From hardcoded MES to a data-driven engine covering 14 machine types

An abrasives manufacturer · Abrasives

An abrasives manufacturer rebuilt a sprawling, hardcoded MES into one data-driven engine for 14 machine types, so adding a machine or a site became a configuration task instead of a software project.

96%
test scenarios resolved (320 of 333) in the first month

8 to 40
rollout-ready machines (of 75) in two weeks

14
machine types on one engine

THE PROBLEM

The first-generation MES was launched without formal technical specifications. Two years of reactive development followed, built by trial and error with machine operators. The code was hardcoded per station, for example 14 separate identical machine windows, so maintenance got harder and more expensive with every machine added. Duplicated code meant customers had to re-test every machine and function on each update. ERP data was also inconsistent across plants and countries, with missing Bills of Materials and non-standard units that blocked basic square-meter scrap and cost calculations.

HOW WE DID IT

The rebuild followed a structured multi-phase plan. Phase A set clear technical specifications, validated with stakeholders across multiple factories. Phases B and C built and validated a standardized backbone covering 14 machine types. The core became a single, extendable engine driven purely by configuration data, so rollouts need no custom code. Every station follows the same workflow: order check, setup, production, verification and completion. Unified material balance rules, standard data dictionaries and centralized ERP, configurator and Ignition interfaces sit underneath. A single business owner vets every new feature request, and each one is validated on a test bench before worldwide deployment.

BEFORE

The legacy framework ran on 100+ machines across multiple countries and seven to eight machine types, needed constant re-engineering for unstandardized parameters, and could not take on new functions the business needed.

AFTER

A plug-and-play framework now manages 14 machine types without per-factory code forks, upgrades ship in one release cycle, and adding machines or sites is a data-entry exercise.

RESULTS

- Test validation at the first site rose from 78.4% in early January 2022 to 96% by the end of that month, with 320 of 333 test scenarios resolved
- Rollout-ready machines at that site jumped from 8 to 40 of 75 in two weeks
- Redundant per-machine development costs eliminated, with much lower testing effort and downtime
- Later rolled out to several more factories and handed over to the client's own development team

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PLANT FORMANCE

NEXT STEP

Planning a project like this?

Talk to an Ignition engineer about your sites, timeline and architecture. We will tell you honestly what it takes.

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