



Confederation of Indian Industry

# Transforming India's chemical sector through digital and analytics

December 2023



## Acknowledgement

The Confederation of India Industry (CII) is proud to publish this report as a part of its seminar on “Smart Factory for Chemicals & Petrochemicals Industry: Adoption of smart manufacturing for shaping a globally competitive growth” on 04 December 2023, New Delhi. The report offers a perspective on the imperative and approach for adopting Digital and analytics (DnA) for companies in the Indian Chemical Industry. It lays out a framework that companies could adopt for embarking on digital and analytics transformations, covering aspects such as aligning and committing leadership on a business led transformation roadmap, building delivery capabilities across talent, operating model, data and technology, and ensuring adoption and scaling across the organization. The report also covers impact stories of digital and analytics transformation in chemical sector that could act as inspiration for players considering transformations of their own. CII is grateful for the efforts and contributions of the people who have made this report possible. We thank our member companies for their support. We extend our gratitude especially to our knowledge partner, McKinsey & Company for their analytical fact base for this report.



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## India's chemical industry is at an inflection point

India has the potential to become the consumption and manufacturing engine of the global chemical industry. It is witnessing rapid economic growth, has a growing middle class, and is highly competitive at a global level due to its availability of feedstock and skilled workforce along with lower capital and operating expenses than other chemical manufacturing hubs. India could also benefit from the shifting supply chains triggered by evolving geopolitical scenarios and the trend to diversify from existing core manufacturing markets<sup>1</sup>.

India's chemical sector is projected to grow 11-12% in 2021–27 and 7-10% in 2027-40 to triple its global market share by 2040. Domestic demand is expected to rise from \$170-\$180 billion in 2021 to \$850-1,000 billion by 2040<sup>2</sup>. MSMEs, that make up 28-30% of the sector<sup>3</sup>, are likely to be key to achieving these growth projections and fulfilling rising demand.

But the sector also faces some big challenges. Shortages of critical products and materials due to supply chain disruptions, surging commodity prices, and the rising cost of capital are putting the industry under increasing pressure. Many players are deferring capital expenditure because of extended payback periods. Skilled R&D talent is scarce and hard to attract and retain. And the decarbonization imperative is heightening scrutiny from regulators, investors, consumers and activists. These challenges put added pressure on MSMEs, who are already likely to be capital constrained, to continuously prioritize their capital deployment to improve the performance and resiliency of their operations.

To capture the next S-curve of productivity in the sector, chemical manufacturers cannot afford to stand still. They must act now to remain ahead – and digital and analytics could be one of the key impact drivers.

## Digital and analytics: a catalyst for change in the chemical industry

Digital and analytics transformation is the process of developing organizational and technology-based capabilities that enable a company to continuously improve its customer experience and lower its unit costs to build and sustain a competitive advantage over time. E2E technology driven digital and analytics transformation can boost EBITDA 5-10 p.p. across manufacturing, supply chain and procurement operations and counter rising costs while creating an exciting workplace and improved customer interaction. A typical Indian micro, small, and medium enterprise (MSME) chemical company has the potential to double its EBITDA margin (INR 5-10 Cr) through digital and analytics linked initiatives, with a few outperformers potentially unlock even more impact (**Exhibit 1**).

Technology helps companies increase production output and reduce costs by improving yield, energy efficiency, throughput, and product quality – largely without major capital expenditure. Digital and analytics initiatives give players new insights into their production lines, revealing complex interrelationships between material properties and process parameters. And their potential goes beyond the plant; digital tools boost supply chain resilience by offering close-to-real-time information on shipments, inventory levels and end-customer demand. Smart pricing models that account for variations in input and processing costs help align sales, manufacturing, and procurement functions. Models of production networks, regional costs and operating risks inform medium-term decisions about sourcing and manufacturing.

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1 McKinsey.com article "India: The next chemicals manufacturing hub" published February 28, 2023: <https://www.mckinsey.com/industries/chemicals/our-insights/india-the-next-chemicals-manufacturing-hub>.

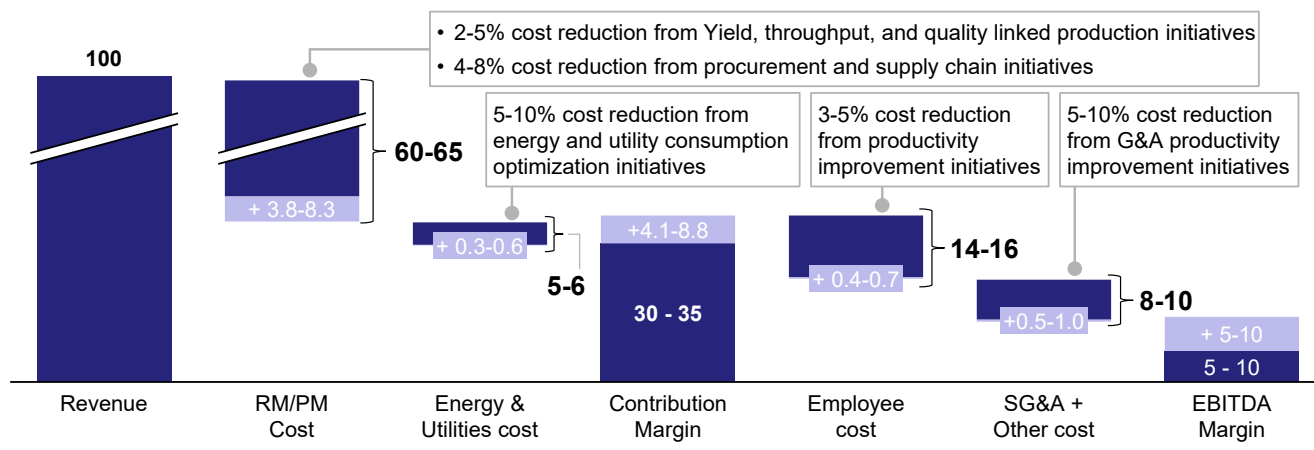
2 McKinsey.com article "India: The next chemicals manufacturing hub" published February 28, 2023: <https://www.mckinsey.com/industries/chemicals/our-insights/india-the-next-chemicals-manufacturing-hub>.

