Capability Maturity Model (CMM) Explainer

***Why maturity matters**: higher maturity means predictable flow, stable quality, less variation and lower total cost-to-serve.*

***Spotlight**: We use CMM as a lens, not a product, to choose right-sized interventions and to ensure gains stick.*

Levels at a glance

***Level 1: Initial** => Unpredictable firefighting; ad hoc, heroics, variable outcomes; little process ownership.*
***Level 2: Managed** => Locally managed and stabilised; basic discipline, repeatable pockets, informal standards; early metrics.*
***Level 3: Defined** => Defined, flowing, proactive; documented processes across functions; training and consistent application.*
***Level 4: Quantitatively Controlled** => Data-driven control, SPC, capability & quality improvements; proactive variation reduction.*
***Level 5: Optimising** => Agile, innovative; continuous improvement culture; rapid PDCA and innovation tied to strategy.*

How Lean and Six Sigma help you climb the CMM ladder

- *Lean stabilises flow: waste removal, pull systems, Standard Work, visual management, TPM, SMED - typically essential from Level 2 upward.*
- *Six Sigma reduces variation: MSA, SPC, capability, hypothesis tests, Regression/ANOVA, DoE – typically introduced from Level 3 and essential by Level 4.*

Engagement ladder

- *Rapid Process Diagnostic (RPD) - (1 week on-site + 1 week analysis) to baseline maturity and prioritise improvements.*
- *DMAIC Transformation Sprint (8 - 12 weeks) to deliver measurable deltas with the right mix of Lean and Six Sigma.*
- *Lean Governance - (quarterly) to sustain with SPC, control plans, and leadership cadence.*

Outcome signals

- *Lead time reduced; queues shortened; quality improved;*
- *FPY improved; waste (scrap/rework) down;*
- *Schedule adherence up; fewer escalations;*
- *Teams confident with clear standards and measures;*

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DELIVERING CAPABILITY

CORE ELEMENTS OF EACH MATURITY LEVEL	MATURITY LEVEL 1	MATURITY LEVEL 2	MATURITY LEVEL 3	MATURITY LEVEL 4	MATURITY LEVEL 5
	AD-HOC FIREFIGHTING, UNPREDICATBLE, REACTIVE	MANAGED AT CELL OR PROJECT LEVEL	EARLY HIGH-LEVEL DEFINITIONS OF END-TO-END PROCESSES, IS PROACTIVE	DETAIL DEFINITIONS OF PROCESSES WITH QUANTITATIVE MANAGEMENT AND CONTROL	FOCUS ON OPTIMISATION, AGILITY AND INNOVATION
MINDSET	Unpredictable and reactive. Success relies on heroes.	"We can stabilise this line/team."	"Flow first, then optimise." Prevent rather than react.	"Manage by signal, not by noise."	Continuous experimentation with flow, speed, quality and discipline.
PROCESS DEFINITION	Tribal knowledge, little or no SOPs or 5S. Workarounds normal.	Key flows mapped at work-cell level. Basic SOPs. Start of standard work.	End-to-end VSM with takt, WIP limits, pacemaker. Standard work documented with revision control.	Standard work is the default; deviations trigger problem-solving. Visual flow and constraint management across functions.	Modular, reconfigurable lines/cells; design for flow is standard in NPI.
DATA & MEASUREMENT	Lag KPIs only. No MSA. Defects tallied inconsistently.	Basic CTQ list, start right-first-time tracking. Define unit, defect, opportunity.	SPC on primary CTQs; capability known (Cp/Cpk) for major processes; golden data sources agreed; routine MSA.	Predictive SPC with rules; automated data capture; capability routinely > 1.33 on key CTQs; COQ tracked and quarter-on-quarter reduced.	Digital twin or simulation for scenario testing; AI-assisted anomaly detection; CTQs cascade from customer value models.
IMPROVEMENT CADENCE	None. Problems solved with quick fixes, not DMAIC or PDCA.	Kaizen events, PDCA on top 3 chronic issues. Isolated DMAICs.	Portfolio of DMAIC projects aligned to value-stream bottlenecks; leader standard work; weekly performance reviews.	DMAIC and DFSS as needed; sustained kaizen with daily problem-solving; A3 thinking embedded.	Hoshin (strategy deployment) aligns annual breakthroughs to weekly PDCA; DFSS used early to prevent waste.
TYPICAL TOOLS USED	Whiteboard, spreadsheets. Occasional Pareto with suspect data.	SIPOC, VSM at cell, Pareto, 5 Whys, spaghetti maps, 5S audits.	Heijunka boards (production levelling), Kanban design, DOE screening, FMEA integrated with control plans.	Full SPC suite, regression/DOE optimisation, PFMEA living documents, control-plan audits, mistake-proofing (poka-yoke) rollouts.	Advanced DOE/optimisation, real-time SPC with automated alarms, queuing models, Monte Carlo risk, cost-to-serve analytics.
ROLES & GOVERNANCE	No owners. Priorities change daily. Escalations by volume.	Process owners named; daily tiered meetings; visible SQDC boards.	Value-stream manager; black belt support; tier 1-2-3 meetings linking floor to execs.	Clear RACI from operator to exec; BB/MBB coaching system; benefits realisation tracked to P&L.	Everyone a problem-solver; skill matrices maintained; performance-based funding of experiments.
PERFORMANCE CLUES	OEE < 50 %, FPY < 85 %, long queues, expedite culture.	OEE 50-65 %, FPY 85-92 %, rework known but tolerated.	OEE 65-80 %, FPY 92-97 %, stable lead times with predictable variance.	OEE 80-90 %, FPY 97-99.5 %, narrow lead-time bands, stable schedule adherence.	OEE 90 %+ where physics allows, FPY ≥ 99.7 % on critical CTQs, rapid changeover and demand agility.