SI PROTECH

KNOWLEDGE PORTAL

Quality Control Systems

Our approach to quality

How we use Total Quality Management, Lean and Six Sigma to deliver consistent, high-quality results.

01 SIX SIGMA & DMAIC

02 ROOT CAUSE ANALYSIS

03 STATISTICAL PROCESS CONTROL

04 QUALITY METRICS & KPIS

05 FMEA

OUR APPROACH TO QUALITY

Our quality philosophy

We believe that quality is not just about meeting standards; it's about exceeding customer expectations and fostering a culture of continuous improvement.

Our quality philosophy is rooted in **Total Quality Management (TQM)**, where every employee is committed to ensuring the highest quality in every aspect of our work.

Commitment to Continuous Improvement

We are dedicated to consistently improving our processes, products, and services. By embracing data-driven decision-making and utilising industry-leading methodologies like **Six Sigma** and **Lean**, we strive for excellence at every stage of our operations. Our culture encourages innovation, learning, and the relentless pursuit of improvement.

STANDARDS

Quality standards and certifications

We take great pride in maintaining the highest industry standards and our certifications assure our customers that we meet or exceed regulatory and quality requirements at every level of our operations.

ISO 9001
Quality management

ISO 14001
Environmental management

ISO 22000
Food safety management

ISO Certifications

As part of our commitment to quality management, we are ISO 9001, ISO 14001 and ISO 22000 certified, ensuring we consistently meet customer and regulatory requirements.

Lean and Six Sigma

Our company embraces Lean and Six Sigma methodologies to drive process improvement, reduce waste, and increase efficiency.

QUALITY TOOLS AND TECHNIQUES

The methods that guide our results

At SI Protech we use a variety of tools and techniques to maintain the highest level of quality in our processes. These are just a few of the methodologies that guide us in delivering superior results.

1 SIX SIGMA

Six Sigma is a data-driven methodology used to reduce defects and improve process efficiency. Through the **DMAIC** framework—Define, Measure, Analyse, Improve, and Control—we analyse our processes, identify opportunities for improvement, and ensure that solutions are sustained.

LEAN SIX SIGMA: DMAIC

D	M	A	I	C
Define	**Measure**	**Analyse**	**Improve**	**Control**
Define the problem	Quantify the problem	Identify the cause of the problem	Implement and verify the solution	Maintain the solution

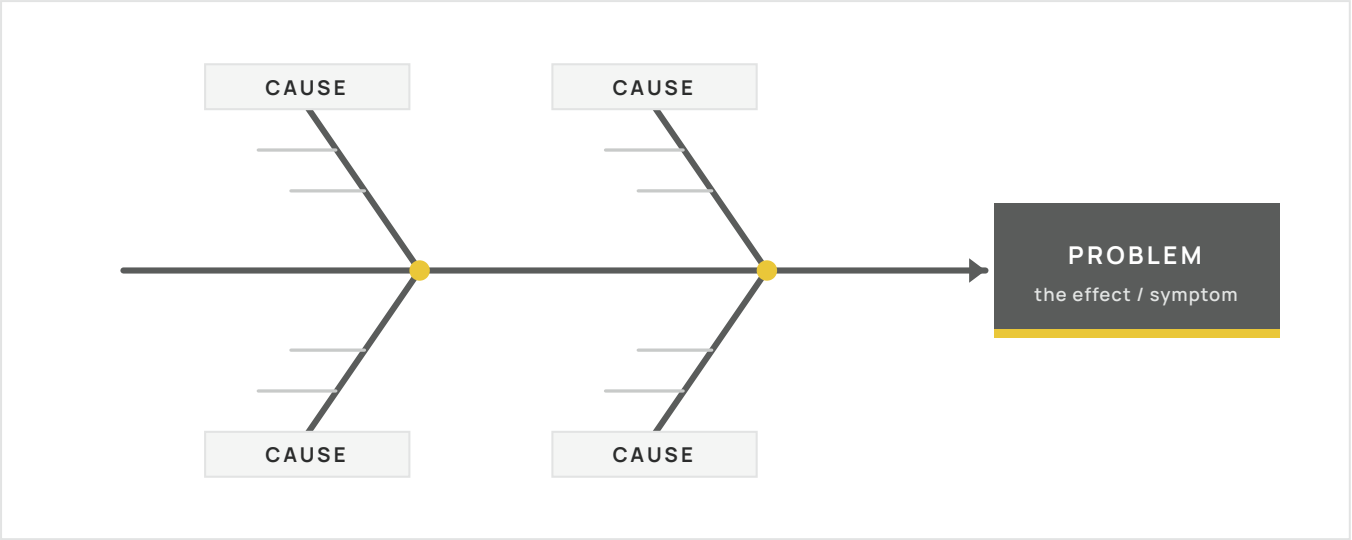
Key benefits of Six Sigma

- **Improved Efficiency:** Reduces waste and optimises resources.
- **Cost Savings:** Cuts scrap, rework, and operational costs.
- **Increased Profitability:** Enhances revenue and reduces costs.
- **Competitive Advantage:** Differentiates the company with high quality.
- **Sustainable Growth:** Enables scalable and adaptable processes.
- **Higher Quality:** Achieves near-zero defects, boosting customer satisfaction.
- **Data-Driven Decisions:** Makes informed decisions based on data.
- **Employee Engagement:** Develops skills and fosters ownership.
- **Regulatory Compliance:** Ensures adherence to industry standards.
- **Customer Retention:** Delivers consistent quality, building trust.

