LEVERAGING COMPLEXITY INSTEAD OF REDUCING IT

SOURCING A HIGH-TECHNOLOGY CAPEX PROJECT

THE CUSTOMER CHALLENGE

TWS’ client faced the challenge to source 10 technology packages across two production lines simultaneously. The cross-functional work was kicked off 1.5 years ahead of the actual procurement decision to enable the largest ever sourcing of capital equipment for TWS’ client. From an economic perspective, only a committed negotiation leveraging the maximum sourcing scope can drive the optimal result. However, a negotiation of this scale exponentially increases the complexity because of the large number of bidders and packages involved, potential synergies between packages offered by suppliers, as well as constraints such as:

I. Supplier capacity – None of the invited suppliers had sufficient capacity to deliver the entire scope. The client therefore had to define packages that could be delivered independently.

II. Internal resource – The team had to consider internal resource constraints as they had to manage multiple suppliers in parallel after the sourcing decision.

III. Risk assessment – It was crucial to reduce the company’s risk exposure, by e.g. limiting the maximum business each supplier can win based on their individual risk profile.

The client recognised that simply choosing the “best” combination of offers and negotiating with those suppliers who are part of that combination will not deliver the optimal outcome. Instead, one must define a strategy on how to select the best solution across all possible combinations of offers, taking potential bundle offers into account. However, calculating the “best” allocation manually would have been very time-consuming if not impossible – with more than 2.5 million different options of how to allocate the business. Furthermore, the client was used to advanced negotiation techniques such as fully committed and game-theoretically optimised negotiations and wanted to use such competitive awarding methods in their largest ever CAPEX sourcing as well. TWS was tasked by the client to develop an optimal approach and implement it together with the client.

THE TWS APPROACH

The key enabler to address such a complex combinatorial problem effectively and efficiently was the use of a technical innovation: an Allocation Tool developed by TWS. The tool uses optimisation algorithms to instantaneously identify the optimal combination of bids for the buyer based on suppliers’ submissions and internal constraints such as minimum or maximum number of suppliers, capacity of suppliers, etc.

Only with the ability to calculate optimal combinations instantaneously, TWS was able to design a dynamic combinatorial auction. In such an awarding mechanism, the participants can place bids simultaneously on any individual package or bundle of packages they seek to win. The auction then identifies the optimal combination of bids for the buyer in each round and provides feedback to suppliers about their competitive position against the leading combination. Suppliers have the chance to further improve in the next round. Such a dynamic negotiation process allows the buyer to improve the commercial outcome in each round and dramatically increases competition and transparency for suppliers – as opposed to a conventional approach that often manages such complexity by cutting the business into packages in advance and negotiating them separately.

THE BENEFITS

In addition to significant commercial savings, the game-theoretic negotiation approach, with a technical innovation at its heart, has demonstrated to all stakeholders, suppliers and the whole organisation that Procurement can manage and drive the most complex sourcing decisions.