Digital Transformation for Superior Quality

Quality Improvement Framework for Industry Leaders

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Introduction

Introduction

Improving quality levels is the reported top challenge for today's industrial manufacturers.[1] Quality management and continuous optimization are at the heart of this, both of which are increasingly powered by digital transformation.

Five industrial marketplace drivers reprioritizing a quality-focused transformation approach

Customer Satisfaction
Enhance customer experience & exceed expectations

Process Robustness
Limit process variances for consistent quality

Regulatory Compliance
Adhere to quality standards with evolving requirements

Technology Advancements
Resolve complex quality issues with Industry 4.0 technology

Cost Optimization
Reduce cost of quality to optimize manufacturing costs

Establish operational agility and resilience

This eGuide offers a quality-focused approach to digital transformation–think big, start small, scale fast, and unlock enterprise-wide value. From top leadership to shop floor management, it helps realize opportunities to optimize costs and provide actionable insights for a quality transformation journey.*

- **15-25%** increase in customer satisfaction levels
- **5-20%** increase in productivity and efficiency
- **15-30%** decrease in the cost of poor quality
- **20-30%** decrease in process risk mitigation
- **20-30%** decrease in parts-per-million defects

1. Industrial and Manufacturing Survey 1H2024, ABi research

*Based on Schneider Electric's Industrial Digital Transformation Program

The Hidden Factory

The Hidden Costs of Poor Quality

For a typical manufacturer, addressing these hidden costs can unlock millions in value—becoming a significant competitive advantage.

*e.g., a line designed to produce 800 parts/hour, operating at 650 parts/hour.

The "hidden factory" concept

A feasibility study of your manufacturing process can expose the "hidden factory" concept—unknowingly diverting resources to manage defects rather than creating value, like:

- Identifying and sorting defective products
- Conducting root cause investigations
- Performing rework operations
- Managing customer complaints
- Expediting shipments to compensate for delays

Implementing robust quality and traceability systems makes waste visible, uncovers root causes, and turns lost productivity into value-adding activities.

>30%

of production time can be lost due to hidden factory activities

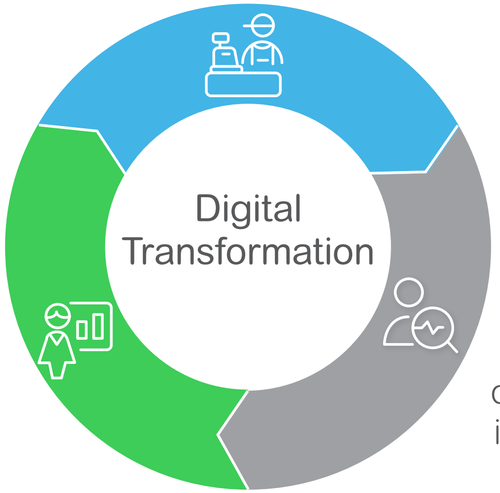
—Six Sigma

Digital Transformation for Superior Quality

Digital Transformation for Superior Quality

When we talk about digital quality transformation, we're talking about empowering your teams with data to add value along the entire value chain.

Shop floor operators
Identify potential issues before they become defects



Executives
Gain visibility to strategize operational improvements

Quality managers/ engineers
Access real-time data for actionable insights and faster decision making

