PGC DIGITAL · MANUFACTURING DATA, AI AND AUTOMATION · FIVE-PART SERIES

Unlock the power of your data. From data silos to an AI-powered value chain.

Data consolidation, real-time visibility, the intelligent factory and the AI-powered value chain. Stories, sample data, SAP and non-SAP data movement, analyst evidence, team, days, indicative budgets and engagement models.



By Vinod Kumar Beli with Sappy · October 2026

pgcdigital.ai

Contents

A pillar guide and four blogs, one per stage. Start with the pillar guide to find your stage.

00 **Unlock the power of manufacturing data: from data silos to an AI-powered value chain**
Pillar guide · ≈ 10 min

01 **From data silos to a single source of truth: the manufacturing data foundation**
Blog 1 · Data foundation · ≈ 9 min

02 **From data visibility to an intelligent factory: real-time manufacturing analytics**
Blog 2 · Intelligent factory · ≈ 9 min

03 **Beyond dashboards: how AI turns manufacturing into a predictive enterprise**
Blog 3 · AI and predictive intelligence · ≈ 9 min

04 **The autonomous manufacturing value chain: connecting data, AI and automation**
Blog 4 · Value chain optimisation · ≈ 9 min

No PGC Digital client is named. Analyst figures are quoted from the linked public summaries. “Reported” outcomes are individual results from published industry examples; sample data, targets, rates and budgets are illustrative planning figures, not a quote.

PILLAR GUIDE · MANUFACTURING DATA, AI AND AUTOMATION · BY VINOD KUMAR BELI WITH SAPPY

Unlock the power of manufacturing data: from data silos to an AI-powered value chain



Where your plants are on the journey from fragmented data to automated decisions, what each stage costs and takes, and the team that moves you to the next one. With SAP and non-SAP data, analyst evidence and sample data.

≈ 10 min	SAP + non-SAP	Gartner · IDC · Forrester
read	data, one foundation	evidence linked

MANUFACTURING DATA, AI AND AUTOMATION · THE SERIES

00 Unlock the power of manufacturing data: from data silos to an AI-powered value chain

01 From data silos to a single source of truth: the manufacturing data foundation

02 From data visibility to an intelligent factory: real-time manufacturing analytics

03 Beyond dashboards: how AI turns manufacturing into a predictive enterprise

04 The autonomous manufacturing value chain: connecting data, AI and automation

Every manufacturer already owns the data it needs: orders and costs in ERP, counts and stops in MES, signals in the machines, complaints in CRM, defects in quality systems. What most do not have is that data in one place, trusted, fresh and connected to the decisions that make money. This guide shows the four-stage journey, where your plants probably are today, and what it takes, in people, days and budget, to reach the next stage.

Why it matters now

$12.9M
average yearly cost of poor data quality to an organisation
Gartner ↗

49%
of organisations lack confidence in their manufacturing strategy for the next three years
Gartner survey, 2025 ↗

66%
say integrating supply chain and manufacturing is their most significant challenge
Gartner survey, 2025 ↗

40%
of all operational data will be integrated across applications and platforms by 2027
IDC FutureScape 2026 ↗

The journey in four stages

01
Data consolidation

One trusted foundation for SAP and non-SAP data

Read blog 1 →

02
Real-time visibility

Machines, MES and ERP visible as it happens

Read blog 2 →

03
Intelligent, predictive factory

AI forecasts, predicts failures and recommends

Read blog 3 →

04
AI-powered value chain

Approved decisions executed automatically

Read blog 4 →

The journey: each stage builds on the last. Most manufacturers sit between stages 1 and 2 today.

Where are you today?

Where is your organisation today? Pick the stage that sounds like you.

STAGE 1 · WHERE YOU ARE

Data is fragmented

- ERP, MES, CRM and spreadsheets are disconnected
- Reports are built by hand
- Numbers are late or disagree
- Leaders lack one view

NEXT STAGE **Consolidated data foundation** Read how →

STAGE 2 · WHERE YOU ARE

Consolidated, but insights are late

- A warehouse and reports exist
- Reports show history
- Refresh is daily, weekly or every few hours

NEXT STAGE **Real-time analytics** Read how →

STAGE 3 · WHERE YOU ARE

Real-time visibility, manual decisions

- Production dashboards are live
- Teams watch KPIs
- People still decide what to do, case by case

NEXT STAGE **Predictive and prescriptive intelligence** Read how →

STAGE 4 · WHERE YOU ARE

AI insights, manual workflows

- Forecasting and predictive models run
- AI flags risks and opportunities
- Teams still execute every action by hand

NEXT STAGE **AI-enabled automated workflows** Read how →



SAPPY SAYS

Do not skip a stage. AI on top of data nobody trusts makes wrong decisions faster. Each stage pays for the next one.

The three pillars

1 · A trusted foundation for full visibility

Consolidate data and create one source of truth. Objective: better data quality, no silos, one view of the business.

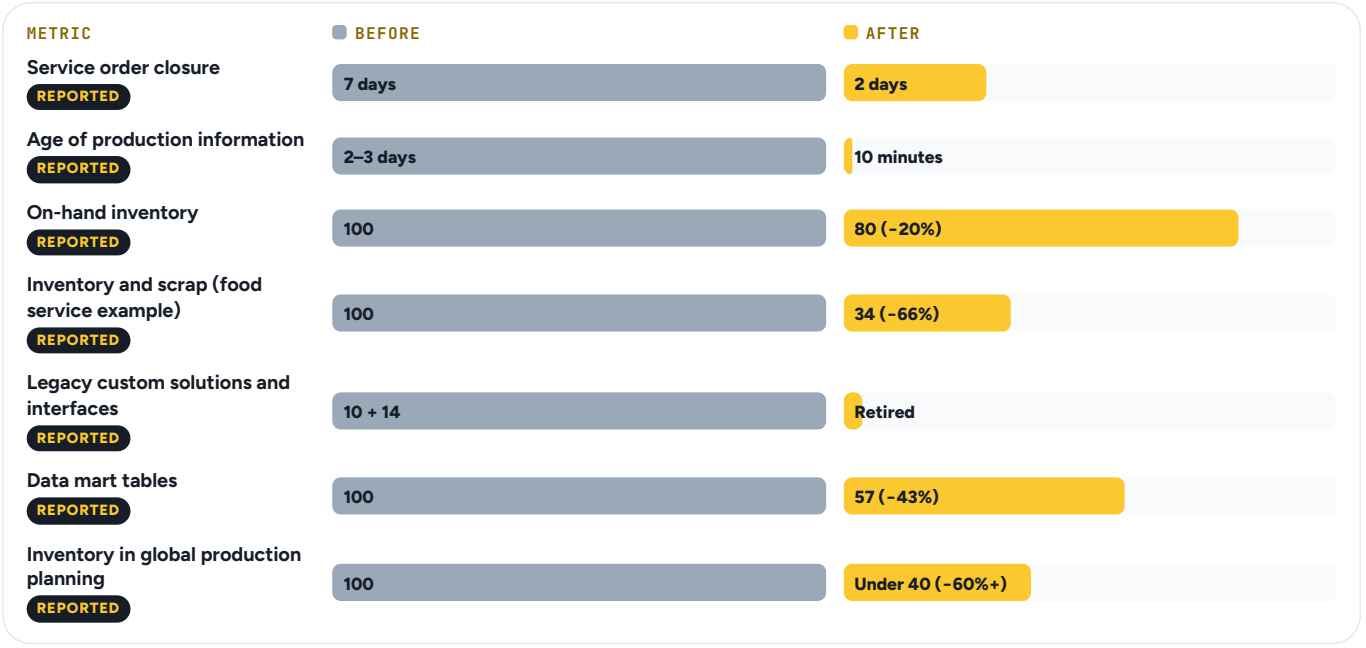
2 · An intelligent factory

Connect machines, operations and analytics in real time. Objective: higher efficiency, less downtime, faster response.

3 · A value chain optimised in real time

Apply AI, prediction and automation to decisions. Objective: better forecasts, inventory, planning and supply chain performance.

What others reported



Reported outcomes from published manufacturer examples in our programme brief. Individual results, not guarantees; bars are indexed so before = 100.

