DRIESCHER increases throughput and at the same time improves adherence to delivery dates

CUSTOMER

Fritz Driescher KG
D-41488 Wegberg

PROJECT

New logistics business model and market-synchronised value stream

CASE STUDY

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Increasing market fluctuations and variant diversity as well as shorter delivery times with delivery dates that could not be postponed caused a lot of extra work and unrest in production and final assembly at Fritz Driescher GmbH & Co KG in Wegberg. In addition, there was a great deal of manual control work in the scheduling department with the resulting loss of efficiency. Together with the experts from Abels & Kemmner, the management redesigned the logistics business model and set up a market-synchronous value chain from component production to final assembly.

High vertical range of manufacture across plants

Production was characterised by a very high vertical range of manufacture, with order-related component production supplying the components required for the final assembly of switchgear and controlgear. Component production consisted of machining, the sheet metal processing centre, the robot welding centre, the powder coating plant, the small assembly and the support production (second plant). The final assembly department, in turn, assembled the switchgears and switchgear from the in-house manufactured components according to the order.

Initial situation

In order to survive on the market as the only medium-sized company in its sector, DRIESCHER.WEGBERG requires not only technically and qualitatively outstanding products, but also a high degree of flexibility when it comes to customer requirements - and this with extremely short delivery times and high adherence to deadlines.

Although the on-time delivery of the switchgear and controlgear assembled to order could be largely adhered to (the delivery dates are fixed and cannot be postponed), the deadline situation has become increasingly critical in recent years. Delivery dates could only be kept with great friction losses and great commitment of all involved. The previous logistical business model was in the form of order-related component production and order-related material provision for final assembly. Due to market fluctuations, the increase in the number of variants and shorter delivery times, this logistical business model now reached its limits.

About >>>

Fritz Driescher KG in Wegberg is a medium-sized company specialising in the development and construction of switchgear and controlgear for the power supply industry.

The product range includes medium-voltage switchgear (SF6 gas and air insulated), medium-voltage switches (outdoor and indoor), transformer stations, low-voltage switchgear as well as high- and low-voltage fuse-links.

www.driescher-wegberg.de

Furthermore, the order centre had to compensate for the lack of detailed capacity planning and partial scheduling of component production dates in the past by manual prioritisation.

The result was a constant need for coordination between component production, the central warehouse, final assembly and the order centre; an almost impossible task due to the complexity of the products and the variety of parts.

As a result, components were constantly missing in final assembly, which led to the temporary

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especially machining, struggled with high order backlogs and long lead times. Thanks to the great flexibility of the working time accounts in component production as well as the relatively high proportion of standard parts produced, it was still possible to save the delivery dates at high cost and through large stocks.

In order to be able to continue to manufacture, assemble and deliver economically, quickly and on schedule, a new optimised logistical business model was required, which would also give DRIESCHER new competitive advantages.

Good conditions for 80/20 levelling

Before the conception and implementation of the optimised logistics business model, the actual situation was analysed in detail. A portfolio analysis of the individual parts made it clear that a large part of the production utilisation (approx. 69 %) is carried out by only approx. 10 % of the parts that are needed on a fairly regular basis and are thus well suited for a so-called pull control according to the supermarket principle.

The remaining 90 % of the parts to be produced occupied the remaining third of the production capacity. Thus, 80/20 levelling in production was the core element of the new logistical business model. In order for this 80/20 levelling to function smoothly, however, a number of prerequisites had to be checked or created.

For example, it had to be ensured that a corresponding production capacity was kept free in the medium term for the order-specific parts so that these parts could be produced without a queue if possible.

Furthermore, it was necessary to examine,

- how the XY or Z articles are distributed to the different machines in the different production areas,
- how evenly the capacity load with XY parts on the one hand and Z parts on the other is over time,
- whether the material flows can be physically separated in part by assigning separate machines to the Z-parts,
- whether line production can be set up for different material numbers.

As the results of the analyses showed, the existing capacities in the various production areas were sufficient over time to produce both the XY articles to be stocked and the Z articles to be manufactured on an order-related basis on schedule. A separation of the material flows between XY and Z articles or even a line production on different material numbers was not necessary or meaningful.

Full production hoppers had to be emptied

However, a lead time analysis in component production showed that despite a balanced inflow and outflow of production order hours, there were too long order queues in front of the different capacity units in production, which were mainly responsible for the long lead times. The work

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backlog averaged 21 working days and led to major problems with on-time delivery in component production.

In order to position the component production correctly from a logistical point of view and to align it with short throughput times and high adherence to schedules, the stock in circulation in the component production had to be reduced with the following direct measures:

- The manufacturing work-in-progress was reduced to the new required target level by temporarily increasing manufacturing capacities through additional and ghost shifts as well as outsourcing orders.
- A personnel capacity control system was developed and installed that shows the short-term personnel capacity requirements for the various sub-areas of component production. With this instrument, the production management could and can shift employee capacities according to the current production needs and precisely schedule the temporary work capacities in terms of time and quantity.
- Production orders were only dispatched on time and no longer prematurely.
- As a matter of principle, production orders were no longer scheduled back into the past.
- Over the course of six months, these measures succeeded in reducing production order lead times to an average of four days.

