

Supercharging Manufacturing Transformation

Delivering Business Value
from shop floor to top floor

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Story of our lives



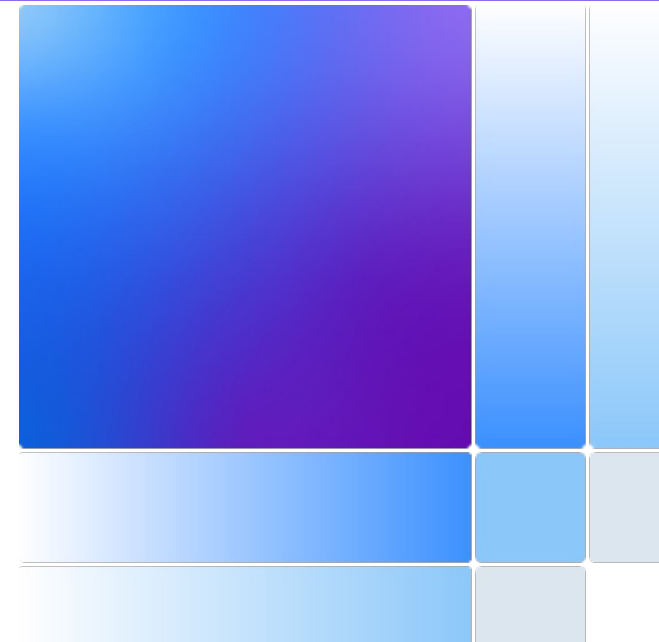


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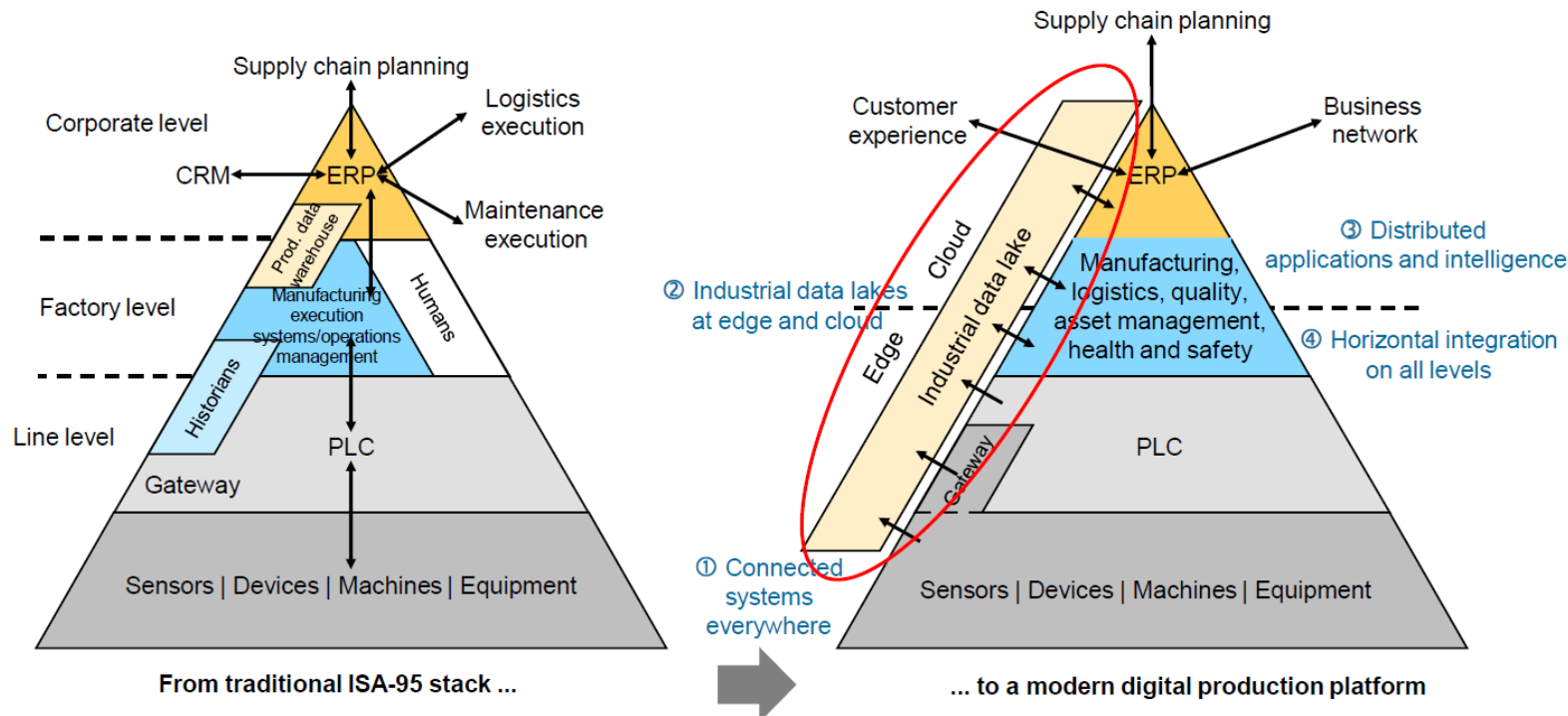
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Industry Trends



Digital Mfg. Trends : Technology View



Based on these trends, what is needed is an Industry standards driven model which drives business value from the sensor to the board room along with a modular technology roadmap.

