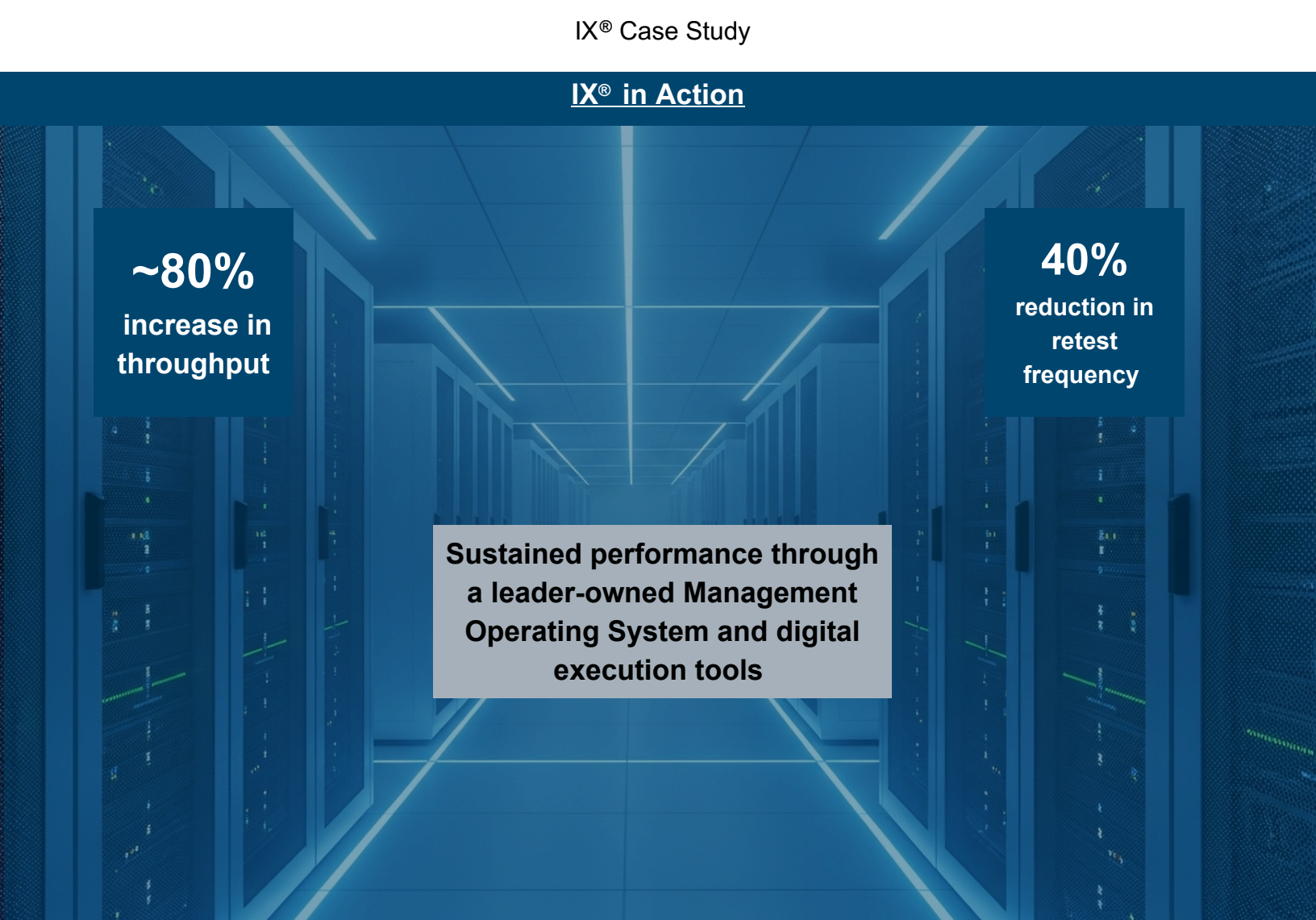


IX[®] Case Study

Transforming Data Server Production Through Operational Execution and Digital Management Systems



IMPLEMENTATION
ENGINEERS[®]
BEYOND CONSULTING

IX® in Action

~80%
increase in
throughput

40%
reduction in
retest
frequency

**Sustained performance through
a leader-owned Management
Operating System and digital
execution tools**

Executive Overview

A global electronics manufacturer supporting large-scale data center infrastructure was facing severe operational strain as demand for its data server racks rapidly increased. Production output was significantly below plan, quality performance was unstable, and leadership lacked real-time visibility into execution across assembly, test, retest, and material flow.