The technology stack, SAP and non-SAP

LAYER	TECHNOLOGIES	BUSINESS USE CASES
ERP and business systems	SAP S/4HANA and ECC, Microsoft Dynamics 365, Oracle	Financials, procurement, inventory, production orders
Manufacturing systems	MES (SAP Digital Manufacturing or others), SCADA, PLC, quality systems	Machine monitoring, production tracking, quality management
Data integration	SAP Business Data Cloud and Datasphere, Azure Data Factory, Fivetran, APIs and connectors	Extract and integrate data from siloed systems
Data platform	Microsoft Fabric and Azure Data Lake, Snowflake, Databricks	Unified storage, modelling and analytics
Real-time processing	Azure IoT Hub, Event Hubs, Fabric Real-Time Intelligence, Kafka	Machine telemetry, production monitoring, downtime analysis
Analytics and reporting	Power BI, SAP Analytics Cloud, manufacturing dashboards	OEE, inventory, margin, supplier and production KPIs
AI and machine learning	Azure Machine Learning, Fabric AI, Databricks Mosaic AI, Snowflake Cortex, Microsoft Copilot, SAP Joule	Forecasting, predictive maintenance, anomaly detection
Automation	Power Platform and Power Automate, SAP Build Process Automation, APIs	Automated workflows, alerts, approvals and business processes

Choose the stack from your landscape, data maturity and target architecture. Not every manufacturer needs every technology.

The SAP data question you must answer first

Since SAP Note 3255746, the ODP-RFC interface is reserved for data transfer between SAP applications. Pulling S/4HANA, ECC or BW data into a non-SAP platform through ODP-RFC is not permitted, with technical enforcement and a temporary opt-out ending in 2026. Table and CDS-view extraction, OData and SAP Business Data Cloud remain open, and SAP Business Data Cloud Connect

now shares SAP data with Databricks, Snowflake and Microsoft Fabric without copying it. Your extraction pattern is the first design decision, not the last.

Who moves, and who benefits

COO and plant heads
Uptime, OEE and on-time delivery

CFO
Margin, working capital and inventory days

Supply chain head
Forecast accuracy, supplier risk, service level

CIO and CDO
Fewer interfaces, one platform, governed AI

Quality head
Scrap, rework and complaints

Sales head
Promise dates customers can trust

How we engage

ASSESSMENT
Fixed price
3 weeks · 15 working days
`$15k–$25k`
Maturity score, target architecture, data inventory (SAP and non-SAP), business case and a 12-month roadmap.

PILOT
Fixed scope and price
12–16 weeks
`From the team plan in each post`
One plant or one value stream live, with a baseline and a scorecard you sign off.

POD
Time and materials, monthly
3–9 people, 30 days' notice
`Team × rate × months`
A cross-skilled pod that scales up or down as the roadmap moves.

MANAGED SERVICE
Monthly, SLA-based
Run and improve
`$8k–$20k a month`
Pipelines, data products, models and dashboards kept running and improving.

OUTCOME-LINKED
Part of the fee at risk
After a measured baseline
`Agreed per KPI`
A share of the fee tied to downtime hours, forecast error or inventory days.

Book the 3-week assessment | **Get a fixed-price pilot proposal**

Read the series

Four blogs, one per stage. Each has a before-and-after story, raw versus business-ready sample data, the SAP and non-SAP data movement, the team with skills and indicative rates, days and budget, and a call to action for every opportunity.

SOURCES AND EVIDENCE

- Gartner: How to improve your data quality (poor data quality costs organisations an average of $12.9M a year) ↗
- Gartner survey (Oct 2025): 49% of organisations lack confidence in their future manufacturing strategy ↗
- IDC: Charting the AI-driven future of manufacturing (IDC FutureScape: Worldwide Manufacturing 2026 Predictions) ↗
- Forrester: Millions lost in 2023 due to poor data quality (Data Culture and Literacy Survey, 2023) ↗
- MESA International and Tech-Clarity: AI and analytics deliver rapid value to manufacturers (2025, 423 responses) ↗
- SAPinsider: SAP Note 3255746, ODP-RFC restrictions for non-SAP targets and the 2026 timeline ↗
- SAP News (Nov 2025): SAP Snowflake and SAP Business Data Cloud Connect ↗
- SAP and Microsoft announce SAP Business Data Cloud Connect for Microsoft Fabric ↗

Analyst figures are quoted from the linked public summaries. "Reported" outcomes are individual customer results from published industry examples in our programme brief, not guarantees. Sample data, PGC Digital targets, rates and costs are illustrative planning figures.

BLOG 1 · DATA FOUNDATION · MANUFACTURING DATA, AI AND AUTOMATION · BY VINOD KUMAR BELI WITH SAPPY

From data silos to a single source of truth: the manufacturing data foundation



How manufacturers consolidate SAP and non-SAP ERP, MES, CRM, quality and supply chain data into one trusted, business-ready foundation.

≈ 9 min	SAP + non-SAP	Gartner · IDC · Forrester
read	data, one foundation	evidence linked

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The Monday margin meeting

BEFORE

Mon 09:00	Finance says Q3 margin on pumps is 31.2%. Sales says 34.0%. The plant says 29.5%.
Mon 09:40	The meeting turns into a debate about whose spreadsheet is right.
Tue–Thu	Two analysts rebuild the numbers by hand from four systems.
Fri	A price decision waits another week.

→

AFTER

Mon 08:00	One margin data product, refreshed overnight from S/4HANA, MES, CRM and quality data.
Mon 09:00	Everyone sees 31.2%, with the drivers: freight, rebates, scrap.
Mon 09:20	The discussion moves to the 1.8-point scrap gap at one plant.
Mon 10:00	A decision is made in the meeting, not next week.

A composite story built from typical manufacturing programmes. Illustrative.

Why it is so important

$12.9M
average yearly cost of poor data quality to an organisation
Gartner ↗

25%+
of data and analytics employees estimate losses above $5M a year from poor data quality
Forrester, 2023 ↗

40%
of all operational data will be integrated across applications and platforms by 2027
IDC FutureScape 2026 ↗

The business problem

Leaders cannot agree on the numbers, because each system tells a different story. ERP holds orders and costs, MES holds what the line produced, CRM holds what sales promised, quality holds the defects, and spreadsheets hold everything in between. Reports are built by hand, late and contested.

WHERE MANY PLANTS ARE TODAY

Stage 1 · Data is fragmented

- ERP, MES, CRM and spreadsheets are disconnected
- Reports are created by hand
- Data is late or inconsistent
- Leaders lack one view

THE NEXT STAGE

Stage 2 · A consolidated data foundation

- One governed platform for SAP and non-SAP data
- Golden records for material, customer, supplier, plant
- Business data products with owners and refresh SLAs

Sample data: what changes

One material, four systems, four versions of the truth

RAW DATA · BEFORE

SOURCE	MATERIAL	DESCRIPTION	UNIT	PLANT	STANDARD COST	UPDATED
SAP S/4HANA	100-245	HYD PUMP 2.2KW	EA	1100	₹18,450	Today
MES	P-100245	Hydraulic pump 2,2 kW	PC	PUNE-1	–	Yesterday
Quality system	100245	Pump hyd. 2.2 kw	Nos	Pune	–	3 days ago
Planning spreadsheet	100-245	Hyd pump	Box (4)	P1	₹17,900	Last month

Four IDs, three units, three plant codes and two costs for the same pump.

BUSINESS-READY · AFTER

GOLDEN RECORD	MATERIAL	DESCRIPTION	BASE UNIT	PLANT	STANDARD COST	QUALITY SCORE
Product: hydraulic pump	100-245	Hydraulic pump 2.2 kW	EA (1 box = 4 EA)	1100 · Pune	₹18,450 (S/4HANA is the owner)	98% · 4 sources linked

One golden record with linked sources, a unit conversion and a single owner for cost.

Sample data, invented for illustration. Red cells are the problems; green cells are what the foundation fixes.

One KPI, three answers

RAW DATA · BEFORE

WHO ASKED	Q3 GROSS MARGIN, PUMP FAMILY	BUILT FROM
Finance	31.2%	S/4HANA, month-end close
Sales	34.0%	CRM export, before freight and rebates
Plant	29.5%	MES costs and a spreadsheet

Three definitions of gross margin, built from different data at different times.

BUSINESS-READY · AFTER

DEFINITION	Q3 GROSS MARGIN, PUMP FAMILY	BUILT FROM
Net of freight, rebates and scrap; one owner: Finance	31.2%	Margin data product, refreshed daily

One definition, one owner, one refreshed data product.

