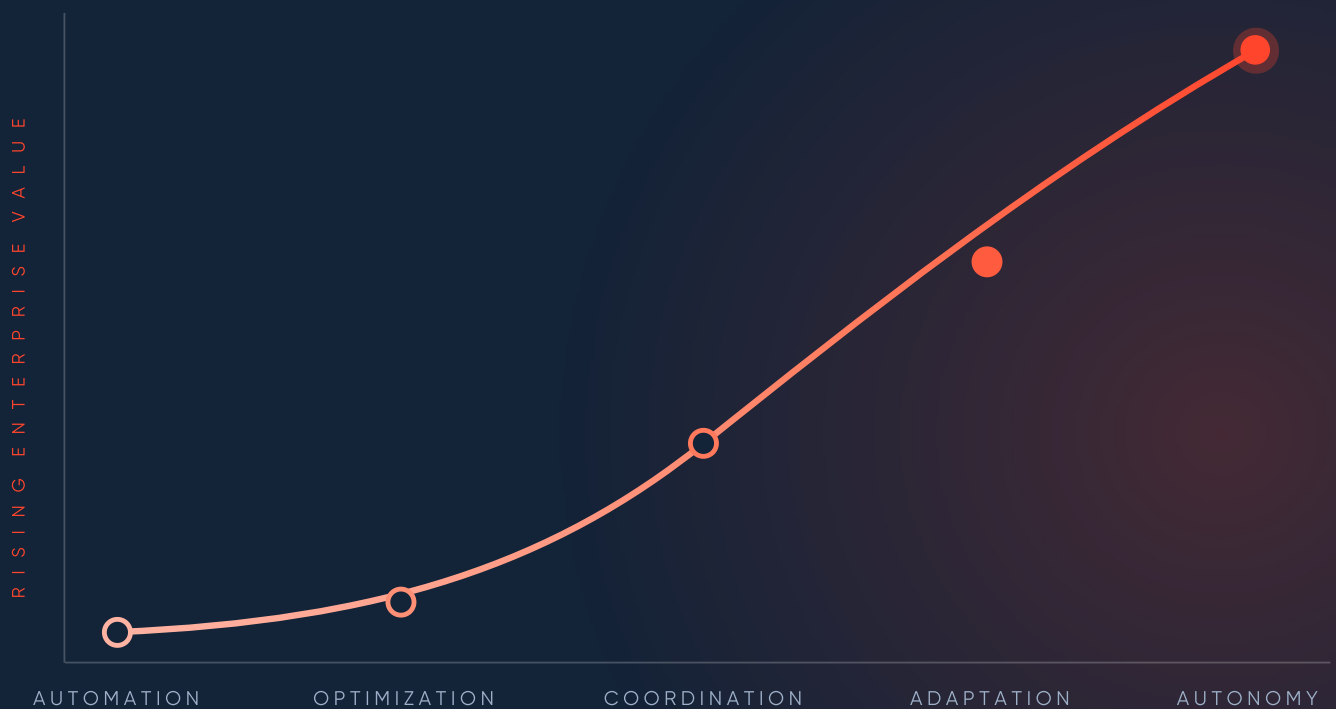


● MANUFACTURING · THOUGHT LEADERSHIP SERIES · AUGUST 2026

The AI Economics Curve:

Manufacturing's next measure of AI value

A boardroom framework for connecting AI investment to productivity, margins, working capital, resilience and return on capital and determining how far an organisation can credibly scale.



IN THIS PAPER

Achieving AI maturity without margin growth is expensive overhead

Manufacturing has never suffered from a shortage of maturity frameworks. It suffers from a shortage of economic clarity. This paper sets out a five-stage curve that ties every AI investment to a metric the CFO already tracks, the foundations that decide how far up it an enterprise can credibly go, and a self-assessment the board can run in a single session.

01	The economic clarity problem	03
	Why capability frameworks stall at the boardroom door and how the economics curve differs	
02	The AI Economics Curve	07
	Five stages of enterprise value creation, each mapped to a financial mechanism and a foundation	
03	The five stages in practice	10
	CEAT, TataSteel, Cipla, Unilever and HUL each with what it means for your organisation	
04	Readiness: the Kyndryl perspective	18
	Six foundations that set the highestst age an enterprise can credibly reach	
05	The board agenda and the executive self-assessment	22
	A five check funding gate, are a diness score card, ten board questions and a 90-day agenda	
06	Sources and references	28
	Twelve primary sources, as disclosed by the companies and programmes cited	

THE PAPER IN FIVE NUMBERS

54%	62%	~20%	47%	\$2.25B
of organizations report positive ROI from AI investment	remain stuck in pilot despite that return	Average EBITDA uplift where AI is concentrated in a few domains	of Indian enterprises run multiple GenAI use cases in production	Kyndryl investment planned in India over three years

Sources: Kyndryl Readiness Report 2025; McKinsey & Company, 2026; EY–CII, November 2025; Kyndryl, August 2025. Full references on page 28.

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01

The economic clarity problem

From Industry 4.0 indices to smart-factory score cards, capability frameworks have guided how manufacturers build. None of them answers the question boards are now asking and none of them can be underwritten by a CFO.

THE DIFFERENCE IN ONE VIEW

MATURITY CURVE

- Measures how advanced AI Capability is
- Progress = more Capabilities/ higher Maturity
- Primary owner: CIO/ Transformation Officer
- READINESS: often separate from value

AI ECONOMIC CURVE

- Measures what AI is worth to the enterprise
- Progress = Measurable P&L / Balance sheet value
- Primary owner: CFO underwrites/ CIO enables
- READINESS: Sets the ceiling before capital is committed

IN THIS CHAPTER

Why maturity is not the same as economics

THE EVIDENCE

Concentration beats experimentation – McKinsey, EY– CII

THE DIFFERENCE

Two curves, two conversations, one investable answer

Maturity without margin is expensive overhead

Manufacturing has never suffered from a shortage of maturity frameworks. It suffers from a shortage of economic clarity.