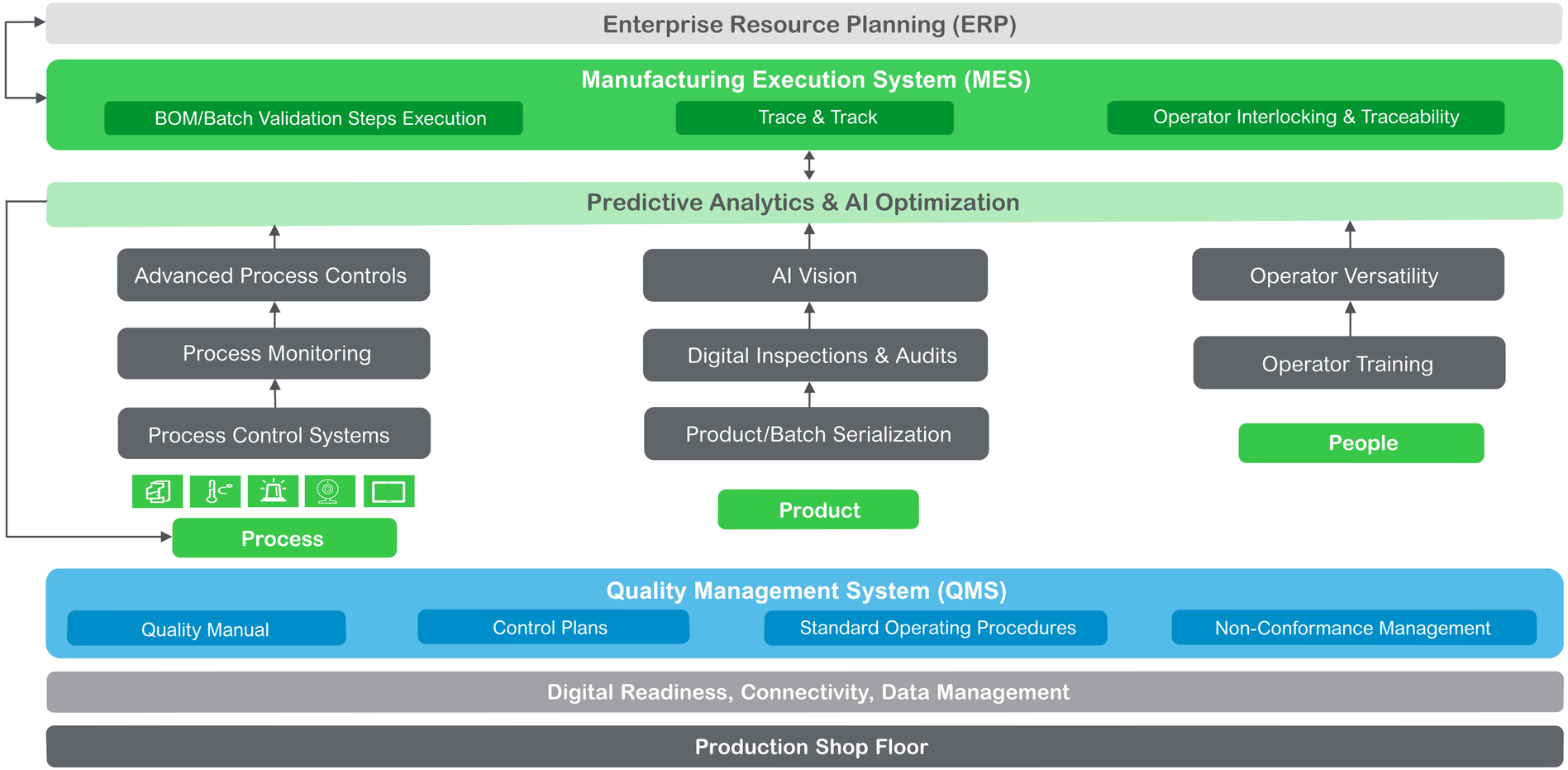
Embedded Quality Transformation

Effective quality transformation requires a cohesive technical architecture integrating people, processes, and technology:

Predictive Quality
Harnessing AI-powered prediction models and multi-variable optimization to optimize processes proactively based on patterns and trends before deviations occur.

Preventive Quality
Deploying real-time monitoring and statistical controls that anticipate potential issues before they impact products.

Reactive Quality
Implementing digital documentation and enhancing detection systems to identify and address defects after they occur.



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A Typical Digital Transformation Journey

Schneider Electric's Industrial Digital Transformation consulting and deployment team walks you through a proven methodology to strategize and implement your transformation plan. Quality management is an integrated part of the process.

Core Framework for Industrial Digital Transformation Approach

Inspiration

- Define business ambition level
- Define target vision—factory of the future

Assessment

- Baseline status-quo
- Identify gaps in OpEx and Digitization

Roadmap

- Define initiatives to close gaps
- Build business cases and prioritize initiatives

Piloting

- Design pilot solutions for prioritized initiatives
- Agile cycle of testing and adjusting

Scaling

- Design global governance model
- Roll out and track global scaling progress

Accelerate your Quality Transformation: From Vision to Value

Think big. Act small. Scale fast.