3 Source: CRISIL Research, 2022.

### Exhibit 1: Impact of digital and analytics for a typical chemical MSME

Based on FY22 Financial performance of ~350 chemical sector MSMEs. Indexed to 100. Typical revenue is 100-105 INR Cr

■ Indexed P&L for a typical chemical MSME (INR Cr)  
 ■ Unlock through DnA (INR Cr)



In short, digital and analytics can improve operational performance indicators and environmental sustainability metrics while increasing EBITDA. It creates impact across domains and KPIs including agility, sustainability, and speed to market (Exhibit 2).

### Exhibit 2: Impact of digital and analytics at successful WEF lighthouses<sup>4</sup>

KPI Improvements		Impact range observed, %	Range
Productivity		Factory output increase	4-140%
		Productivity increase	3-400%
		OEE increase	2-85%
		Product cost reduction	2-70%
		Operating cost reduction	1-100%
		Quality cost reduction	2-100%
		Indirect labour cost reduction	20-30%
Agility		Inventory reduction	5-100%
		Lead time reduction	10-100%
		Change-over shortening	10-100%
		On-time delivery increase	1-33%
Sustainability		GHG emissions	8-100%
		Waste reduction	4-95%
		Water consumption reduction	5-75%
		Energy efficiency	1-100%
Speed to market		Speed to market reduction	10-90%
		Design iteration time reduction	2-100%
Logistics		Supply chain admin cost	20-40%
		Transport/warehousing cost	10-20%
Sales & marketing		Lost sales reduction	20-40%
		Forecast accuracy	30-70%
Customization		Lot size reduction	40-100%

Source: WEF Lighthouse Network

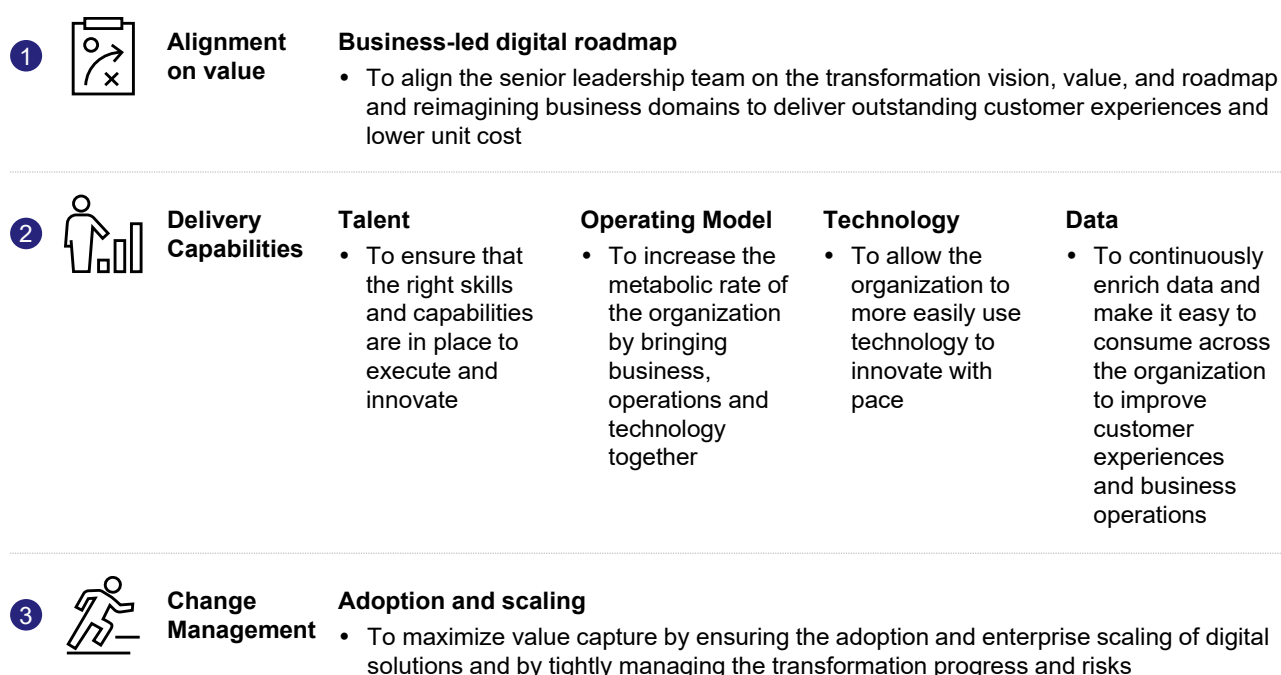
<sup>4</sup> The Global Lighthouse Network is a World Economic Forum initiative co-founded with McKinsey & Company. It examines the future of operations and considers how fourth industrial revolution (4IR) technologies are shaping production.