From Industry 4.0 to smart-factory indices, traditional models have successfully guided how capability is built. They consistently fail to answer the single question boards now ask: is AI improving the fundamental economics of the business?

As leading global and regional benchmarks confirm, frontrunners are separating themselves not by running more experiments, but by concentrating AI into high-value operational domains that move core metrics. That shift demands a new management architecture.

Recent evidence reinforces the point. These findings should not be read as manufacturing- wide averages. They illustrate that organizations capable of scaling AI systematically are beginning to separate themselves from those still trapped in isolated pilots.

This is where the AI Economics Curve comes in. It moves the narrative out of the IT sandbox and into board-level governance, giving C-suite leaders a framework to convert AI capability into measurable improvement in capital efficiency, resilience and bottom-line profitability.

EVIDENCE · MCKINSEY & COMPANY, 2026

Organizations following the Rewired transformation approach and concentrating digital and AI investment on a small number of high-value domains generated significantly higher returns than peers. A cohort of roughly 20 companies delivered around **20% average EBITDA uplift**, cash accretive within one to two years, at approximately **\$3 returned per \$1 invested** – and two-thirds used three or fewer focus areas.

EVIDENCE · EY-CII, NOVEMBER 2025

A C-suite survey of 200 organisations across more than 20 industries found **47% now run multiple generative AI use cases in production** across business functions, with a further 23% in pilot, signalling that enterprise AI is moving beyond experimentation towards value realization. Yet more than 95% still allocate under a fifth of the IT budget to AI.

THE KYNDRYL LENS

Concentration only pays where the underlying estate can carry it. In our experience running mission-critical IT and OT systems for manufacturers, the binding constraint on AI economics is rarely the model, it is fragmented plant data, an estate that cannot serve inference at the line, and a resilience posture that puts the throughput gain back at risk. Kyndryl's own research finds 54% of organizations already report positive AI ROI, while 62% remain stuck in pilot. The gap between those two numbers is a readiness gap, not an ambition gap.

Achieving AI maturity without margin growth is merely expensive overhead. The question is no longer how advanced the capability is, but which line of the P&L it moves.

Sources: McKinsey&Company, "Rewiring for AI: from ambition to advantage", 2026; EY and CII, "India's AI shift from pilots to performance November 2025; KyndrylReadinessReport 2025.

Two curves, two conversations

A maturity framework measures how good an enterprise has become at AI. An economics curve measures what AI has become worth. Only one of the two can be underwritten by a CFO and that is the whole of the difference.

DIMENSION	TRADITIONAL AI MATURITY FRAMEWORK	THE AI ECONOMICS CURVE
The question it answers	How advanced is our AI capability?	Which line of the P&L does this investment move?
Unit of progress	Use cases live, platforms adopted, pilots running	Enterprise value released at each stage
Measure of success	A maturity score or index level	Conversion cost, gross margin, EBITDA per plant, working capital, ROCE
Who owns it	The CIO and the digital transformation office	The CFO underwrites, operations owns the outcome, the CIO enables
Sequencing logic	Ascend the levels; higher is better	Each stage funds the next; foundations set the ceiling
Treatment of readiness	Assumed, or scored separately from value	A capital-allocation constraint that caps the stage reachable
Typical failure mode	Advanced capability, unchanged margin	Investment deferred at the gate rather than written off after the spend
Decision it supports	Approve a technology roadmap	Fund, defer, or fix the foundation first – then re-present the case

THE POSITIONING IN ONE LINE

Maturity frameworks answer “how far have we come?” The AI Economics Curve answers “what did it buy, and what will the next tranche buy?” The first is a progress report. The second is an investment case.

WHAT THIS DOES NOT REPLACE

The curve does not replace engineering standards, functional-safety regimes or Industry 4.0 architecture. It sits above them, translating what they enable into the language in which capital is allocated.

THE KYNDRYL LENS

A maturity framework can be satisfied on paper. An economics curve cannot: the outcome shows up in the plant and on the balance sheet, or it does not show up at all. That is why readiness is treated here as a first-class variable rather than an annex the stage an enterprise can credibly reach is set by the infrastructure, data, OT-IT integration, run-cost discipline, cyber resilience and governance beneath it.

How to use this paper

Three uses, three audiences, one sequence. Read the curve to locate value, the foundations to locate the constraint, and the self-assessment to decide what to fund next quarter.

USE 01 · DIAGNOSE

Where are we actually creating value?

Place each live AI initiative on the curve by the metric it moves, not by the technology it uses. Initiatives that cannot be placed are the first candidates for review.

USE 02 · SEQUENCE

What must be true before the next stage?

Map the six foundations against the stage being funded. A gap is not a delay – it is a ceiling, and it should be priced into the business case.

USE 03 · GATE

Should this investment be approved?

Run the AI Economics Test and the readiness scorecard in chapter 05 before capital is committed, not after the pilot has run.

WHERE EACH EXECUTIVE SHOULD START

ROLE	THE QUESTION YOU OWN	START AT
Chief Financial Officer	Is the return underwritable, and when does it land in the accounts?	The stage table (page 09), the AI Economics Test (page 22) and the worked example (page 23)
Chief Information / Digital Officer	Can the estate carry what we are about to promise?	The six foundations (page 20) and the readiness scorecard (page 24)
Chief Operating Officer / plant leadership	Which constraint are we actually removing, and who is measured on it?	The five stages in practice (pages 11–17), especially the takeaways
Board and audit committee	Is delegated decision-making controlled, explainable and reversible?	The autonomy guardrails (page 16) and the ten board questions (page 25)

A NOTE ON THE EVIDENCE IN THIS PAPER

Every case from Stage 2 onward is drawn from a named, publicly disclosed programme – predominantly World Economic Forum Global Lighthouse sites and company disclosures. These are, by selection, advanced sites. Their outcomes typically reflect AI and advanced analytics working alongside conventional operational levers, and should be read as demonstrations of what the stage makes possible, not as sector averages or as forecasts for any individual plant.

