



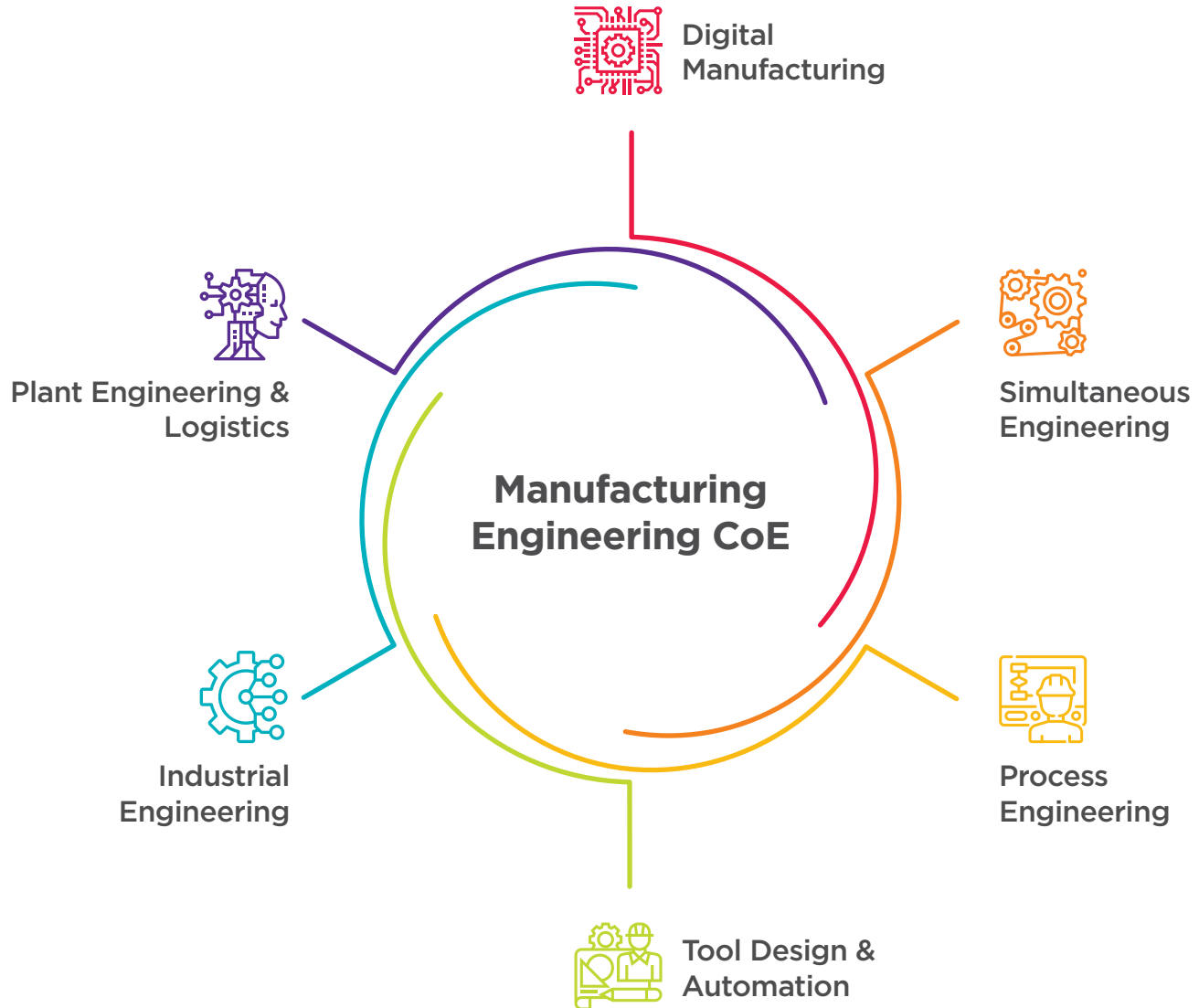
Growth partnership for a self-care centric lifestyle

 Innovation | Acceleration | Growth

Manufacturing engineering services by HCL

HCL has brought \$40 MN Savings through various Manufacturing Services across various verticals. With our highly experienced 750+ manufacturing engineering professionals, we achieved 60-70% reduction in time in CNC tool path programming and 50% productivity improvement. Optimize your productivity with our comprehensive portfolio of manufacturing engineering services.