Implementation Engineers was engaged to stabilize operations, increase throughput, and build a sustainable operating model that combined **hands-on operational execution**, a robust **Management Operating System (MOS)**, and **digital operations tools** that enabled leaders to manage performance in real time.

Implementation Engineers embedded directly into the operation—working alongside supervisors, engineers, technicians, and site leadership—to redesign how work was executed, managed, and sustained. The result was a step-change in production performance, improved quality outcomes, and a digitally enabled operating cadence that the organization continues to own and run.

Demand Outpaced Operational Capability

The facility was tasked with significantly increasing output of complex data server racks to meet escalating customer demand. However, the operation was constrained by multiple systemic issues:

Throughput gap:

Production was shipping roughly **30–40 racks per day**, well below the **day target**, creating persistent delivery risk.

Quality and rework instability:

Rolled First Pass Yield was low, and racks averaged **~6.5 retests per unit**, consuming capacity, extending lead times, and masking root causes.

Limited real-time visibility:

Performance data was largely manual, lagging, and fragmented. Leaders lacked timely insight into cycle time adherence, bottlenecks, and material readiness.

Material flow disruptions:

Waiting on material was a leading driver of downtime, with limited end-to-end visibility from order release through kitting and assembly.

Workforce challenges:

Approximately **90% of the workforce was new or inexperienced**, with language barriers and inconsistent standard work execution.

Management system gaps:

While leadership was engaged, there was no consistent, tiered management cadence to identify issues early, escalate effectively, and drive sustained improvement.

The organization needed more than isolated process fixes—it required a **cohesive operating system** that aligned people, processes, and digital tools around daily execution.

Implementation Engineers' Approach

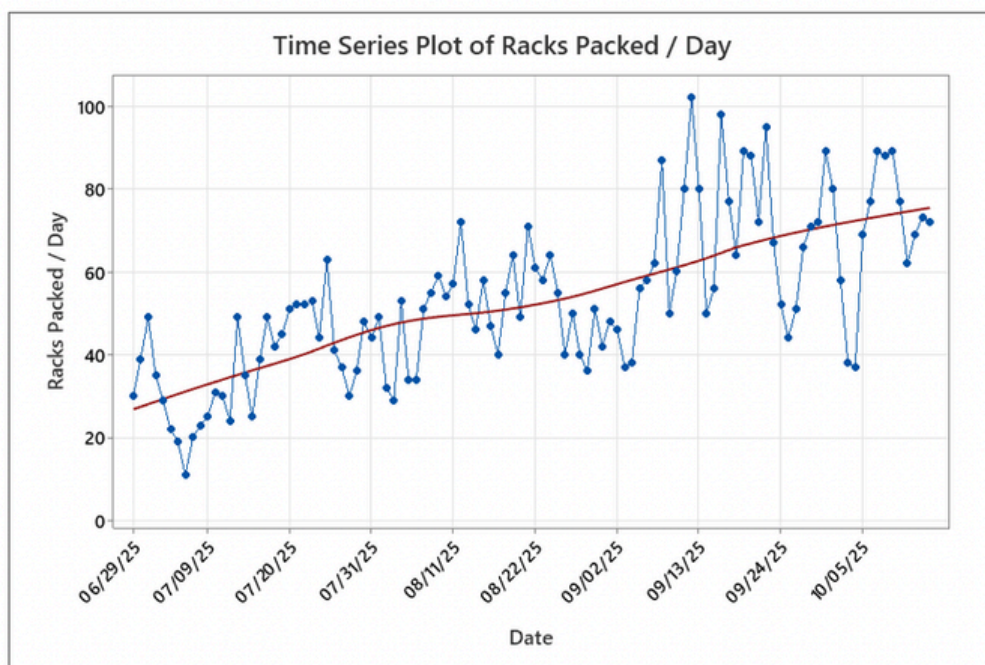
Implementation Engineers applied its **Align–Design–Execute–Sustain** methodology, focusing on rapid stabilization followed by capability building.

