



Case study

Reducing Total Delivered Cost through Optimized Production and Logistics Allocation Planning in Commodities Distribution

A leading global cement manufacturer, which is among the top three firms of the Indian cement industry, engaged IGSA Labs to assist its monthly production and outbound logistics allocation planning for the distribution of cement products across all markets in India.

Challenge

Prior to the engagement, the client was using an allocation planning system formulated in MS Excel with optimization in Solver. This system had several problems, viz. it made allocation plan between plants and markets and did not consider warehouses, did not consider multiple products, did not consider rail and road as separate transportation modes, minimized only the primary transportation cost, required manual processing of input data and its upload. In short, the system did not yield total optimal plan, did not provide plans disaggregated at the levels of products, plants, warehouses, markets and mode of transportation, and required lot of manual work.

Solution

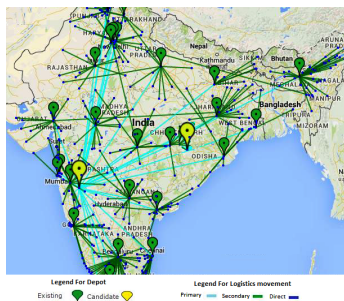
IGSA team understood the objectives of cement logistics and production planning, inputs to the total delivered cost minimizing allocation plan, and noted the plant capacities, transport availability and desired service levels. Subsequently, one region was marked out for the pilot to demonstrate the capability of IGSA's solution. IGSA tailored its network allocation planning solution to the client's requirement. The OR model of the solution, developed by IGSA in GAMS/CPLEX, was modified to incorporate all the components of total delivered cost and the constraints of plant capacities, warehouses, rail and road logistics encountered by the company. The solution's user interface, developed with J2EE, and the Oracle database were also tailored to seamlessly align with the IT system and database used by the client.

Post the successful implementation of the pilot, the client engaged the services of IGSA for pan India deployment. After using IGSA's optimization solution in software-as-a-service (SAAS) mode for three years, the client conveyed its preference to install the solution in-house and acquire the internal capability to run the same. Thereby IGSA deployed its solution at the client's server. IGSA trained the client's logistics planning team to enable them to run the optimization solution and generate plans. Post internal deployment, the client has been using IGSA services for regular maintenance and periodic upgrades required for new features and further value-added analysis. For instance, a major value-added component developed by IGSA for the client was a compliance analysis module. This module performs a post-facto comparison of actually executed production and logistics dispatches with an optimal plan and identifies the 'production', 'logistics' and 'sales' variance factors responsible for the loss of contribution margin.

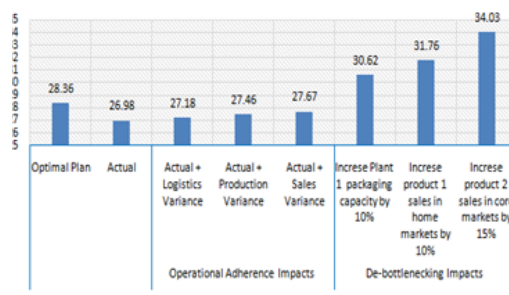
Results

The client has been satisfactorily using IGSA's network allocation optimization solution for over a decade. In addition, it has successively increased the depth of services from IGSA. These services help the client to carry out value-added analysis that supports the quality of managerial decisions. The major benefits to the client are:

- Reduction in all India total delivered cost of about 10% as a result of optimal production and outbound logistics planning.
- Quantification of compliance between actual execution and optimal plan every month and identification of 'variance factors' responsible for deviation, leading to optimal plan to close the non-compliance gap.
- Identification of most critical bottlenecks in the production-logistics chain whose removal would result in further increase in company's contribution margin.
- Automation of the process of monthly production-logistics planning, compliance tracking, and analysis, resulting in saving of managerial time for value-added analysis and decision making.



Network Planning Model



Water fall analysis