2 ROOT CAUSE ANALYSIS

Root cause analysis (RCA)

To address the core causes of quality issues, we utilise Root Cause Analysis (RCA) techniques, including tools like the **Fishbone Diagram (Ishikawa)** and **5 Whys**. These methods help us dig deeper into problems, ensuring that we don't just treat the symptoms, but address the underlying issues.



FISHBONE (ISHIKAWA) DIAGRAM

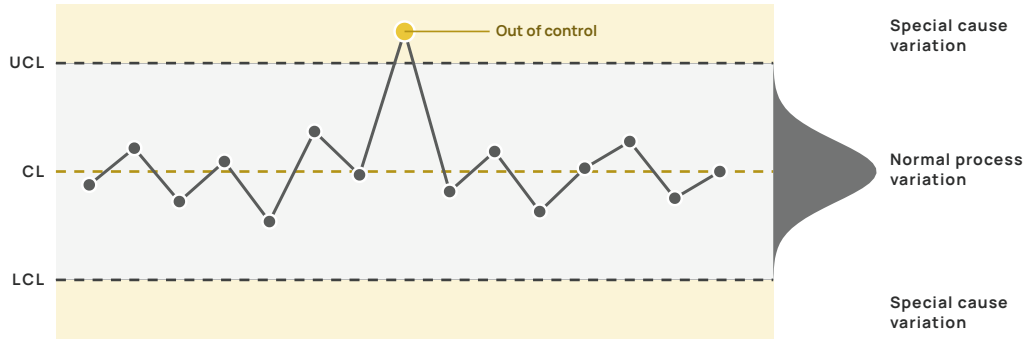
SOLVING PROBLEMS WITH 5 WHYS

01	02	03	04	05
Why did the problem occur?	Why did problem 1 occur?	Why did problem 2 occur?	Why did problem 3 occur?	Why did problem 4 occur? Root cause found: identify a countermeasure

3 STATISTICAL PROCESS CONTROL

Statistical process control (SPC)

We leverage Statistical Process Control (SPC) techniques to monitor and control process variation over time. Through the use of **Control Charts**, we track key performance indicators (KPIs) to ensure that our processes remain stable and capable of delivering consistent, high-quality results.



CONTROL CHART

4 MEASURING QUALITY

Quality metrics and key performance indicators

Measuring quality is crucial for ensuring that we continue to meet and exceed our goals. Below are some of the key metrics we use to track our performance:

Defect Rate

The percentage of products or services that fail to meet quality standards.

Cycle Time

The time it takes to complete a specific process from start to finish.

Customer Satisfaction (CSAT)

A key measure of how well we meet customer expectations.

On-Time Delivery

A measure of how well we meet our promised delivery schedules.

Process Capability (Cp, Cpk)

Measures the ability of a process to produce products within specification limits.

These metrics allow us to continuously monitor, evaluate, and improve our processes, ensuring we consistently meet customer needs.

5 FMEA

Failure mode and effect analysis (FMEA)

Failure Mode and Effect Analysis (FMEA) is a systematic, proactive methodology used to identify potential failure modes in a product, process, or system, assess their effects, and prioritise them based on their severity, likelihood, and ability to detect them. The ultimate goal is to improve the design or process by addressing potential issues before they occur, ensuring higher quality, reliability, and safety.

Example of FMEA in action

Let's look at an example of FMEA applied to a manufacturing process of a motor assembly line.

FAILURE MODE	EFFECT	CAUSE	SEVERITY (S)	OCCURRENCE (O)	DETECTION (D)	RPN
Motor overheating	Causes product failure, safety risk	Poor ventilation in the motor unit	9	6	4	**216**
Incorrect part assembly	Leads to defective motors, rework required	Lack of training for assembly staff	8	7	5	**280**
Wire insulation failure	Can cause short circuits, product recall	Poor material quality	10	4	3	**120**

RPN (Risk Priority Number) = Severity × Occurrence × Detection

Highest priority: incorrect part assembly
In this example, the incorrect part assembly has the highest RPN (280), meaning it's the highest priority to address.

High severity, lower urgency: motor overheating
Motor overheating has a severity of 9, but its RPN (216) is less urgent than the assembly issue, despite the high severity because the likelihood of occurrence (6) and detection (4) are relatively manageable.

SI PROTECH

QUALITY CONTROL

Reputation is Key

Quality is built into every stage of our work, from design and tooling through to production and assembly. Talk to us about your next project.

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