1 Foundational Shopfloor Systems refresh for large manufacturing clients

2 SCADA, MES, and ERP systems are converging.

3 Systems of Quality, Asset Management and Logistics are getting integrated.

4 Sustainability and Predictive capabilities using Data and Physics models are converging.

5 Shopfloor applications and data are moving to the cloud.



Strategy for Supercharging Manufacturing

02

Manufacturing with Digital Twin / Digital Thread and IT-OT Convergence



ENGINEERING

- Program performance (Cost, Quality, schedule)
- Product performance (Safety, Reliability)
- Better Products to suit Customer Usage Patterns



MANUFACTURING

- Predictive maintenance
- Inventory and logistics
- Asset Management
- Supply chain optimization
- Improve operational efficiency



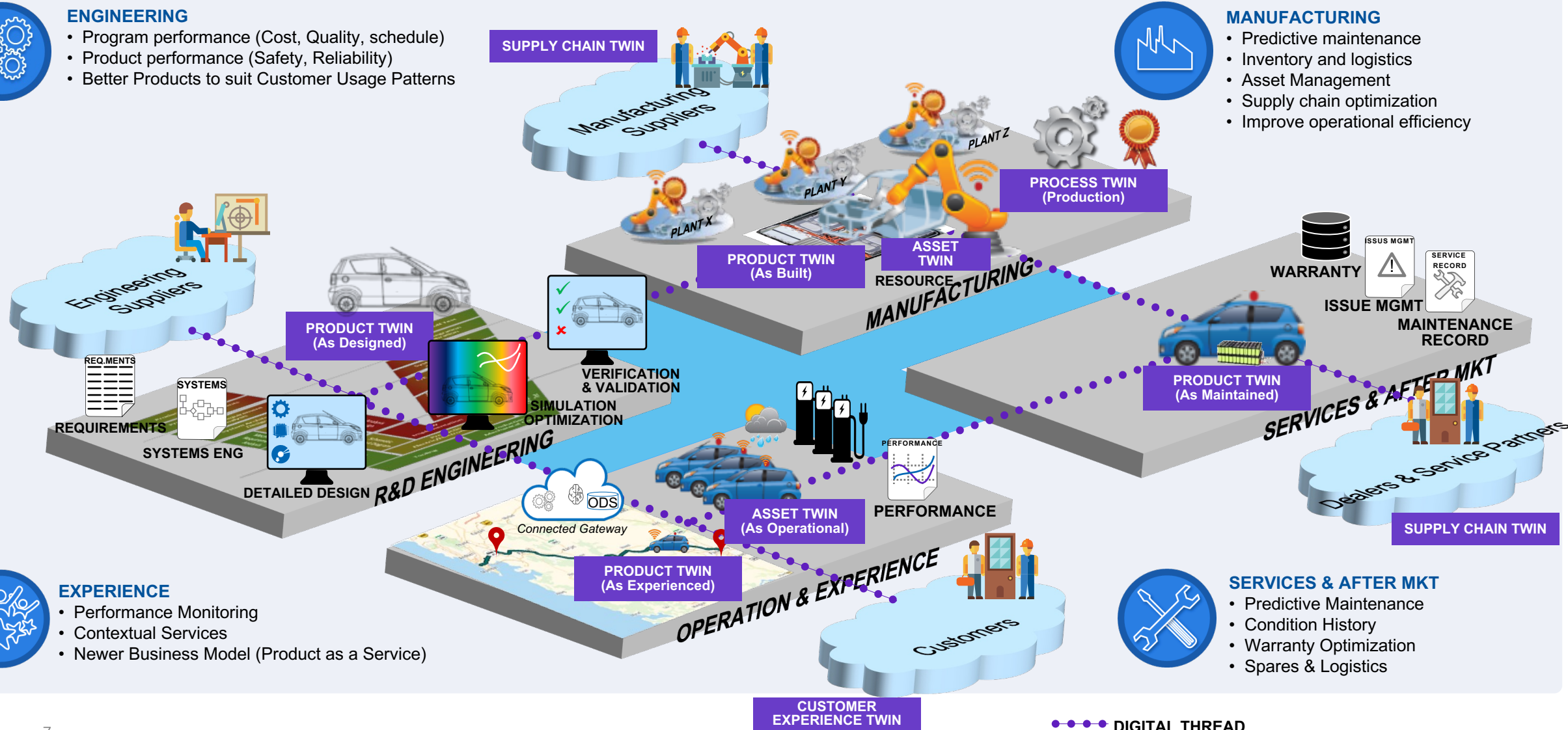
EXPERIENCE

- Performance Monitoring
- Contextual Services
- Newer Business Model (Product as a Service)

