

Harsha Engineers International Ltd Company Profile for TPM Special Award

1. Company Profile

1.1 Plant profile, Company Ownership and Geographical spread

Harsha Engineers International Limited* (Harsha), headquartered in Ahmedabad, Gujarat, was established on 1st September 1972. Formerly known as Harsha Engineers Ltd., the company became publicly listed on the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) on 26th September 2022.

Harsha is the largest manufacturer of precision bearing cages in India's organized sector, boasting a global market share of 5-6% in the Brass, Steel and Polyamide segment. The company is led by Mr. Vishal H. Rangwala, CEO & Executive Director, and Mr. Pilak R. Shah, COO & Executive Director.

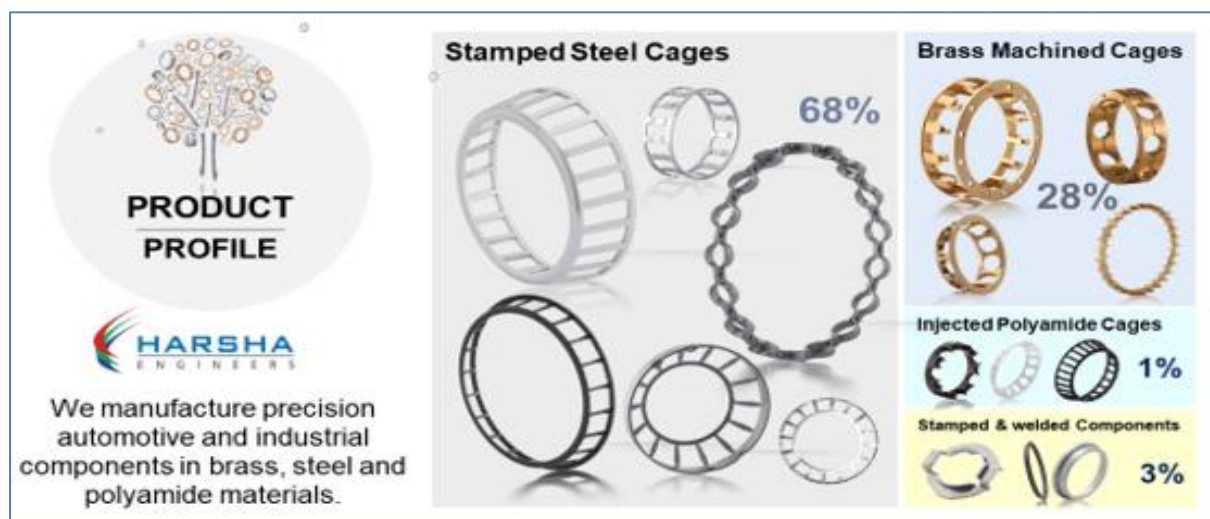
Our primary production facilities are in Changodar and Moraiya, near Ahmedabad, Gujarat, India, with interlinked manufacturing processes. Additionally, we have production facilities in Changshu, China, and Ghimbav Brasov, Romania.

To support future growth, we have acquired land for a new facility under Harsha Engineers Advantek Limited in Bhayala, Ahmedabad, Gujarat. This new plant, set to be commissioned by mid-2025, will house the Bronze, Stamping, and LSB Manufacturing Divisions, which will be relocated from the existing facilities to enable further expansion.

1.2.1 Products, Products ranges, Process Technology, Management Organization, and staffing Structure

1.2.1 Product, Product ranges & Process Technology

The image below highlights Harsha's key product offerings:



Harsha manufactures a wide range of bearing cages including Taper Roller Bearing Cages (TRB), Deep Groove Ball Bearing Cages (DGBB), Brass Cages, Bronze Bushings, Special stamped Components and Polyamide Cages. With sizes ranging from 20 mm to 2000 mm, these products are supplied to major global bearing manufacturers.

The TRB Cage manufacturing process includes stamping operations such as Cup Forming, Notching, Coining, Spreading, followed by Vibro-finishing, shot blasting or phosphating, and concludes with visual inspection and packing.

The Deep Groove Ball Bearing cage manufacturing process involves ring cutting, cage making, vibro-finishing, rivet inserting followed by visual inspection and packing.