## Digital and analytics transformation framework

To succeed, digital and analytics transformations require a holistic approach<sup>5</sup> across three dimensions (Exhibit 3):

1. Align and commit leadership on the value and the plan by developing a business-led roadmap
2. Build delivery capabilities across talent, the operating model, technology and data to develop competitively differentiating digital solutions
3. Implement effective change management to drive adoption across E2E business processes and scale across the business

### Exhibit 3: Holistic digital and analytics transformation approach



Source: Rewired - The McKinsey guide to outcompeting in the age of Digital and AI

### 1. Align and commit leadership on the value and the plan

A business-led roadmap is the blueprint for a successful digital and analytics transformation. Digital and analytics transformations often stall because of inadequate planning and leadership alignment. Common pitfalls are a different conceptual understanding of digital between leaders who ‘speak different languages’; focusing on projects that do not deliver much value, or over-focusing on technology solutions at the expense of critical people and capability needs. If the scope of a transformation is too broad then investments will be spread too thin, or the CEO may delegate responsibility to another executive.

<sup>5</sup> Approach framework derived from Rewired: The McKinsey Guide to Outcompeting in the Age of Digital and AI by Eric Lamarre, Kate Smaje, Rodney Zimmel, June 2023.

Based on learnings from successful digital and analytics transformations, an effective transformation roadmap could:

- Inspire and align the top team by establishing a common digital language, learning from other industries, developing a shared vision and agreeing on a set of commitments that match leadership's ambitions.
- Choose the right transformation “bite size”, which is neither too small to achieve meaningful impact nor too big and complex to deliver.
- Have business leaders define what is possible by setting ambitious but realistic transformation goals across business domains.
- Determine the type and scale of resources needed to achieve the transformation goals.
- Build capabilities for today and the next decade to outcompete.
- Treat the digital roadmap as a contract for leadership by detailing specific plans to transform business domains with investments and benefits and articulating a plan to build enterprise capabilities with measurable maturity endpoints.
- Drive collaboration at the top level, across domains and functions and make sure every C-suite executive does their part to help the company succeed on its digital and analytics transformation journey.

For MSMEs, choosing the right transformation bite size is critical to ensure buy-in across the organization and create meaningful value that showcases the ROI potential of digital and analytics. An effective way to do this is to take a domain-based approach, i.e., identify a few important and self-contained domains (e.g., manufacturing, supply chain, procurement, logistics) and rethink them completely. Then assess their value potential and feasibility to understand which to go after first. Value potential assessment comprises a high-level estimate of the value potential (across customer experience, financial benefits, time to value creation, synergy with other domains etc.) based on a combination of outside-in analysis, discussions with senior leaders and industry experts, and benchmarks from within and outside the industry. Feasibility looks at data and technology readiness, ease of adoption and scaling.

In MSMEs, impact is more likely to be driven by domains such as process optimization, maintenance and reliability, and procurement than by, e.g., capital productivity.

## 2. Build delivery capabilities

Four core capabilities are required to deliver digital solutions: talent, operating model, technology and data. These capabilities could be either developed in-house or sourced externally through an ecosystem of partners and providers. Understanding where a company stands against these capabilities is a prerequisite to knowing how to improve them. MSMEs can do this by benchmarking themselves against companies that are further along the digital and analytics transformation journey. Domains tend to be industry-specific, but capabilities can be benchmarked against any industry, particularly those that are already digitally mature. Benchmarking can be carried out using self-assessment surveys such as DXcel<sup>6</sup> supported by independent expert interviews with executives and managers across business units and functions. In addition, Go & See<sup>7</sup> programs offer executive teams the opportunity to visit and learn from best practice companies.

When it comes to talent, organizations typically develop capabilities in one of two ways: they create a center of excellence (CoE) staffed by externally hired data scientists (possibly with limited knowledge of chemical operations or commercial activities) who team up with focus area experts to develop value-creating use cases, or they train key staff in data science so that they can develop their own use cases. For MSMEs, a CoE creates