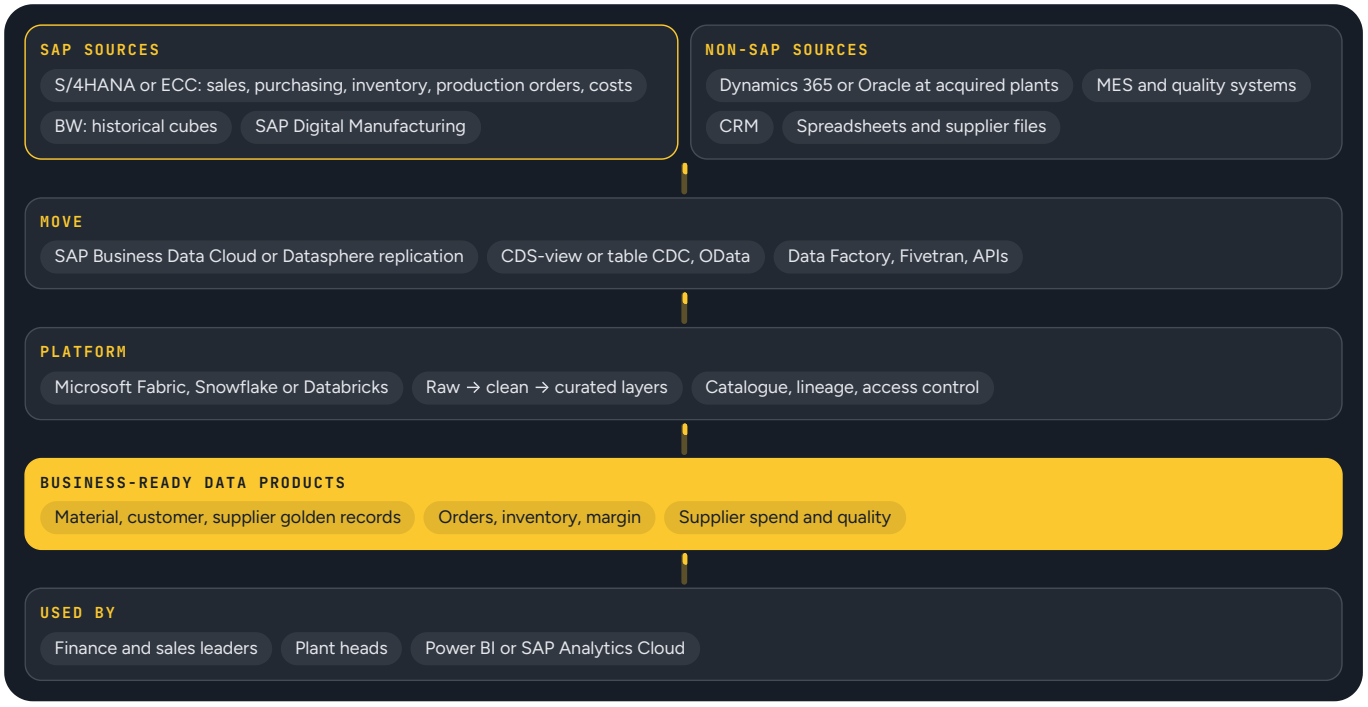
Sample data, invented for illustration. Red cells are the problems; green cells are what the foundation fixes.

Before and after

METRIC	BEFORE	AFTER
Time to build the monthly management pack (ILLUSTRATIVE)	5 days	Same morning
Reports built by hand (ILLUSTRATIVE)	42	6
Material master duplicates (ILLUSTRATIVE)	11%	Under 1%
Legacy custom solutions and interfaces (REPORTED)	10 + 14	Retired
Data mart tables (REPORTED)	100	57 (-43%)

Illustrative targets for a PGC Digital foundation pilot, and reported outcomes from published examples. Bars are indexed so before = 100.

How SAP and non-SAP data move



How data moves, SAP and non-SAP, from source to decision. The dots show the direction of flow.

SOURCE	DATA	HOW IT MOVES	LATENCY	WATCH OUT
SAP S/4HANA or ECC	Orders, deliveries, invoices, costs, stock, production orders	SAP Business Data Cloud or Datasphere, CDS views, table CDC or OData	Minutes to hourly	Not ODP-RFC to non-SAP targets (SAP Note 3255746)
SAP BW	History and existing KPIs	BDC data products, or one-off history load	One-off, then retire	Rebuild meaning, not just tables
Dynamics 365 or Oracle	Plants on another ERP	Native connectors or Fivetran	Hourly	Map to the same golden records
MES and quality	Output, scrap, defects, batches	Database CDC or APIs	15 minutes	Plant and order keys must match SAP
CRM	Pipeline, quotes, service cases	APIs	Hourly	Customer IDs to the golden record
Spreadsheets	Plans, targets, supplier lists	Governed upload with validation	Daily	Retire them once the data product exists

Choose the pattern your SAP licence, release and platform support; we confirm it in the assessment.

Opportunities

OPPORTUNITY

Single view of margin

HOW ERP, CRM, freight and rebate data in one margin data product

BENEFIT One number, faster pricing and product decisions

TRACK Margin by product, customer and plant

OPPORTUNITY

Inventory visibility

HOW ERP stock, MES WIP and warehouse data, daily

BENEFIT Less excess and fewer stock-outs

TRACK Days of inventory, stock-outs

OPPORTUNITY

Supplier spend and quality

HOW Procurement, invoices and quality results joined

BENEFIT Better negotiations and fewer defects

TRACK Spend under contract, supplier PPM



SAPPY SAYS

Start with three data products that leaders argue about today. When the argument stops, you know the foundation works.

The team that brings it

- 1 Data architect
- 1 SAP data consultant
- 2 Data engineer
- 1 Data quality and MDM specialist
- 1 BI developer
- 1 Project manager

ROLE	SKILLS	PEOPLE × ALLOCATION	INDICATIVE RATE PER HOUR (USD)
Data architect	Lakehouse design, data modelling, governance on Microsoft Fabric, Snowflake or Databricks	1 × 100%	$55–$75
SAP data consultant	S/4HANA and ECC tables, CDS views, BW, SAP Datasphere and Business Data Cloud	1 × 100%	$45–$65
Data engineer	Pipelines, CDC, SQL and Spark, dbt; Data Factory, Snowpipe or Lakeflow	2 × 100%	$30–$45
Data quality and MDM specialist	Profiling, matching, golden records; SAP MDG or Informatica	1 × 100%	$35–$50
BI developer	Power BI or SAP Analytics Cloud, semantic models, KPI design	1 × 50%	$28–$40
Project manager	Agile delivery, scope, risk, steering reports	1 × 50%	$35–$50

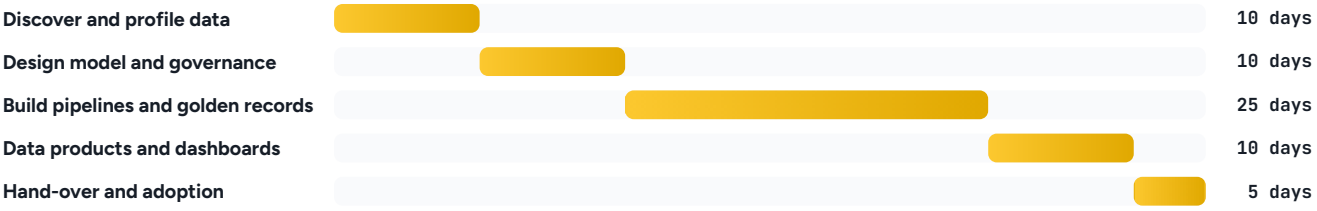
6 full-time equivalents. Indicative offshore rates for delivery from India and Vietnam, before taxes; onsite, US and Germany delivery are priced separately.

How many days, and what it costs

60
working days to a live pilot

$110k–$155k
indicative pilot budget (team × rate × 3 months)

$35k–$50k
per month if you continue as a pod



Indicative plan and budget for one plant or one value stream, offshore delivery, excluding software licences and cloud consumption. A fixed price follows the assessment.

Engagement models

ASSESSMENT
Fixed price
3 weeks · 15 working days
$15k–$25k
Maturity score, target architecture, data inventory (SAP and non-SAP), business case and a 12-month roadmap.

PILOT
Fixed scope and price
12–16 weeks
From the team plan in each post
One plant or one value stream live, with a baseline and a scorecard you sign off.

POD
Time and materials, monthly
3–9 people, 30 days' notice
Team × rate × months
A cross-skilled pod that scales up or down as the roadmap moves.

MANAGED SERVICE
Monthly, SLA-based
Run and improve
$8k–$20k a month
Pipelines, data products, models and dashboards kept running and improving.

OUTCOME-LINKED
Part of the fee at risk
After a measured baseline
Agreed per KPI
A share of the fee tied to downtime hours, forecast error or inventory days.

Book the 3-week assessment | **Get a fixed-price pilot proposal**

What comes next

With trusted data in one place, the next question is speed: what is happening on the line right now? That is blog 2, the intelligent factory.

SOURCES AND EVIDENCE

- Gartner: How to improve your data quality (poor data quality costs organisations an average of $12.9M a year) ↗
- Forrester: Millions lost in 2023 due to poor data quality (Data Culture and Literacy Survey, 2023) ↗
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BLOG 2 · INTELLIGENT FACTORY · MANUFACTURING DATA, AI AND AUTOMATION · BY VINOD KUMAR BELI WITH SAPPY

From data visibility to an intelligent factory: real-time manufacturing analytics



How IoT, MES, cloud analytics and live dashboards let plants see performance, downtime, quality and energy as it happens, not three days later.