The engagement was structured around four integrated workstreams:

- ✦ **Operational execution improvements** across rack assembly, server assembly, test, retest, and supporting flows
- ✦ **Management Operating System (MOS)** design and deployment
- ✦ **Digital operations enablement**, including Andon dashboards, cycle-time-to-plan reporting, and material flow visibility
- ✦ **Capability transfer and sustainment**, ensuring the organization could own and evolve the system

Rather than operating as an advisory function, Implementation Engineers embedded directly into daily operations—participating in shift handoffs, standing at the line, coaching leaders, and using live data to drive decisions.

Daily Throughput Trend: Racks Packed per Day



What Was Implemented

1 Operational Execution Improvements

Rack and Server Assembly Throughput

The team executed a phased stabilization and improvement strategy that delivered measurable step-changes in performance:

- ✦ Established clear production standards and flow expectations
- ✦ Identified and removed structural constraints limiting daily output
- ✦ Implemented focused Kaizen events targeting high-impact bottlenecks
- ✦ Introduced rapid test and process changes that unlocked additional capacity

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Performance data showed distinct and sustained improvement phases:

- **Pre-Kaizen:** ~37 racks/day, high variability
- **Post-Kaizen:** ~51 racks/day, improved stability
- **Post rapid test implementation:** sustained performance at ~67–71 racks/day

This represented an **~80% increase in throughput**, achieved without adding disproportionate labor or capital.

IX® in Action

Test and Retest Reduction

Retest loops were a major capacity drain and quality risk. Implementation Engineers worked with engineering, quality, and operations teams to:

- Introduce **tiered technician oversight**, improving troubleshooting effectiveness\
- Implement **targeted BI reporting** to highlight repeat failure modes
- Align **MES routing logic** to ensure units flowed to the right technicians at the right time
- Improve daily prioritization of debug work through MOS routines

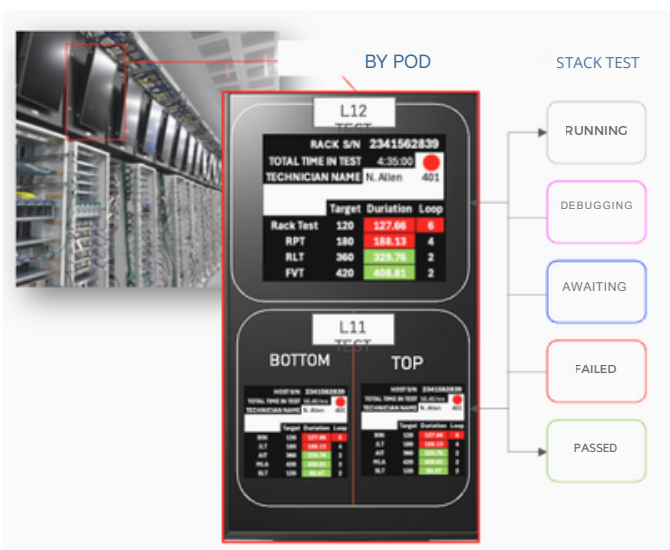
These changes reduced retest frequency from ~6.5 to ~4.0 retests per rack, a 40% reduction, while improving overall debug effectiveness and flow.

Material Flow and Inventory Control

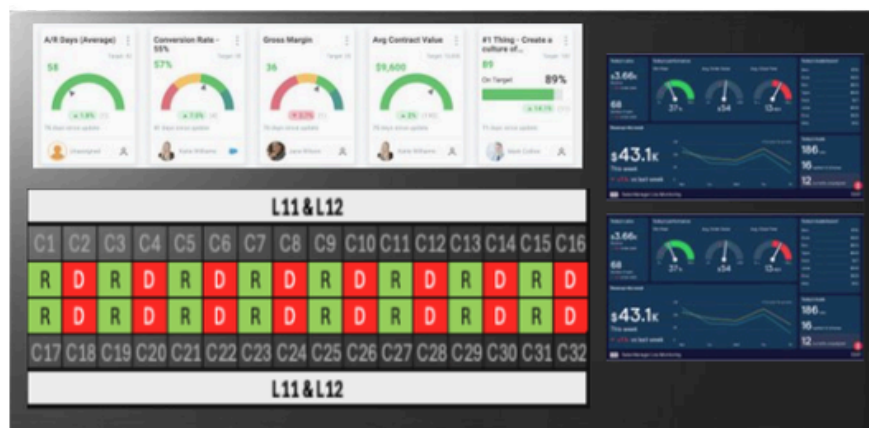
Waiting on material was consistently identified as a top driver of lost production time. To address this, Implementation Engineers:

- Mapped the end-to-end order fulfillment and kitting process
- Clarified ownership and handoffs across planning, inventory control, and production
- Implemented visual and digital controls to highlight aging orders and SLA misses
- Integrated material readiness into daily management discussions

These changes reduced uncertainty, shortened delays, and allowed leaders to proactively manage material constraints rather than react after production was already impacted.



Test and Debug System



BY BAY

② Management Operating System (MOS)

A cornerstone of the engagement was the design and deployment of a **tiered Management Operating System** that ensured problems were surfaced, addressed, and sustained daily.

MOS Structure Implemented

Implementation Engineers implemented a full daily cadence that included:

- **Area CAC (Control and Accountability Center)** meetings for Rack and Server Assembly
- **Shift Huddles** focused on safety, quality, delivery, productivity, and people
- **Shift-to-shift handoff** with standardized checklists
- **Daily Gemba walks** aligned to leader standard work
- **Site-level escalation** with defined 48-hour response expectations

Each tier had clearly defined inputs, outputs, and escalation paths, ensuring issues moved quickly to the appropriate level for resolution.

MOS Tools and Governance

To reinforce consistency and ownership, the team implemented:

- Standard CAC board structures aligned to SQDP
- Clear action tracking and follow-up discipline
- A **MOS maturity model** used to assess and coach leaders
- Regular **health checks** to reinforce behaviors and identify gaps
- A feedback and coaching loop (Audit → Feedback → Improve)

This transformed daily management from reactive firefighting to proactive execution.

3 Digital Operations Enablement

Digital tools were deliberately designed to **support the MOS**, not replace it. The goal was to give leaders real-time visibility so problems could be addressed immediately on the floor.

Andon Digital Dashboard (Rack & Server Assembly)

Implementation Engineers designed and deployed a **Power BI Andon dashboard** providing real-time production visibility.

Key capabilities included:

- Real-time view of units **within cycle-time goal, within tolerance, or exceeding plan**
- Standardized cycle-time classifications tied directly to engineered standards
- Drill-down to **serial-level detail**, enabling immediate root cause analysis
- Visibility by model, route step, and work area

A defining feature was the **cycle-time-to-plan report**, which compared actual cycle times against defined targets for every major process step. This became a central management tool used daily by supervisors and leaders during CACs and Gemba walks.

Digital Material Flow and Order Fulfillment Tracking

To support material readiness, the team implemented a **digital Order Fulfillment Tracking tool** that visualized:

- Order release to kitting status
- Time elapsed at each process phase
- SLA adherence and aging orders
- Gaps between planning data and execution reality

This tool eliminated blind spots, improved accountability, and directly supported faster decision-making during daily management routines.

Leaders were equipped with tablets and a **Digital Gemba App** that reinforced leader standard work, ensured consistent execution of Gemba routines, and tied observations directly into CAC actions.

Digital Gemba App



- ✦ **~80% increase in throughput**
(racks/day)
- ✦ **40% reduction in retest frequency**
- ✦ Improved cycle time adherence and reduced variability
- ✦ Faster escalation and resolution of operational issues

- ✧ Leaders transitioned from managing by lagging reports to **managing in real time**
- ✧ Daily management became disciplined, predictable, and leader-owned
- ✧ Digital tools reinforced accountability rather than adding reporting burden
- ✧ The organization built internal capability to sustain and scale improvements