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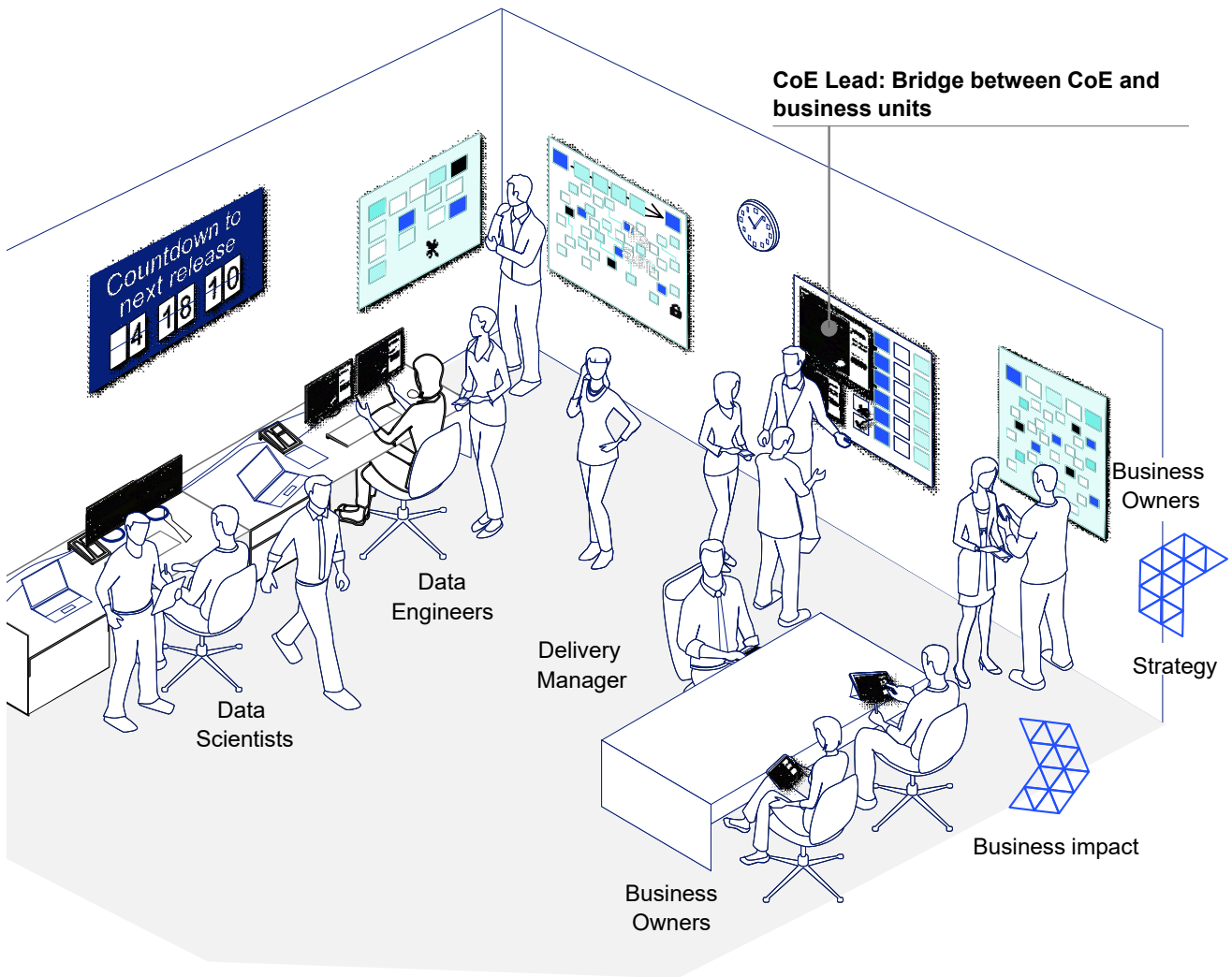
6 CII-CDT's Digital Transformation Maturity Framework enables a holistic assessment of the entire organization/unit/plant across strategy, structure, governance, business processes, current IT initiatives and infrastructure, people, culture and the business results that can be attributed to digital initiatives.

7 Go & See programs enable organizations considering a large-scale transformation program to learn from their peers and focus on topics such as embarking on a new digital strategy, agile at scale, DnA, and reimagining customer journeys.

impact faster and is more practical. Training people in-house may deliver more value but requires more time and resources, making it more suitable for large businesses. MSMEs need to take a pragmatic approach to developing talent based on make vs buy vs hire decisions. They need to decide which skills will set them apart and keep these in-house, filling any gaps through external providers.

In terms of operating model capabilities, to drive real impact, a CoE can work in an agile way and interact frequently with the business (**Exhibit 4**).