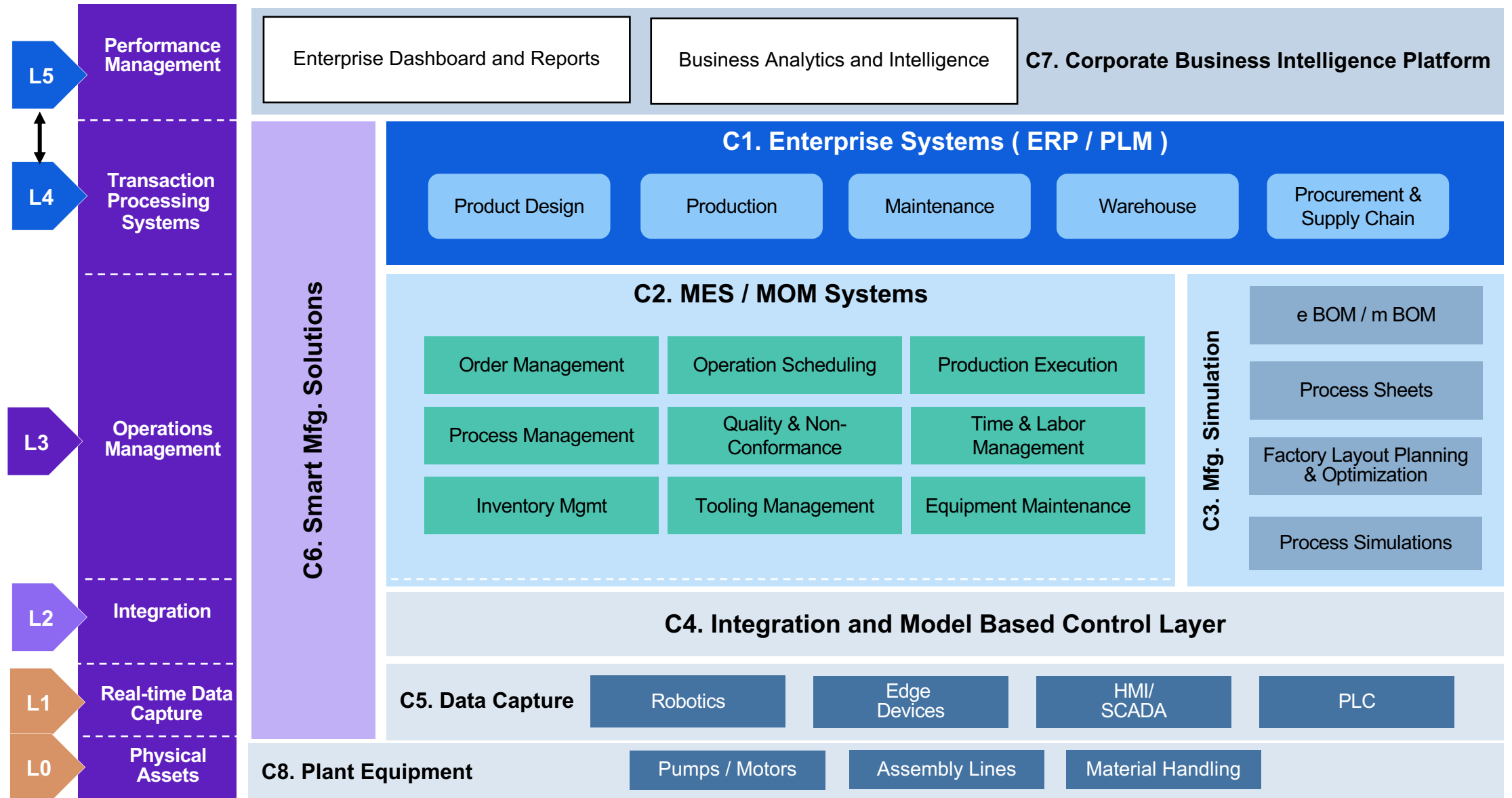


SERVICES & AFTER MKT

- Predictive Maintenance
- Condition History
- Warranty Optimization
- Spares & Logistics



Reference Architecture for Digital Manufacturing



Transformation thru' Business Value

Overall Equipment Effectiveness

- Improvement in OEE by better maintenance and lower downtime

Improve Product Quality

- Improved First pass yield, reduced rework thru better compliance

Improve Operations Efficiency

- Improve operational efficiency thru reduction in variable costs.

Reduction in Material Inventory holding cost

- Improved planning and space utilization on shop floor..