You need to know where you are today to determine where to go tomorrow.

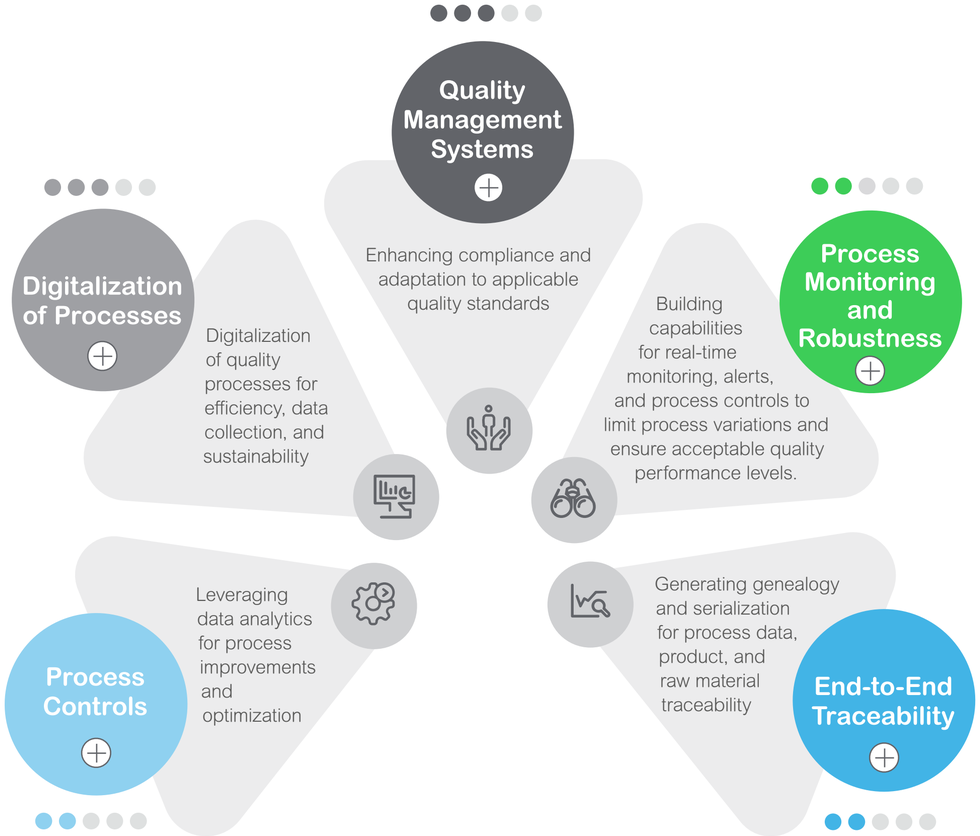
Your quality transformation journey balances an ambitious vision with practical implementation across five phases:

Define	Discover	Design	Deliver	Sustain
• Understand the quality problems and challenges	• Review of current quality performance, defects paretto, and metrics	• Assess maturity rating of quality capability leveraging quality scorecard	• Define digital core model, templates, and execution framework	• Execute pilot solutions for prioritized initiatives
• Business alignment for quality improvements	• Validation of quality controls and projected risk reductions	• Prioritization and ROI calculation	• Governance and change management plan	• Standardization of processes for scalability

Maturity Assessment Criteria

During the Design phase, our maturity assessment evaluates your current quality capabilities across five key domains

Click on each ⊕ to learn more.



