

Logistics Development UK Limited

Delivering major supply chain improvements

Stock Level Simulations

For deciding reordering, stocking and overall supply chain strategies, as well as for tuning current operations to achieve better results.

Our stock simulations are a sister product of our "Winscope" reordering system.

They are used to address a wide range of strategic and tactical projects as well as to tune and adjust "Winscope" for specific clients. Some examples of the non Winscope projects include:

Food and drink for the Troops!

In this project we were asked to look at the retail supply chain strategy for the British Armed forces based in Northern Europe.

In deciding whether to use one or two distribution centres it was not only transport and infrastructure costs that needed to be considered. Our stock level simulation was used to accurately quantifying how much stock would be needed to provide the required product availability levels if the demand was split between two sites, as opposed to one. It was concluded that the considerable extra stock holding and infrastructure costs more than offset any transport savings that would occur with two sites.

The biggest Digger manufacturer in the UK decides how to service spares demand in the Asia Pacific region.

The servicing of an actual year's sales to the whole of the above region was simulated. Interestingly it was concluded that the transport cost savings and much improved delivery times, that could be offered if two sites were used, would more than offset the modest increase in stock holding and infrastructure costs that this solution would demand when compared to a single site option. Accurate simulation of potential stock levels against actual transaction data thus helped to decide on the opening of a new joint venture distribution centre to serve Australasia as well as the existing premises in the Malaysian area.

Toothpaste, Cider, Petroleum Additives, Wire mesh and Flower Pots – but not all at the same time!

These are all examples of situations where we have used stock simulations, and related analysis, to look at the trade off's between the stock holding of finished goods, or Work in progress, and the costs of different lengths of production runs.

As we, and our many clients, have found "Just In Time" principals can be great for a major manufacturer. From their supplier's perspective it can also result in holding considerable stocks if they are not to carry the cost of excessive, underutilised production capacity and/or pay for uneconomically short production runs. Getting this equation right for each product is very important if maximum profitability is to be achieved.

From high volume discount stores to up market fine wine shops.

With the discount stores the biggest problem is trying to keep control of stock levels whilst the product range is changing very rapidly. (In this case excessive stock levels rapidly translated into thousands of pallets of extra stock that had to be stored, millions of pounds of cash required to fund this excess stock and significant costs of writing down large amounts of obsolescent stock). Accurate stock level simulation was thus critical to identify how to control these problems and in this case identified the effect of a clear range control strategy.

With the Wine Shops, a Senior Director had always demanded very high product availability levels. Accurate simulation identified the cost, in stock holding terms, of such service levels and how much these would reduce if the targets were changed. The result of the exercise was that the target availability levels were promptly dropped by 2%.

How the simulations work.

These simulations use detailed week by week sales transaction data for all products over the past 1 – 4 years. This is combined with equally detailed supplier lead time history (or scheduling data) over the same period.

The simulation works through each day of the period required, for each individual product. It places orders in accordance with the set up configuration and receives those orders according to the actual historic lead times (or scheduled results). It deducts the sales that actually occurred and calculates the actual daily stock balances that would have arisen. The simulation also tracks if a product would have run out and how many sales would have been lost (or back ordered). It further retains full information on the orders placed on the relevant supplier/production area. It has been used to simulate ranges of over 100,000 product types.

Thus it provides an extremely accurate picture of what would happen to the stock holdings, availability levels to the customers, and the costs of acquisition/ production under a several sets of circumstances.

When used for strategic purposes the output of the simulation is often combined with other relevant data such as transport, warehousing, production and overhead cost information to build financial models for "cost/benefit" analysis purposes.

As will have been seen, it is either used at a strategic/operational level or to optimise the set up of the re-ordering/planning system to achieve the best result. (Including Winscope).

It can be configured in many ways to accurately replicate a wide range of problems and can take many issues into account. (MOQ's and supplier lead times being very popular at the moment).

It undergoes continuous development as different projects require different issues to be addressed.

Over the last twenty years we have been able to observe just how accurate this system is, by comparing the results that were achieved after a change has been made with those that the simulation predicted would occur.