8-12%

- Improved Utilization



10-15%

- Reduction of Defects



20-25%

- Variable costs reduction



15-20%

- Reduction in WIP Inventory costs

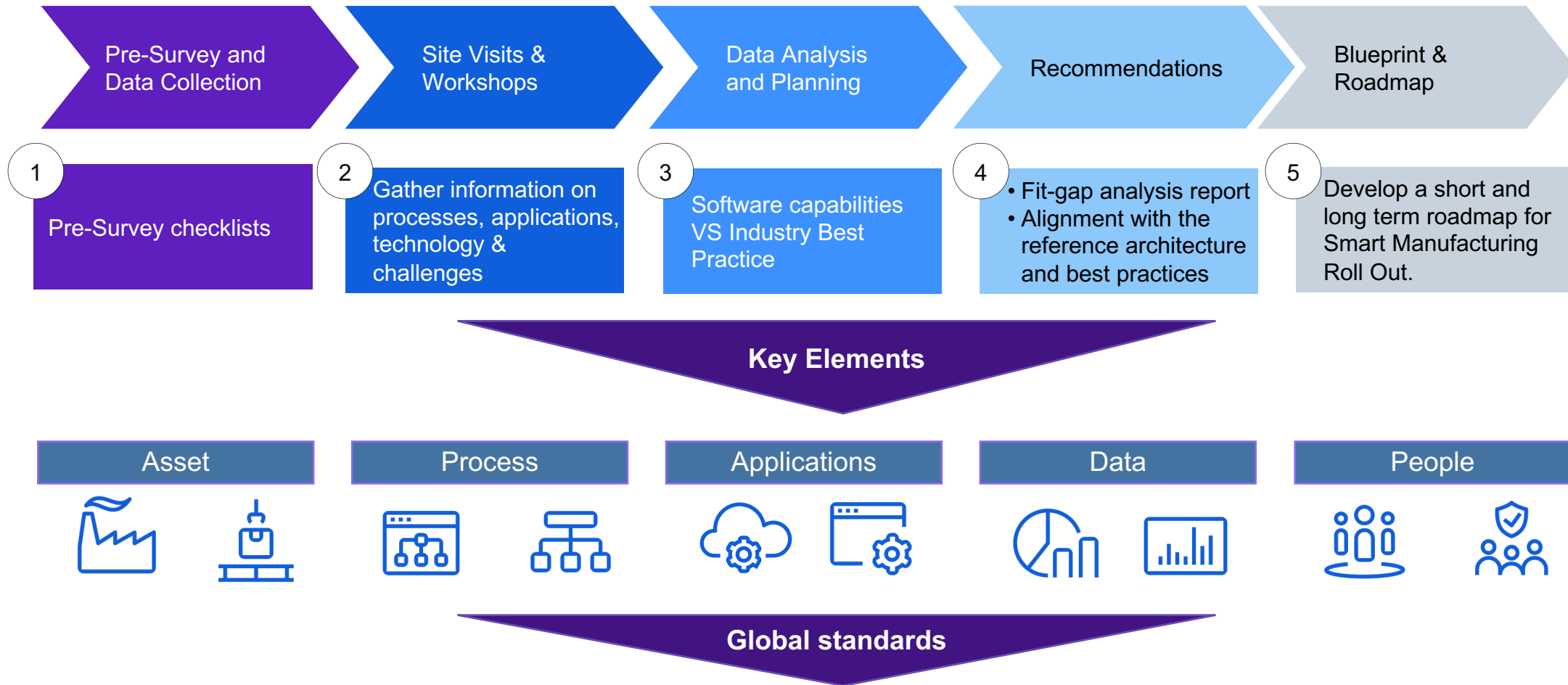


Developing a Roadmap with Business Value Focus

03

HCLTech Consulting Methodology for Smart Manufacturing

Smart Manufacturing Industry Standards



Methodology for Business Value Modelling

5 Pt. Weighted Average Model

Assessments are reviewed by Domain SME & Application SMEs

HCL Domain SME Inputs

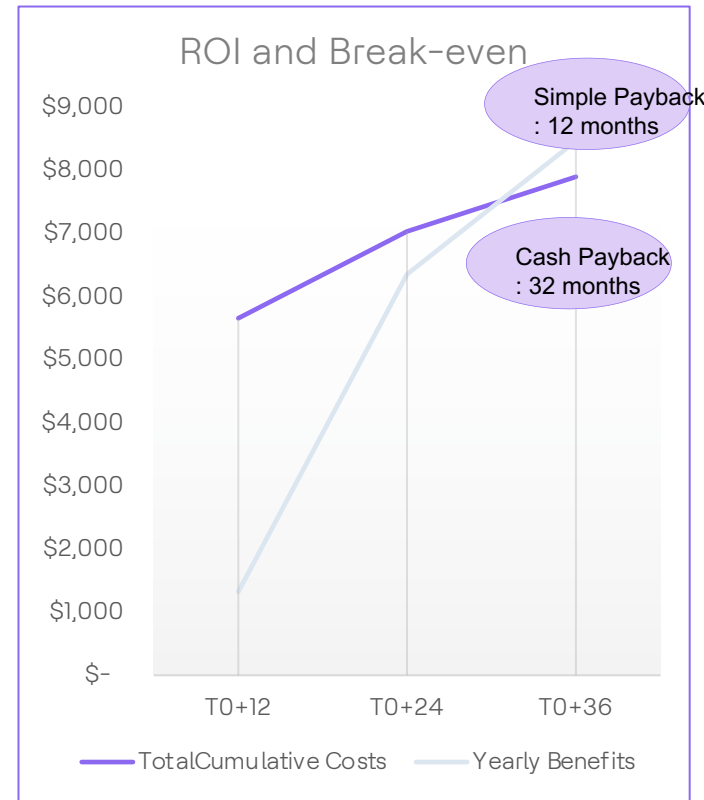
HCL Application SME Inputs

Product Vendor Inputs

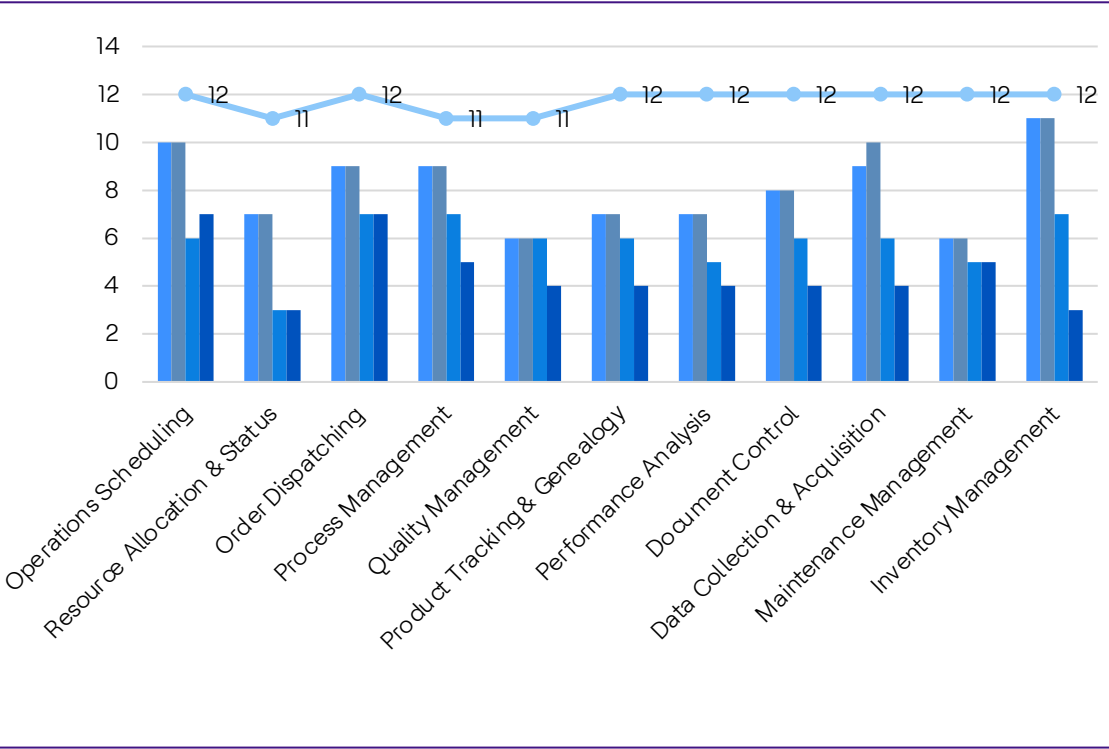
Product Capability Knowledge DB

Reports from Independent Research Cos

Use Cases	Weightage	Total Score	OOTB	Customization
Overall rating		8.67		10.38
MES Core Functionality	50%	100%	8.9125	10.865
Order Management	15%	6.3	11.4	11.4
Production Execution	25%	10.65	11.55	9.1
Station-wise display of Work Instructions (2D/3D) for Operator	25%	12	4 Low	12
Ability to display and confirm check-list for Operator at each station/workcenter	10%	12	4 Low	12
Station-wise BOM - Display list of parts to be consumed at each workstation	15%	15	5 Low	15
Station-wise tracking of order status	15%	12	4 Low	12
Station-wise display of next job in Queue	10%	9	3 Low	9
Material No generation based on Work Order	10%	6	2 Low	6
Provides reverse logistics functionalities that handle RMA reception, hold and disposition for a unit in repair.	15%	6	2 Low	12
& Labour Tracking	10%	9.7	10.35	10.65
Quality Management	15%	9.9	11.25	
Logistics	15%	8	9.5	
Manufacturing Process Intelligence	10%	8.6	9	
Control	5%	8.2	10	
Deployment	5%	7.6	14.4	
Functionality	35%	100%	9.06	9.66
Integration	30%	10.2	8.2	
	40%	9.6	10	
	30%	7.2		
	15%	100%	6.975	