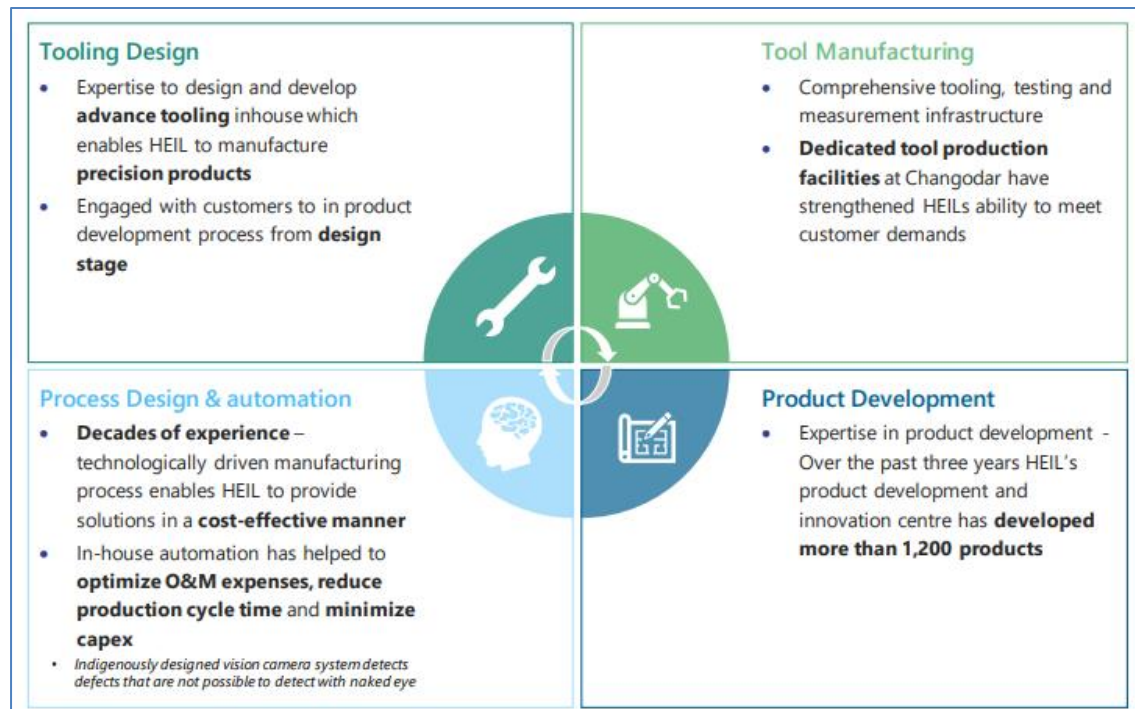
Harsha produces precision stamping components such as railway seal, AC compressor head, chassis parts, engine drive, clutch component, gear shifted assembly parts etc.

The Brass Retainers manufacturing process involves turning, pocketing, and vibro-finishing followed by visual inspection and packing.

Harsha has expanded its portfolio to include bronze bushings for sliding bearing applications, particularly focusing on wind gearboxes. The bushings range in outer diameter (OD) from 200 mm to 600 mm and in height from 200 mm to 800 mm.

The Polyamide cage manufacturing process includes RM inspection, de-humidifying, molding, conditioning, drying followed by visual inspection and packing.