Furthermore, the planning and control in the disposition with the Baan 5 ERP system as well as the work organisation in the final assembly and the component production were analysed in detail and evaluated in terms of data technology within the scope of the as-is analysis.

New logistics business model:

Once a production situation has gotten out of hand like this, the situation can only be remedied by properly balancing the production chain in terms of capacity and orders. Based on the results of the as-is analysis, the consultants defined and designed the new logistics business model and the necessary fields of action. The goal was to adapt the logistics business model to the market requirements and to build a market-synchronous value chain.

Accordingly, the definition of the fields of action and packages of measures associated with the new logistics business model and to be implemented looks like this:

Final assembly:

- Two-bin Kanban for XY and some Z parts on the supermarket shelves in final assembly.

Component production:

- Systematically reduce component production lead times,
- build operational capacity management,
- 80/20 levelling of production capacities for standard parts (XY) and order-specific (Z) parts,
- Pull control for part of the standard components (XY parts),
- Push control for the order-specific parts (Z parts).

"Hare" and "Hedgehog" strategy in component production

As the actual analyses confirmed, the article structure was ideally suited for 80/20 levelling. Whereas all articles were previously manufactured to order and only stored according to batch size, the AB/XY articles ("hedgehog articles") are now stored under the new logistical business model via pull control (via Kanban) in the central warehouse or on the supermarket shelves of the final assembly. The big advantage is the now more continuous utilisation of capacities.

Despite this new stock level for the AB/XY articles, the stock levels could be reduced. All articles to be manufactured on an order-related basis can thus be produced prioritised with short lead times and fast availability ("rabbit articles") (push production via production order in the ERP Baan 5 system).

Pull control via Kanban

Pull control via Kanban was set up for the regularly consuming articles. For this, a corresponding extension for Kanban control had to be programmed in the Baan 5 system. This was also necessary for the two-bin Kanban system in the final assembly.

Today, the kanban cards of the empty containers of the component production are scanned in the central warehouse and the yellow and red areas of the kanban board are monitored electronically in Baan.

If the red zone is reached, component production must start production; if the yellow zone is reached, it can do so. Additional flexibility in component production has thus been created via the yellow range in order to optimise capacity utilisation.

Operational capacity management

A simple Excel Access application also helps to set up capacity planning based on Baan 5 data for all production capacities. Capacity requirements (machines/personnel) are now monitored based on the production requirement dates for each production stage. This means that current and future bottleneck situations are immediately visible and can be actively dealt with and thus avoided in most cases.

Two-bin Kanban for XY and some Z parts on the supermarket shelves in final assembly

In the past, the central warehouse provided all components for the order-related assembly of the switchgear and controlgear for the final assembly. Due to the large number of items required for a switchgear and the problems in component production, the final assembly often had to deal with missing components. As a result, the employees could not finish the partially assembled switchgears and had to temporarily store components, which led to space problems and frequent material searches.

Under the new logistical business model, all XY and also some Z items in the final assembly are stored in a two-bin Kanban system. For this purpose, the final assembly was rebuilt in such a way that each of the eight assembly areas could have its own Kanban shelves and pallet spaces. If a container is empty today, a transfer order is generated in the central warehouse by scanning the corresponding

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barcode. The empty container has to be refilled within two working days. During this restocking time, the employees help themselves from the second Kanban container with the required components.

This system makes it possible to supply the final assembly with standard components with a delivery readiness of over 98 % in some cases. An enormous reduction in stock removal processes also relieved the central warehouse in particular. In the transfer processes from the central warehouse to the final assembly, the central warehouse now prioritises the order-related components, just like the component production, which in turn has led to a high availability of all components in the final assembly. In final assembly, a total of 3,176 items have so far been converted to the two-container Kanban system for the eight assembly areas.

In order to avoid the problem of switchgear that cannot be assembled to completion and its interim storage with subsequent material search, the material provisioning (picking reports) for the order-related manufactured items was also reorganised in Baan in such a way that transfer orders to final assembly are now only carried out if 100% material availability of all components for an assembly order is given.

Set of rules, MRP parameter optimisation, monitoring of production segmentation

In order to efficiently carry out the push and pull control for component production and the two-bin Kanban system in final assembly, the planners and schedulers regularly readjust the planning, control and scheduling settings in the Baan 5 ERP system on an item-specific basis. The "operating point" is always readjusted so that the value chain functions at minimum cost.

In order to achieve this, a set of rules for optimising the system settings (technical jargon: MRP parameter optimisation) had to be developed. In the set of rules, the parameter settings such as push/pull control, degree of readiness for delivery, safety stock, ordering method, etc. were defined for the individual article classes (ABC/XYZ/ELAN/etc.).