Manufacturing Engineering Services



HCL Manufacturing Capability

DIGITAL MANUFACTURING

- ▶ Robotic Simulation
- ▶ Assembly simulation
- ▶ Plant Scanning, 2D & 3D plant Layout
- ▶ Plant simulation
- ▶ Ergonomics simulation- static and dynamics
- ▶ Robot, CNC,CMM, programming

PROCESS ENGINEERING

- ▶ Process study & analysis
- ▶ Process improvements
- ▶ APQP, FMEA & control plan
- ▶ Smart work instructions
- ▶ Accessibility & Ergonomics analysis
- ▶ First Article Inspection Reports
- ▶ Plant & Process documentation

INDUSTRIAL ENGINEERING

- ▶ Standard Time computation (MTM, MODAPTS, MOST)
- ▶ Line Balancing
- ▶ Workstation Design
- ▶ Value Stream Mapping
- ▶ CAPEX estimation & project management
- ▶ Route study & analysis



SIMULTANEOUS ENGINEERING

- ▶ Assembly Feasibility Studies
- ▶ Selection of suitable process
- ▶ Process optimization
- ▶ Welding Operation Analysis
- ▶ Sealing Operation Analysis
- ▶ Assembly process Analysis
- ▶ Safety analysis

TOOL DESIGN & AUTOMATION

- ▶ Jigs and Fixtures - Machining, Assembly, Welding & Inspection
- ▶ Rack, Trolley design
- ▶ Tooling requirement gathering & design for NPI
- ▶ Low cost automation

PLANT ENGG. & LOGISTICS

- ▶ Layout Optimization
- ▶ Material Flow optimization
- ▶ Material classification (ABC)
- ▶ PFEP creation
- ▶ Material preparation, Kitting, Sequencing, & Storage design
- ▶ Space Optimization

HCL Credibility



Driving cost saving

<p>\$30MN VALUE SAVING through various Manufacturing Services and our own IPs till date</p>	<p>60-70% TIME REDUCTION in CNC Tool Path Programming</p>
<p>\$2M SAVED by successful design, validation and setup of high density racks for inbound logistics in manufacturing plant</p>	<p>Over 50 plants were digitally set up and optimized by discrete event simulation</p>
<p>50% PRODUCTIVITY IMPROVEMENT by Minimizing the overall operating cost by redesigning workstation and overall layout</p>	
<p>Savings of 4.6 million RMB per year, by reduction of line side inventory</p>	



Extensive capacity and capability

<p>750 Mfg Engg Professionals across the globe</p>	<p>9 Years Average FTE Experience in ME Service</p>
<p>Presence in USA, Germany, France, UK, Sweden, China, India, Indonesia, Korea</p>	<p>Three decades of experience in Manufacturing Engineering Services</p>
<p>50+ SMEs across HCL in Mfg Engg. Practice</p>	