Benchmarking processes of plants under assessment



Identify
Process
Gaps

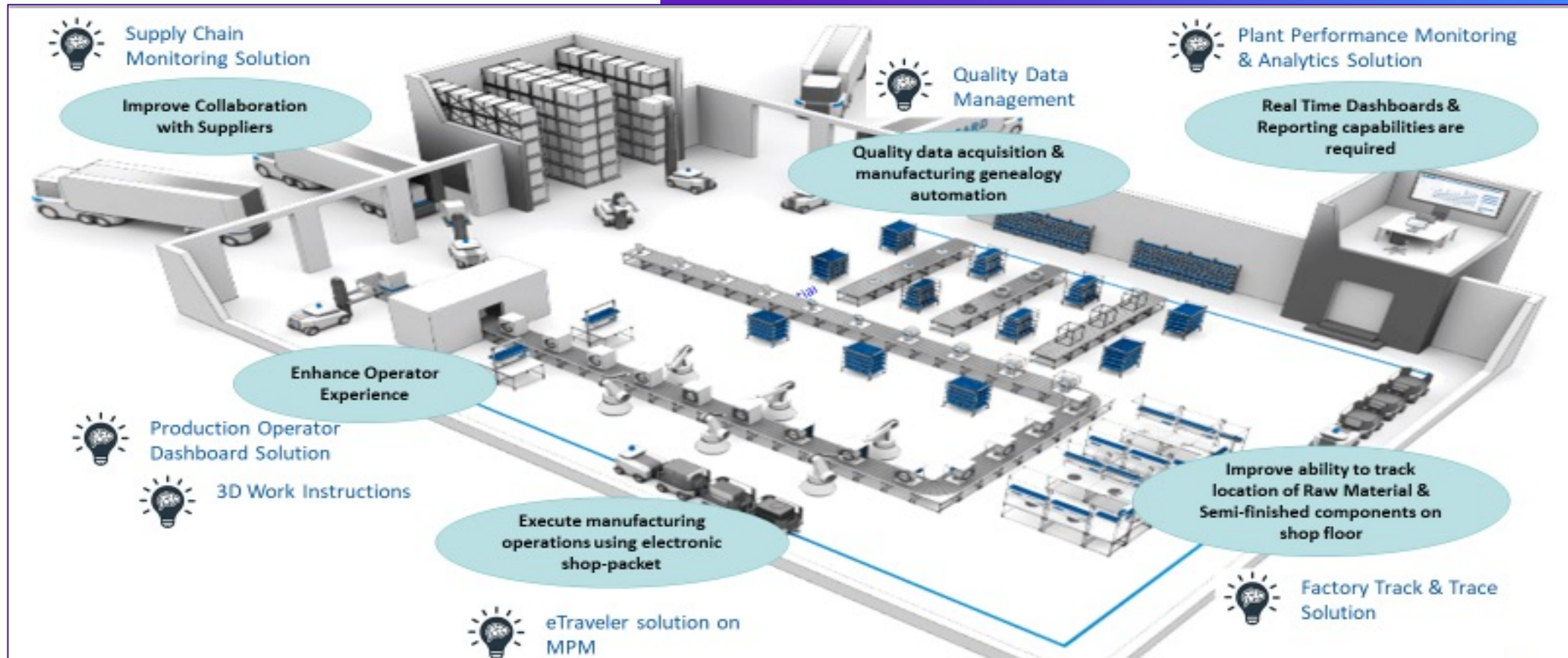
Identify
System
Gaps

		Charlotte	Indianapolis	CMX-C	CMX- E
Manufacturing Operations	Operations Scheduling	6	7	2	2
	Resource Allocation Status	8	8	4	4
	Order Dispatching	5	5	3	3
	Process Management	6	4	2	2
	Quality Management	7	5	5	5
	Product Tracking & Genealogy	8	6	5	5
	Performance Analysis	8	7	6	6
	Document Control	8	6	4	4
	Data Collection & Acquisition	8	6	4	3
	Maintenance Management	7	7	6	6
	Inventory Management	9	5	1	1
Supply Chain	Demand Visibility and Integration	7	4	3	3
	Visibility to Component Inventory	10	9	5	5
	Order Management	6	4	3	3
	Supplier Collaboration Portal	9	5	4	4
	MRP, Kanban & JIT inventory integration	9	7	1	1
	PO/ASN/Invoicing collaboration	8	5	1	1
	Supplier Performance	7	3	1	1
	Data Analytics & KPI Dashboards	6	4	3	3
	Supply Planning and Detailed Scheduling	7	5	3	3
	Visibility to Supplier Inventory	6	4	3	3
	Finished Goods Inventory visibility	6	6	4	4

