STRATEGIC BRIEF

The Gradual Decline in Electronics Manufacturing – How Routine and Tunnel Vision Erode Margins and Quality

Why experienced teams often stop noticing inefficiencies and what can be done about it

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Electronics manufacturing brings together numerous disciplines, each requiring its own expertise and experience. Product development, design for manufacturability, component placement, soldering, testing, materials management, quality and logistics must work together. Specialists in individual areas are therefore essential. Problems arise when the focus on individual responsibilities overshadows the bigger picture.

Over time, established procedures become routine. Deviations are accepted, small losses are no longer questioned, and opportunities for improvement go unnoticed. Processes gradually become less efficient, while costs rise and quality and delivery performance may suffer. There is often no single event responsible. Instead, small changes accumulate and frequently go unnoticed in day-to-day operations.

This Strategic Brief explains how this gradual decline develops, why it is difficult to recognize from within an organization, and how companies can address it.

1. Specialists and the Limits of Individual Departments

Those responsible for a production line know its specific characteristics. Purchasing knows its suppliers, quality assurance understands recurring defect patterns, and production planning knows the manufacturing documentation. This knowledge is a major strength of any company.

Problems arise when perspectives stop at departmental boundaries. A design change, for example, can affect component placement, require additional testing or alter material requirements. If these consequences are not assessed collectively, each department may optimize its own processes while creating additional work elsewhere.

Such functional silos encourage local optimization that does not necessarily benefit the overall business. The performance of individual departments matters, but so does an understanding of how their activities and decisions affect one another.

2. When Routine Changes the Way We See Things

Routine is fundamentally useful. It speeds up processes, reduces the need for coordination and creates consistency. However, it becomes a risk when established procedures are no longer reviewed regularly.

Organizational research describes several mechanisms that can contribute to this problem. The Einstellung effect can cause familiar approaches to overshadow better alternatives. The normalization of deviance describes how repeated tolerance of departures from established standards can lead them to be perceived as acceptable. *Process drift* occurs when actual practices gradually diverge from intended procedures.

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In manufacturing, this can mean that manual corrections to component placement data become permanent without addressing the underlying cause. Alternatively, changes to process parameters may remain in everyday use even though their effects on process stability have not been adequately assessed.

The problem is not experience itself. It arises when experience replaces the regular reassessment of established working practices.

3. Where the Decline Becomes Visible in Electronics Manufacturing

This gradual decline often takes the form of small losses that accumulate over time.

Manufacturing and process quality: Scrap and rework increase. Deviations in reflow profiles go unnoticed or are not investigated thoroughly. Design for Manufacturability (DFM) deficiencies create avoidable problems during component placement, soldering or testing.

Production planning and data: Bills of materials, work instructions and component placement data are not consistently updated to reflect changes. Manual corrections become permanent workarounds rather than leading to the elimination of underlying causes.

Materials management and purchasing: Inventory levels increase, materials are purchased too early or remain unused. Price changes for standard components are not reviewed in time, and outdated planning parameters lead to unnecessary working capital being tied up in inventory.

Quality and customer complaints: Recurring defects are corrected repeatedly without their root causes being eliminated. Inspection and rework requirements increase while the underlying process problems remain.

These losses affect more than direct manufacturing costs. They consume personnel and machine capacity, extend lead times and undermine delivery performance. Their economic impact therefore extends well beyond visible scrap. In quality management, the costs associated with poor quality and its consequences are commonly referred to as *Cost of Poor Quality (COPQ)*. Depending on the definition used, these costs include scrap, rework, additional inspections and customer complaint handling.

4. Why Internal Controls Alone Are Not Always Enough

People who work with the same processes every day become accustomed to them and may no longer recognize changes. Past performance becomes the benchmark, even when actual performance has deteriorated.

Performance indicators can also provide an incomplete picture. Average values may conceal differences between products, production lines or shifts. For example, a stable overall scrap rate does not rule out increasing rework on individual assemblies or a decline in First Pass Yield (FPY).

Organizational boundaries and the pressure of day-to-day operations add to the problem. Responsibilities are distributed across departments, urgent delivery commitments take priority, and there is often insufficient time for comprehensive root cause analysis. Those who have established existing processes may also find it difficult to assess them with sufficient objectivity.

Internal performance indicators and audits remain important. However, they are effective only when anomalies are consistently investigated, assessed across departmental boundaries and evaluated against appropriate benchmarks.

5. How Companies Can Counteract the Decline

Review processes regularly. Inspection plans, work instructions, master data and process parameters must reflect the current product and manufacturing status. Changes should be assessed and documented in a traceable manner.

Assess performance indicators in context. In addition to scrap and rework, relevant indicators include First Pass Yield, setup times, lead times, inventory trends and material variances. Trends and their underlying causes matter more than individual monthly figures.

Eliminate root causes instead of correcting symptoms. Recurring defects require systematic root cause analysis. Permanent manual corrections or additional inspections may provide short-term relief, but they are no substitute for sustainable process improvement.

Use benchmarks and fresh perspectives. Exchanges with other manufacturing operations, cross-functional reviews and external assessments can reveal weaknesses that are easily overlooked in familiar routines. Improvement measures should be prioritized according to their economic impact and practical feasibility.

When capacity utilization is high, internal teams often lack the time to pursue these tasks consistently. An external assessment can help identify weaknesses systematically, evaluate their impact on costs, quality and delivery performance, and develop a prioritized action plan. EMS Strategy Group supports OEMs and manufacturing companies with these assessments and the implementation of appropriate improvements.

Conclusion

In electronics manufacturing, costs and quality rarely deteriorate overnight. Small deviations are often tolerated for years, additional work steps become routine, and unnecessary inventory becomes the norm. Eventually, the performance indicators may still look acceptable, but the effort required to achieve those results has increased considerably.

Managing directors and production leaders should therefore look beyond whether manufacturing targets are being met. They should also examine the effort required to meet them, identify where deviations have become established practice, and determine which losses can be avoided. A regular, objective review of established processes can make a real difference—before the cumulative impact of many small weaknesses becomes a serious business problem.

About the Author

Dirk Kaussen is Founder and Managing Director of EMS Strategy Group. With around 40 years of experience in the electronics industry — including founding and managing his own electronics manufacturing company in Germany — he brings deep expertise in manufacturing processes, EMS partner selection, supply chain stability, relocation projects, and risk management. His approach combines practical solutions with a direct connection to industrial reality.

About the EMS Strategy Group

EMS Strategy Group supports industrial enterprises in the strategic and operational advancement of their electronics manufacturing. Our core expertise lies in the strategic relocation of manufacturing volumes, the selection of qualified EMS partners, the establishment of new production capacities, and the expansion of existing manufacturing structures.

Furthermore, we design resilient supply chain frameworks, conduct comprehensive risk assessments, and guide dual-sourcing strategies, with operational support through to a successful series production ramp-up.

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