02

The AI Economics Curve

Five stages of enterprise value creation not five stages of technical sophistication. Each is defined by the executive question it answers, the financial mechanism it moves, and the foundation it cannot be built without.

STAGES 1-2

Conversion cost and gross margin

STAGES 3-4

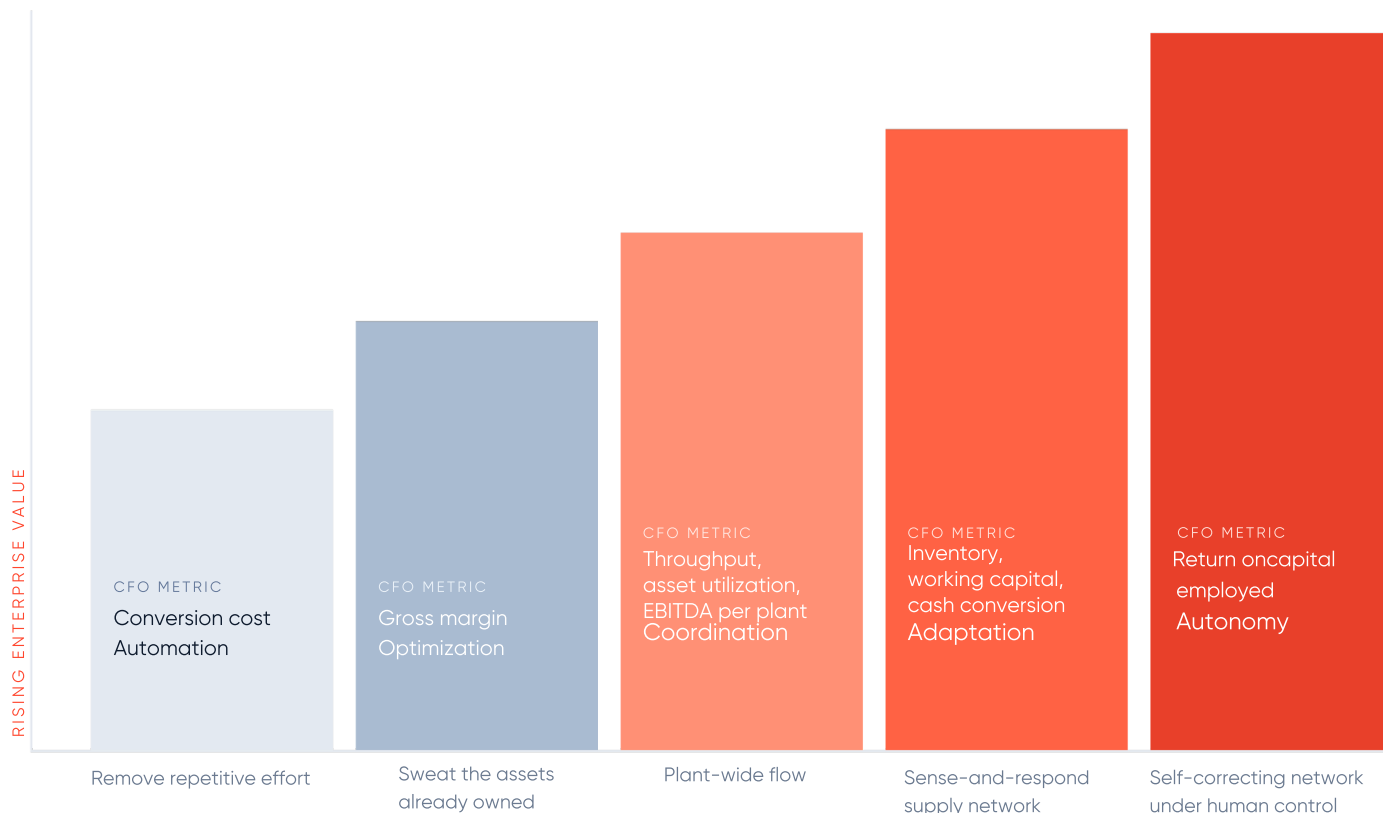
Throughput, EBITDA per plant and working capital

STAGE 5

Return on capital employed and resilience

The curve at a glance

The curve represents increasing levels of enterprise value creation rather than increasing levels of technical sophistication. Organizations may operate at several stages simultaneously across different plants, functions and processes.



Each stage funds the next. Value released at one stage pays for the capability required at the next. Sequencing is a financing decision as much as a technology one.

Stages need not be sequential. Different plants and use cases will operate at different stages at the same time but their foundational capabilities cannot be skipped.

The ceiling is set underneath. Stages 3 to 5 are unreachable without integrated OT and IT data, disciplined run-costs and tested cyber resilience see chapter 04.

STAGES 01-03 · THE INCOME STATEMENT

AI improves what a plant costs and what it produces: conversion cost, gross margin, throughput and EBITDA per plant.

STAGES 04-05 · THE BALANCE SHEET

AI improves what the enterprise ties up and what it returns: inventory, working capital, cash conversion and ROCE.

THE KYNDRYL LENS

The crossover between the two halves is where readiness stops being an IT matter. Moving from Stage 3 to Stage 4 asks the estate to run continuously, at controlled cost, without compromising production.

The anatomy of each stage

Every stage is defined by fourthings: the executive question it answers, the financial mechanism it moves, the metric the board sees and the foundation without which it cannot be reached.