≈ 9 min	SAP + non-SAP	Gartner · IDC · Forrester
read	data, one foundation	evidence linked

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Line 3 stops at 02:10

BEFORE

02:10	A press stops. The night shift restarts it twice and writes “machine problem” on paper.
08:30	The morning meeting learns about it from yesterday’s report, already 2–3 days old.
10:00	Nobody knows how many units were lost or which orders slip.
Fri	The same stop happens again.

→

AFTER

02:10	The stop, its reason and the order it hits appear on the live line dashboard.
02:11	Maintenance gets an alert with the temperature and vibration trend.
02:48	Fixed. 37 minutes and 61 units lost, recorded automatically against the order.
08:30	The meeting starts from causes, not from finding out what happened.

A composite story built from typical manufacturing programmes. Illustrative.

Why it is so important

66%
say integrating supply chain and manufacturing is the most significant challenge ahead
Gartner survey, 2025 ↗

30%
of factories will configure and manage control systems centrally by 2029
IDC FutureScape 2026 ↗

99%
of manufacturers are investing in operations analytics and AI in 2025 and 2026
MESA and Tech-Clarity, 2025 ↗

The business problem

Plants run on information that is hours or days old. Downtime is discovered the next morning, scrap at the end of the shift, energy use at the end of the month. By then the cost is already paid.

WHERE MANY PLANTS ARE TODAY

Stage 2 · Consolidated, but insights are late

- A data warehouse and reports exist
- Reports show past performance
- Refresh every few hours, daily or weekly

→

THE NEXT STAGE

Stage 3 · Real-time visibility

- Machine signals linked to orders and materials
- Live OEE, downtime, quality and energy
- Alerts to the right person within a minute

Sample data: what changes

Machine signals versus a business event

RAW DATA · BEFORE

TIME	TAG	VALUE	CONTEXT
02:09:58	PRS03.SPDL_TMP	71.2	None
02:10:00	PRS03.STATE	0	Code meaning unknown
02:10:00	PRS03.VIB_RMS	9.8	Unit missing
02:10:01	PRS03.CNT	18,452	No order, no material

Tags, codes and numbers without meaning, order or unit.

BUSINESS-READY · AFTER

EVENT	ASSET	REASON	ORDER AND MATERIAL	IMPACT	ACTION
02:10 unplanned stop	Line 3 · Press PRS-03	Hydraulic over-temperature (71 °C, vibration 9.8 mm/s)	1000452 · 100-245 hydraulic pump	37 min, 61 units	Maintenance alerted 02:11

One event with reason, order, material, impact and action.

Sample data, invented for illustration. Red cells are the problems; green cells are what the foundation fixes.

OEE, calculated live

86%

Availability Ran 413 of 480 planned minutes

90%

Performance Ran at 90% of ideal speed

97%

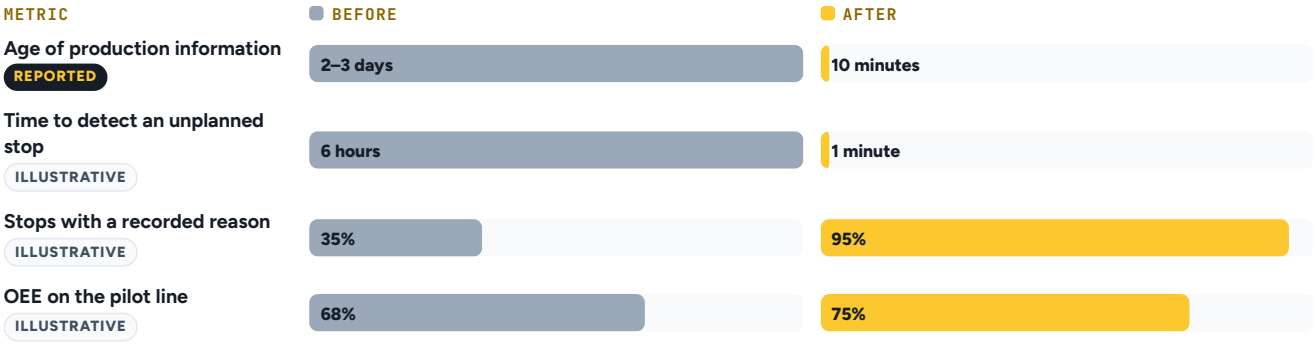
Quality 97% good units first time

75.1%

OEE 0.86 × 0.90 × 0.97

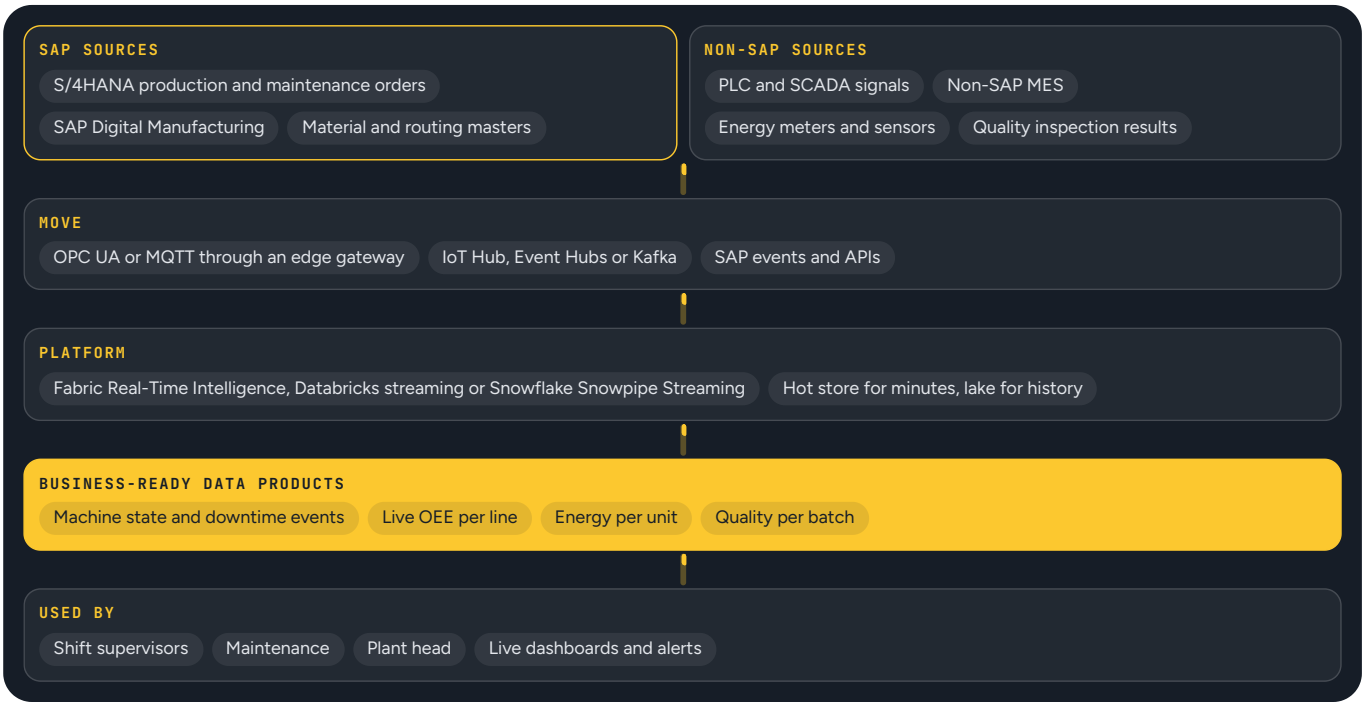
OEE for one shift on Line 3, recalculated every minute from machine and MES data. Illustrative figures.

Before and after



Reported outcome from a published example, and illustrative pilot targets. Bars are indexed.

How SAP and non-SAP data move



How data moves, SAP and non-SAP, from source to decision. The dots show the direction of flow.

SOURCE	DATA	HOW IT MOVES	LATENCY	WATCH OUT
PLC and SCADA	Temperatures, vibration, counts, states	OPC UA or MQTT, edge gateway, IoT Hub or Event Hubs	Seconds	Plant network security; never write back to control systems without approval
MES (SAP or non-SAP)	Orders in progress, output, scrap	APIs, database CDC, SAP Digital Manufacturing APIs	Under a minute	Shared order and asset keys
SAP S/4HANA	Production and maintenance orders, materials, routings	Events and APIs; BDC or CDS views for history	Minutes	Keep SAP the owner of orders
Energy meters	kWh per machine and line	MQTT or meter APIs	Minutes	Map meters to assets
Quality systems	Inspection results, defects	APIs or CDC	15 minutes	Link to batch and order

Choose the pattern your SAP licence, release and platform support; we confirm it in the assessment.