**Exhibit 4: CoE structure and role**



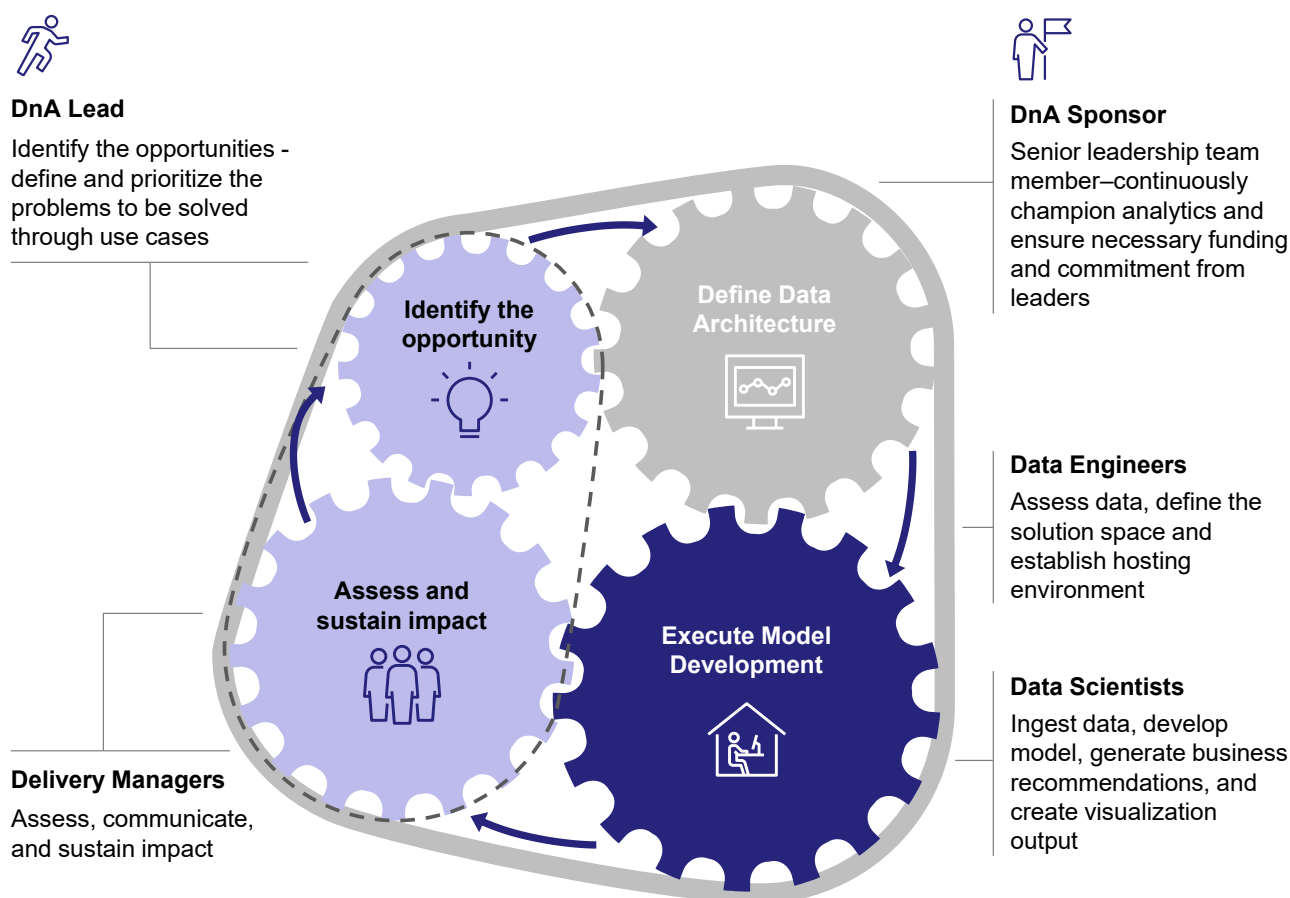
**Role of the CoE**

- ▶ **Co-locates with business functions**, in flexible working spaces
- ▶ **Trains people on-the-job**, in addition to seminars
- ▶ **Spreads ideas and innovative practices** to the entire organization
- ▶ **Supports multiple problems** for each function
- ▶ **Prioritizes cases** where value is created, and **outcome is measurable**
- ▶ **Spreads cultural change**

The CoE team would need specific skills to rapidly identify, develop, execute, and sustain use cases (**Exhibit 5**).



## Exhibit 5: Skills required in the CoE



MSMEs can build data and technological capabilities by setting up a fit-for-purpose data and technology infrastructure based on their digital strategy and roadmap, i.e., focus on capturing and processing only the data needed for high value priority use cases rather than building a perfect data platform or data lakes across their entire operation. They also do not need 100% technological readiness to start their transformation journey. Data and technology infrastructure also need not be build from scratch; MSMEs can leverage technology and vendor ecosystems to quickly deploy a few off-the-shelf, productized solutions that fit their overall roadmap

### 3. Implement effective change management

All too often, digital solutions do not have the impact anticipated. Companies typically invest in the initial solution development but can chronically underinvest in adoption and scaling because they fail to address technical, process and human issues in sufficient detail. As a rule of thumb, every rupee spent to develop a digital solution requires at least another one rupee to cover change management initiatives, e.g., process changes, user training etc. Adoption and scaling have four critical elements: continuous prioritization of domains; change management; impact and performance tracking; and developing the execution speed and skills needed to scale.

MSMEs would need to generate and showcase high-impact use cases early in the transformation to obtain the support of internal and external stakeholders. To achieve early impact, they could start their transformation through select high value use cases across priority domains (e.g.: manufacturing, procurement etc.) which could act as a self-funding source for their overall transformation. The use cases or solutions implemented could then be “assetized” in form of a digital and analytics implementation playbook and the funds generated then could be continuously prioritized for deployment in areas of high impact potential to sustain the transformation momentum.



Effective change management is also critical to change mindsets and behaviors. MSMEs can take inspiration from the actions of successful WEF lighthouses when it comes to preparing their organization for digital and analytics transformations (**Exhibit 6**).

