

Order Feasibility & Capacity Simulation

Key Performance Indicators

—17%

wasted and idle time across
the flow

—13%

rework and reprocessing

+9%

effective capacity from the
same footprint

—11%

energy per unit processed

—14%

avoidable scrap and carbon



4,800

configured builds over twelve
months at the operation: about
12% of revenue and 15% of
gross profit, quoted today on
experience



90,000

catalogue items parsed to the
technical specification, so
component availability and
substitution are checked in
seconds, not by walking the
shelf



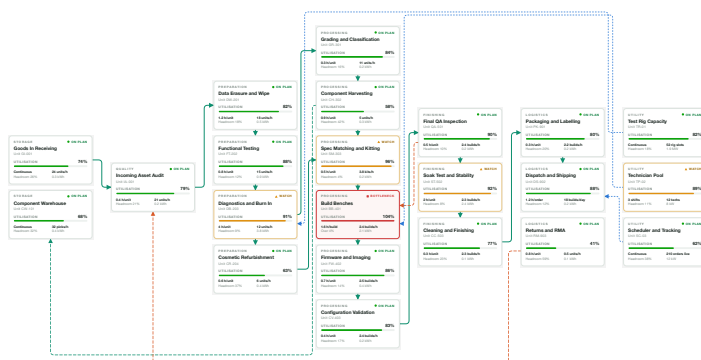
1 day ahead

tomorrow's bottleneck visible
today, whether it is a build
bench, a test lane or a missing
component at spec level

In refurbish and resell operations with an assemble to order channel, effective capacity varies with incoming stock and order mix. Configured systems and component sales compete for the same inventory, while units pass through goods in, testing, grading, assembly and QA at different rates. Operational constraints therefore shift with demand and material availability. Quotation decisions are often based on experience rather than an explicit view of system capacity, leading either to conservative commitments that reduce margin and utilisation, or to delivery promises that cannot be met.

EntroMetrix builds a capacity simulator using existing operational data, including process stages and bench capacity, component level inventory and the current order book extracted from the ERP. A prospective order can then be evaluated against committed loading and component availability to estimate a feasible ship date, identify pressure on each stage and determine what would need to change to meet a tighter deadline. The simulator captures operational factors that make capacity nonlinear, including shared benches and technicians, component substitution, sequence dependent setups and test constraints. It can then evaluate alternative production scenarios against objectives such as margin, throughput and lead time, supporting more efficient scheduling and reducing avoidable waiting and rework.

System simulation: live view



The operation modelled end to end, each stage carrying its own utilisation, throughput and headroom. The binding stage, the bottleneck that sets the ship date, is flagged in red.

What the Simulator Does

- **Order feasibility:** enter a prospective configured order and receive a feasible ship date against current bench loading and component stock, in seconds.
- **Capacity utilisation:** stage and bench loading computed from the live order book, with headroom and overload visible per stage and per day.
- **Component availability:** a configured system is mostly components by value; the simulator checks availability and compatible substitutions at spec level before promising.
- **Marginal order decisions:** fill idle bench hours knowingly, with the cost, margin and delivery impact of each candidate order computed before acceptance.
- **What if in seconds:** replan against a technician loss, a rush order or a large lot arriving without touching the real plan.
- **No integration required:** static ERP exports are enough to start; the model becomes dynamic when live feeds arrive.

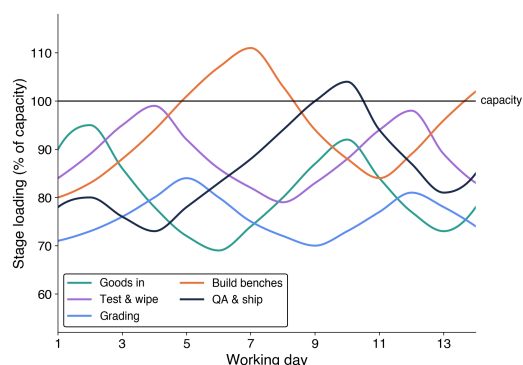


Figure 1. The shifting bottleneck, as the simulator sees it: computed loading per stage against the committed order book, day by day. The stage that binds changes through the fortnight, which is why fixed quoting rules cannot price time.

The model can be built within weeks because it begins with existing data extracts rather than systems integration. These include sales and purchase orders, stock and item master data from the ERP, together with bench times and routing knowledge captured with the operations teams. Key assumptions are documented and validated by the operation's engineers before results are presented.

EntroMetrix delivered this for an enterprise hardware refurbish and resell operation. EntroMetrix analysed approximately 90,000 catalogue items at specification level and characterised the assemble to order channel across roughly 4,800 builds over twelve months, representing about 12% of revenue and 15% of gross profit. As an independent validation, stock health estimates derived from raw transaction data agreed with the operator's internal assessment for 72% of SKUs within one classification band.

Validation is retrospective and blind. The simulator is tested against a held back period of operational history, using success criteria agreed in advance: whether it can reproduce observed bottlenecks, delayed orders and shipping performance. Only after this validation is it used prospectively. In that engagement the model was built and validated within weeks of receiving the data, instead of months, using only several hours of the operator's time.

What the Simulator Does (cont.)

- **Retrospective validation:** the model must reproduce last quarter's actual bottlenecks and shipping performance before it advises on anything.
- **Blind validation:** a held back period of the operation's own history, with success criteria agreed before results are seen.
- **Pricing the promise:** quotes anchored to the live market cohort for the components consumed, so the build channel's premium is protected as markets move.
- **Buying linked to builds:** the same model shows which component purchases unblock the most order book value per pound spent.
- **Minimal load on the operation:** roughly eight hours of engineering time plus a one time data extract under NDA; no software installed on operator systems.
- **A path to live:** the same model becomes the daily decision layer when live feeds arrive, without waiting for an integration programme.

What the Simulation Delivers

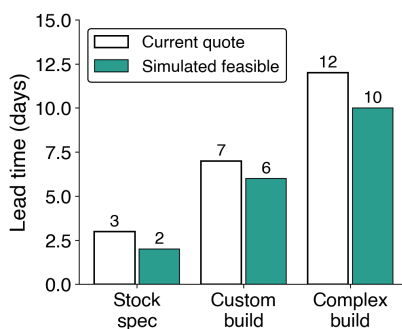


Figure 2. Current quotes versus simulated feasible lead times by order type. Every order type comes down, as resequencing and easing the binding stage take time out of the flow.

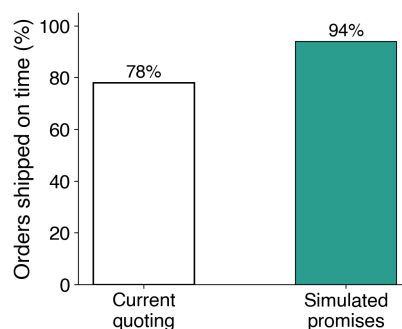


Figure 3. Promises computed against real bench loading and component stock are promises the operation can keep.

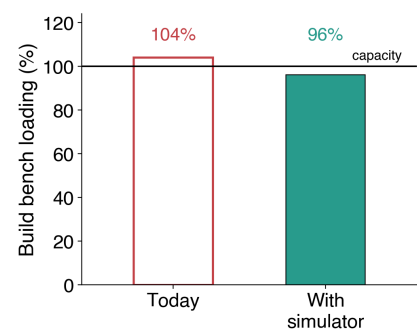


Figure 4. The binding stage eased: build bench loading brought back under capacity by resequencing and marginal order decisions.

From Experience to Computed Promises

Delivered for an enterprise hardware refurbishment operation

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