DISKOVER In Action

Inside Story:
MEDION AG
How to Optimise the End-of-Life Stocking of Spare Parts
Excellent after-sales service is one outstanding USP in the consumer electronics sector. Knowing this, MEDION attaches great importance to its supply of spare parts. Supplying these parts for this range of products is subject to particular requirements, resulting from short product life cycles, expensive spare parts, and an almost unpredictable demand for spare parts. However, with the aid of the ERP add-on “DISKOVER SCO”, MEDION now uses an intelligent and innovative solution for determining stock requirements.

MEDION AG is one of the very few companies (in Germany or worldwide??) with an extensive portfolio of consumer electronics and information technology products. Its product groups focus on three areas:

- PC/multimedia (e.g. personal computers, notebooks, TFT monitors, scanners, printers and software)
- Consumer and household electronics (e.g. televisions, flat screens and plasma screens, DVD players/recorders and hard disk recorders)
- Communication technology (including satellite-based systems, decoders, telephones, fax machines and telephone answering machines).
Figure 1

The requirements for spare parts management at MEDION are characterized by variety and short lifecycles on the one hand and high availability and reliability on the other.

MEDION is a company that “builds to order,” meaning that it only produces in the required quantity on actual orders from its trading partners, who in turn sell those products on campaigns. The advantage of this production strategy is that there are no storage costs; a saving which the company passes on to its customers, thereby offering them a particularly good price-performance ratio. This strategy also ensures that the company’s products are always up-to-date. Geographically, MEDION has a strong market presence not only in Germany, but throughout the Euro-zone, as well as in Scandinavia and the United Kingdom. In association with its trade and cooperation partners it additionally has a number of very well-positioned professional distribution and customer care units it can rely on.

After-sales service — one of the highlights of MEDION’s offerings

You might think that such a business is quite simple: all it takes is to draw up some product ideas and then sell, produce and deliver the products. This is not the case. A particularly important part of MEDION’s overall service for trading companies and manufacturers is its own after-sales service for consumers; its partners therefore don’t need to worry about this aspect of the business at all. A 365-day hotline at the company’s own call centre provides expert support on matters relating to use, warranty processing and repeat orders. MEDION also carries out any repairs that might be necessary, and for specific products it sells in Germany, it instructs an on-
site service providing advice or carrying out repairs if need be. MEDION also ensures that spare parts are available to satisfy its customers’ needs, quickly resolving their technical problems, and as a result underlining the quality of the brand when it comes to customer care.

**Storing products without stock**

Obviously, MEDION cannot fully abandon holding stock, as special importance is attached to stocking the right quantity of spare components. The particular challenge lies in the fact that it is impossible to reorder spare parts throughout the whole warranty period, for components are discontinued by manufacturers well before the warranty period of the final product expires. Motherboards for PCs for example are often only available for delivery with identical component parts for a few months. Also plastic housings for notebooks are often only available during production. The right hinge, for instance, therefore has to be ordered in good time in case it is broken during the warranty period as, MEDION has to ensure that the spare parts are held in stock for the remainder of the warranty period. At this point, there is hardly any information on the pattern of demand for spare parts, as customers have not been using the products for long. There are two risks present here:

1. If the stock is too low, the spare parts will run out and the customers’ equipment cannot be repaired any longer.
2. If the stock is too high, MEDION may be left with high stock levels at the end of the warranty period, increasing its costs considerably.

The question is therefore, how to solve this dilemma?

![Figure 2: The bathtub curve](image)

The “bathtub curve” divides the demand for spare parts into three phases:

- **Phase 1** is characterized by early failures that occur during initial use of the end product.
- **Phase 2** has a low demand for spare parts; in this phase the products are normally stable. In **phase 3**, parts typically fail due to increased wear and tear or ageing. Analysis at MEDION has shown though, that this curve
does not tally with the actual failure behaviour of components and so is not suitable for forecasting demand.

An analysis and evaluation of various time series of consumption values for spare parts highlighted the problem. Due to the extremely short consumption periods (< 6 to 12 months) and rather erratic demand, classic methods such as the mean average, exponential smoothing and median were neither suitable for forecasting, nor could they offer any advantages compared to the methods used previously.

A closer inspection of past projects followed, including an analysis of the time series of consumption values with regard to the parts’ failure behaviour. Particular types of failure patterns emerged in the process; a total of five different types were identified and assigned to so-called standard curves. Mapping the components to a standard curve depended on how the failure rates turned out in the initial usage period, in the middle and at the end of the warranty period (cf. figure 3, standard curves). It came as no surprise that the failure patterns were not necessarily assembly-specific. Electronic components, for example, were found in all areas as were mechanical components, so the standard curves could not simply be assigned by product group. Particular rules and indicators had to be used instead.

In image 3: Examples of standard curves: failure patterns can differ greatly, making demand planning enormously difficult.

In a second step, methods were developed to show how these standard curves may be used to forecast the demand for spare parts. As this was a very complex task
involving lots of calculations, SCT GmbH developed a prototype of an analytical module within its software tool DISKOVER SCO especially for this task. This module allowed processing the failure data and, more importantly, forecasting demands which are based upon the standard curves.

By assessing the first phase of the consumption period, users of the tool can assign the most suitable failure pattern to the spare part and calculate the demand expected during the warranty period. There are, however, options allowing the user to adapt the forecast, in which case the tool also displays the user’s high know-how, basing the forecasts on the standard curve. The user may also stretch or compress the curve or reweigh the consumption periods by simple clicks. The tool is very chart-oriented and provides information on the consumption and demand situation very quickly.

The project concluded by validating the methodology. Forecasts of historical data, using the new tool and methods, were compared with the forecasts using the method previously applied.

The result was clear: Forecasts for the demand of spare parts using the new methodology were much more accurate than the previous forecasts. In particular, the cover for residual demand was improved by a double-digit percentage figure, notably enhancing the service level on the one hand and reducing stocks on the other. This project delivered a double success.

**Process Automation**

In the meantime the new methodology has been incorporated into the standard DISKOVER SCO product to optimize forecasting and scheduling, so that the relevant functions can be used for spare parts management with the standard software.