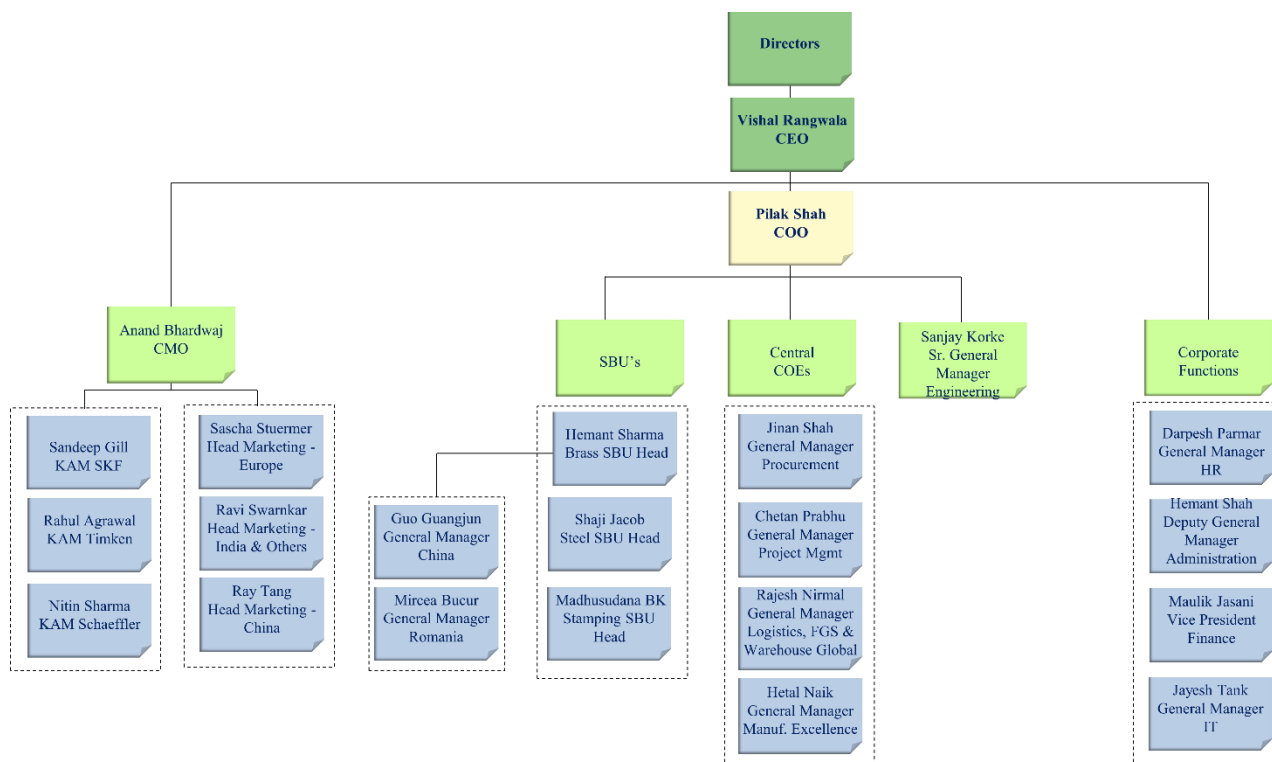
The manufacturing bays are equipped with advanced machinery including power presses from AIDA, Minster, Schuler, etc.; CNC machines from Jyoti, AGIE, Charmilles, Moriseiki, Deckle, Maho, Sodick, Mitutoyo, Brown & Sharp and Injection molding machines from BOY & Toshiba, ensuring the production of precision quality products.



Driven by a strong focus on innovation and development, Harsha continuously innovates to meet diverse customer requirements. With in-house expertise in advanced tooling design and development, the company excels in manufacturing complex and intricate products, leveraging these capabilities to achieve manufacturing excellence.

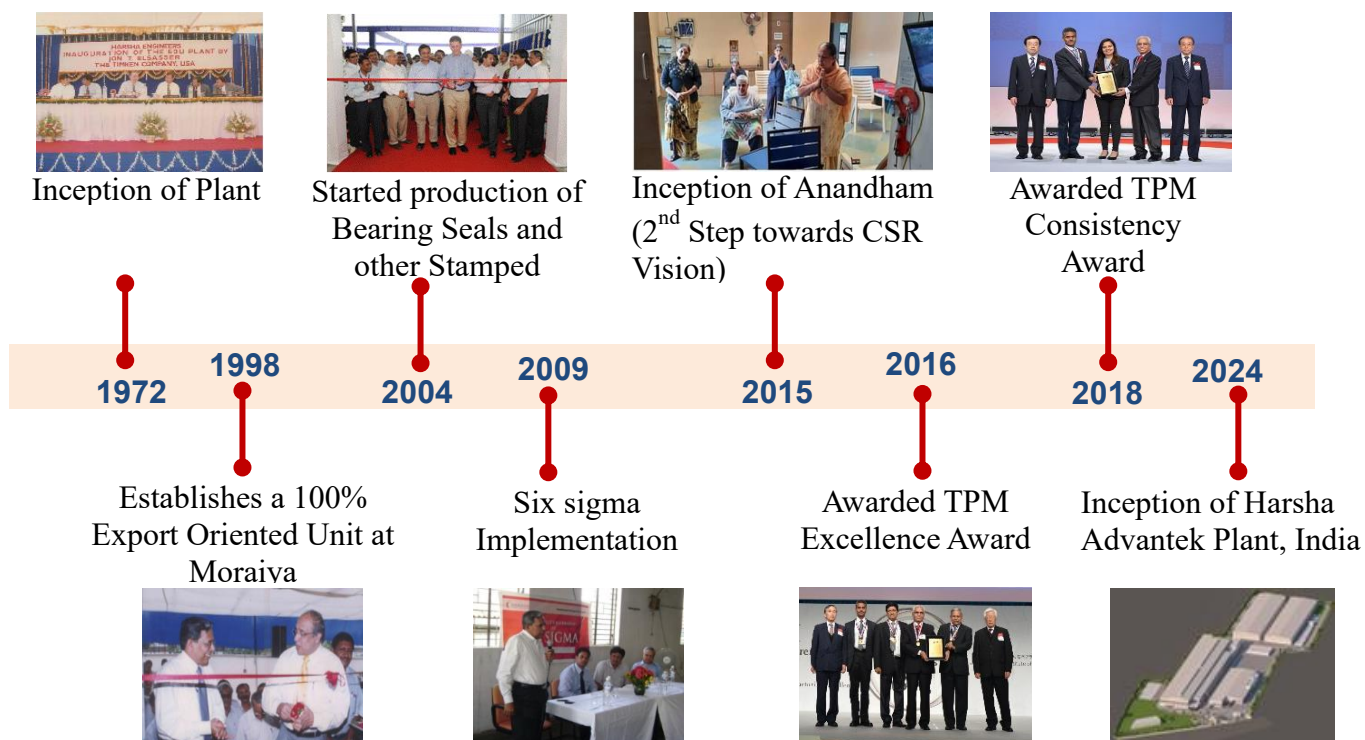
1.2.2 Management Organization and Staffing Structure