Opportunities

OPPORTUNITY

Machine monitoring and downtime

HOW IoT telemetry, MES states, reason codes

BENEFIT Less downtime, faster response

TRACK Downtime minutes, MTTR

OPPORTUNITY

Quality analytics

HOW Quality, machine and batch data, statistical control

BENEFIT Less scrap and rework

TRACK First-pass yield, scrap %

OPPORTUNITY

Energy optimisation

HOW Sensor and meter data per asset

BENEFIT Lower energy cost per unit

TRACK kWh per unit

OPPORTUNITY

Production tracking

HOW	MES and ERP orders, live
BENEFIT	Accurate promise dates
TRACK	Schedule adherence



SAPPY SAYS

Pick one line, one shift and three signals that explain most stops. A dashboard on everything first shows nothing clearly.

The team that brings it

1 Solution architect (IIoT and data) · 2 OT/IoT engineer · 1 Data engineer · 1 SAP manufacturing consultant · 1 BI developer · 1 Project manager

ROLE	SKILLS	PEOPLE × ALLOCATION	INDICATIVE RATE PER HOUR (USD)
Solution architect (IIoT and data)	OT/IT architecture, streaming, edge, plant network security	1 × 100%	$55–$75
OT/IoT engineer	PLC, SCADA, OPC UA, MQTT, IoT Hub or Event Hubs, edge gateways	2 × 100%	$40–$60
Data engineer	Pipelines, CDC, SQL and Spark, dbt; Data Factory, Snowpipe or Lakeflow	1 × 100%	$30–$45
SAP manufacturing consultant	PP, QM, PM and SAP Digital Manufacturing	1 × 50%	$45–$65
BI developer	Power BI or SAP Analytics Cloud, semantic models, KPI design	1 × 100%	$28–$40
Project manager	Agile delivery, scope, risk, steering reports	1 × 50%	$35–$50

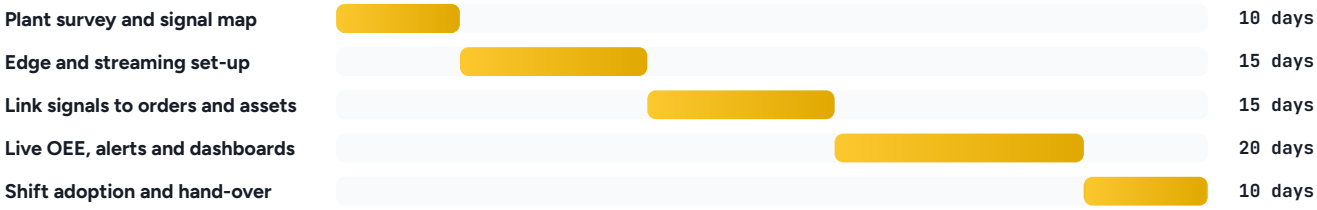
6 full-time equivalents. Indicative offshore rates for delivery from India and Vietnam, before taxes; onsite, US and Germany delivery are priced separately.

How many days, and what it costs

70
working days to a live pilot

$130k–$190k
indicative pilot budget (team × rate × 3.5 months)

$35k–$55k
per month if you continue as a pod



Indicative plan and budget for one plant or one value stream, offshore delivery, excluding software licences and cloud consumption. A fixed price follows the assessment.

Edge gateways, sensors and plant network work are quoted separately after the plant survey.

Engagement models

ASSESSMENT

Fixed price

3 weeks · 15 working days

$15k–$25k

Maturity score, target architecture, data inventory (SAP and non-SAP), business case and a 12-month roadmap.

PILOT

Fixed scope and price

12–16 weeks

From the team plan in each post

One plant or one value stream live, with a baseline and a scorecard you sign off.

POD

Time and materials, monthly

3–9 people, 30 days' notice

Team × rate × months

A cross-skilled pod that scales up or down as the roadmap moves.

MANAGED SERVICE

Monthly, SLA-based

Run and improve

$8k–$20k a month

Pipelines, data products, models and dashboards kept running and improving.

OUTCOME-LINKED

Part of the fee at risk

After a measured baseline

Agreed per KPI

A share of the fee tied to downtime hours, forecast error or inventory days.

Book the 3-week assessment **Get a fixed-price pilot proposal**

What comes next

Seeing a stop in one minute is good. Knowing it will happen nine days before is better. That is blog 3, AI and predictive intelligence.

SOURCES AND EVIDENCE

- Gartner survey (Oct 2025): 49% of organisations lack confidence in their future manufacturing strategy ↗
- IDC: Charting the AI-driven future of manufacturing (IDC FutureScape: Worldwide Manufacturing 2026 Predictions) ↗
- MESA International and Tech-Clarity: AI and analytics deliver rapid value to manufacturers (2025, 423 responses) ↗
- SAPinsider: SAP Note 3255746, ODP-RFC restrictions for non-SAP targets and the 2026 timeline ↗

Analyst figures are quoted from the linked public summaries. "Reported" outcomes are individual customer results from published industry examples in our programme brief, not guarantees. Sample data, PGC Digital targets, rates and costs are illustrative planning figures.

BLOG 3 · AI AND PREDICTIVE INTELLIGENCE · MANUFACTURING DATA, AI AND AUTOMATION ·
BY VINOD KUMAR BELI WITH SAPPY

Beyond dashboards: how AI turns manufacturing into a predictive enterprise



How machine learning improves forecasts, right-sizes inventory, predicts machine failures and recommends the next best action.

≈ 9 min	SAP + non-SAP	Gartner · IDC · Forrester
read	data, one foundation	evidence linked

MANUFACTURING DATA, AI AND AUTOMATION · THE SERIES

00 Unlock the power of manufacturing data: from data silos to an AI-powered value chain
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04 The autonomous manufacturing value chain: connecting data, AI and automation

The bearing that warned us nine days early

BEFORE

Day 0	A press bearing fails mid-shift. Six hours down, an urgent part flown in.
Day 1	Orders slip; overtime is booked to catch up.
Month end	Planners carry extra stock "just in case", because forecasts miss by 25% or more.

→

AFTER

Day -9	The model sees vibration drifting above the normal pattern and raises failure risk to 82%.
Day -8	A maintenance order is created in S/4HANA for the planned Saturday stop.
Day -1	The bearing is replaced in 40 minutes. No unplanned stop.
Month end	Forecasts with ranges let planners hold less safety stock.

A composite story built from typical manufacturing programmes. Illustrative.

Why it is so important

40%+
of manufacturers with a production scheduling system will add AI capabilities by 2026
IDC FutureScape 2026 ↗

60%
of manufacturers will use hyperscaler ecosystems to build and scale AI by 2027
IDC FutureScape 2026 ↗

100%
of manufacturers that deployed analytics and AI reported benefits; poor training data is the top obstacle
MESA and Tech-Clarity, 2025 ↗

The business problem

Dashboards tell you what happened. Planners and engineers still guess what will happen next: how much customers will order, which machine will fail, how much stock to hold. Guesses are expensive, so buffers grow.

WHERE MANY PLANTS ARE TODAY
Stage 3 · Real-time visibility, manual decisions

- Production dashboards are available
- Teams watch KPIs
- People decide what action to take

→

THE NEXT STAGE
Stage 4 · Predictive and prescriptive intelligence

- Forecasts with ranges, refreshed weekly
- Failure risk per critical asset
- Recommended actions written back to SAP for approval

Sample data: what changes

Weekly demand: spreadsheet versus model

RAW DATA · BEFORE

WEEK	ACTUAL UNITS	SPREADSHEET FORECAST	ERROR
W36	1,180	1,400	19%
W37	1,320	1,050	20%
W38	980	1,400	43%
W39	1,410	1,050	26%

A flat forecast that misses by 19–43% each week.