STAGE & OBJECTIVE	THE EXECUTIVE QUESTION	PRIMARY ECONOMIC OUTCOME	BOARD METRICS	FOUNDATION IT DEPENDS ON
01 · Automation Remove repetitive work	Where are we still paying for effort that AI can perform faster and more consistently?	Lower conversion cost	Labour productivity · Conversion cost · Operating cost	AI-ready infrastructure at or near the line
02 · Optimization Maximize existing assets	How do we generate more output and quality from the assets we already own?	Margin expansion	OEE · First-pass yield · Scrap · Gross margin	Trustworthy, contextualized process data
03 · Coordination Synchronize plant operations	Where do disconnected decisions constrain throughput and asset utilization?	Higher throughput and EBITDA per plant	Throughput · Asset utilization · EBITDA per plant	OT-IT integration across machine, MES and ERP
04 · Adaptation Respond dynamically to demand and supply	How quickly can our network adapt to disruption while protecting cash?	Working capital optimization	Inventory days · Working capital · Cash conversion cycle	Cloud and digital operations with run-cost discipline
05 · Trusted autonomy Enable AI-assisted enterprise decisions	Which decisions can AI execute safely within defined governance guardrails?	Higher ROCE and enterprise resilience	ROCE · Resilience · Growth capacity	Cyber resilience, operational safety and model governance

HOW TO READ THE CURVE

Value, not vanity

Progression is measured in enterprise value created, not in technologies deployed or pilots running.

Concurrent, not linear

A single enterprise will sit at Stage 2 in one plant and Stage 4 in its planning function. Both can be true.

Foundations gate the ceiling

The highest stage reachable is set by the foundations beneath it – see chapter 04.

THE KYNDRYL LENS

The fifth column is the one most often omitted from a business case, and the one that decides whether the first four are deliverable. A Stage 4 ambition on Stage 2 foundations fails quietly, as run-costs rise and the working capital release never reaches the accounts. Read the right-hand column before approving the left.

03

The five stages in practice

Each example has been selected because it demonstrates measurable business outcomes rather than technology deployment alone. All figures are as disclosed by the companies and programmes cited. Every case closes with what it means for a manufacturer that is not yet there.

WHAT YOU WILL SEE

CEAT, Tata Steel, Cipla, Unilever and Hindustan Unilever

HOW TO READ IT

Outcome first, then the transferable lesson, then what had to be true underneath

THE CAUTION

Lighthouse outcomes reflect AI alongside conventional operational levers

01

STAGE 01

Automation

ECONOMIC METRIC Lower conversion cost per unit

BUSINESS CHALLENGE

Manufacturers continue to consume valuable engineering and operator capacity on repetitive activities such as visual inspection, maintenance documentation and production reporting.

AI INTERVENTION

Machine vision, intelligent document processing and robotic process automation take over repetitive, rules- based work, allowing skilled employees to focus on higher-value operational decisions.

BUSINESS OUTCOME

Faster
execution of routine tasks

Consistent
quality and higher first-pass yield

Less rework
and fewer warranty claims

ECONOMIC IMPACT

Lower conversion cost per unit, reduced warranty claims and improved manufacturing efficiency. Stage 1 is usually self-funding within a single budget cycle, which is precisely why it is so often mistaken for a strategy.

WHAT THIS MEANS FOR MANUFACTURERS

Automation buys time; it does not compound on its own. Judge it on conversion cost per unit, not on headcount removed, and insist that released capacity is redeployed against a named constraint. Set the exit criterion before you start: when this works, which margin problem do we point the freed capacity at?

WHAT HAD TO BE TRUE UNDERNEATH

Inference close enough to the line to keep pace with it. Models that perform in a lab and time out on the shop floor are an infrastructure problem, not a model problem, at Stage 1, latency becomes a quality issue.

WHERE STAGE 1 TYPICALLY SHOWS UP

APPLICATION	WHAT IT REPLACES	THE METRIC IT MOVES
Machine vision inspection	Manual visual checks at the line	First-pass yield, scrap, warranty claims
Intelligent document processing	Maintenance records, quality documentation, supplier paperwork	Engineering and operator capacity released
Robotic process automation	Production, compliance and shift reporting	Operating cost and time to close the period

Automation is the entry fee, not the strategy. It buys capacity; only the stages above it convert that capacity into economics.

Stage 1 is described as a widely adopted practice across automotive and electronics manufacturing rather than a single published case. From Stage 2 onward, every example is drawn from a named, publicly disclosed programme.

02

STAGE 02

Optimization

ECONOMIC METRIC Higher gross margin from assets already owned

CEAT · Halol plant, Gujarat

WORLD ECONOMIC FORUM GLOBAL LIGHT HOUSE NETWORK · JANUARY 2023

WORLD'S FIRST TYRE LIGHTHOUSE

BUSINESS CHALLENGE

Existing production assets were not operating at their full potential, while increasingly stringent OEM quality requirements and sustainable materials made manufacturing more complex.

AI INTERVENTION

CEAT combined advanced analytics with digitally enabled operator workflows to optimize cycle times and improve manufacturing consistency.

BUSINESS OUTCOME

-20%

-46%

-15%

energy consumption

THE COMMERCIAL CONSEQUENCE

The resulting consistency enabled the plant to qualify for more demanding OEM and export programmes. CEAT subsequently reported export and OEM sales increasing approximately 2.5x over the following two years.

ECONOMIC IMPACT

Higher gross margin from the same manufacturing assets, achieved by simultaneously reducing waste, improving productivity and unlocking access to higher-value revenue. This is the defining signature of Stage 2: no new capital, better economics.

WHAT THIS MEANS FOR MANUFACTURERS

Quality consistency is a commercial qualification, not a cost programme. Ask: which order book are we currently disqualified from, and what level of process variance buys entry? Then price the case on the margin mix that qualification unlocks, not only on the scrap removed.

WHAT HAD TO BE TRUE UNDERNEATH

Process data trustworthy enough that an operator will change a setting because of it. Where master data is inconsistent between lines, every use case pays a rediscovery tax, which is why Stage 2 gains so often stop at one line.

Stage 2 is where quality stops being a cost centre and becomes a commercial qualification: consistency buys entry to the higher-margin order book.