**Exhibit 6: Six common actions that WEF lighthouses have taken to prepare their organization for digital and analytics transformation.**

	<b>From</b>	<b>To</b>
<b>Empowering front-line workers to innovate by using technology and data</b>	Top-down driven innovation	Bottom-up collaboration driven innovation
<b>Proactively building capabilities, both technical and soft, and managing talent development</b>	Basic job-related skill development and one size fits all talent management system driven by internal knowledge	Customized reskilling and talent development programs in partnership with external agencies (e.g., universities and other companies)
<b>Adjusting the organizational structure to enable digital and analytics transformation</b>	Siloed IT and production organizations	Cross functional teams focusing on digital deployment.
<b>Implementing new ways of working such as agile methodologies and increased transparency</b>	Solutions being developed independently and delivered to production/operations for testing at end of development	Development of a fit-for-purpose product through an agile team that involves production/operations early in minimum viable product (MVP) development, though sprint review
<b>Augmenting day-to-day assembly and operational tasks through automation and technology</b>	Manual and repetitive tasks involving paper SOPs and operator experience driven operations	Automation and cobots, digital tools for real time help, and automated machine setting and parameter optimization
<b>Increasing levels of problem-solving and collaboration on the front line</b>	Heuristics-based decision making relying on incomplete data	Data driven decision making based on real time centralized data

Source: WEF Lighthouse Network

To enable scale, MSMEs could build a strong execution engine. A transformation office (TO) is a highly effective way to track performance and build the execution speed and capabilities needed to scale. The TO defines roles and responsibilities and ensures the right people are in the right place by hiring or developing talent. It establishes a governance cadence, tracks progress across workstreams, and sets meeting agendas. It embeds new digital toolsets and ways of working. And it defines measurable KPIs to ensure that the company captures value.

MSMEs can use their CoEs as TOs by training internal resources (e.g., continuous improvement champions/ teams), using a digital and analytics implementation playbook based on lessons learned from successful pilot initiatives, and bringing in external experts to fill any gaps. The performance management structure for such teams needs to be updated to reflect the additional deliverables required by the digital and analytics transformation.

## Impact stories of successful digital and analytics transformations

### Leading Indian chemical player

*Unlocked US\$10+ million in EBITDA in two years by implementing 15+ use cases.*

#### Context:

In 2021, the company launched a digital and analytics transformation to become a data-driven organization, improve critical business KPIs across production, safety, quality and maintenance; build a robust data and technology infrastructure to support scaling; and develop in-house data science capabilities.

#### Business-led roadmap as the first step to a successful digital and analytics transformation:

The company identified that the first step for a successful digital and analytics transformation was to align leadership on the value and the plan by developing a business-led roadmap. They conducted a 10-week blueprinting exercise to create their transformation roadmap resulting in a roadmap that identified 65+ use cases, called for set up of a digital and analytics CoE, and defined the data and tech architecture required to implement 15+ priority use cases at one manufacturing site in the first phase of the transformation. The blueprinting exercise brought together executives across the company leadership, including heads of manufacturing, IT and digital and analytics, in one forum ensuring leadership buy-in for the transformation process.

#### Leveraging internal talent and external hiring for creation of digital and analytics CoE:

The company, guided by their transformation roadmap, created a digital and analytics CoE to build delivery capabilities. The CoE was mandated to deliver the program in phases over 1.5 years and appointed 50+ staff with 12+ skillsets including data science and engineering, cloud, MLOps, Visualization etc., in a phase manner based on value delivery timelines. The CoE was built using a combination of internal talent and external hires. External hiring for the CoE was done from leading industry players as well as from top-tier campuses across India. They also launched a digital and analytics academy for internal capability building to empower leaders, and employees to own and sustain impact from D&A transformation. They trained 25+ digital and analytics translators and 10+ data scientist through a combination of classroom learning programs and offline courses curated as per specific roles.

### Leading Indian multinational pharmaceutical player

*Unlocked 56% higher factory output, 30% lower production lead time, 10% reduction in manufacturing cost, and 43% reduction in customer complaints through 40+ use cases deployed over 4 years.*

#### Context:

The company was facing challenges in form of price erosion, fragmented yet stringent regulatory requirements, unprecedented demand/supply volatility, increasing manpower costs, low productivity and high degree of errors and quality deviations leading to lost sales. They decided to embark on digital and analytics transformation to overcome above challenges and unlock performance.

#### Reimagining business domains to create organizational impact:

The company identified manufacturing, warehousing, and QA/QC as key domains and decided to reimagine them completely by carrying out end-to-end process redesign and digitalization to deploy a digitally enabled “plant of the future” with interconnected systems and real-time performance management.

They implemented 40+ digital and analytics use cases spanning 6 major 4IR technologies including high value use cases such as multi-constrained dynamic schedule optimization for scheduling production orders that alone led to 10% increase in OEE, and 46% reduction in logistics cost.

Other high value use cases across manufacturing, warehousing, and QA/QC included AA models to improve process robustness and yield, at minimum energy usage and costs, real time digital performance monitoring, Automated storage, and retrieval system (ASRS) for finished goods, Dynamic QC test scheduler using Digital Twin, and Performance dashboards to track safety, health and sustainability related KPIs.

### Leading Indian paper and packaging player

*Unlocked 4 p.p. EBITDA improvement through at scale deployment of 50+ models across 25+ use cases in 12 months.*

#### Context:

The company embarked on digital and analytics transformation with an aim to unlock next jump in productivity and enhance and sustain their competitive advantage.

#### Pragmatic approach to technology for delivering impact:

The company took a very pragmatic and low-cost approach to building their technology capabilities. They focused on having a reliable data source at the beginning of their transformation journey and upgraded their data & tech stack gradually, slowly ramping up data connectivity and access.

Initially, they relied on available data sources such as DCS/PLC/HMI/Lab data and collected data every month from these sources and maintained a backup of the same. They created data stitching tools to convert data into useful form and leveraged closed loop models coded into DCS/PLC. They ramped up gradually and added a historian and an analytics layer on top. Data historian allowed for live access to any data within the plant ecosystem, made data stitching very simple and enabled Machine learning models to be deployed with ease on live data.