The entire range of articles that the order centre is responsible for is structured as follows

- components with reasonably consistent demands, and
- Components with a low degree of repetition, sporadic demand behaviour or customised parts.

While the first group of parts is controlled via Kanban organisation, the second group continues to be controlled conventionally in order to avoid unnecessary inventories and still meet delivery deadlines and further shorten delivery times.

The application of the set of rules to all articles and the determination of the parameter setting to be changed in the Baan 5 ERP system can no longer be done manually. The effort required for this would be far too great.

Automated dispensing parameter maintenance using the DISKOVER system

Due to the variety of system settings to be changed, this is now done with the help of the DISKOVER software, which was also used for the analysis of the actual situation and the simulation of different scenarios.

With the help of DISKOVER, planners and dispatchers can also perform three other important tasks regularly, efficiently and semi-automatically in addition to scheduling parameter optimisation:

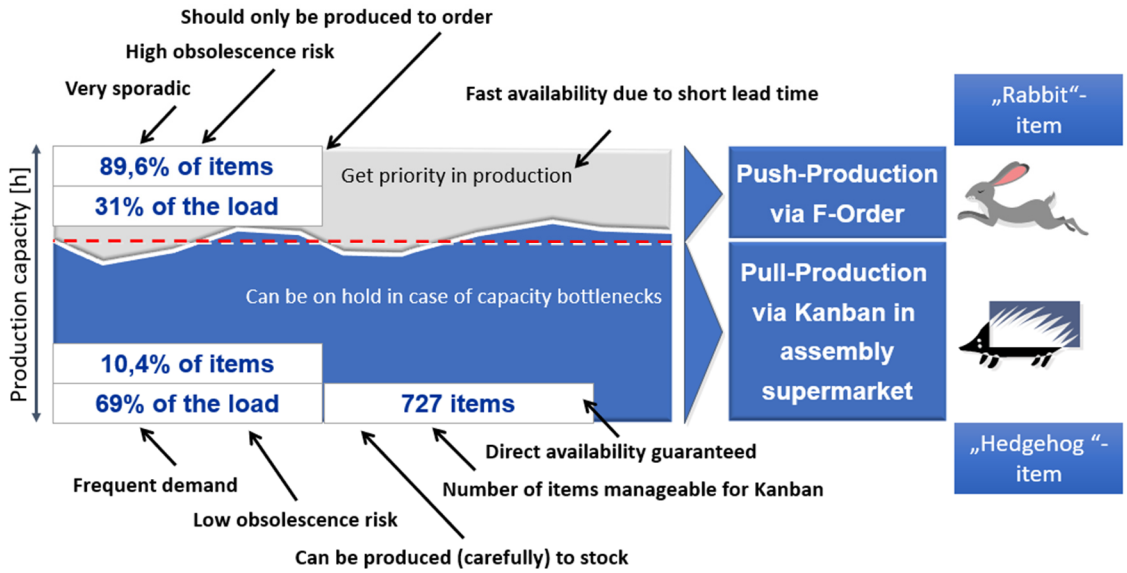
1. checking the push/pull items for component production as well as for the two-bin Kanban items of the supermarket shelves in final assembly. Which articles have to be taken out of the Kanban system and which have to be converted to Kanban is determined by DISKOVER and provided in the form of a report.
   This regular maintenance is necessary to ensure that the right parts are controlled in the kanban system and the right parts in the push system in the future. Without this maintenance, the entire production system would become unbalanced in the medium term.

2. readjustment of the 80/20 levelling. In order to keep the 80/20 levelling in balance, DISKOVER determines how much production capacity must be kept ready for the customer-specific push orders and which capacities can be used on average for kanban production. Depending on the available kanban capacity, the following is then done

3. the re-dimensioning of the Kanban items. This involves determining and simulatively checking how large the item-specific circulating stocks and thus the number of kanban cards per kanban item must be. Too many cards cause unnecessary stocks, too few cards lead to delivery readiness problems.

4.

The principle of organizational production segmentation (80/20 leveling) differentiates between regular and irregular requirements



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Practical experience and successes

The new logistical business model and the market-synchronised value stream have led to a great deal of calm at DRIESCHER.WEGBERG in component production, the central warehouse and final assembly. The high delivery readiness in final assembly, the great adherence to schedules and the increase in throughput in component production - without capacity expansion - as well as the high acceptance and satisfaction of the employees are proof of this.

The Kanban-controlled items have become so-called self-running machines that only need to be checked and readjusted at regular intervals; the order centre, production, central warehouse and final assembly can concentrate on the components to be manufactured on an order-by-order basis.

With the implementation of the new logistics business model, DRIESCHER.WEGBERG has significantly strengthened its competitive position in the market, which is impressively reflected in the disproportionate growth in incoming orders.

Kanban shelf

Final assembly

Supermarket shelf

Final assembly

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