

Split awards with an optimizer: allocating volume across suppliers

Flow Procurement

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A buyer's guide to constraints, weighted criteria and the questions to ask before accepting an allocation.

Decide whether splitting is useful

Single sourcing can simplify ordering and give one supplier responsibility for the full volume. It also concentrates dependency. A split award distributes volume across suppliers, but creates more relationships to manage. Neither choice is automatically better. Start with the purchasing need and the reason to consider a split. Capacity, continuity, lead time and contract commitments may matter as much as the quoted unit price.

An optimizer helps examine those choices under explicit rules. It does not know which trade-offs your organization is willing to make unless you describe them. Before running it, write down which suppliers are eligible, which items can be split and which conditions are mandatory. If the purchase has indivisible packages, record that fact. A fractional allocation is not useful when suppliers can only deliver whole packages or complete projects.

Make the inputs comparable

Collect cost, lead time, quality and ESG inputs on a consistent basis. Decide whether cost includes transport or other relevant charges and which currency and unit apply. A fast lead time quoted from a different starting point is not comparable. Quality and ESG scores need evidence and a defined scale. Leave missing data visible and resolve it before presenting a confident recommendation based on an incomplete table.

Weights express how much the decision values each criterion. They do not replace mandatory requirements. A supplier that fails an essential specification should not gain eligibility through a low price. Document the scoring method and why each factor is present. Check that units and normalization do not accidentally let one measure dominate. The team should be able to explain the weights before it sees which supplier benefits from them.

Turn business rules into constraints

Capacity limits say how much a supplier can deliver. Minimum and maximum shares can express an agreed allocation policy. Contract lock-in can require a committed supplier to receive volume. A budget constraint limits spending under the chosen cost definition. Some rules apply to an item, others to the full award. Keep the scope visible. A minimum share across the event may not satisfy a line-specific commitment.

Hard constraints must all hold. If capacity is too low or several required shares conflict, the model can be infeasible. That result is useful: it tells you the proposed rules cannot be satisfied together. Do not silently relax a contract commitment to obtain an answer. Ask which rule can legitimately change, obtain the necessary decision and run the model again. Record the change so reviewers can see why the next result became feasible.

Understand LP and MIP

A linear programming model, or LP, can allocate divisible volume using continuous quantities. It is suited to situations where a share can be varied within the declared limits. A mixed-integer model, or MIP, adds discrete decisions. Those can represent choosing a supplier, requiring a whole package or turning an allocation on or off. Choose the model that reflects the commercial decision rather than the one that is easiest to run.

Flow Procurement uses LP and MIP optimization for supplier allocation. Buyers should inspect the model's assumptions as well as its output. Ask whether minimum order quantities, supplier count limits or fixed costs are represented in the configured model. If a real condition is absent, the allocation may be mathematically valid and operationally unsuitable. Treat that as an input or scope issue and resolve it before moving to an award.

Use a Pareto front to discuss trade-offs

A Pareto front shows alternatives where improving one objective requires giving up something on another. It can help a team compare cost and delivery performance without pretending that one weight setting is the only reasonable choice. Each point still needs to satisfy the declared constraints. An attractive trade-off outside a binding contract or capacity limit is not an available award under the current rules.

Read the alternatives with the people who own the consequences. A receiving team may challenge a delivery assumption. A category buyer may explain why a quality difference matters. Select a small set of meaningful alternatives and show their assumptions together. Do not describe a point as best without saying best for which objective and under which constraints. Keep the selected weights and the reason for choosing an alternative with the decision record.

Stress-test uncertain inputs

Monte Carlo stress testing explores how a result behaves when uncertain inputs vary across defined scenarios. It can help identify a fragile allocation, such as one that depends on a supplier always meeting its quoted lead time. The test depends on the distributions and relationships you provide. Arbitrary ranges produce arbitrary conclusions. Use evidence where it exists and label judgment-based assumptions clearly when it does not.

A stress test is not a forecast guarantee. Ask which inputs varied, which stayed fixed and whether shared risks were represented. Suppliers may face the same disruption, so independent variation can miss a common dependency. Examine scenarios where important assumptions fail together. Use the output to ask better questions and prepare alternatives. Do not convert simulated behavior into a claimed customer result or a promised level of savings.

Read shadow prices in plain words

In an LP, a shadow price describes how the objective would change with a small change to a binding constraint, within the range where the local relationship holds. For a capacity limit, it can indicate the value of a little more capacity under the current model. It is a local signal. It is not a supplier quotation, a universal value or permission to renegotiate a contract without checking the terms.

Look at the constraint name, unit and direction before interpreting the number. A solver's sign convention may differ from the business phrasing. Ask for an explanation in the units used by the model. Do not apply LP shadow prices to discrete decisions as if they had the same meaning. If a change is substantial or affects an indivisible award, run a new scenario and compare the actual modeled allocations instead.

Challenge the recommendation before award

Use what-if scenarios to change one assumption at a time: capacity, budget, weights or an eligible supplier. Then examine the combined change that reflects a plausible business situation. Check which suppliers gain volume, which lose it and which constraint drives that movement. Calculated differences should come from the real engine. Keep the baseline and scenario inputs together so the team can reproduce the comparison later.

Before award, verify the supplier offers and the practical ability to fulfill the proposed split. Confirm that quantities, units and commitments match the contract you intend to sign. The buyer owns that decision. The optimizer makes the consequences of stated rules easier to inspect. A good review ends with either a defensible allocation or a specific question that sends the team back to improve the inputs.

Checklist

- Collect comparable offers with units, currency and delivery assumptions.
- Define evidence and scales for quality and ESG.
- Separate mandatory requirements from weighted preferences.
- Verify capacity, share limits, contract lock-in and budget.
- Choose LP or MIP to reflect divisible or discrete decisions.
- Review feasibility, Pareto alternatives and scenario assumptions.
- Challenge the allocation with suppliers before recording the award.

See the workflow with your team

Bring a request, a set of offers or an invoice exception. We can walk through the decisions together.

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