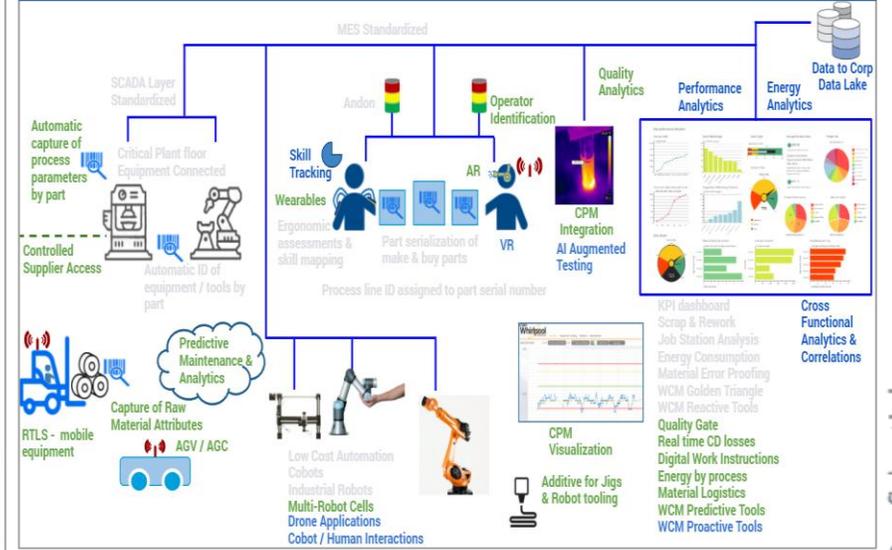
## MANAGERIAL PROCESS UPDATE



## LEAN TRANSFORMATION EXPANSION



## DATA COLLECTION & PROCESSING



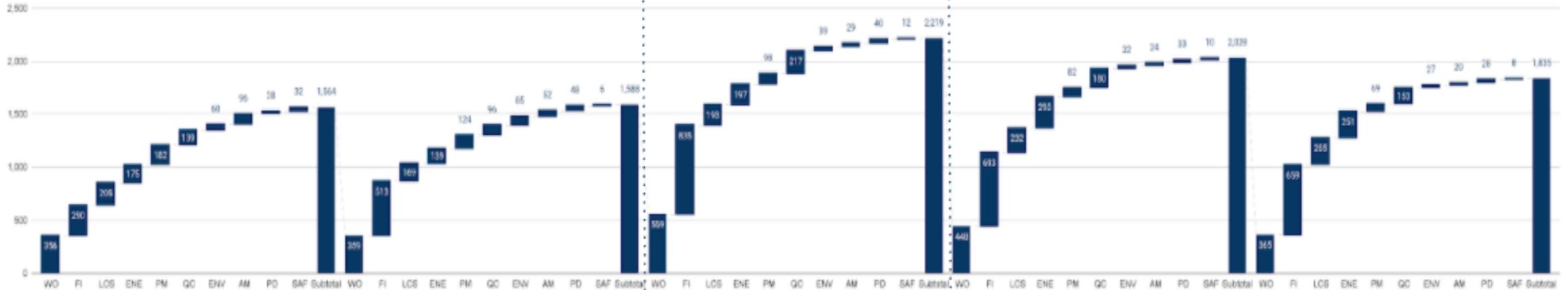
WCM Saving Evolution per Pillar **2020 ACT**

**2021 ACT**

**2022 PP**

**2023**

**2024**



*Current*

**LEAN**

**PRODUCTIVITY**

**or**

**INDUSTRY 4.0 ???**



**THANK YOU FOR YOUR ATTENTION**

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