Cross industry experience



Serving Top 5 OEMs and 7 out of top 10 Tier 1s for over a decade



Serving Top 3 Off-highway equipment manufacturers since a decade



A decade long engagement with world Leaders in Medical Devices



Serving world leader in Consumer Appliances



Serving Top 5 Industrial Equipment manufactures

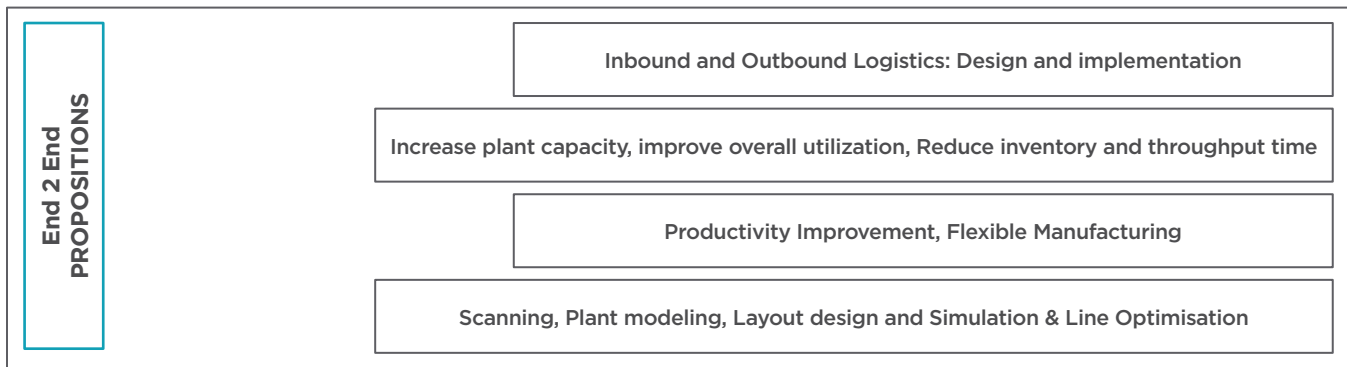
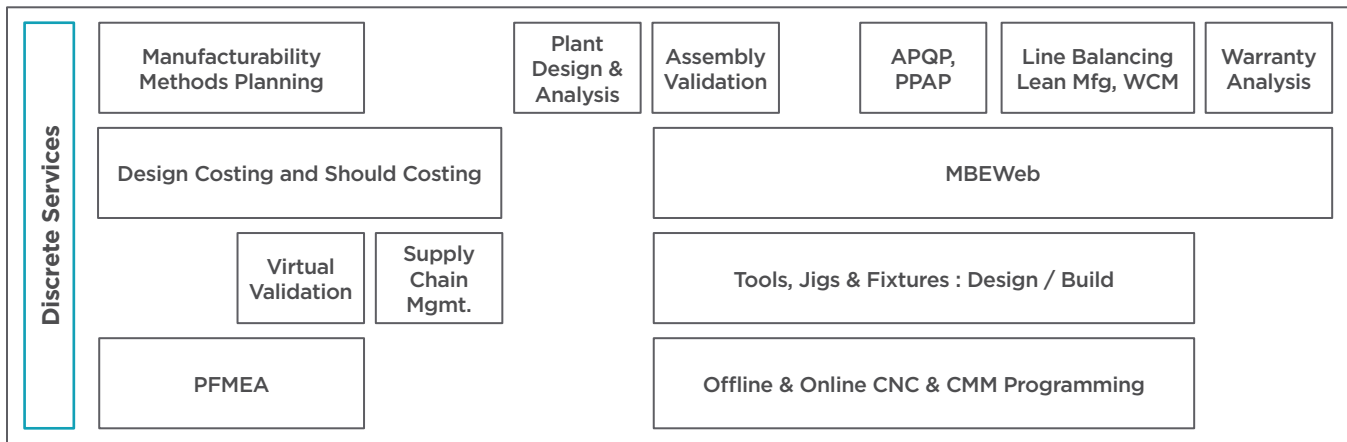
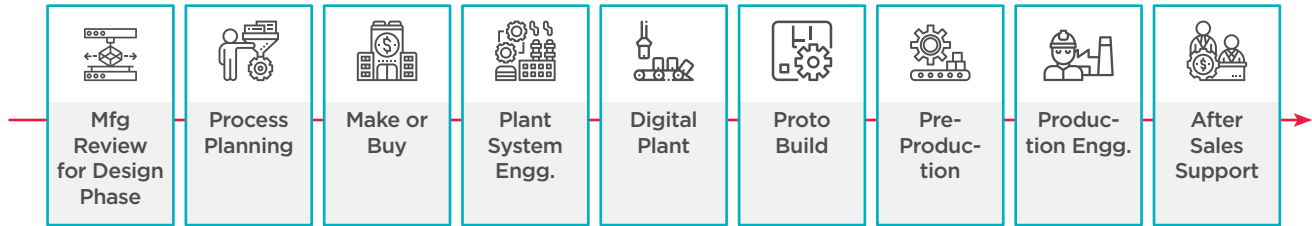


Serving world leader in Office automation



Serving Top 5 Automotive OEMs since last 3 decades

How COE helps in each phase?



Case Study:

HCL – Lab Diagnostics Divisions of a Large IVD Player Manufacturer



Challenges

The customer's METS group had a challenge in executing complex functional test fixture in quick turnaround time and they were looking for partner to the support in design, procurement, build, software development and installation at production location.



HCL Solution

- ▶ HCL did excellent job in the first project by taking ownership of design from concept to build. This was done with offshore onsite model of highly experienced resources and excellent project planning to handle procurement activities from offshore location in parallel to tester design to meet the aggressive timeline. The customer was able to get the assembled test fixture before the deadline.
- ▶ By seeing the performance of the team in first project, Customer approached HCL for duplication of test fixture development and installation at their vendor production location. HCL executed step by step approach to procure, build and install testers at vendor site over a period of 12 months.
- ▶ HCL took several initiatives such as development and installation of demo test fixture at offshore location, Customer's network connectivity for HCL offshore engineers at HCL India sites, step by step Knowledge transfer to take up higher roles and retention of knowledge, etc. HCL engineers could take up complete ownership of tester development activities independently.



Value Delivered

- ▶ Successful completion of 42 electromechanical test fixture design, procure, build, Software development and Installation at production location.
- ▶ Successful completion of 25 electromechanical test fixture duplication at vendor location.
- ▶ USD 504,000 worth value delivered by design standardization and simplification.