They also had dedicated resources identified for building Data & Tech stack and researching on new I4.0 technologies who built Data & Tech stack through partnering with external technology ecosystem incl. experts and technology vendors. They piloted solution in critical plants, gradually expanding to multiple plants to ease use case delivery before full scale deployment of data and tech solution across the entire plant.

This approach allowed them to unlock 8% increase in pulp production, 10% reduction in costs, and 70% reduction in quality defects in the first 12 months of their digital journey.

### Indian MSME specialty chemical player

*MSME company in the specialty chemicals sectors is investing digital and analytics with an aim to unlock its next S-curve of growth by creating safe, data-driven world class manufacturing facilities that could compete on the global stage.*

#### Context:

The company manufactures 50+ products across 5+ sites and is embarking on a digital and analytics journey to increase outputs, improve safety, improve labor productivity, reduce cost of production, and optimize working capital.

#### Assessing and aligning value of digital and analytics with key stakeholders in the organization:

The company leadership was aware of the potential that digital and analytics could have for improving business performance through data driven operations. They aimed to create an environment where data is readily available and is being leveraged regularly to improve operational performance and plant safety. To create a roadmap for achieving their digital ambitions, the company embarked on an assessment program partnering with an external agency that evaluated the company across 16 I4.0/ digital and analytics dimensions covering 3 manufacturing units and 2-3 key products. The assessment allowed the company to understand their current digital maturity across facilities and domains, benchmark themselves to best-in-class industry peers and identify a roadmap covering key areas of improvement and their associated value/impact on critical KPIs. The company ran the assessment across both their newer, more technologically advanced manufacturing facilities and their older legacy units to identify gaps and create a roadmap to bridge the gaps in digital maturity between their new and legacy facilities.

The company also ensured that all stakeholders who would be directly impacted by digital and analytics are actively engaged in the assessment program. By involving the relevant stakeholders early in their transformation journey, the company ensured that their digital and analytics roadmap was business led, took cognizance of their operational context, and ensured stakeholder buy-in across the organization on the impact potential.

### 5 key learnings outlined by players with successful digital and analytics transformations:

1. Digital solutions should be value-focused, not technology focused. There must be partnership between business and technology to solve business needs. Think of a digital and analytics transformation across all pillars and not an IT, operations, or data science project.
2. Combination of both domain and digital and analytics expertise is required to crack the problem. There is no need for massive external recruitments, many capabilities can be built within existing organization.
3. Data availability is not an unsurmountable issue. Build a "Fit-for-Purpose" data-technology architecture instead of attempting for expensive "best in class" deployments.
4. Change management is extremely critical for adoption of new solutions or new ways of working. Involve front line operators (end-users) early in the process to gain buy-in and facilitate change management.
5. Think of implementation right from the start as implementation is where it gets hard. Rigorously monitor implementation status and drive a transformation office with daily, weekly, and monthly touchpoints.

## Digital and analytics transformations: myth vs. reality<sup>8</sup>

Digital and analytics is top-of-mind for companies across all sectors, with 90% of CEOs believing that it will transform their industry. Yet only ~17% of CEOs have sponsored and launched digital and analytics initiatives. What is holding them back? Surveys and experience working with manufacturers across the globe show that there is still a lot of misunderstanding about what digital and analytics is and how it works. The myths are far from reality.

### Digital and analytics is only about data collection and dashboards

Digital and analytics transformations rethink how to increase, improve and accelerate value creation end-to-end. They create value by optimizing processes, deploying new technologies such as AI/ML, natural language processing, visual analytics, and moving beyond descriptive analytics (dashboards) to prescriptive and predictive analytics (AI/ML models). A full understanding of the business and its pain points is required to enable a company to invest in digital and analytics where it matters.

### Digital and analytics will displace workers

The new technologies used in digital and analytics transformations can create jobs and eliminate repetitive tasks, enabling the workforce to learn new skills. However, companies need to retrain their people and invest in new capabilities, e.g., data scientists, data engineers/architects, technology leaders, digital and analytics translators, and product owners. Some companies are partnering with post-secondary educational institutions to develop training programs and new ways of working.

Instead of hiring pure data scientists, Tata Steel Europe trains its domain experts in data science at its Advanced Analytics Academy. At its IJmuiden plant in the Netherlands, Tata built the digital skills of its site team to improve productivity, cost and quality.

### Digital and analytics requires greenfield sites

Digital and analytics transformation does require new equipment – but this does not always mean brand-new, “greenfield” sites capable of fully automated “lights out” manufacturing. Digital and analytics creates a lot of value

<sup>8</sup> All case examples in this section are taken from McKinsey.com article “Industrial IoT generates real value—if businesses overcome six myths” published June, 2022: [https://www.mckinsey.com/capabilities/operations/our-insights/industrial-iot-generates-real-value-if-businesses-overcome-six-myths\\_unless\\_stated\\_otherwise](https://www.mckinsey.com/capabilities/operations/our-insights/industrial-iot-generates-real-value-if-businesses-overcome-six-myths_unless_stated_otherwise).





by improving brownfield sites and by connecting and optimizing existing infrastructure and augmenting it with new, e.g., sensors, apps, and connectivity to collect and convert data into insights.