Assessment Deliverable Examples

- A visual representation of current capabilities, see **Figure 1**
- Use cases detailing problem statement, solution, and benefit, see **Figure 2**

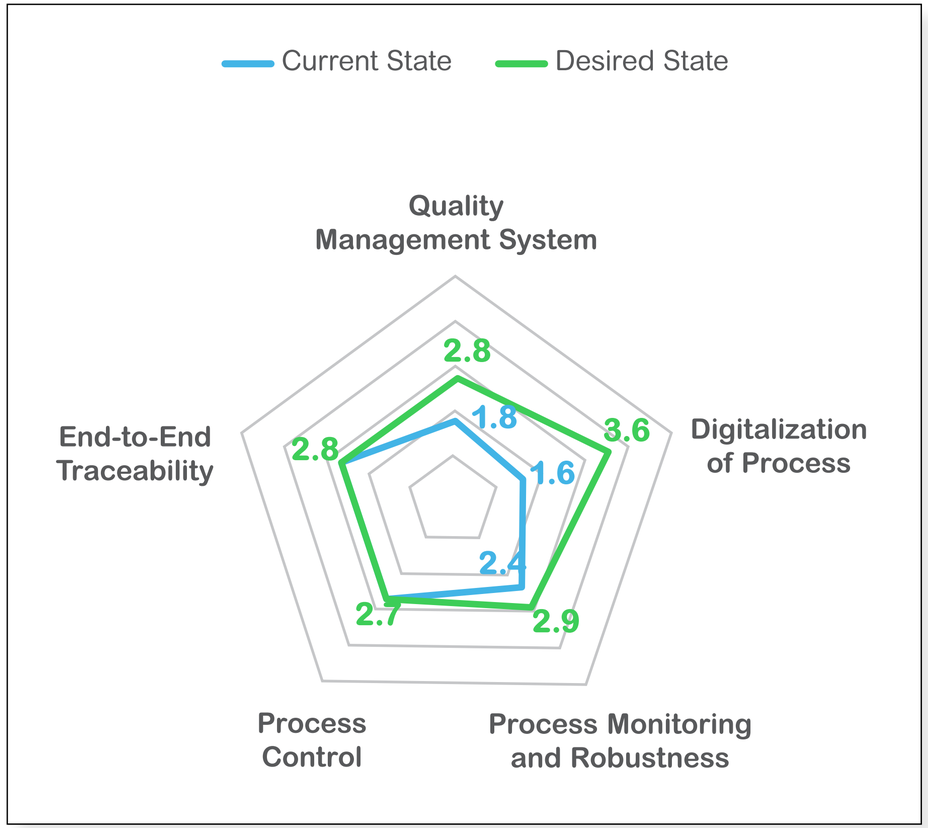


Figure 1: Quality digital maturity scoring: current vs. desired state

UC-08	Quality Management Digitization
Process Desc	**Quality Management Area** Regular quality check on the production line is documented on paper. If there are deviations, a remark to archive the deviation is raised in ERP quality module. A physical sample of each good part is stored from beginning of each order to beginning of the next order.
Problem Statement	There currently is no standard process like a PFMEA, or a root cause analysis based on six sigma. The quality reporting is done manually and put in ERP only for purpose of documentation. **No reporting, No awareness, No tendencies, No continuous improvement, No lessons learned, No known compliance status of quality plan** at any time.
Digital project	**Digital Quality Management System solution: MES Quality Module** This solution would enable: • Enable automatic digital quality data input into digital action plan and **continuous improvement**. • Eliminate paper format and **reduce reporting time** for quality auditors. • **Awareness** of production and quality difficulties coming from previous shifts. • **Awareness/Alert** when production order is relaunched which requires new quality operations. • **Awareness/Alert** if auditor is not called for PO launch after change over in Assembly area. • Enable **quality analytics** and Statistical Process Control.
Benefits	Based on fiscal year 2022/23, the average quality cost was $X million. Considering the MES deployment to enable process interlocking and controls, traceability, defect tracking, and yield optimization, we estimate to reduce scrap, rework, and productivity loss by $X milllion in year 1. Furthermore, any customer issue escalations and warranty recalls will provide a reduction of $X million.

TECHNOLOGY LEVERS

Mobile devices · Cloud · Digital dashboard · BI/Analytics

FINANCIALS

Upfront costs	$_____
Recurring costs (year)	$_____
Recurring benefits (year)	$_____
Estimated ROI	___ yrs.

Figure 2

4 Key Performance Indicators

Establishing baseline measurements before transformation initiatives enables the accurate tracking of improvements and validates ROI.