Source: WorldEconomicForum, "AgainstEconomicHeadwinds,18 ManufacturingLighthouses...", January2023.

03

STAGE 03

Coordination

ECONOMIC METRIC Higher throughput, asset utilization and EBITDA per plant

As AI matures, value shifts from optimizing individual processes to coordinating decisions across production, maintenance, quality and supply chain.

Tata Steel · Kalinganagar

WORLD ECONOMIC FORUM GLOBAL LIGHT HOUSE NETWORK · JULY 2019

CAPACITY RAMP-UP

BUSINESS CHALLENGE

Operational functions were optimized independently, creating delays and inefficiencies across the production system.

AI INTERVENTION

Plant-wide deployment of predictive maintenance, advanced analytics and digital manufacturing capabilities supported rapid capacity ramp-up.

+50%

improvement in time to market

Economic impact

Higher throughput and faster conversion of installed capacity into revenue-generating output

Cipla · Indore manufacturing facility

WORLD ECONOMIC FORUM GLOBAL LIGHTHOUSE NETWORK

30+ USE CASES · 22 SITES

BUSINESS CHALLENGE

Improve productivity and manufacturing economics across multiple facilities while scaling digital transformation consistently across sites.

AI INTERVENTION

More than 30 Fourth Industrial Revolution use cases spanning IIoT, advanced analytics, natural language processing and robotic process automation, eventually scaled across 22 manufacturing sites.

-26%

manufacturing cost

+23%

Plant EBITDA

Better asset utilization, lower cost, higher throughput

WHAT THIS MEANS FOR MANUFACTURERS

At Stage 3 the money is in the seams. Identify the handover that absorbs the most margin – maintenance to production, quality to planning – and fix the decision, not the department. Cipla's signal is replication: the second site must cost materially less than the first.

WHAT HAD TO BE TRUE UNDERNEATH

Machine, MES, ERP and planning data reconciling into one operating picture across sites. Without it, optimization stays local and the seams keep absorbing margin.

Sources: World Economic Forum, "Scaling Intelligent Manufacturing", July 2019; WEF Global Lighthouse Network case study, Cipla Indore.

04

STAGE 04

Adaptation

ECONOMIC METRIC Lower inventory and improved cash conversion

Unilever · Doom Dooma factory, Tinsukia

WORLD ECONOMIC FORUM LIGHTHOUSE · JANUARY 2025

CONTINUOUS PLANNING

BUSINESS CHALLENGE

Demand volatility, input cost fluctuations and supply disruptions made traditional planning increasingly ineffective.

AI INTERVENTION

An AI-powered planning engine continuously evaluates more than 10,000 product combinations across over 300 variables, dynamically synchronizing demand signals with factory production schedules.

BUSINESS OUTCOME

+35%

demand forecast accuracy

-16%

finished goods inventory

14 to 1

planning frozen period

ECONOMIC IMPACT

Lower working capital, faster cash conversion and improved service levels, achieved through continuous planning rather than periodic planning, on the same physical asset base.

PLANNING FROZEN PERIOD

14 days, periodic planning

1 day – continuous planning

More than 10,000 product combinations evaluated across 300+ variables, continuously.

WHAT THIS MEANS FOR MANUFACTURERS

The frozen period is the tell. Before funding a forecasting programme, measure how many days elapse between a demand signal changing and a production schedule moving – then convert those days into inventory and cash at your own cost of capital. That number, not forecast accuracy, is the Stage 4 business case, and it is the one the treasurer will recognise. Accuracy that does not shorten the frozen period releases no cash.

WHAT HAD TO BE TRUE UNDERNEATH

Continuous planning means continuous compute. At Stage 4, pilot economics quietly invert unless inference and integration run-costs are observed and controlled as deliberately as the benefit is tracked – the reason cloud and digital operations discipline, not the planning engine, is usually the constraint.

Stage 4 is where AI stops improving the plant and starts improving the balance sheet. Planning latency, measured in days, is the conversion rate.

Source: Unilever, "Five ways Unilever's new Lighthouse site applies AI for impact", January 2025.

05

STAGE 05

Trusted autonomy

ECONOMIC METRIC Higher return on capital employed (ROCE)

Hindustan Unilever · Haridwar factory

WORLD ECONOMIC FORUM GLOBAL LIGHT HOUSE NETWORK · JUNE 2026

AGENTIC SUPPLY CHAIN

BUSINESS CHALLENGE

Support premium, small-batch manufacturing despite a 50% increase in SKUs and a fourfold increase in demand volatility, while maintaining cost competitiveness and service levels.

AI INTERVENTION

An agentic AI-powered Supply Chain Nerve Centre continuously monitors market demand, automatically adjusts production plans and anticipates material constraints. The factory also introduced Nano 3.0 manufacturing, enabling multiple product variants to run simultaneously.

BUSINESS OUTCOME

-72%

response time

-24%

inventory days on hand

99%

on-time-in-full delivery, sustained through growth

ECONOMIC IMPACT

Continuous optimization of production, inventory and capacity improves return on capital while making resilience a competitive advantage. Continuous rebalancing lifts return on capital and buys a resilience premium.

WHAT THIS MEANS FOR MANUFACTURERS

Stage 5 is a governance product before it is a technology product. Delegate decision classes, not systems: name the specific decisions AI may execute, the thresholds at which they escalate, and the person accountable for each class. The economics follow the control – an enterprise that cannot evidence control cannot price the resilience premium, and its auditors will not let it try.

WHAT HAD TO BE TRUE UNDERNEATH

Zero-trust segmentation of the OT estate, safety interlocks that no model may supersede, and tested recovery for production systems. A connected plant enlarges the attack surface; at Stage 5, an hour of unplanned downtime can consume a quarter's throughput gain. Resilience is not a cost against the return – at this stage it is the return.

Autonomy that cannot be explained, audited, interrupted or overridden is not maturity. It is unpriced operational risk.

