Internal 80/20: parts and operating complexity

Internal 80/20 for Manufactured Parts — module 1. Worked example with synthetic data invented for teaching.

Internal eighty-twenty for manufactured parts: from the quad to Strategic Intent and team metrics. A Compass Performance learning session. Here is the business question. Synthetic Plant S makes forty machined parts.

Its five-axis cell is the constraint, and lead time has stretched to seven weeks. Leadership asks: which parts earn their place on the constraint, and what should we change first? A second shift or a new machine is not in the budget. The answer has to serve one Strategic Intent, not forty opinions.

Start with twelve months of ERP data for every part: units, price, and variable cost from the bill of material and the routing. Contribution margin is revenue less variable cost, before allocated overhead. Add constraint hours from the routing, setup hours from the actual job history, and scrap. Then validate before you analyze.

Revenue less variable cost must reconcile to the ledger: ten point oh eight million dollars of revenue, seven point one seven million of variable cost, two point nine one million of contribution. Constraint hours must reconcile to the production log for the cell: three thousand five hundred thirty-six of three thousand six hundred eighty available, ninety-six percent loaded. If the totals do not reconcile, stop and fix the data first. Every number in this example is synthetic.

Rank the parts by contribution. The Pareto curve shows the vital few: eleven parts, about twenty-eight percent, carry eighty-one percent of positive contribution. Eighty-twenty is an empirical pattern, not a law. Here it is twenty-eight and eighty-one.

Three parts lose money, and they are reported separately. A loss-making part on the constraint costs twice: its own loss, and the hours it takes from better work. Quartiles are different. They are equal counts: ten parts each.

The top quartile carries eighty-one and a half percent of contribution, the bottom quartile less than one percent. The quartile tells you where a part ranks. The Pareto curve tells you how concentrated the business is. Keep them apart: part S-1178 sits in the second quartile, yet it is outside the vital few.

Now the quad, as the Compass Quad and Quartile Builder defines it. The first letter is value: A for the top two quartiles by contribution, with contribution above zero, and B for the rest. The second letter is complexity, a zero to twenty-five effort-to-serve score across the part drivers: unique tooling or

fixtures, single-source or long-lead supply, inventory, and inspection and quality handling, plus setups and scrap in this plant. Fifteen or below is A.

Above fifteen is B. Each dot is a part. AA, high value and low complexity: eleven parts. AB, high value and high complexity: nine.

BA, low value and low complexity: eight. BB, low value and high complexity: twelve. Notice the spread inside each quadrant. Parts close to the dashed lines deserve a second look at their data before anyone acts.

A quadrant is a hypothesis to test, not a verdict. AA: protect and grow. These eleven parts earn about two thousand two hundred seventy dollars per constraint hour. Reserve cell capacity for them first, keep their lead times short, and grow volume with the customers who buy them.

AB: simplify, then reprice. Nine parts carry nine hundred thirteen thousand dollars of contribution, but they use forty-six percent of constraint hours, at about five hundred sixty dollars an hour. First remove the self-inflicted complexity: quicker changeovers, common fixtures, fewer engineering changes. Then reprice only the complexity the customer asks for.

BA: maintain efficiently. Eight small, simple parts. Standardize the work and the schedule, and automate only where the payback is validated. Do not add management time.

BB: reprice, restructure or release. Twelve parts use one thousand twelve constraint hours for sixty-seven thousand dollars. Test cost to serve, strategic role and safety first. Here, three parts are released or outsourced.

One safety-critical part for a strategic customer stays, with a new price and a minimum order. Never release on the chart alone. One caution. Annual contribution and contribution per constraint hour answer different questions.

Part S-1108 earns four hundred twenty thousand dollars a year, but only six hundred fifty-six dollars per cell hour. Part S-1241 earns twenty-two thousand, at one thousand three hundred sixty-five dollars an hour. When the cell is the constraint, its hours go to the higher rate. Translate the findings into one Strategic Intent: within twelve months, raise contribution per constraint hour from eight hundred twenty-three dollars to at least one thousand, and cut lead time from seven weeks to five, without adding cell capacity.

Then cascade it. Operations owns setup hours on the nine AB parts: from eight hundred five to four hundred eighty-three by month six. Commercial owns the four BB decisions by month three. Quality owns scrap: from three percent to two point two.

The cell team owns OEE on the constraint: from sixty-one to seventy percent. Each objective has an owner, a baseline, a SMART target, a KPI, a milestone, and the people and budget to deliver it. Finance counts a saving only when it is validated against the baseline. Close the review with ARC.

Analyze what the data shows. Refine the plan with the people who do the work. Commit to the decisions, the owners and the dates. The commitments become a project charter, and the charter links to the To-Be value stream, so the freed constraint hours, about six hundred seventy-six, are planned into the flow.

The end decision in this example: release three parts, reprice one, cut AB setup hours by forty percent, and plan the freed hours for validated AA demand. The companion module, External Portfolio eighty-twenty, shows which markets, customers and products that demand comes from. To apply this to your business, Schedule a Conversation with Compass Performance.

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