

CASE STUDY

Reference Arvato Supply Chain Solutions, Germany:
System Extension with Innovative Storage and
Picking Solution for Powerful Publishing Supply

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BERTELSMANN
Supply Chain Solutions



SSI SCHAEFER



PREPARING FOR FURTHER GROWTH TOGETHER - SPACE-SAVING, INNOVATIVE, AND FUTURE-ORIENTED

Be it books for children or teens, novels, biographies, art books, or specialist literature – demand for books remains high. That much is clear given the business growth of the Vereinigte Verlagsauslieferung (VVA) in recent years. The publishing supplier reached its limits in terms of performance and capacity at the site in Gütersloh and so the decision was made to modernize and expand the existing system together with SSI SCHAEFER. With its patented 3D-MATRIX Solution® the reliable partner SSI SCHAEFER was the only company able to implement an innovative and powerful solution in combination with optimal space utilization.

As a partner and service provider, Arvato Supply Chain Solutions (SCS), with its Vereinigte Verlagsauslieferung VVA, supplies small and large bookstores around the world working for more than 200 publishers, all from its three sites in Gütersloh, Verl, and Gilching. In the central logistics center of the Bertelsmann subsidiary in Gütersloh alone, there are around 70,000 different items in storage - in addition to books, CDs, and DVDs, there are also magazines, calendars, stationery, and toys. Alongside conventional logistics services such as warehousing, picking, transport management, and comprehensive value-added services, Arvato SCS develops and operates complex global supply chains, e-commerce and IT platforms, omnichannel solutions, and digital distribution models for its customers.

As a global solutions provider of modular warehouse and logistics systems, SSI SCHAEFER were already responsible for the automation project for the VVA back in 2006.

At that time, a 4-aisle automated small parts warehouse (ASPW) with 24,000 container storage locations, a static rack system with 14,000 storage locations, and 24 SSI Carousel systems with around 26,000 container storage locations for highly dynamic individual parts picking were built in Gütersloh.

The expansion of the existing logistics system is the follow-up project. Based on the longstanding partnership, SSI SCHAEFER was able to implement an optimized, future-proof, and energy-efficient solution to improve space efficiency, capacity, and performance. This consisted of the automated shuttle warehouse for small parts, which has been designed using the patented 3D-MATRIX Solution®, and innovative work station systems, which are subject to the highest ergonomic standards. Furthermore, the solution is scalable and can be flexibly adapted to meet future requirements.

The innovative storage and picking system has used space efficiently occupying just 900 m², with the system processing around 16 million books per year.





SUSTAINABLY EXPANDABLE LOGISTICS SOLUTION

SSI SCHAEFER developed a modular concept of a highly dynamic material handling system for Arvato SCS.

An innovative solution was needed to cope with increased throughput requirements as the number of articles grows and structures become increasingly small-scale. Existing material handling systems, processes, and material flows should be maintained from a sustainability perspective. In addition to the optimal usage of existing premises, it was a matter of

planning the expansion in a way that ensured it could take place during ongoing operation. It was vital that the business wasn't impaired at any point. With a view to being future proof, the new system needed to be flexibly scalable in order to depict future developments efficiently.



“It’s a solution that guarantees us maximum flexibility and performance. This is where SSI SCHAEFER offered us something truly unique, with the optimal performance-to-space ratio. We were able to achieve our aims of boosting productivity and technical performance thanks to the innovative and, above all, space-saving warehouse solution.”

Harald Horstmann
Vice President Publisher at
Arvato Supply Chain Solutions

PROJECT OBJECTIVES

- Performance: modular logistics concept to cope with increased throughput requirements as the number of articles grows and structures become increasingly small-scale
- Future proof: flexibly scalable solution for future growth
- Retention and connection of existing systems, and optimal use of existing space
- Realization of extensive expansion measures during ongoing operations without impairing business
- Ergonomics: ergonomic handling of all articles and pleasant working according to the ergonomics@work!® principle



At order start, order containers or cartons are removed automatically

FLEXIBILITY AND PERFORMANCE IN A NEW DIMENSION

Innovative and space-saving storage and picking solutions boosting productivity and technical performance.