Source: Hindustan Unilever, press release, 22 June 2026; World Economic Forum, Global Lighthouse Network announcement, 22 June 2026.

Autonomy at this stage is controlled and trusted autonomy or it is not investable

Delegating decisions to machines raises the turn on capital only if the enterprise can also demonstrate control of them. Six guardrails should be non-negotiable before any decision class is delegated.

01 · A named human owner

Accountability for every category of delegated decision sits with an identified person, not a committee.

02 · Explainability at the machine

Sufficient for a plant manager to interrogate and, where necessary, overrule a recommendation.

03 · Defined intervention thresholds

Beyond which the system escalates to a person, with a manual override always available and regularly rehearsed.

04 · OT security and safety interlocks

Cybersecurity and functional-safety controls that no model is permitted to supersede.

05 · Full auditability

Any machine decision can be reconstructed for a regulator, a customer or an investigation.

06 · Periodic revalidation

As processes, materials and demand patterns drift away from training conditions, models are re-tested against reality.

THE BOARD TEST FOR ANY DELEGATED DECISION

Can we name the owner, show the reasoning, state the escalation threshold, prove the interlock, reconstruct the decision twelve months later, and evidence the last revalidation? Six yes answers, or the decision class is not delegated.

THE KYNDRYL LENS

These guardrails are operational commitments, not policy statements: they require tested recovery of production systems, segmentation between the IT and OT estates, and model governance that survives an audit. In manufacturing, the control environment for industrial and operational data sits outside personal-data regulation and must be designed deliberately, see the precision point on regulation on page 21.

The evidence at a glance

Five programmes, five financial mechanisms, five transferable lessons. Read the last column first: it is the part that travels to a plant that is not a Lighthouse.

STAGE	PROGRAMME	DISCLOSED OUTCOME	WHAT MOVED FINANCIALLY	THE LESSON THAT TRANSFERS
01 Automation	Widely adopted practice, automotive and electronics	Faster, more consistent execution; higher first-pass yield; less rework	Conversion cost per unit	Redeploy released capacity against a named constraint, or the saving does not compound
02 Optimization	CEAT · Halol, Gujarat	Cycle time -20%, process scrap -46%, energy -15%; export and OEM sales ~2.5x in two years	Gross margin and revenue mix	Consistency is a commercial qualification – price the order book it unlocks
03 Coordination	Tata Steel · Kalinganagar Cipla · Indore	Time to market +50%; manufacturing cost -26%, productivity +23% across 22 sites	Throughput and EBITDA per plant	The value is in the seams; the second site must cost less than the first
04 Adaptation	Unilever · Doom Dooma, Tinsukia	Forecast accuracy +35%, finished goods inventory -16%, frozen period 14 days to 1	Working capital and cash conversion	Measure planning latency in days and convert days into cash
05 Trusted autonomy	Hindustan Unilever · Haridwar	Response time -72%, inventory days -24%, OTIF sustained at 99% through 50% SKU growth	Return on capital employed	Delegate decision classes with named owners, thresholds and rehearsed override

THE PATTERN ACROSS ALL FIVE

Value moves from the income statement to the balance sheet as the stages rise. Stages 1–3 improve what a plant costs and produces; Stages 4–5 improve what the enterprise ties up and returns. The higher the stage, the more the CFO – not the CIO – is the natural sponsor.

HOW TO READ THESE FIGURES HONESTLY

These are advanced, publicly recognised sites, and their outcomes reflect AI and advanced analytics working alongside conventional operational levers and capability building. Treat them as evidence of what each stage makes possible not as a benchmark any single plant should expect to reproduce.

THE KYNDRYL LENS

None of these results was achieved on weak foundations. Each rests on infrastructure close to the line, data trusted without rediscovery, OT and IT estates that reconcile, run-costs that are observed, and resilience that protects the gain once it exists. That is the subject of the next chapter.

04

Readiness: the Kyndryl perspective

The curve describes where value sits. It does not tell an enterprise whether it can reach it. That is a question of readiness and readiness is where most AI economics is won or lost.

THE GAP

54% report AI ROI; 62% remain stuck in pilot

THE BURDEN

Manufacturing runs two estates IT and OT

THE ANSWER

Six foundations that gate the ceiling

Progressing along the curve requires more than AI

The cases in chapter 03 show what each stage can deliver. They also carry a quieter lesson: none of these results was achieved on weak foundations.

For most manufacturers, the challenge is no longer identifying AI use cases. It is integrating fragmented OT and IT data, cleaning poor master data locked in legacy ERP, building plant-level trust in AI recommendations, and scaling proven pilots across sites with different equipment, processes and operating cultures — all under real constraints of cybersecurity, data ownership, capex discipline and scarce skills.

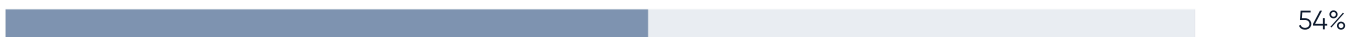
The curve does not wish these away. It orders them: the highest-value stage an enterprise can credibly reach is set by the foundations beneath it.

Manufacturing carries an additional burden that most sectors do not: it runs two estates. An IT estate optimized for change, and an OT estate optimized for uptime and safety — often with equipment older than the analytics being asked to interpret it.

Progress along the economics curve depends on making those two estates behave as one, securely, and without compromising production. In our experience running mission-critical estates for manufacturers, six foundations determine how far up the curve an enterprise can credibly go.

THE READINESS GAP · KYNDRYL READINESS REPORT 2025

Report positive ROI from AI investment



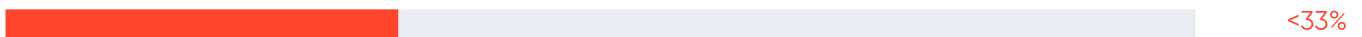
Remain stuck in pilot



Believe they have the tools and processes to scale innovation



Say their people are genuinely ready for AI



Experienced a cyber-related outage in the past year



Kyndryl Readiness Report 2025: a survey of 3,700 senior leaders across 21 countries, conducted with Edelman DXI, June–August 2025. More than half also report being stalled by their technology stack.