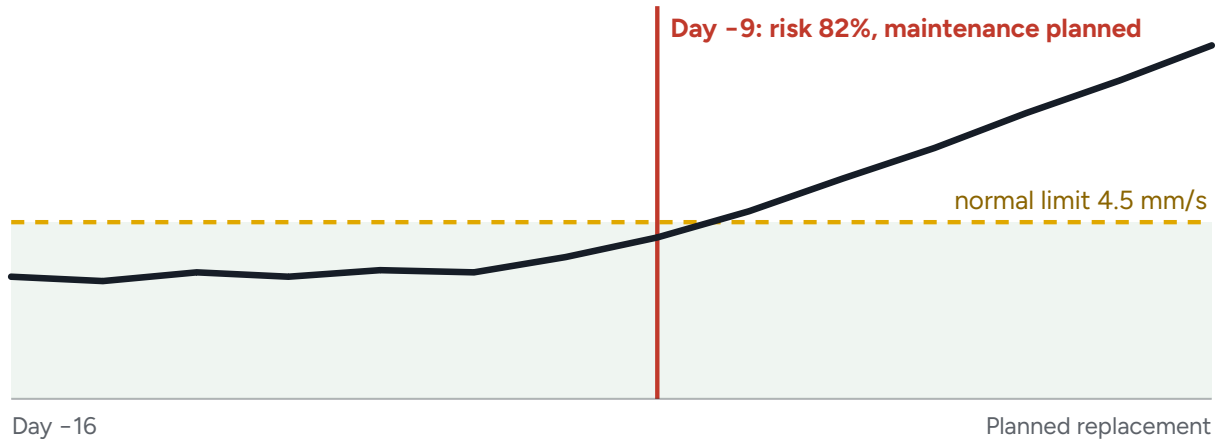
BUSINESS-READY · AFTER

WEEK	ACTUAL UNITS	AI FORECAST (RANGE)	ERROR	DRIVER THE MODEL FOUND
W36	1,180	1,210 (1,120–1,300)	3%	Dealer promotion
W37	1,320	1,290 (1,190–1,390)	2%	Season
W38	980	1,040 (950–1,130)	6%	Plant shutdown at a key customer
W39	1,410	1,360 (1,250–1,470)	4%	Backlog recovery

A forecast with a range, under 6% error on these weeks, and the driver behind each move.

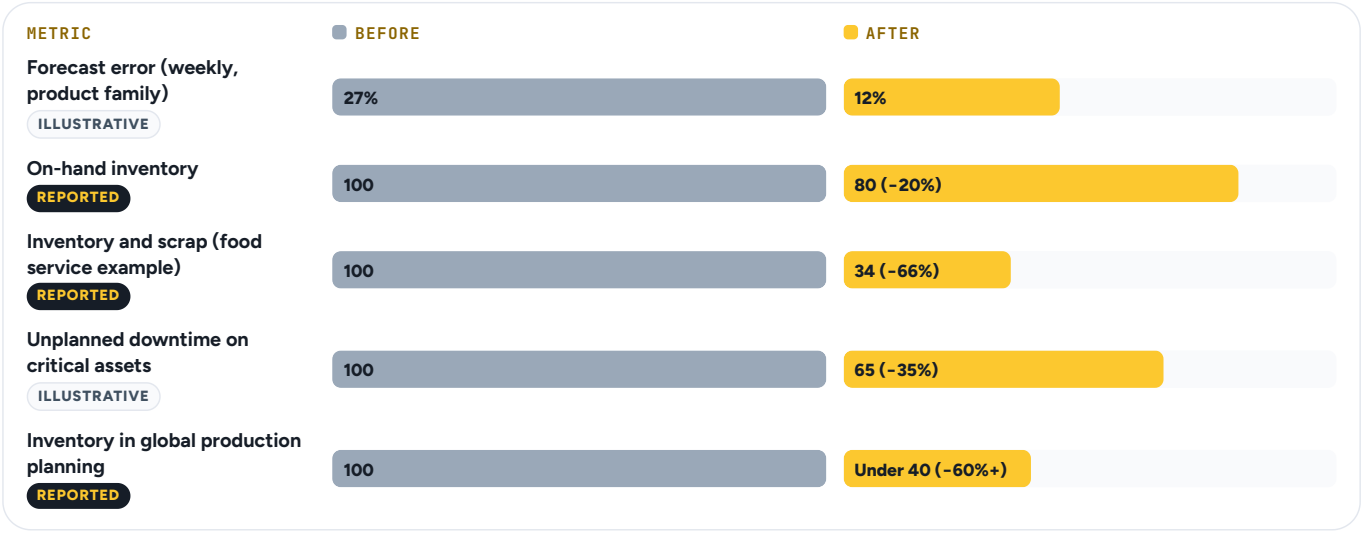
Sample data, invented for illustration. Red cells are the problems; green cells are what the foundation fixes.

The early warning, drawn



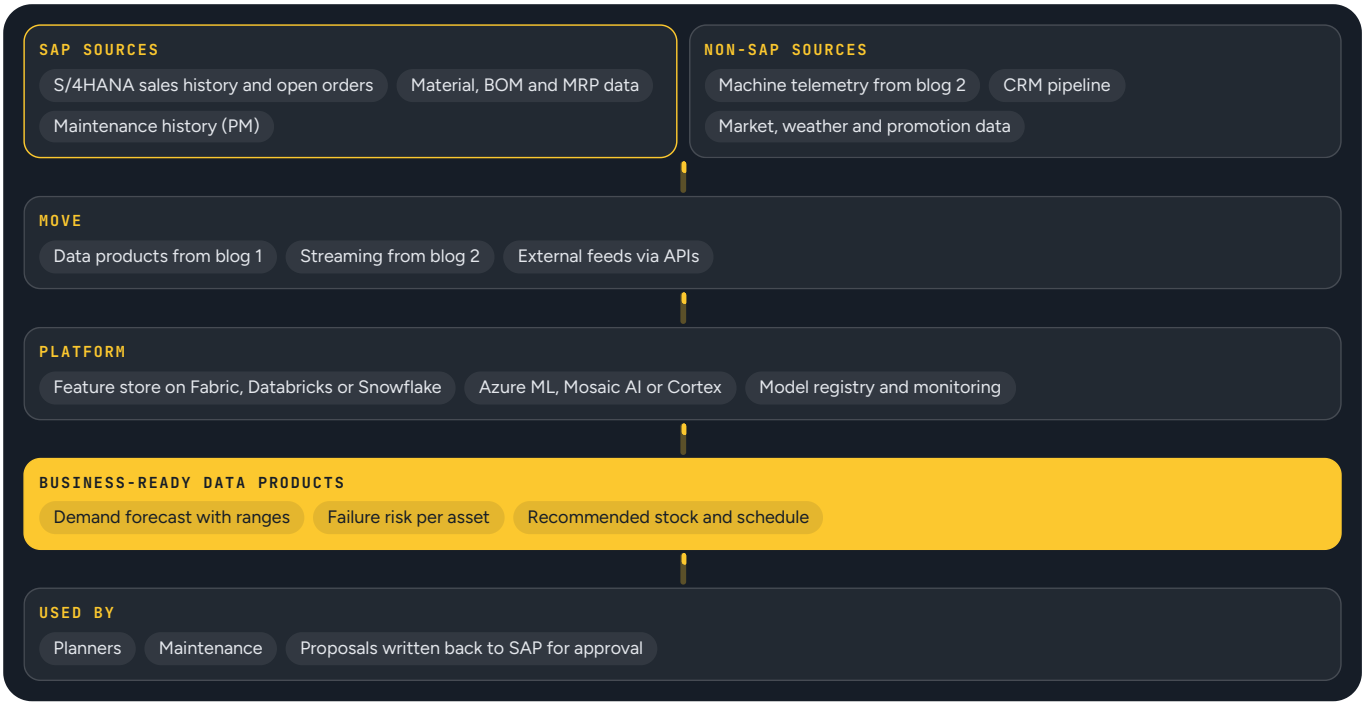
Bearing vibration on Press PRS-03. The model flags the drift nine days before the bearing would have failed. Illustrative data.

Before and after



Reported outcomes from published examples, and illustrative pilot targets. Bars are indexed so before = 100.

How SAP and non-SAP data move



How data moves, SAP and non-SAP, from source to decision. The dots show the direction of flow.

SOURCE	DATA	HOW IT MOVES	LATENCY	WATCH OUT
SAP S/4HANA (in)	Sales history, orders, materials, MRP, maintenance history	Data products from the foundation (BDC, CDS views)	Daily	Model training needs 2–3 years of clean history
Telemetry (in)	Vibration, temperature, load	Streaming from the factory layer	Seconds to minutes	Label past failures to train the model
CRM and market (in)	Pipeline, promotions, external signals	APIs and files	Daily to weekly	Licence terms for external data
SAP S/4HANA (out)	Planned orders, maintenance notifications, stock targets	Released APIs or SAP Build workflows, with approval	On demand	People approve; the model proposes

Choose the pattern your SAP licence, release and platform support; we confirm it in the assessment.

Opportunities

OPPORTUNITY

Demand forecasting

HOW Sales history, ML, ERP and CRM data

BENEFIT Better forecast accuracy and planning

TRACK Forecast error, bias

OPPORTUNITY

Predictive maintenance

HOW IoT telemetry, anomaly detection, ML

BENEFIT Less downtime and maintenance cost

TRACK Unplanned downtime, MTBF

OPPORTUNITY

Inventory optimisation

HOW ERP, warehouse data, predictive analytics

BENEFIT Lower carrying cost

TRACK Inventory days, service level

OPPORTUNITY

Production scheduling

HOW MES, ERP, optimisation algorithms

BENEFIT Higher throughput and utilisation

TRACK Schedule adherence, changeovers



SAPPY SAYS

A model nobody trusts is a dashboard with extra steps. Show the range, show the driver, and let planners overrule it, then learn from the overrule.