Smart Factory Vision with Intervention Use Cases

Use Cases identified

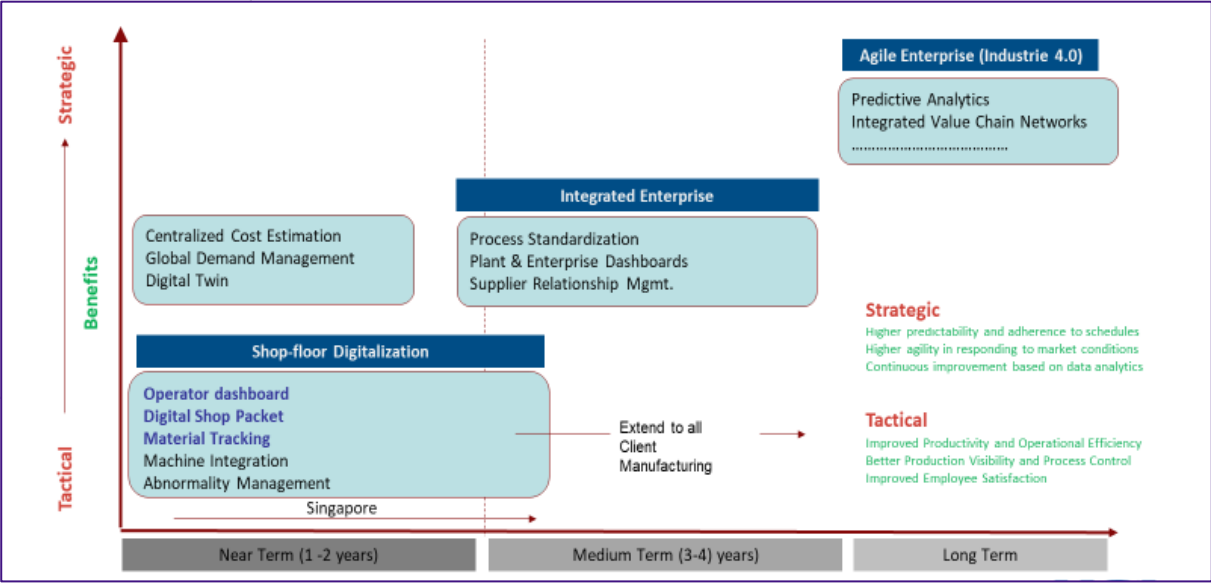
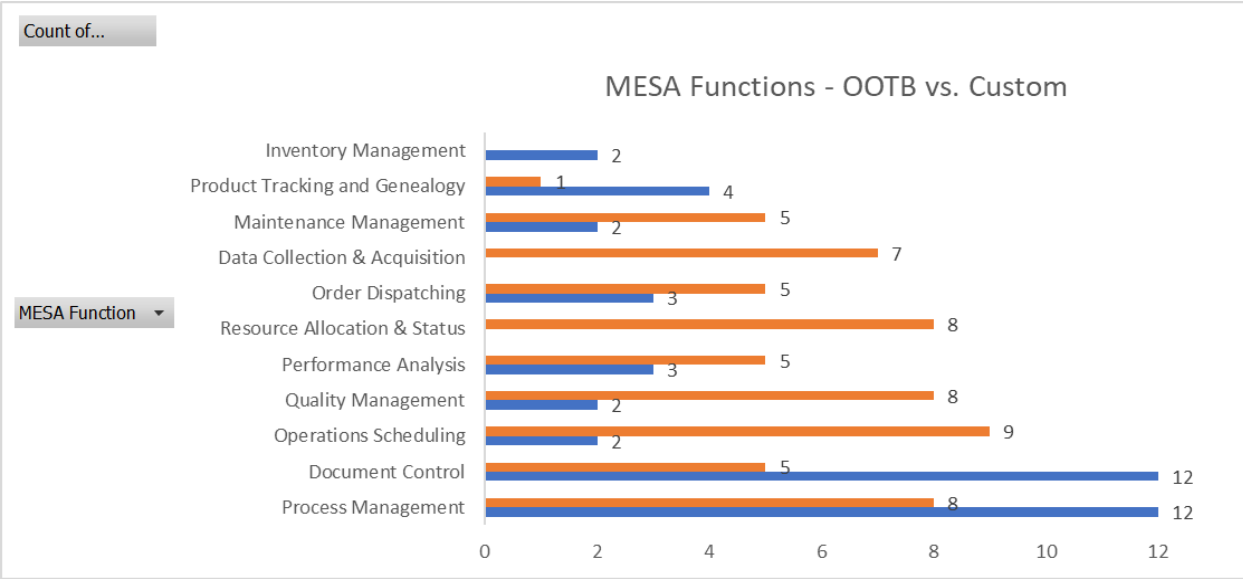
Business Benefits Modelling



Solution Blueprinting and Adoption Roadmap

Functional roadmap based on Industry Standards

Implementation roadmap based on Business Value

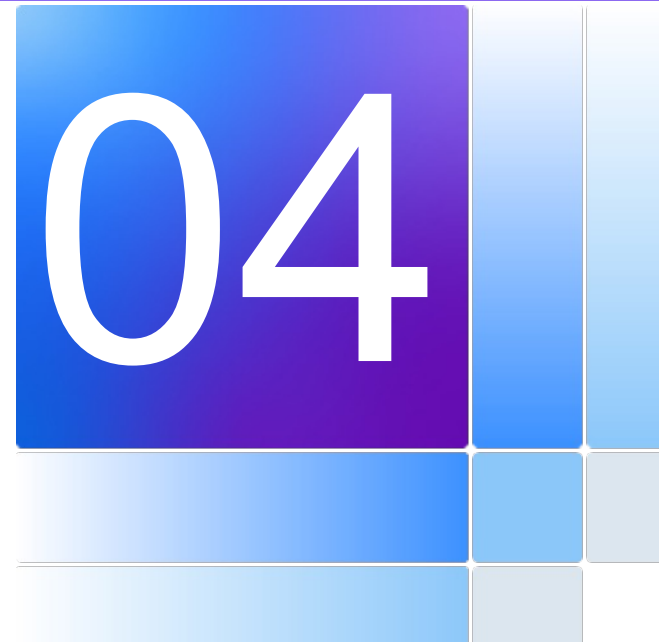


Sample Benefits and Use Cases





Examples from around the world



Example of a Medical Technology leader embarking I4.0 digital maturity journey

About Customer



Businesses – 6
Bn \$ Repair,
regeneration and
replacement of
tissues



Headquarters UK,
100 + countries
30 + Mfg. sites in
US, Europe and
Asia



HCLTech works
for Operation
Technology and
Innovation
Division

Summary

- Client embarked a journey of improving operational efficiency, with I4.0 digital maturity
- Client choose HCLTech as consulting partner to assess the current digital maturity, Industrial engineering assessment and create strategy and road map
- 12 week assignment with SME led session at chosen site leading to clear roadmap, digital maturity improvement in the next 18-24 months
- Comprehensive muliti dimensional assessment with 117, non-linear progress model