The top management organizational structure is illustrated below.



2. Milestone on the journey of Manufacturing Excellence

Here is an overview of Harsha's journey so far.



2.1 Reasons for adopting TPM as a company policy

In today's challenging economic environment, organizations face heightened competition, requiring the elimination of losses across the supply chain to ensure survival. Stringent product quality standards demand zero defects and on-time delivery of the total quantity. Additionally, small-lot production, shorter lead times, and diverse customer needs necessitate improved flexibility, reliability, and sustainability.

Total Productive Maintenance (TPM) was identified as a powerful methodology to enhance performance, productivity, and profitability through the efficient integration of machines and people. To address safety, quality, delivery, cost, and foster cultural transformation through total employee involvement, Harsha adopted TPM in September 2011.

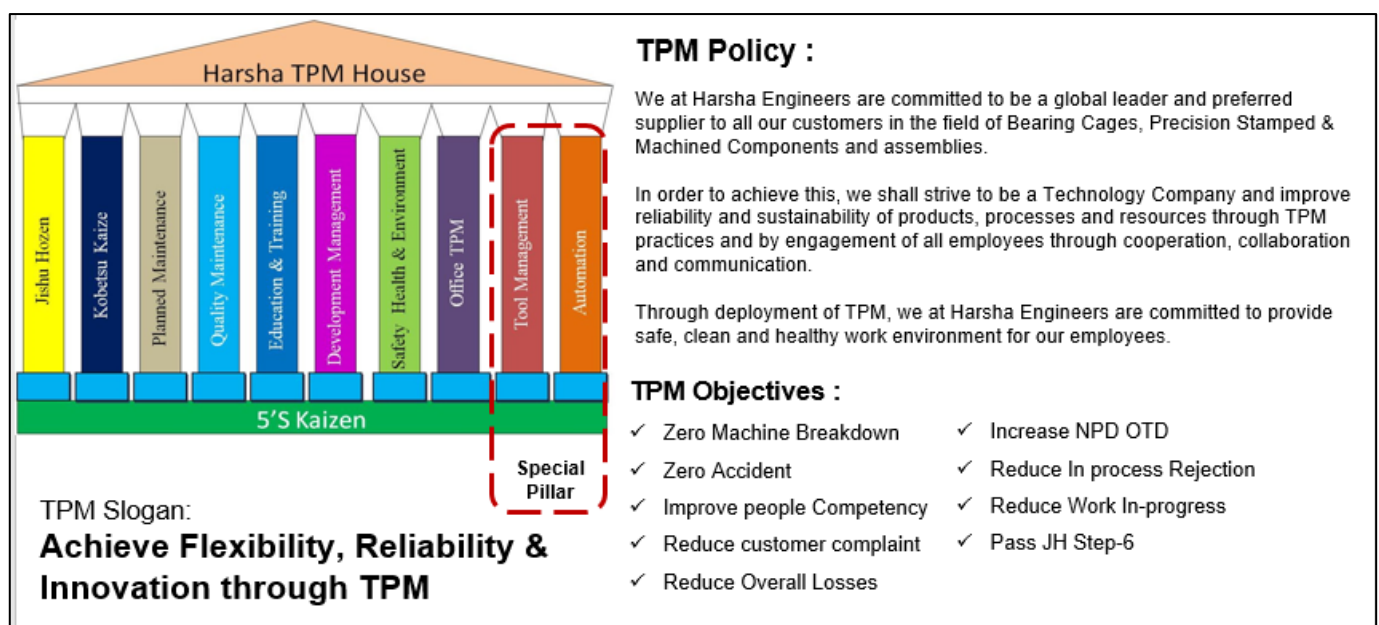
- 2015: Received the **TPM Excellence Award (Category-A)**.
- 2018: Honored with the **TPM Consistency Award**.