The team that brings it

1 Data science lead · 1 Data scientist · 1 ML engineer (MLOps) · 1 Data engineer · 1 SAP planning and maintenance consultant · 1 Change and adoption lead · 1 Project manager

ROLE	SKILLS	PEOPLE × ALLOCATION	INDICATIVE RATE PER HOUR (USD)
Data science lead	Forecasting, anomaly detection, experiment design, business framing	1 × 100%	$50–$70
Data scientist	Python, time series, ML; Azure ML, Databricks or Snowflake Cortex	1 × 100%	$38–$55
ML engineer (MLOps)	Feature store, MLflow, model monitoring, CI/CD	1 × 100%	$38–$55
Data engineer	Pipelines, CDC, SQL and Spark, dbt; Data Factory, Snowpipe or Lakeflow	1 × 100%	$30–$45
SAP planning and maintenance consultant	PP and MRP, MM, PM, IBP interfaces	1 × 50%	$45–$65
Change and adoption lead	Process change, training, KPI ownership with plant teams	1 × 50%	$35–$50
Project manager	Agile delivery, scope, risk, steering reports	1 × 50%	$35–$50

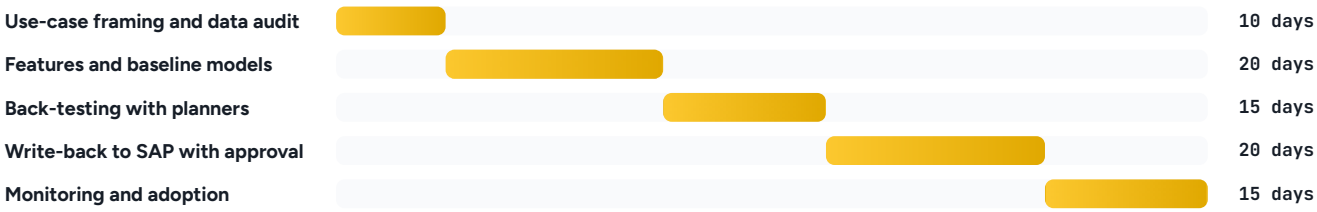
5.5 full-time equivalents. Indicative offshore rates for delivery from India and Vietnam, before taxes; onsite, US and Germany delivery are priced separately.

How many days, and what it costs

80
working days to a live pilot

$135k–$195k
indicative pilot budget (team × rate × 4 months)

$35k–$50k
per month if you continue as a pod



Indicative plan and budget for one plant or one value stream, offshore delivery, excluding software licences and cloud consumption. A fixed price follows the assessment.

Engagement models

ASSESSMENT
Fixed price
3 weeks · 15 working days
$15k–$25k
Maturity score, target architecture, data inventory (SAP and non-SAP), business case and a 12-month roadmap.

PILOT
Fixed scope and price
12–16 weeks
From the team plan in each post
One plant or one value stream live, with a baseline and a scorecard you sign off.

POD
Time and materials, monthly
3–9 people, 30 days' notice
Team × rate × months
A cross-skilled pod that scales up or down as the roadmap moves.

MANAGED SERVICE
Monthly, SLA-based
Run and improve
$8k–$20k a month
Pipelines, data products, models and dashboards kept running and improving.

OUTCOME-LINKED
Part of the fee at risk
After a measured baseline
Agreed per KPI
A share of the fee tied to downtime hours, forecast error or inventory days.

Book the 3-week assessment | **Get a fixed-price pilot proposal**

What comes next

When the model is trusted, the question becomes: why does a person still click every button? That is blog 4, the autonomous value chain.

SOURCES AND EVIDENCE

- IDC: Charting the AI-driven future of manufacturing (IDC FutureScape: Worldwide Manufacturing 2026 Predictions) ↗
- MESA International and Tech-Clarity: AI and analytics deliver rapid value to manufacturers (2025, 423 responses) ↗
- Gartner: How to improve your data quality (poor data quality costs organisations an average of $12.9M a year) ↗

Analyst figures are quoted from the linked public summaries. "Reported" outcomes are individual customer results from published industry examples in our programme brief, not guarantees. Sample data, PGC Digital targets, rates and costs are illustrative planning figures.

BLOG 4 · VALUE CHAIN OPTIMISATION · MANUFACTURING DATA, AI AND AUTOMATION · BY VINOD KUMAR BELI WITH SAPPY

The autonomous manufacturing value chain: connecting data, AI and automation



How manufacturers move from insight to automated, approved decisions across procurement, production, inventory, logistics and customer fulfilment.

≈ 9 min	SAP + non-SAP	Gartner · IDC · Forrester
read	data, one foundation	evidence linked

MANUFACTURING DATA, AI AND AUTOMATION · THE SERIES

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A supplier delay at 09:00, solved by 09:20

BEFORE

Day 1	A delay arrives by e-mail and waits in an inbox.
Day 2	The planner rebuilds the impact by hand across three systems.
Day 3	The customer finds out when the truck does not arrive.

→

AFTER

09:00	The delay arrives as an SAP event.
09:02	An AI agent finds the impact and proposes three options with cost and risk.
09:05	The planner approves one option.
09:06	SAP is updated, the customer is told, the trail is kept.

A composite story built from typical manufacturing programmes. Illustrative.

Why it is so important

50%
of cross-functional supply chain management solutions will use intelligent agents by 2030
Gartner, 2025 ↗

5%
of organisations will make at least 10% of supply chain planning decisions autonomously by 2030
Gartner, 2026 ↗

60%
of manufacturers will use AI agents to manage hybrid-cloud workloads by 2030
IDC FutureScape 2026 ↗

Read the second figure carefully: the technology is arriving faster than the trust. The winners will automate the many small, reversible decisions first, with people approving the big ones.

The business problem

AI finds the risk; people still copy numbers between systems to act on it. Every hand-off adds hours, errors and customers who learn about problems last.

WHERE MANY PLANTS ARE TODAY

Stage 4 · AI insights, manual workflows

- Forecasting and predictive models run
- AI flags risks and opportunities
- Teams execute every action by hand

→

THE NEXT STAGE

Stage 5 · AI-enabled automated workflows

- Events from SAP trigger agents
- Options with cost and risk, approved in one click
- Actions executed in SAP with an audit trail

Sample data: what changes

The same supplier delay, two ways

RAW DATA · BEFORE

TIME	WHAT HAPPENED	WHO
Day 1 · 09:00	Supplier e-mails: steel castings delayed 6 days	Buyer inbox
Day 1 · 16:30	Buyer reads it, forwards to planning	Buyer
Day 2 · 11:00	Planner checks which orders are hit, in three systems	Planner
Day 3	**Customer learns about the delay when the truck does not arrive**	Customer

Three days from signal to customer, all by e-mail.

BUSINESS-READY · AFTER

TIME	WHAT HAPPENED	WHO
09:00	Advance shipping notice changes: castings delayed 6 days	SAP event
09:01	**Impact found: 3 production orders, 2 customer orders, ₹42 lakh revenue at risk**	AI agent
09:02	Options: A wait (penalty risk), B second supplier +4% cost, C split delivery	AI agent
09:05	Planner approves B in one click	Planner
09:06	**Purchase order created in S/4HANA, schedule updated, customer ETA confirmed**	Automation
09:20	Case closed with an audit trail	System

Twenty minutes from event to resolution, one human approval, full audit trail.

Sample data, invented for illustration. Red cells are the problems; green cells are what the foundation fixes.

How far should it run on its own?