Case Study:

Improving throughput for a leading Agricultural, Construction equipment manufacturer



Customer Requirement: Necessitate partner support to increase the throughput (the amount of material or items passing through a system or process) through maximizing the utilization of the resources of Transmission, Cab and Final Assembly line.



Business Challenges: Logistics improvement to increase the productivity for the emerging market.



Solution Approach

- ▶ Project charter created with dependencies / Objectives
- ▶ Business forecast of the organization was the key plan to improve the logistics function
- ▶ Designed flexible material handling, packaging and line presentation equipment with better visual factory
- ▶ Identified components for kitting and sequencing to reduce the footprint of the material at line side
- ▶ Minimized the non value added work and balanced the workload between the resources to eliminate wait time and WIP
- ▶ Optimized the material delivery routes to improve the utilization of the material handling resources and deliver the material using JIT concepts



Key Benefits

- ▶ 25% reduction in Lead time
- ▶ US \$ 2,271,000 savings to customer
- ▶ Productivity was increased after the logistics improvement due to which the company was able to achieve the target as per the schedule
- ▶ Improved the utilization of the floor space
- ▶ Eliminated the capital investment of \$ 587,000 in additional floor space

Case Study:

Supplier Base Optimization – Industrial Paint Makers



Business objectives

Analyze spend from indirect expenses (field spend) and suggest cost saving opportunities across group of industries.



Products analyzed



Salient points

Quick win savings

No-design change /
supplier validation

Large Savings

Processes adopted

Data Selection	Data Analysis	Approach	Results & Savings
<ul style="list-style-type: none">▶ Top indirect Spend Commodities selected for analysis▶ Batteries▶ Cable ties▶ Industrial Paint markers	<ul style="list-style-type: none">▶ 69 different types of batteries identified▶ 17 Suppliers▶ 97 Manufacturers for these 69 types▶ 6 Types of batteries have spent of contributing \$207k out of 322K	<ul style="list-style-type: none">▶ 5 types contributing to \$152k or 48% spend identified▶ Manufacturer of each battery type identified▶ Consolidated and standard pack procurement suggested	<ul style="list-style-type: none">▶ Total Spend can be reduced by \$100K per annum giving a saving of 48%▶ Plan B saving suggested \$86K with 41% saving▶ New Vendors proposed for further reduction

Case Study:

Leading HVAC Equipment Manufacturer



About Customer

- ▶ Products: HVAC equipment's, Fire Suppression, Security products, Retail solutions
- ▶ Company size: USD 30Bn
- ▶ Procurement spend: USD 11Bn (Direct, Indirect, Field)



Products / Commodities analyzed

- ▶ Top categories supported:
 - Injection molded parts - Resin spend, Molded
 - Motors - fractional ECM, IHP (1 to 100 HP)
 - Heat Exchangers
 - Compressors
 - Valves - Check, Butterfly, Gas, Reversing
 - Metals - Steel, SS, Copper, Aluminium - flats and rolls, stamping, fab, casting, machining, forging
 - Electrical - PCB, standard items (Relays, Contactors, Switches, Transformers, etc.)
 - Mechanical - Drives, Bearings, Couplings, Filters, Seals, Pumps
 - Adhesives and Chemicals
 - Indirect spend - PPE, Hand Tools, Cleaning, etc.
 - Field branch spend - Pipes, Valves, Fittings, HVAC components, Electrical, etc.



Business Challenge

- ▶ Consolidated / Clean Spend Data not available, due to high number of ERP / PLM systems - 30
- ▶ Large number of non strategic suppliers - long tail spend (also due to large number of plants -108)
- ▶ Continuous mergers and acquisitions
- ▶ Pressure on bottom line improvement
- ▶ Decentralized sourcing processes in different business units



Scope of Work

- ▶ Support to Category Management:
 - L3: Spend Data Analysis, Book of business, Recommendations, Alternate suppliers, RFI / RFQ, eAuction
 - L2: Should cost models, provide technical assistance for negotiations, Regression models
 - L1 support: VA workshops, Supplier benchmarking, CI roadmaps, Cost evaluations
- ▶ Competitive Benchmarking:
 - Internal Benchmarking - cost gaps for same / similar parts and products
 - External Benchmarking - Competitive product teardowns
 - VA workshops - product / process cost optimization and implementation of ideas
- ▶ Implementation Support:
 - Project Management
 - PAP support
 - Prototyping / Testing / Qualification
 - Engineering / Design support
 - Tool move coordination



HCL Engagement Overview

- ▶ 3 years of relationship - 50 resources
- ▶ Support geographies: NA, EMEA, Asia
- ▶ Savings realized: \$45M realized

FOR MORE INFORMATION, PLEASE CONTACT



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HCL