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# Manufacturing excellence without forecast-driven MRP

**Martin Alexander explains how Stannah Stairlifts Ltd copes with the day-to-day management of its complex operation.**

**S**tannah Stairlifts Ltd is a business-to-consumer and business-to-business manufacturer, with 62% of its output channelled to distributor-led export markets. Business is good despite the turbulent economic climate, where the ageing population helps to ensure that demand is continuous and steady. However, the company cannot become complacent, so Stannah invests heavily in its R&D, engineering and process improvement activities. The adoption of modern Demand Driven principles is one process improvement that Stannah is in the middle of implementing.

## What we make and how

Somebody with no prior knowledge of stairlifts would be forgiven for thinking that Stannah's product range might be relatively narrow; but in fact, a stairlift comprises three key components, and each has a multitude of product variants.

All stairlifts are supplied with a number of kit either for aesthetic customisation or to meet a user's particular need – for example, leather, vinyl and woven upholstery designs are available in a multitude of colours. Then there are seatbelts, wall-mounted controls, hinges, audio/visual alarms: the list goes on. All of this means that each stairlift shipped out of Stannah's factory is configured to an exact specification that meets the end-user's needs, and no two stairlifts are ever exactly the same.

With so many stock keeping units (SKU), it is perhaps surprising that Stannah is able

to maintain an on time in full metric just shy of 100%. The ability for Stannah to promise a despatch date within a competitive lead-time helps its distributors to guarantee an installation date to an end-user and create a reliable installation schedule.

## Mitigating variability

Customer lead-time varies according to the type of stairlift. Curved stairlifts are typically six to ten days from order to despatch, where the cycle time to design and manufacture the bespoke rail is relatively long. Straight stairlifts, with no design process and short manufacturing cycle time, are typically despatched in two to three days, and sometimes the very same day where the need is urgent.

All other stairlift components are SKUs, rather than bespoke products. Stock of the 138 chair and carriage SKU has turned approximately 70 times in the last year, meaning that chairs and carriages spend an average of three days in stock before they are sold.

There is rarely a stock-out for either finished goods or component stock. This is achieved by the strategic positioning of independent inventories to decouple the supply chain and buffer each segment from variability. The hard part for Stannah is knowing how much of each product to stock.

For Stannah, demand variability is relatively low at the aggregate stairlift level, with slight seasonal variation when sales deviate from the average on the run

up to Christmas. However, drill down to the SKU level and variability becomes more problematic. In 2011, the company started to offer its customers more choice, resulting in a proliferation of chair models and variants. This made forecasting even more time-consuming and error prone, so it was decided to change to production scheduling and inventory management.

## Push to pull and visual management

Before 2011 a planning department would spend considerable time each week manually creating the master production schedule: a statement of what will be manufactured and when. Despite the planners' best efforts, their weekly production plan would usually be rendered unusable almost as soon as it was issued, with regular expediting required as a result of an inaccurate forecast.

To try to overcome the problem of frequent stockouts and expediting, Stannah implemented a simple pull system between its assembly facility and finished goods warehouse. This involved configuring its ageing ERP system to generate hourly production orders that replenish the current stock-on-hand quantities back to target stock levels. Those orders are displayed on touchscreens at stage one of the assembly cells, with a simple red, amber or green status indicating the relative priority of the work. To provide managers and planners with visibility of the bigger picture and to help identify any adverse trends, a web

app was developed to display rolling historical stock charts – see Figure 1.

This simple change eliminated traditional production planning, freeing up the planners' time to focus on inventory optimisation instead. Simple statistics were used to recommend robust yet lean inventory targets. For the first time, Stannah began to hold the right amount of the right products and started to ensure that its production was always in line with its customer demand.

**DDMRP: the next evolution**

The 2014 IOM conference featured a presentation on Demand Driven material requirements planning (DDMRP), showing the results of a recent implementation at an FMCG company. What was interesting to me was that at Stannah we had already adopted many of the principles being demonstrated, yet it seemed many other companies had not.