L0 · Report
People find the problem and act
Dashboards

L1 · Alert
The system flags it; people act
Alerts with context

L2 · Recommend
AI proposes options with cost and risk; people choose
Most decisions start here

L3 · Act with approval
AI acts after one approval, inside limits
Supplier delays, expedites, reorders

L4 · Act within guardrails
AI acts alone on small, reversible decisions and reports
Low-value reorders, customer ETA updates

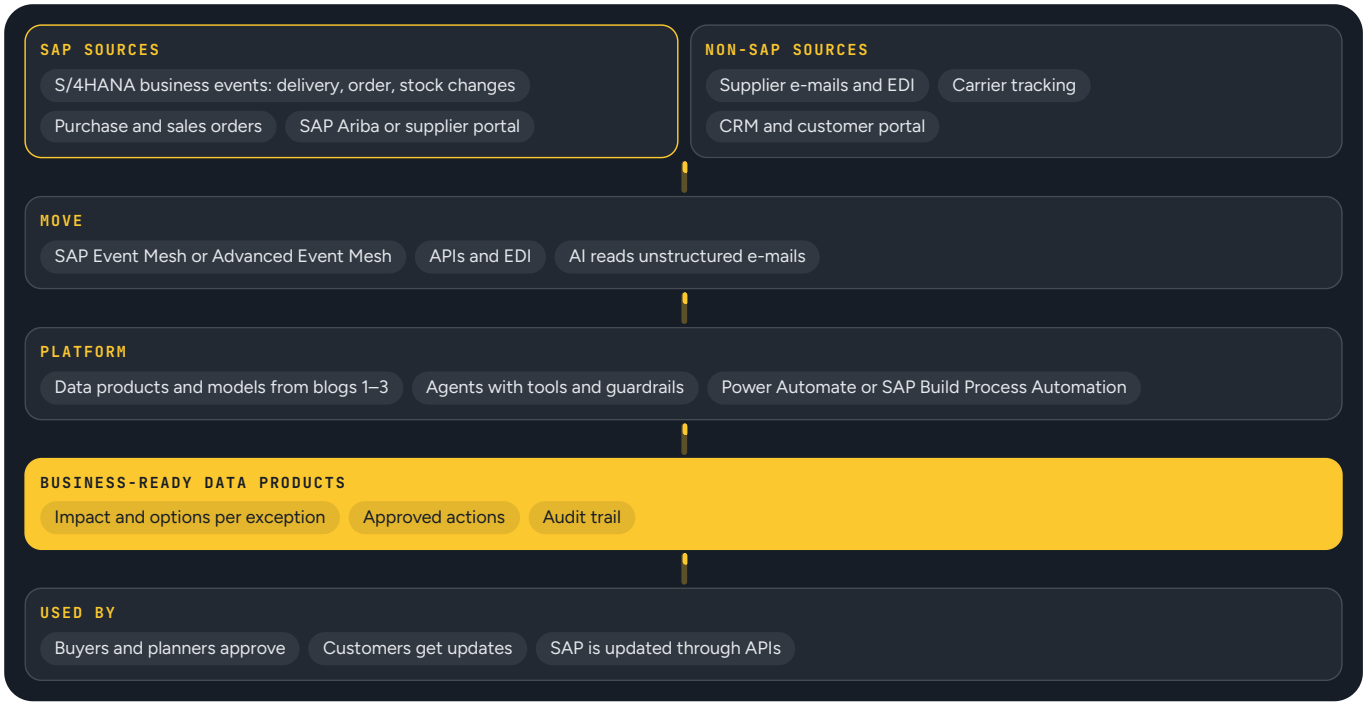
Autonomy levels. Each decision type climbs one level at a time, only after the previous level has proven itself in the data.

Before and after

METRIC	BEFORE	AFTER
Service order closure (REPORTED)	7 days	2 days (-70%)
Supplier delay to customer update (ILLUSTRATIVE)	3 days	20 minutes
Manual hand-offs per exception (ILLUSTRATIVE)	9	1 approval
Orders fulfilled without touch (ILLUSTRATIVE)	20%	65%

Reported outcome from a published example, and illustrative pilot targets.

How SAP and non-SAP data move



How data moves, SAP and non-SAP, from source to decision. The dots show the direction of flow.

SOURCE	DATA	HOW IT MOVES	LATENCY	WATCH OUT
SAP S/4HANA (events in)	Delivery, order, stock and production changes	Business events through SAP Event Mesh or Advanced Event Mesh	Seconds	Subscribe to the events you act on, not all of them
Suppliers and carriers (in)	E-mails, EDI, tracking	EDI, APIs, AI extraction from e-mails	Minutes	Confirm extracted values above a threshold
Agents (decide)	Impact, options, cost and risk	Agents on your data platform with tools	Seconds	Guardrails, limits and evaluation logs
SAP S/4HANA (actions out)	Purchase orders, schedules, confirmations	Released APIs or SAP Build workflows	Seconds	Human approval above agreed limits; full audit trail

Choose the pattern your SAP licence, release and platform support; we confirm it in the assessment.

Opportunities

OPPORTUNITY

Supplier risk management

HOW	Supplier, procurement and logistics data with agents
BENEFIT	Resilience and early warning
TRACK	Supplier OTIF, exceptions resolved

OPPORTUNITY

Automated order fulfilment

HOW	ERP, CRM and workflow automation
BENEFIT	Faster order processing
TRACK	Touchless order rate, cycle time

OPPORTUNITY

Procurement automation

HOW	Agents propose POs and expedites, people approve
BENEFIT	Less buyer effort, fewer stock-outs
TRACK	PO cycle time

OPPORTUNITY

Logistics exceptions

HOW	Carrier events, ETA models, automated customer updates
BENEFIT	Customers told first
TRACK	On-time delivery, proactive notices



SAPPY SAYS

Automate the decision you make fifty times a day and can reverse in a minute. Keep people on the ones you make twice a year.

The team that brings it

1 Solution architect (AI and automation)
2 AI agent engineer
1 Automation developer
1 SAP order and procurement consultant
1 Change and adoption lead
1 Project manager

ROLE	SKILLS	PEOPLE × ALLOCATION	INDICATIVE RATE PER HOUR (USD)
Solution architect (AI and automation)	Agent design, event-driven integration, approvals and guardrails	1 × 100%	$55–$75
AI agent engineer	LLM agents, tool calling, retrieval, guardrails, evaluation	2 × 100%	$45–$65
Automation developer	Power Automate, SAP Build Process Automation, APIs, approval flows	1 × 100%	$28–$40
SAP order and procurement consultant	SD, MM, business events and APIs for orders and purchasing	1 × 50%	$45–$65
Change and adoption lead	Process change, training, KPI ownership with plant teams	1 × 50%	$35–$50
Project manager	Agile delivery, scope, risk, steering reports	1 × 50%	$35–$50

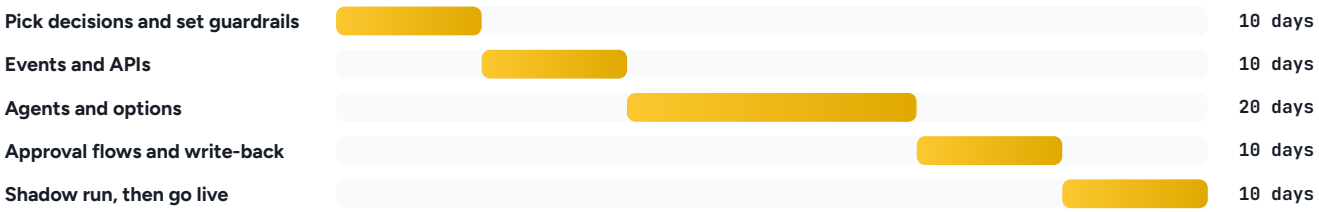
5.5 full-time equivalents. Indicative offshore rates for delivery from India and Vietnam, before taxes; onsite, US and Germany delivery are priced separately.

How many days, and what it costs

60
working days to a live pilot

$110k–$155k
indicative pilot budget (team × rate × 3 months)

$35k–$50k
per month if you continue as a pod



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The whole journey

01
Data consolidation

One trusted foundation for SAP and non-SAP data
Read blog 1 →

02
Real-time visibility

Machines, MES and ERP visible as it happens
Read blog 2 →

03
Intelligent, predictive factory

AI forecasts, predicts failures and recommends
Read blog 3 →

04
AI-powered value chain

Approved decisions executed automatically
Read blog 4 →

The journey: each stage builds on the last. Most manufacturers sit between stages 1 and 2 today.

SOURCES AND EVIDENCE

- Gartner (May 2025): half of supply chain management solutions will include agentic AI by 2030 ↗
- Gartner (Sep 2026): only 5% of organisations will make at least 10% of supply chain planning decisions autonomously by 2030 ↗
- IDC: Charting the AI-driven future of manufacturing (IDC FutureScape: Worldwide Manufacturing 2026 Predictions) ↗
- MESA International and Tech-Clarity: AI and analytics deliver rapid value to manufacturers (2025, 423 responses) ↗

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Ready to unlock your manufacturing data?

Start with a 3-week assessment: maturity, SAP and non-SAP data inventory, architecture, business case and roadmap.



Vinod Kumar Beli · Chairman and Managing Director, PGC Digital

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OUR PROMISE · SAP

DATA FIRST. AI-POWERED. SAP AT THE CORE.

Talk to us

PGC DIGITAL

Enterprise Intelligence. Delivered.

SAP. DATA. AI. TALENT.

Since 2016, headquartered in Bengaluru, PGC Digital connects SAP, supply chain, finance and customer data into a governed enterprise foundation — turning it into trusted decisions, production-ready AI agents and business outcomes, powered by the talent to deliver and operate at scale.

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Hiring and payroll guides for the 8 countries listed above



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