Data Collection &
Planning

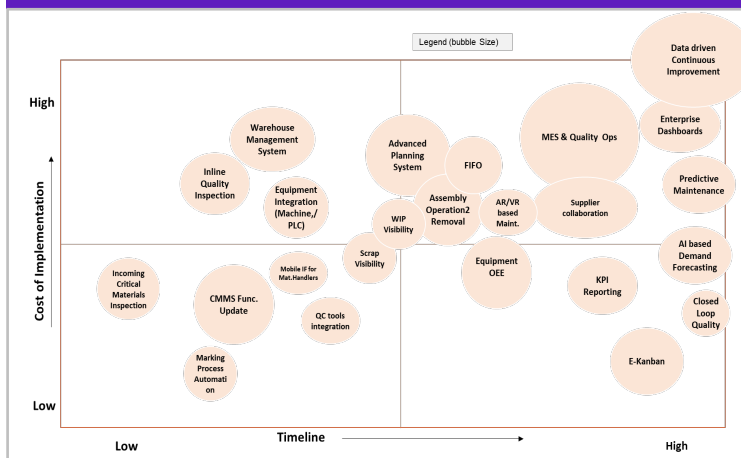
Map Current State

Identify
Opportunities for
Improvement

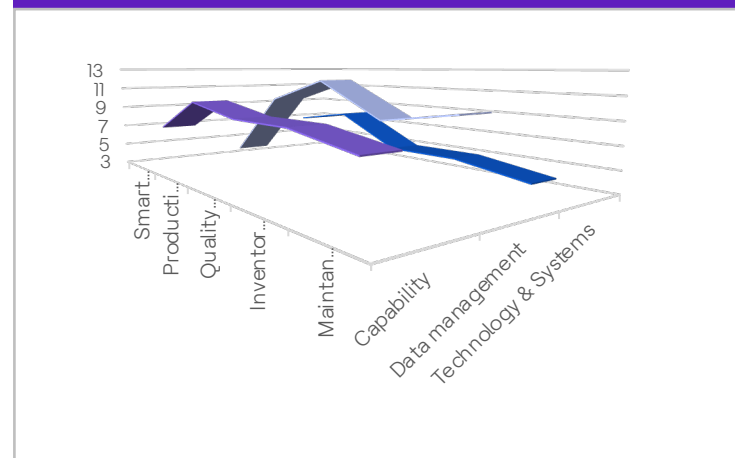
Solution
Recommendations

Roadmap

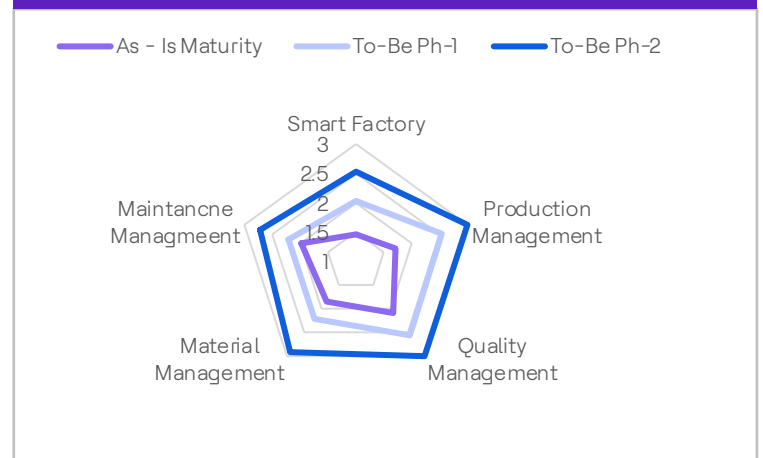
Opportunity for Improvement



Multi Dimensional Assessment Model



Digital Maturity Assessment



Customer example of building a roadmap for Ind4.0

‘Factory of the Future’ MES for Leading Hi-Tech company

Business Challenge

- Global implementation of MES as part of ‘Factory of the Future’

HCLTech Approach

- 360-deg view on DHR Process and plan for eDHR
- Phase wise release using Agile SCRUM Methodology.
- Replace multiple shop floor applications with CM based integrated solution.

Business Benefits

- Implementation ongoing for multiple sites across US and Europe
- 20,000 products produced per day for Europe site



Success Stories: People and Trainings

Smart factory initiative for manufacturer of industrial tools, household h/w & security products

Business Challenge

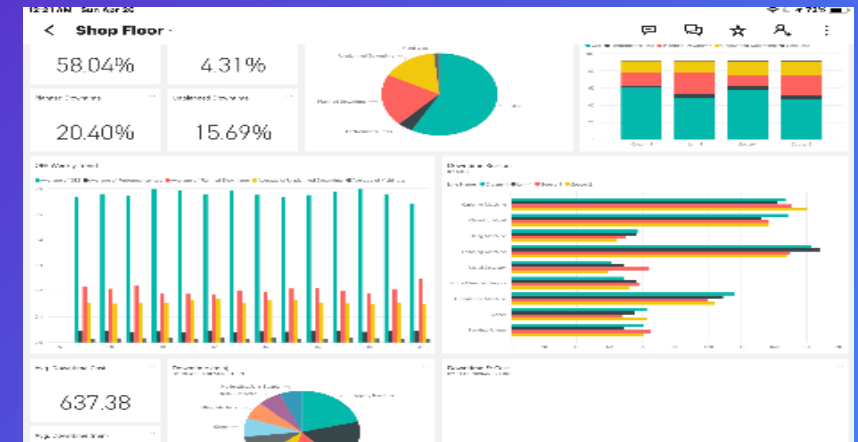
Transforming a complex heterogeneous Shopfloor IT application landscape along with attracting and retaining talent with emerging technology skillset across multiple stakeholders.