Confidence, in other words, is running ahead of capability. Ninety percent believe they can scale; fewer than a third say their people are ready to.

Six foundations that gate the ceiling

Each foundation unlocks a specific band of the curve. Skipping one does not slow the programme it caps it, and puts a price on the shortfall.

FOUNDATION	WHAT IT DETERMINES	STAGE IT UNLOCKS	THE COST OF SKIPPING IT
AI-ready infrastructure	Whether compute, storage and edge capacity sit close enough to the line to support real-time inference	STAGES 1-2	Models that work in the lab and time out on the shop floor; latency becomes a quality problem
Data foundations	Master-data quality, a common semantic layer, and contextualized process data that is trustworthy by default	STAGES 2-3	Every use case pays a rediscovery tax; no two plants can compare performance
OT-IT integration	Whether machine, MES, ERP and planning data reconcile into one operating picture across sites	STAGE 3	Optimization stays local, and the seams between functions keep absorbing margin
Cloud and digital operations	Run-cost discipline, observability and AIOps that keep AI services available and economically defensible at scale	STAGES 3-4	Pilot economics quietly invert as inference and integration run-costs scale faster than benefit
Cyber resilience and operational safety	Zero-trust segmentation of OT, safety interlocks AI cannot supersede, and tested recovery for production systems	STAGES 4-5	A connected plant enlarges the attack surface; unplanned downtime erases the throughput gain that funded the programme
Governance and organizational adoption	Model governance, auditability, decision rights and the skills for operators to trust and challenge AI output	STAGE 5	Autonomy without accountability; recommendations are overridden informally and value never lands

None of this is a technology shopping list. It is the balance sheet of capability that determines whether an AI investment case is credible before it is approved. The six foundations are assessed directly in the readiness scorecard on page 24.

HOW KYNDRYL READS THIS TABLE

We use it in the opposite direction to most planning conversations: not "which stage do we want?" but "given what is beneath us today, which stage is investable and what is the cheapest path to raising the ceiling by one?" For most manufacturers the answer is unglamorous: reconcile the two estates, fix master data at source, instrument run-cost before scaling. That sequence turns a promising pilot into a programme a CFO will fund twice.

Three implications for the board

1

Readiness is a capital-allocation question, not an IT question

A manufacturer whose OT and IT data cannot be reconciled should not be funding Stage 4 forecasting ambitions. The money will be spent, and the working capital will not move. Sequencing investment against readiness is the single highest-return decision on the agenda.

2

Resilience is part of the return, not a cost against it

Kyndryl's research finds that 82% of businesses experienced a cyber-related outage in the past year, and that three in four leaders are now concerned about the geopolitical risk of where data is stored and managed — with 65% already adjusting cloud strategies in response. In a connected plant, an hour of unplanned downtime can consume a quarter's throughput gain. The resilience premium at Stage 5 is real, but it is earned by design.

3

Adoption is an operating discipline, not a communications exercise

AI creates value only when an operator acts on a recommendation. That requires explainability at the machine, decision rights that are explicit, and reskilling funded alongside the technology.

CAPABILITY FORMATION, NOT APPETITE · KYNDRYL IN INDIA

\$2.25B

planned investment in India over three years

200,000

citizens targeted for digital training

Bengaluru

AI Innovation Lab, aligned to the India AI Mission

Source: Kyndryl, "Kyndryl continues to invest in India, with plans to spend \$2.25 billion over three years", 21 August 2025.

A PRECISION POINT ON REGULATION

India's Digital Personal Data Protection Act, 2023 applies where AI systems process digital personal data — employee, customer or vendor information. Industrial and operational data sits outside that Act and requires a separate control set covering OT cybersecurity, operational safety, model governance and change control. Assuming one regime covers both is an unmeasured risk.

Readiness is not a precondition to be cleared before the interesting work begins. In manufacturing, it is the work and it is what decides whether the interesting part is fundable at all.

05

The board agenda

Foundations determine how far an enterprise can credibly go. They do not decide what it should fund first. Five checks answer that and turn the framework into a funding gate.

THE AI ECONOMICS TEST

Before approving any AI investment, the board asks one question above all: where do we invest first? Five checks answer it.

- 1 Does it remove a bottleneck that is limiting profitability?
- 2 Does it improve a financial metric the CFO already tracks?
- 3 Can it scale across plants?
- 4 Does it improve a core business process?
- 5 Can meaningful value milestones or leading indicators be demonstrated within 12 months?

Used as a practical management heuristic rather than an established benchmark, three or more 'no' answers is a signal to reconsider the investment or to fix the foundation it depends on first. The test turns the framework from a concept into a funding gate.

Key takeaways for the C-suite

01

Prioritize business constraints, not technology opportunities

The most successful AI programmes begin by addressing the operational constraint that most limits enterprise performance. AI should follow business priorities, not the other way around.

02

Scale proof, not promise

Expand AI only after one plant shows repeatable gains in cost, throughput or quality. The Lighthouse evidence is consistent on this point: value comes from scaling what has already been proven at a site, not from parallel experimentation across a network.

03

Make finance the scorekeeper

Every AI initiative should commit to a measurable business outcome before funding is approved. Financial metrics – not technology metrics – should determine whether programmes expand.

04

Fix data, security and governance before autonomy

Treat unified OT and IT data, master-data quality and an AI assurance framework as Stage-1 infrastructure. On regulation, be precise about which regime applies to personal data and which control set governs industrial and operational data.

05

Create shared executive ownership

The AI agenda earns conviction when the CIO enables the technology and data foundation, the CFO validates the economics, and business and operations leaders own the outcomes.