To support this journey, Harsha established a dedicated **TPM Office** as part of its organizational structure. The TPM framework includes:

- **15 Steering Committee Members**
- **57 Circle Leaders** (shop floor and office)
- **150 Subcommittee Members**
- **1,400 Associates**

Innovative Additions:

- **2015:** Introduced **Tool Management** as a new pillar to address tool-intensive processes and products.
- **2021:** Added **Automation** as a pillar to enhance production flow and achieve **single-piece flow lines**.



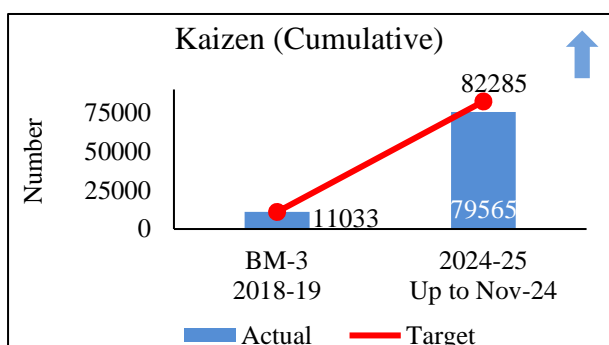
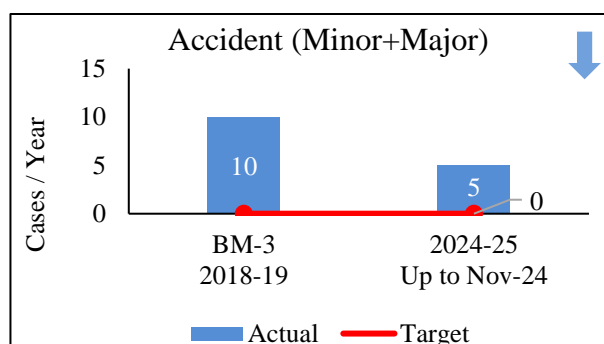
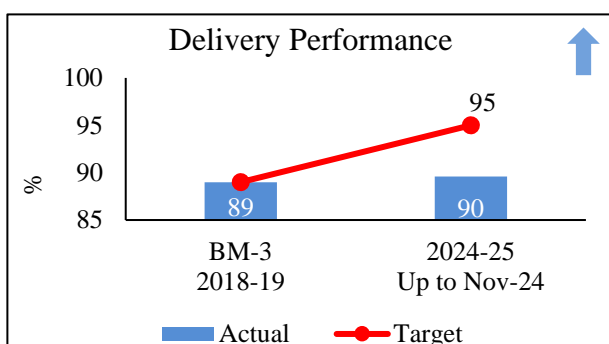
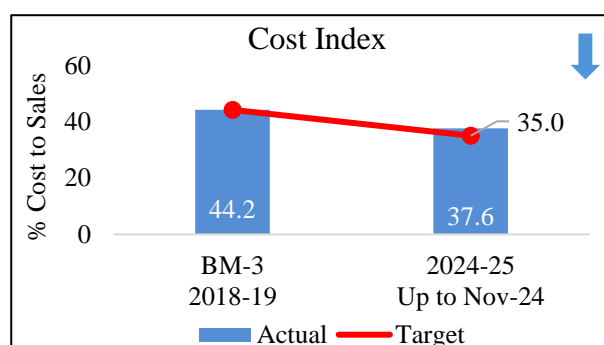
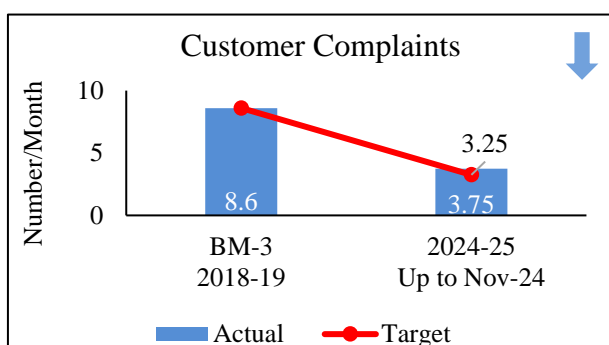
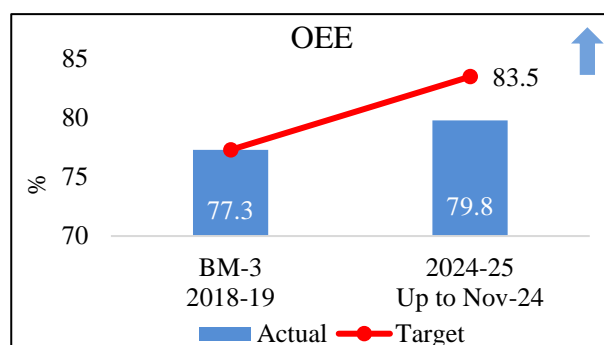
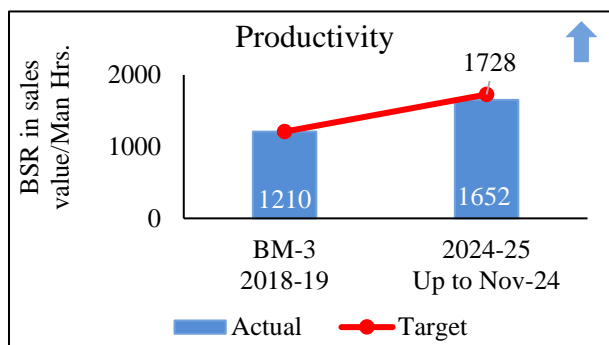
2.2 Major activities during TPM Special Award journey