The project was executed in three steps altogether; to be able to implement the planned expansions, the order start in the old system first had to be transferred and automated extensively. Then the direct conveying system connection to the fully automated high-bay warehouse was established for both the existing and future storage and picking systems. The third and most important project step was finally the construction of the shuttle warehouse including the accompanying work stations.

The automated high-bay warehouse with a total of 60,000 storage locations predominantly stores single-item book pallets. It serves as a supply depot for the automated small parts warehouse (ASPW) and the picking systems. As part of the expansion project, SSI SCHAEFER completed a retrofit of the system and converted the eight depalletizing work stations according to the latest ergonomic standards. Here, the books are repacked into single-item storage containers and transported to the ASPW, the connected SSI Carousel systems, and the new shuttle warehouse via the conveying system.

The picking warehouses are connected to the central order start. If the IT system releases an order, the designated picking container or carton is removed from the buffer lanes automatically and moves toward the predetermined picking area.

In warehouse management, Arvato SCS differentiates between anything from fast movers to D-items by process. Employees remove D-items from static racks by hand according to the multi-order picking procedure and place them in the order picking trolley for that order. Orders that contain B- or C-items are picked according to the goods-to-person principle. The Advanced Pick Station two-level work stations are located in the middle between every twelve SSI Carousel systems on the opposite side. Several orders are handled at the same time at these work stations. Fast movers, such as the latest titles from bestseller lists, are primarily picked from flow channels at optimized Pick by Light work stations. The channels are replenished directly from an ASPW aisle by the storage-retrieval machine.

Complete order picking is possible at a single work station (one-stop-pick solution) in the new automated SSI Flexi shuttle warehouse because every work station has access to the entire range of items of the 3D-MATRIX Solution®.

As many as four orders per station can be picked at once directly into shipping cartons. If an order can be finished in this area, it will then be transported directly to the order dispatch area. Otherwise, the order will move on to the other picking areas (ASPW or SSI Carousel system) for finishing. These areas are connected by the conveying system.

Once picking has been completed, the weight will be checked before the order is finished in the order dispatch area. Here, the employee prints the order papers, fills the empty space in the carton with packing material, and attaches the shipping label to the carton, which is then transported to goods-out on the conveying section.



Transport of the order container or carton to the predetermined picking area



Advanced Pick Station one-level: picking of as many as four orders simultaneously at a single work station



One-stop-pick solution: complete order picking at a single work station



Fast material flows on the vertical level thanks to integrated lifts

OPTIMAL PERFORMANCE IN LIMITED SPACE

The storage cube for the new shuttle warehouse is located in a 24-meter-high extension of the high-bay warehouse and has been designed using the patented 3D-MATRIX Solution® from SSI SCHAEFER. This gives Arvato SCS a future-proof solution for automated storage, buffering, and integrated sequencing of order processing. For instance, decoupling individual processes along the horizontal and vertical axes prevents bottlenecks during storage and retrieval. Now, 84 integrated SSI Flexi type single-level shuttles facilitate efficient storage and retrieval processes. 20 integrated lifts ensure fast material flows on the vertical system level.

The system expands the capacities of Arvato SCS in automated storage containers available on an ad-hoc basis to a total of more than 60,000 locations. In order to deal with volatile order fluctuations and future developments provisions have already been made in the shuttle warehouse for a potential expansion to include as many as eight aisles. The innovative shuttle technology featuring super capacitors as an energy storage system ensures optimal performance with maximum energy efficiency.



Ergonomics and social responsibility in close collaboration

In addition to the performance and flexibility of the system, there was a focus on the ergonomics of the work stations. Arvato SCS has developed a corresponding concept together with its employees, SSI SCHAEFER, the Technical University of Darmstadt, and the start-up cellumation to increase ergonomics.