Procter & Gamble leveraged digital and analytics to reduce rework and complaints by 50%, lower the incidence of scrap generation and quality inspections, and cut throughput time by 24 hours at its 150-year-old Rakona plant in the Czech Republic. It rolled out an in-process quality-control system in its legacy systems to address issues in manual sampling and subsequent delays in product releases. Sensors now monitor product characteristics and produce data to help operators determine batch quality for release or stop the line if a deviation occurs.

### **You need to be 100% ready to go digital**

Many companies spend too much time planning. Setting up a digital TO to oversee pilots and guide the organization through a “fail fast, succeed big” process accelerates implementation. The TO is the execution engine to achieve scale through proven methodologies, best practices, and a holistic vision. Agile methods of working enable companies to move in sprints, iterate fast and learn from their failures.

Petkim embarked on its digital and analytics transformation journey with just one digital and analytics use case that delivered substantial value. It proved the merit of digital and analytics and mobilized the organization to pursue it at scale<sup>9</sup>.

### **Continuous improvement through digital and analytics is expensive**

Traditional methodologies are often too incremental to deal with the challenges and threats manufacturers face in the global digital economy. Digital and analytics transformations use big data, real-time insights and agile ways of thinking and working to improve operations continuously. WEF lighthouses show that the savings unlocked by digital and analytics initiatives far outweigh the costs; optimizing rather than replacing existing infrastructure can achieve 2-4x RoI compared to 10-50% for capex initiatives. As transformations evolve and escalate, savings and bottom-line impact grow.

A global electronics manufacturer made a limited investment in digital and analytics to obtain a holistic view of operations across dozens of production facilities and more than 25,000 employees. Replacing the production planning system would have been a massive, time-consuming and costly undertaking. Instead, the company installed sensors on its production lines to capture critical real-time data, such as equipment efficiency and line productivity. An IIoT platform processes the data, serving as a remote performance dashboard and providing real-time access across all facilities. This transparency enabled the manufacturer to bring all its facilities up to the same level of productivity—and raise productivity by 10+% in the first year.

### **Digital and analytics is not feasible in emerging economies**

Conversely, companies in developing regions are often well positioned to implement digital and analytics because they are less encumbered with brownfield facilities and legacy systems – as witnessed by WEF lighthouses in emerging economies. Of the 29 new lighthouses added to the WEF Global Lighthouse Network in 2022, 23 are in emerging economies – China (13), India (5), Brazil (2), Thailand, Philippines and Turkey (1 each) – and 22 are in Asia<sup>10</sup>.

Tata Steel set up a greenfield plant in Kalinganagar, India, to run at full capacity in far less time than the industry standard. It invested in digital and analytics solutions and to develop the capabilities of its relatively inexperienced team. Applying advanced analytics at scale has enhanced plant performance by improving raw material usage, uptime, and quality.

9 Mckinsey.com article “How the petrochemicals industry can benefit from advanced analytics” published May, 2022. <https://www.mckinsey.com/industries/chemicals/our-insights/how-the-petrochemicals-industry-can-benefit-from-advanced-analytics>.

10 WEF whitepaper “Global Lighthouse Network: Shaping the Next Chapter of the Fourth Industrial Revolution” published Jan, 2023. <https://www.weforum.org/publications/global-lighthouse-network-shaping-the-next-chapter-of-the-fourth-industrial-revolution>.

## Conclusion

India's chemical sector is poised for rapid growth over the next decade and MSMEs are likely to drive it. To capture this growth, the sector must act now to resolve critical challenges around cost of production, supply chain, skilled labor and sustainability.

Digital and analytics could unlock the next S-curve of productivity for MSMEs by enabling them to tackle some of these challenges and creating impact across the value chain. It isn't easy to embark on a digital and analytics transformation journey, be it due to the level of awareness, concerns about the capital needs or the current skills in the organization. But those players who have bet on digital and analytics have achieved real impact and offer a transformation blueprint for others in the industry.

The blueprint comprises an end-to-end approach to digital and analytics transformation that includes creating a business-led roadmap around which leadership is aligned, taking a 'bite-sized' approach across high-value domains such as manufacturing and procurement, taking a pragmatic approach to building delivery capabilities across talent, organization, data and technology, and ensuring adoption and scaling by deploying the right change management and governance structure based on existing resources.



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## Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, with around 9,000 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from 286 national and regional sectoral industry bodies.

For more than 125 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, livelihoods, diversity management, skill development, empowerment of women, and sustainable development, to name a few.

As India strategizes for the next 25 years to India@100, Indian industry must scale the competitiveness ladder to drive growth. It must also internalize the tenets of sustainability and climate action and accelerate its globalisation journey for leadership in a changing world. The role played by Indian industry will be central to the country's progress and success as a nation. CII, with the Theme for 2023-24 as 'Towards a Competitive and Sustainable India@100: Growth, Inclusiveness, Globalisation, Building Trust' has prioritized 6 action themes that will catalyze the journey of the country towards the vision of India@100.

With 65 offices, including 10 Centres of Excellence, in India, and 8 overseas offices in Australia, Egypt, Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with 350 counterpart organizations in 133 countries, CII serves as a reference point for Indian industry and the international business community.

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