The following Key activities are carried out during the TPM Special Award Journey.

- 1) During the Special Award journey, Harsha aligned its focus with market demands and internal priorities. Key market needs addressed include digitalization, product diversification, zero defect quality, digital cock-pit inspection, and competitive costs. The company focused on innovation and continuous improvement to meet these requirements.
- 2) We pursued zero loss machine, no touch lines, no supervisor lines and single piece flow lines through a collaborative approach across JH, KK, QM, PM, DM, Automation, TM, and E&T Pillars.
- 3) We utilized advanced analytical tools like Figure 8, PM Analysis, and Factor Analysis to eliminate defects at their root.
- 4) Aligned with the management directive "Making Harsha Ready for Future", we implemented Navigator software in the tool shop for machine scheduling, time and cost tracking, real-time WIP tracking, and accurate data management.
- 5) We improved Equipment reliability by following 10 step PM System and RCM Projects.
- 6) A breakthrough improvement was the installation of a robot for part loading and unloading on the 1000-ton press machine, enhancing safety, reducing employee fatigue, and lowering cycle time.
- 7) Innovation through Product Diversification - Super precise Bushes and Discs were developed first time in India working closely with Customer. Extensive trials and research, jointly conducted by DM, TM and QM, were carried out to design the equipment and processes.
- 8) We implemented KYK, HIRA, TBT, Safety Operating Procedures, and assigned a Safety Officer for one-day activities to develop safe workstations.
- 9) We initiated CO2 emission reduction activities, focused on ESG parameters, and are steadily increasing long-term value creation through sustainability.
- 10) Key initiatives driven through Tool Management include enhancing tool life, achieving zero tool breakdown, and optimizing tool costs.
- 11) In the Automation Pillar, productivity is driven through low-cost automation and single-piece flow development projects.
- 12) Value stream mapping helps reduce lead time, inventory, and material movement.

