

## CASE STUDY: Aerospace

Optima Systems, a Dyalog Ltd Application Development Partner, develop new applications for a wide range of businesses. One of their development tasks was to come up with the solution to a very simple issue - "Determine the necessary manpower around all of the manufacturing sites to support the assumed product delivery schedule."



The task was manually intensive, prone to error and took a great deal of time to complete. Various options had previously been investigated; some never got off the ground and others would take too long to implement but none gave the speed of delivery and flexibility that APL promised.

The Head Office function was to prepare a delivery schedule of all products over a 20 year span and from this determine the likely manning requirements across all sites to

manage the workload. The deliveries were categorised as "Firm", "Probable" and "Possible". The full exercise was to be repeated every quarter and reported up to the main Board but "on-the-fly" runs were required much more frequently. In addition, the system was to maintain all of the "Actual" data and blend it into the calculated forecasts.

We had thousands of pieces of information to put together. Data was provided for each of the major assemblies together with historical S-Curve and L-Curve profiles, lead times and the relationships between each assembly and the other.

Our aim was to back-calculate from the delivery schedule when the various assemblies would be required. Knowing this and applying Learning Curve data to the build times we could gauge, with a fair degree of accuracy, the staffing levels required across a number of disciplines.

The first phase of the system was implemented on an IBM Mainframe running VSAPL under TSO with GDDM supplying the graphics. Our team consisted of 2 APL programmers plus a business analyst. The implementation was very well received by all of the planning staff around the sites. Previous to this implementation a speculative run would take anything up to 3 weeks to complete, was prone to errors and was extremely laborious for all concerned. Our first run took a little over 20 minutes once the initiating parameters had been supplied and showed a close correlation to the observed actuals.

For the first time the company directors could make business decisions on the product mix or company assets and see the likely effect within minutes. In addition, these investigations could be done at the central Head Office without the knowledge of any site staff. Confidentiality could, therefore, be better protected.

After the success of the first phase a new requirement was made to allow investigations into the parts ordering cycle. Now that we could tell exactly when assemblies would be required, more

accurate ordering strategies could be adopted which would reduce space requirements in store and optimise the batch spend profile, which would ultimately lead to improved company cash flow.

Although this system was not designed to control the exact ordering process with external suppliers it did allow for improved negotiations with these suppliers, which in turn produced lower prices and more reliable delivery.

The process of continual acquisitions, corporate restructuring and changes to the product portfolio meant that the directors were in continual need of the latest information, particularly as a result of "What-If" type questions. The system gave tremendous power to the management - even to the extent of allowing them to drive the models themselves (a facility that became ever more popular).

The final addition was to allow the estimating of requirements for a new product based on the historic data from similar current products. Clearly this sort of forecasting is much more difficult, and various strategies and statistical tools were provided to help define "similar". The resulting data emerging from this module was then added into the data from the primary calculations, so enabling a more complete picture to be established.

By the end of the development period the system was being used in all sites around the United Kingdom. Various teams were involved in keeping the underlying data up-to-date and the management, up to board level, were receiving regular reports and scenario analyses which enabled key decisions to be made.

The system was built up in approximately 9 months elapsed. Savings to the business are hard to determine but on one set of Titanium castings alone, where the delivery requirements over an extended period could be more accurately indicated, approximately £250k was negotiated off of the historical cost.

Cost savings are only one benefit with a system like this. Probably the most important benefit was to allow the business to make difficult but informed decisions quickly and with confidence of the outcome.