Comprehensive KPIs across multiple dimensions ensure balanced progress:

Quality Performance

- Defect rates (PPM)
- First pass yield / Right first time
- Cost of poor quality (as % of revenue)
- Supplier quality metrics

Customer Impact

- Net satisfaction score
- Quality-related complaints
- On-time order delivery
- Recall incidents

Operational Metrics

- Production efficiency
- Process capability
- Overall equipment effectiveness
- Material utilization

Financial Outcomes

- Quality cost savings
- Return on quality investments
- Revenue protected/enhanced
- Compliance cost reduction

To help ensure effectiveness and fuel continuous improvement, it's essential to monitor and analyze key performance indicators.

Industry Use Cases

Quality Improvement Across Industry Segments*

Materials, Mining & Metals (MMM)

Challenge: Critical surface defect detection in high-speed steel production

Solution: Multi-camera AI vision system capturing 360° images at production speeds

Results: 95% detection accuracy, elimination of manual inspections, and 20% reduction in quality-related downtime

Consumer Packaged Goods (CPG)

Challenge: Inconsistent packaging seal integrity leads to product waste

Solution: Deep learning-based seal inspection system integrated with production line

Results: 30% reduction in leakage defects, elimination of destructive testing, and enhanced food safety compliance

Life Sciences

Challenge: High-precision component measurement with regulatory documentation

Solution: Automated optical measurement system with integrated compliance reporting

Results: 10x increase in measurement accuracy, complete measurement traceability, and 40% reduction in quality control labor

*Based on Schneider Electric customer projects

Automotive Manufacturing

Challenge: Component-level traceability across complex assemblies

Solution: Integrated traceability system linking components to finished products

Results: 90% reduction in the scope of quality investigations, precise recall targeting, and regulatory compliance

Food & Beverage

Challenge: Farm-to-fork traceability for food safety and authenticity

Solution: Traceability platform with supplier integration

Results: Verification of product origins, 70% faster contamination investigations, and enhanced consumer transparency

Energies & Chemicals

Challenge: Batch genealogy across multi-stage production processes

Solution: Digital batch record system with process parameter tracking

Results: Complete material and process genealogy, automated regulatory reporting, and rapid quality deviation analysis

These examples, based on Schneider Electric customer projects, demonstrate how traceability evolves from a compliance necessity to a strategic advantage, enabling precise quality management and fostering customer trust.

Why Schneider Electric

Why Schneider Electric?

Technology alone cannot drive sustainable change.

Successful quality transformation requires technical excellence and organizational adoption, encompassing leadership alignment, cross-functional teams, and an effective adoption approach.

This is where Schneider Electric's expertise in Industrial Digital Transformation can help you.

- **Digitally transformed** 100+ Schneider Electric sites and hundreds of customer factories.
- **Thought-leadership** in creating business impact with digital and sustainability.
- **Deploying EcoStruxure, ProLeiT, and AVEVA** platforms to create a seamless IT/OT digital portfolio from sensors to cloud and design to operations.
- **Lessons learned** in cybersecurity, Lean, OT, IIoT, energy efficiency, and digitization of business operations programs.

Schneider Electric's Proven Quality Record

150+
Optimized Processes

400+
Production lines with MES

100+
Smart Quality Sites

500+
AI Vision Systems

Typical deployment benefits

23%
Decrease in cost of quality

5.3%
increase trend customer net satisfaction score

15%
increase in throughput and optimized cycle times

55%
reduction in process risks

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Gartner
#1
Top 25 Supply Chain for 2025

World Economic Forum
8
WEF-recognized Lighthouse Factories and Distribution Centers

Corporate Knights SINCE 2002
#1
Most Sustainable Corporation in Europe - 2025

Time Magazine and Statista
#1
World's Most Sustainable Corporation - 2025

No matter your place in the journey, the Schneider Electric Industrial Digital Transformation team will meet you:

1. Are you facing challenges with quality performance in your process that impact your overall business result?
2. In what ways is your workforce skilled and empowered to drive quality improvement culture?
3. What are your current costs related to quality issues (rework, recalls, fines)?
4. What are the regulatory compliance standards your business is required to meet and how are you prepared for updates in these standards?
5. Are you currently using any digital tools for quality management? If so, how effective are they?

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