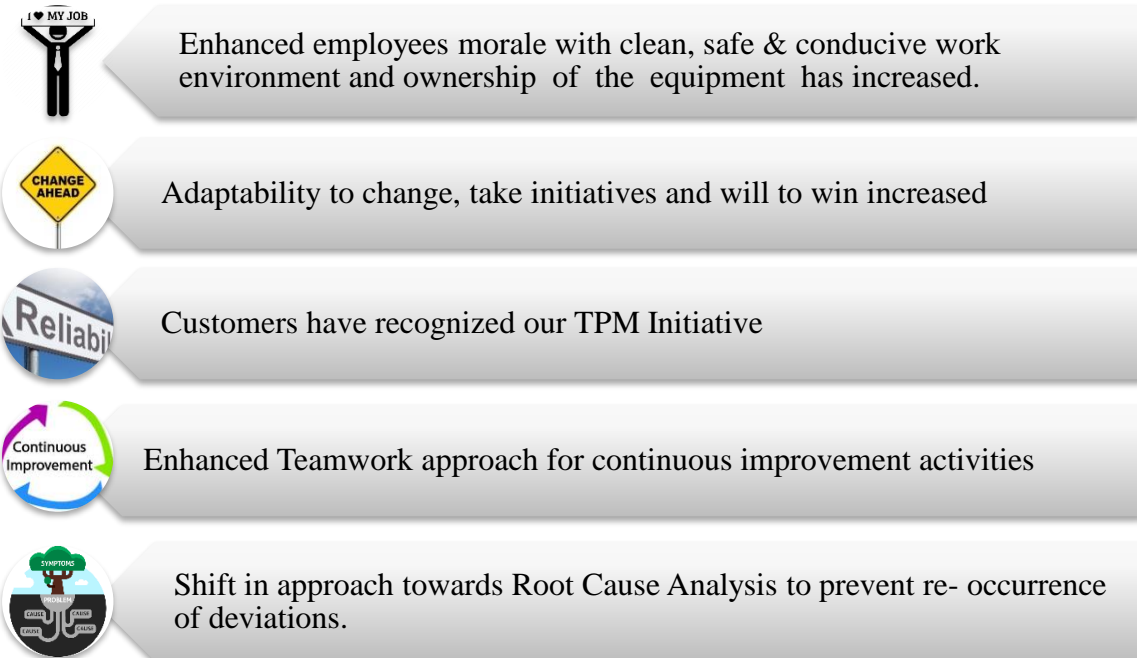
3. Benefits Achieved

3.1 Tangible business results



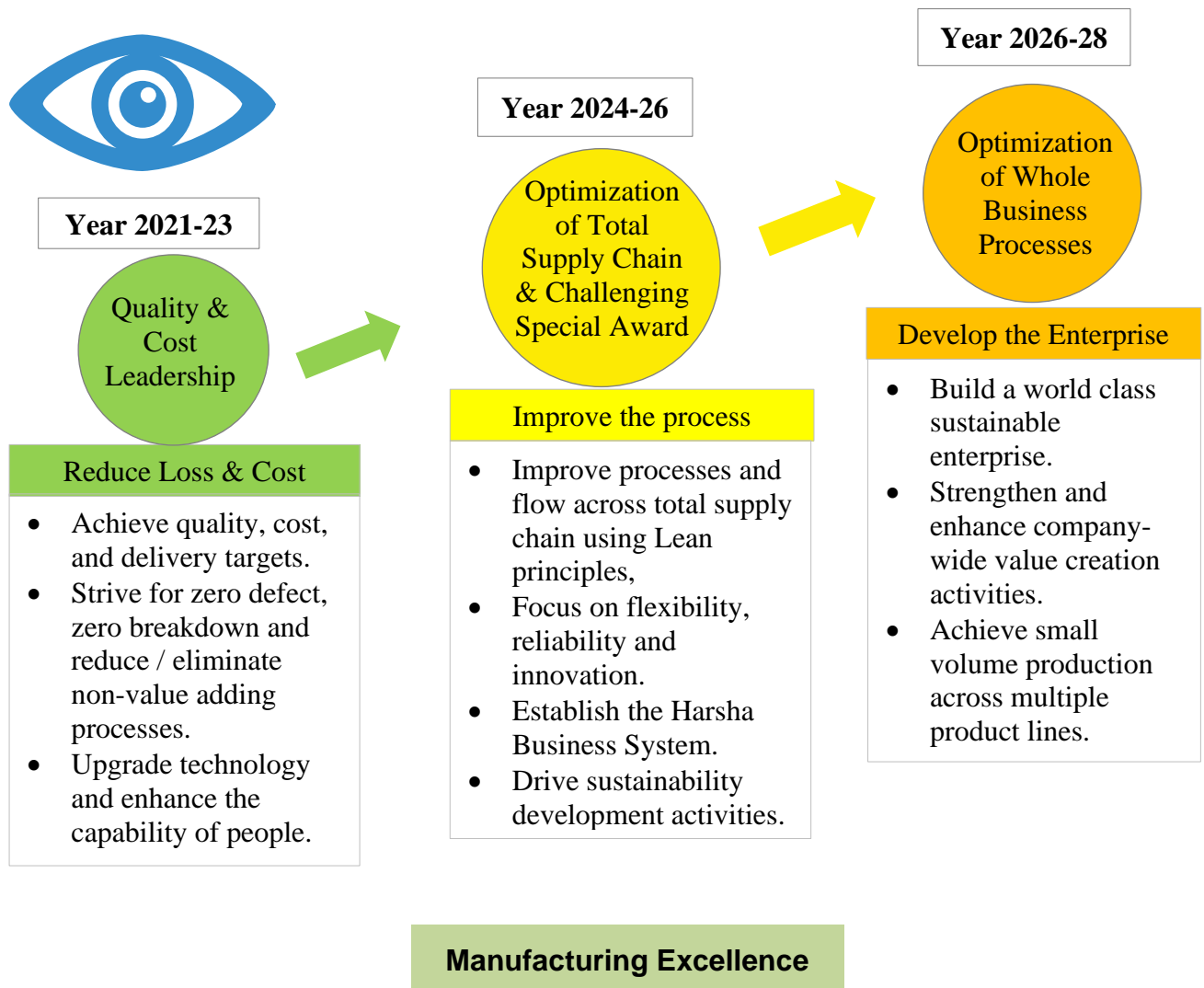
3.2 Intangible Benefits

Harsha experiences many intangible benefits, including an improved brand image, higher worker morale, continual improvements, and a strong sense of ownership and teamwork, all contributing to higher customer satisfaction.



4. Key of our Manufacturing Excellence

The following is the roadmap for Manufacturing Excellence.



5. Achievement Record – TPM Award Assessment Sheet 2024

TPM Award Assessment Achievement Sheet 2024							
Company & Plant name		Harsha Engineers International Ltd, Changodar and Moraiya Plants.					
TPM Slogan / Objective		TPM Objective: 1) Develop safe work stations 2) Achieve zero defect work stations / lines 3) Improve on time delivery / OTIF 4) Reduce overall Losses 5) Improve people competency 6) Pass JH step-6 7) Deploy supplier improvement program 8) Create innovative & breakthrough kaizen TPM Slogan: Achieve Flexibility, Reliability and Innovation through TPM					
Category	Index	Unit	Better to be	2018-19 (BM-3)	2024-25 (Up to Nov-24)	2024-25 Target	Remarks
S	Number of work-related accidents requiring days off work - Reportable	Cases / year	Down	9	5	0	1) No fatal accidents reported. 2) Five new occurrences, difficult to predict. Strengthening proactive actions with the KYT and KYK approach.
S	Number of work-related accidents requiring days off work - Non-Reportable	Cases / year	Down	1	0	0	