What DDMRP does is pull together all of the supply chain processes and combine them into a single, simple and effective planning and replenishment methodology. DDMRP is defined as: 'a multi-echelon materials and inventory planning and execution solution.' Its fundamental premise is that all benefits will be directly related to the flow of relevant information and materials, and that by protecting and promoting flow, companies can maximise their return on investment – see Figure 2.

I attended a Certified Demand Driven Planner course that proved that Stannah had made some steps in the right direction back in 2011, but also showed there was a clear case for the adoption of a fully fledged, enterprise-wide DDMRP implementation, something that Stannah is now working towards.

The opportunities for further improvement are very exciting. Examples include:

- An improved method for buffer sizing, where red, yellow and green zones are calculated from demand variability, consumption over lead-time, and minimum order size, and account is taken of stock on order as well as on hand – see Figure 3
- An improved method for selecting the most appropriate replenishment technique – for example, level schedule, Demand Driven or make to order – using demand volume and historical variability data

- An improved method for triggering execution (the net flow equation) that takes into account any qualified demand spikes on the horizon, such as distributor bulk orders, to provide a buffer penetration prioritisation measure – see Figure 4

**Our DDMRP pilot**

DDMRP's methods are applicable to any type of supply chain segment, whether in purchasing, operations or distribution – see Figure 5. To prove this concept, in April 2016 Stannah piloted DDMRP between its finished goods warehouse and its supplier of upholstery, Global Upholstery Solutions Ltd (GUS). The pilot project was a big success for GUS, which benefited from clear prioritisation of work and smooth, predictable demand allowing maximum efficiency of its own operation. Stannah has benefited from a much improved service level from GUS, meaning that picking operatives nearly always have stock to pick from.

**Plans for the future**

Stannah is in the process of developing a new open source ERP system. The new IT system will enable the automation of data-intensive tasks that are currently completed using spreadsheets, meaning those tasks can be completed more frequently, the prime example being the recalculation of target stock levels for Stannah's 250+ made-to-replenish SKUs. This will provide time savings and help to ensure that any changes in customer demand patterns are responded to quickly.

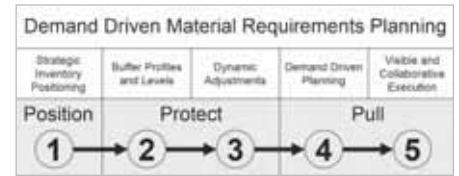
Although it is already 'demand driven' in its replenishment of the downstream warehouse, the Stannah's Andover assembly facility will see an improvement in how work is prioritised, with DDMRP factoring in any demand spikes on the horizon.

However, the biggest opportunity is the adoption of DDMRP principles throughout the end-to-end supply chain. Overseas subsidiaries will use the same ERP platform as the Andover site, so it will be possible for those customers' warehouses to be replenished using the exact same logic as used to replenish the Andover warehouse. Distributors will therefore benefit from a reduction in forecasting and replenishment planning effort, as well as an improved inventory and service performance.



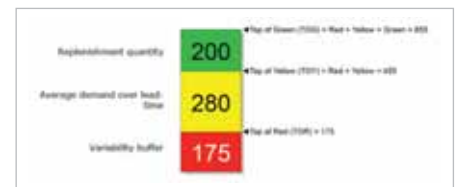
**Internally developed stock chart web app**

Figure 1



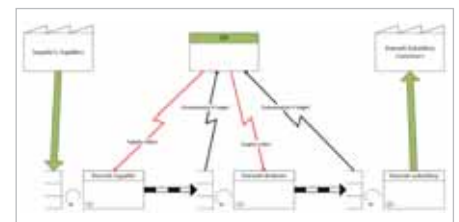
**The five components of DDMRP**

Figure 2



**DDMRP buffer sizing**

Figure 3



**The net flow equation components**

Figure 4



**Enterprise-wide DDMRP**

Figure 5

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