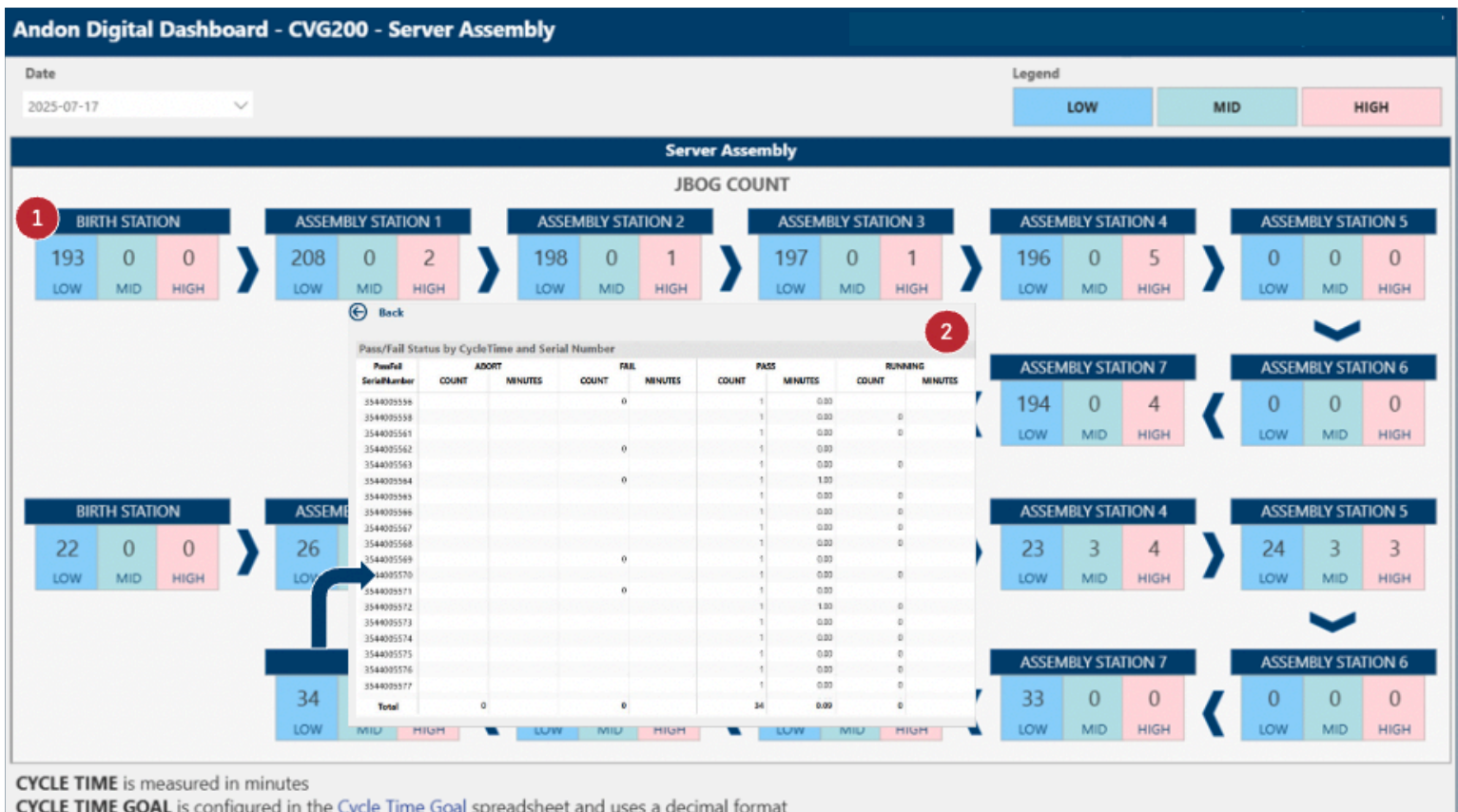
Why This Matters

This engagement demonstrates Implementation Engineers' differentiation:

- **We don't stop at analysis**—we embed, execute, and transfer ownership
- **Operations, MOS, and digital tools are implemented together**, not in isolation
- **Results are sustained** because leaders are trained to run the system themselves

For complex, high-mix electronics manufacturing environments, this integrated execution model delivers measurable performance improvement—and keeps it.

Dashboard Enabling Cycle-Time Control



Let's Turn Your Vision Into Results

At Implementation Engineers, we don't just execute projects - we transform your vision into operational reality. Our proven 3-phase approach - **Align, Design, Execute** - delivers lasting value, from aligning your team on strategic goals to optimizing operations and driving measurable outcomes. Whether you're aiming to lead your market, boost efficiency, or maximize shareholder value, we're here to make it happen, step-by-step, side-by-side.

Ready to Get Started?

Let's explore how we can bring your vision to life. Contact us today to schedule a conversation. Together, we'll chart the path to your success.

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