S	Number of work-related accidents not requiring days off work - First Aid Injury	Cases / year	Down	183	27	0	
P	Average Productivity of all products	BSR in sales value/Man Hrs.	Up	1210	1652.1	1727.8	
P	OEE	%	Up	77.3	79.8	83.5	1) The period 2019-20 has been reported as BM-3. 2) Revised cycle time.
P	Availability Rate	%	Up	83.1	86.6	86.3	
P	Performance Rate	%	Up	93.5	92.2	96.8	
P	Quality Products Rate	%	Up	99.5	99.96	100.0	
P	Number of Breakdowns	Occurrence / Month	Down	636	119	119	Newly defined breakdown indices were added in 2019-20, reported as BM-3.
P	MTBF	Hours / Month	Up	994.1	7606.5	7558.8	
P	MTTR	Hours / Month	Down	0.99	2.6	2.4	1) Newly defined method of calculating and reporting breakdown time. 2) High repair lead time from the OEM for certain breakdowns.
Q	Number of customer complaints	Number / Month	Down	8.6	3.75	3.25	
Q	In-line defect rate (Scrap)	PPM / Month	Down	11094	9664	8103	
Q	Rework	PPM / Month	Down	10513	9,229	13,181	Stringent in-house inspection criteria have been adopted to prevent defect outflow.
C	Cost Index	% Cost to Sales	Down	44.2	37.6	35.0	
D	Production Lead Time	Days	Down	39.5	21.2	21.0	The lead time for 2021-22 is reported as BM-3.
D	Delivery performance	%	Up	89	90	95	1) Short lead-time orders. 2) Logistical concerns for overseas customers, particularly regarding the Red Sea.
S	Accident Frequency Rate	Number of occupational accidents with leave for 1 000 000 worked hours	Down	1.66	1.19	0.00	
M	Number of Kaizen (Cumulative)	Number	Up	11033	79565	82285	