The solution comprises special work stations to which source and target containers can be delivered on one level and from which pickers can process orders ergonomically. The new work stations on the shuttle warehouse are multifunctional and, in addition to order compilation, enable returned goods to be re-sorted. To further boost the ergonomics and optimize the working environment, the partners also make use of the solution's individually adjustable working heights, ergonomic arrangement of the widgets, optimal presentation of the information, and touch-friendly materials. The system boosts the number of goods-to-person picking stations by 60 %.



“The central elements of innovation and sustainability are reflected in this jointly developed solution: flexible, powerful, future-proof, space-saving, energy-efficient, and ergonomic - these are all target attributes that we managed to successfully combine.”

Harald Horstmann
Vice President Publisher at
Arvato Supply Chain Solutions

Maximum ergonomics at specially designed work stations

FACTS AND FIGURES

System Key Figures

Logistics area	75,000 m ²
SKUs	approx. 70,000
Article types	Books, audio books, magazines, CDs, DVDs, calendars, stationery
Copies / year	approx. 90 million
Shifts / day	2; 3 during season
Working hours / shift	8

SSI SCHAEFER Scope of Supply and Services

Planning and implementation

- Conception
- Creation of logistics concept
- Simulation and implementation planning
- Visualization

Existing system (1980/2006)

Steelwork: Automated high-bay warehouse (HBW)

Number of HBW	1
Storage locations	60,000
Aisles	14
Loading aids	Euro pallets
Storage type	Single-deep

Automated small parts warehouse (ASPW)

Number of ASPW	1
Storage locations	24,000
Aisles	4
Loading aids	Containers (LTF 6220)
Storage type	Double-deep

Static rack

Storage locations	14,000
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Picking systems and work stations

Pick by Light	6 work stations with flow rack
SSI Carousel	24 carousels with around 26,000 container storage locations
Advanced Pick Station two-level	8 goods-to-person work stations designed according to the ergonomics@work! [®] principle

Conveying system

Carton and bin conveying system	2,200 m belt, strap, and roller conveyors
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System extension (2019)

Automated shuttle warehouse

Number of shuttle warehouses	1
Size	900 m ²
Storage locations	38,000
Loading aids	Containers (LTF 6220)
Aisles	2, potential expansion to include as many as eight aisles
Shuttle	Single-level shuttle SSI Flexi
Number of shuttles	84
Number of lifts	20
Design	3D-MATRIX Solution®
Picking capacity	approx. 16 mio. copies / year (actual output)

Picking systems and work stations

Advanced Pick Station one-level	5 goods-to-person work stations designed as one-stop-pick solution according to the latest ergonomic standards
Depalletizing work stations	12 (8 retrofitted work stations, 4 additional work stations)

Conveying system

Carton and bin conveying system	1,100 m
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SIX REASONS FOR CHOOSING SSI SCHAEFER

- **Stability**

As a financially independent family business, SSI SCHAEFER is committed to long-term solutions. You can trust that our team of experts will be there for you today, tomorrow and in years to come.

- **Efficiency**

SSI SCHAEFER solutions are scalable and able to grow with your business. You can always upgrade or retrofit.

- **Quality**

As a systems specialist and original equipment manufacturer, SSI SCHAEFER provides tailor-made and high-quality solutions from a single source, specifically designed to meet your challenges.

- **Reliability**

Thanks to our worldwide Customer Service & Support network, SSI SCHAEFER ensures smooth operation of your system, both during and after installation.

- **Know-how**

SSI SCHAEFER solutions are always up-to-date with the latest technological standards and can be easily integrated into an existing (IT) landscape.

- **Internationality**

As a global organization, SSI SCHAEFER has local offices worldwide. With over 70 operative subsidiaries, our team of experts speak your language.

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