THE CLEAREST SIGNAL OF A MATURE PROGRAMME

It is not a larger technology budget. It is a CFO willing to underwrite it and a plant head willing to be measured on it.

WORKED EXAMPLE

A Stage 4 demand-planning proposal at a manufacturer whose OT and IT data cannot yet be reconciled fails checks 2, 3 and 5. Three 'no' answers. The correct board decision is not to reject AI, it is to fund the data foundation first, then re-present the same case.

WHAT THE TEST PROTECTS AGAINST

Programmes that pass every technology review and still fail the P&L: strong models, credible vendors, no owner of the financial outcome, and no plant able to absorb the change.

Ten questions to ask before the next AI investment

Structured for a single board or executive-committee session. If a question cannot be answered in one sentence with a number in it, that is the finding.

THE ECONOMICS · QUESTIONS 1–4

- | | |
|--|---|
| 01 Which line of the P&L does this move, and by how much? | If the answer is “efficiency”, the case is not yet written. |
| 02 Which stage of the curve is this, and are we funding the stage above our ceiling? | Cross-check against the scorecard on page 24. |
| 03 What does the second site cost, and who has committed to that number? | Replication cost is the true test of the data foundation. |
| 04 What is the annual run-cost at full scale, and when was it last re-tested? | Inference and integration costs scale with success, not with the pilot. |

THE READINESS · QUESTIONS 5–7

- | | |
|---|---|
| 05 Can our OT and IT data reconcile today, without manual intervention? | A ‘no’ caps the programme at Stage 2, whatever the model can do. |
| 06 If this plant lost its production systems for a day, what would it cost – and have we tested recovery? | Downtime risk should be netted off the throughput gain, explicitly. |
| 07 Which operators must change behaviour, and what have we funded to help them? | Adoption spend belongs in the same business case, not a later one. |

THE GOVERNANCE · QUESTIONS 8–10

- | | |
|---|---|
| 08 Which decisions will AI influence, and which will it execute? | Name the classes; a system-level answer is not an answer. |
| 09 Who is the named owner of each delegated decision class, and what triggers escalation? | A committee is not an owner. |
| 10 Which regime governs the data involved – personal, or industrial and operational? | They are different control sets; assuming one covers both is unmeasured risk. |

Three or more unanswerable questions is not a reason to reject AI. It is a reason to fund the foundation first and re-present the same case – usually one quarter later, and usually at a lower total cost than the original proposal.

The first 90 days

A framework earns its place only if something changes in the next quarter. Five actions, each owned by a named executive, each producing an artefact the board can review.

WHEN	ACTION	OWNER	THE ARTEFACT IT PRODUCES
Weeks 1-2	Place every live AI initiative on the curve by the metric it moves	CIO with Finance	A one-page portfolio map; initiatives that cannot be placed are flagged for review
Weeks 3-4	Run the readiness scorecard with plant leadership, not only with IT	CIO and COO jointly	A scored ceiling, and the single foundation that is capping the enterprise
Weeks 5-8	Re-underwrite the two largest initiatives against the AI Economics Test	CFO	Fund, defer, or fix-the-foundation-first decisions, minuted
Weeks 6-10	Price the resilience exposure of the plants carrying the largest AI-dependent gain	CISO with Operations	A tested recovery position, and downtime risk netted against the expected gain
Weeks 9-12	Name owners and escalation thresholds for every decision class AI already influences	COO with Legal	A decision-rights register, ready for audit and for the next stage

THE ONE METRIC TO INTRODUCE THIS QUARTER

Replication cost. What it costs to take a proven use case to the next site. It is the single number that exposes whether an enterprise has a scaling programme or a collection of pilots and it is the number that moves 62% stuck in pilot towards the 54% reporting return.

THE ONE CONVERSATION TO HAVE

Between the CFO and the plant head, before the next funding round: which metric will you both sign, and when does it land? Programmes with two signatures on one number behave differently from programmes with a steering committee.

WHERE KYNDRYL FITS

Kyndryl designs, builds, manages and modernizes the mission-critical systems manufacturers depend on – running IT and OT estates as one, securely and economically. In practice, that means a structured readiness review across the six foundations, a costed path to raising the ceiling by one stage, and the operating discipline to keep AI services available, defensible and auditable once they are carrying real production decisions. The starting point is not a technology selection. It is a scored ceiling and an honest replication cost.

THE BOTTOM LINE

Manufacturing has always rewarded organizations that turn operational excellence into financial advantage. AI does not change that equation, it changes the tools available to achieve it.

The AI Economics Curve provides a practical framework for making that transition. It shifts executive conversations away from technology maturity and towards enterprise value, helping leadership teams prioritize investments that strengthen long-term competitiveness.

From Kyndryl's perspective, the organizations that will realize the greatest returns from AI are those that combine modern digital infrastructure, trusted data, integrated operations, disciplined governance and organizational adoption into a single enterprise transformation agenda.

The winners over the next decade will not be those that deploy the most AI. They will be those that deploy AI where it changes the economics of the business — and who have built the foundations that let them do it safely, repeatedly and at scale.

THE THREE QUESTIONS TO LEAVE THE ROOM WITH

01

Which line of the P&L is our AI investment moving this year — and who has signed for it?

02

Which foundation is capping our ceiling, and what would it cost to raise it by one stage?

03

If we had to delegate one decision class tomorrow, could we evidence control of it?

AI becomes most valuable not when it is deployed everywhere, but when it is systematically embedded into the operating model of the business.

Sources and references

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ABOUT KYNDRYL

Kyndryl designs, builds, manages and modernizes the mission-critical technology systems that the world depends on every day. For manufacturers, that means running IT and OT estates as one – securely, resiliently and economically – so that AI investment translates into measurable enterprise outcomes.

ABOUT MINT CIO CIRCLE

Mint CIO Circle convenes senior technology and business leaders across India's largest enterprises, producing research and executive dialogue on the decisions shaping enterprise technology, operations and growth.