HCLTech Approach

- Implemented Next-gen Integrated operations (Application and Infrastructure layers) aligned into a single cohesive operating model
- Intensive training of 280+ resources in 17 countries ensuring seamless and disruption free transition
- Leveraged an innovation CoE to drive Manufacturing transformation

Value Delivered

- Setup Delivery and Technology Co-Innovation Center & Continuous value generation through HCLTech Value Creation Portal
- Setup a Knowledge academy for customer

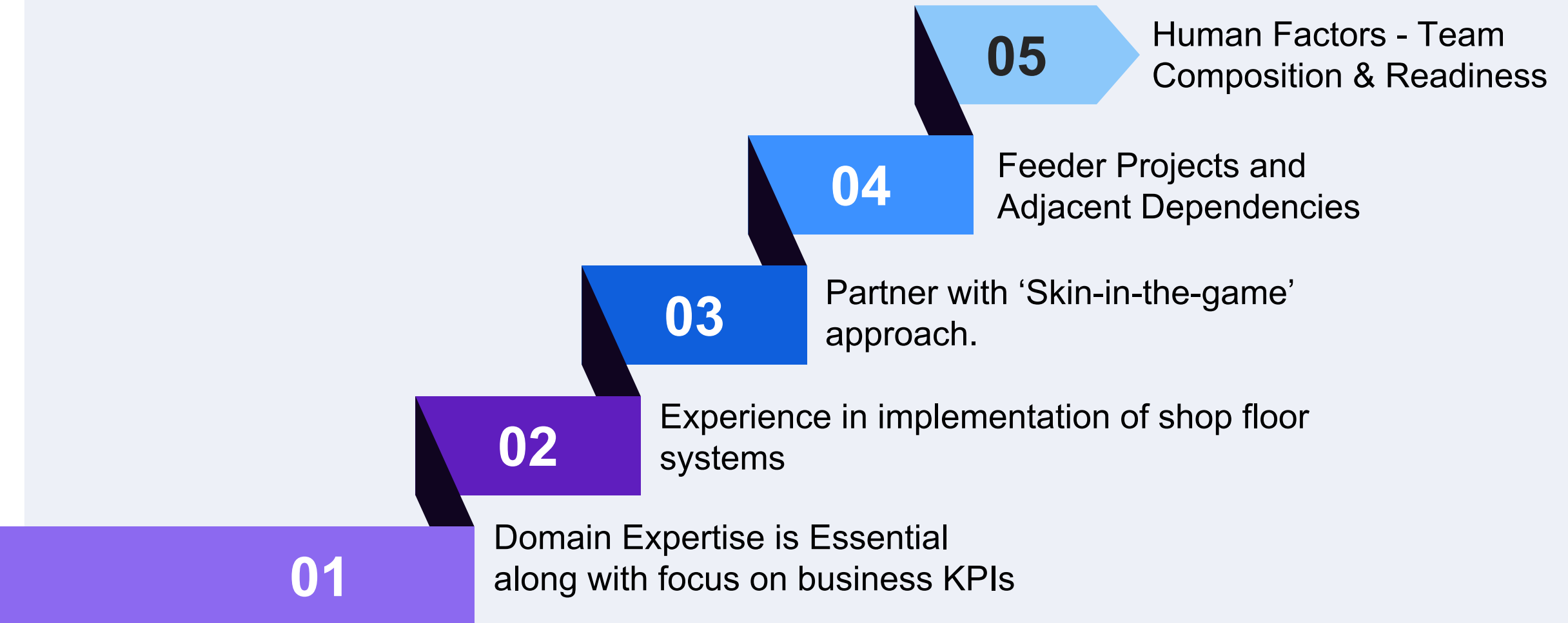




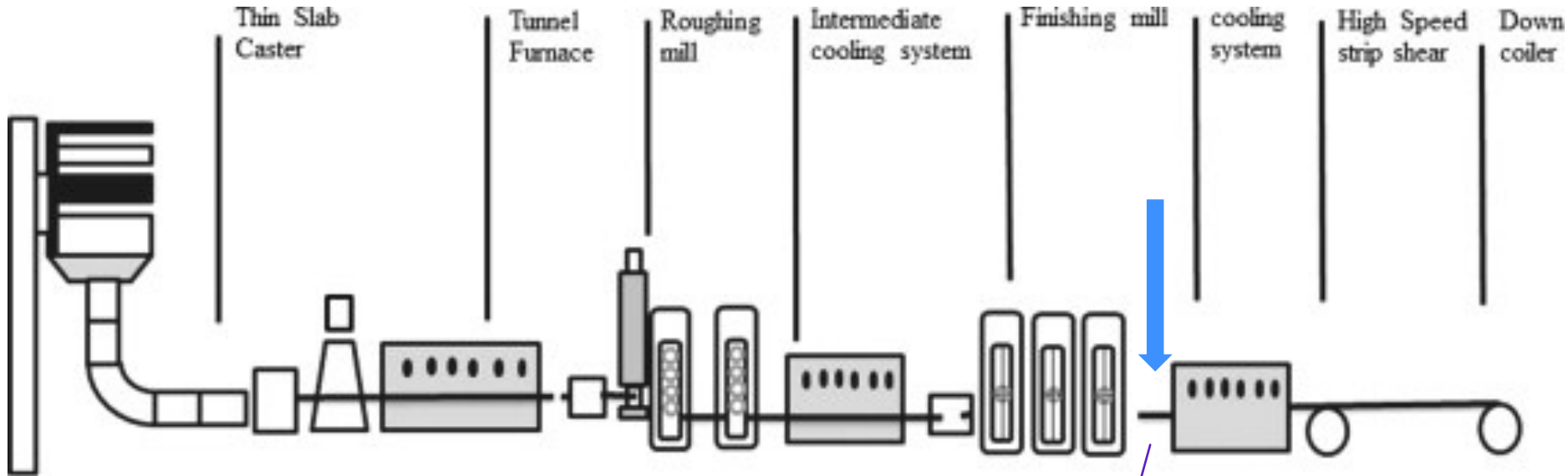
Learnings from our experience

05

FIVE key reasons of success



Quiz ... in a lighter vein



Pyrometers installed here continued to give wrong readings due to high amount of vapor / steam.

What can be a solution :

- A. Put Multiple Pyrometers
- B. Probably a Software Bug
- C. Use AI/ML to auto correct readings
- D. Think Out of the Box.



Answer : Install this... 😊



Thank you.

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