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Project praxpack

TYPIFICATION OF DIFFERENT STORAGE AND SHIPPING METHODS IN E-COMMERCE

Insights into the current situation

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praxpack

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1 Brief overview: Market structure

According to the HDE (German Retail Association) (2019, p. 6), the sales volume of the German online e-commerce amounted to 53.3 billion euros in 2018. The share of "clothing" and "electrical and electronic equipment" is about 25 % each; followed by the sectors "leisure & hobbies" (14.9 %), "home & furnishings" (9.3 %), "fast moving consumer goods" (FMCG) (8.4 %), "health & wellness" (6.3 %), "DIY & garden" (4.3 %), "jewellery & watches" (1.7 %), "office & stationery" (1.6 %) and "other" (4.3 %) (HDE 2019, p. 11).

Table 1 shows the 10 online shops with the highest revenue in 2017 and the respective main product segment:

Table 1: 10 Top-selling online shops in the B2C sector in Germany (according to EKUPAC 2018, p. 54)

No.	Company	Revenue (in Mio. Euro)	Product segment
1	www.amazon.de	8.122,9	Generalist
2	www.otto.de	2.743,4	Generalist
3	www.zalando.de	1.121,8	Clothing
4	www.notebooksbilliger.de	706,8	Consumer electronics
5	www.bonprix.de	586,6	Clothing
6	www.mediamarkt.de	532,8	Consumer electronics
7	www.cyberport.de	517,4	Consumer electronics
8	www.conrad.de	471,8	Consumer electronics
9	www.tchibo.de	450,0	Generalist
10	www.alternate.de	432,3	Consumer electronics

In contrast to the respective revenues of the online shops, there are only vague figures on the number of online retailers. The definition used for the survey or estimate (especially with digital products or without) is not usually specified.

According to Heinemann (2018), the following "business types" of online e-commerce can be distinguished:

1. pure online e-commerce
    a. Pure product sales
    b. E-Rentals (rental models)
    c. Subscriptions (e.g. Douglas Beauty Box on a subscription basis)
    d. Mitch & Match (linking the shopping basket to social media where members give feedback)

2. cooperating online e-commerce
    a. Cooperative retail platform (different manufacturers offer their goods on the same platform)
3. multi-channel retailing
    a. Online e-commerce in addition to bricks-and-mortar retailing
4. hybrid online e-commerce
    a. Online e-commerce in addition to catalogue business or teleshopping
5. verticalised online e-commerce
    a. Manufacturer-led

Table 2 lists specific examples of each of these types:

Table 2: Types of online e-commerce according to Heinemann 2018

Type	Example
Pure online e-commerce	Zalando.de, zooplus.de, reuter.de, thomann.de, aboutyou.de, amazon.de, ventepriveé.de
Cooperative online retail	ebay.de (without auction), Amazon marketplace, Otto marketplace, Zalando partner programme, Dawanda, Etsy
Multi-channel retail	thalia.de, douglas.de, breuninger.de, cunda.de, mediamarkt.de, hornbach.de, ikea.de
Hybrid online e-commerce	otto.de, bonprix.de, baur.de, klingel.de, QVC.de
Verticalised online e-commerce	nike.de, boss.de, esprit.de, spreadshirt.com, seidensticker.de, zara.de

2 Typification of different storage and shipping methods in online e-commerce

In the context of the subject matter and the objectives of the project, a typification of the various shipping processes that exist in practice was made in a dialogue with various industry experts. Shipping includes the following sub-processes

- storage,
- order picking,
- packaging,
- dispatch as well as
- transport and delivery of the goods.

In e-commerce, a basic distinction can be made between four different “shipping types”:

- Type 1: 100% stocking of the assortment by the online retailer.
- Type 2: Decentralised storage with order completion at the online retailer's location.
- Type 3: Decentralised storage with order completion at the online retailer's location and additional direct shipping by product supplier.
- Type 4: 100% Dropshipping model.

The different types are each briefly described below.

3 Type 1 – 100% stocking of the assortment by the online retailer

Storage

The product suppliers deliver the goods to the online retailer's warehouse. The number of packages delivered depends on which product group is delivered. Household appliances and electrical appliances are usually delivered in their article packaging as palletised goods. Whereas in the fashion sector, several parts of an article are delivered and stored individually packed in polybags in an outer box. Depending on the volume of the article (for example, down jacket vs. socks), the number of pieces per outer box varies. This key figure controls the number of packages used when goods are delivered and stored in the warehouse. Depending on the size of the online retailer and the structure of the internal logistics processes, there may be additional external/replenishment warehouses. The transfer between the different warehouses usually takes place in the supplier packaging or internal loading aids.

Order picking

Depending on the layout of the warehouse, there is an order-picking area with shelving and pallet spaces and pure storage areas. In the picking area, all products are stored that are usually picked daily. In the storage area, the replenishment or articles that are not ordered daily are stored. Before the picking sub-process can start, the stocks in the picking area are checked and replenished. For this purpose, the supplier packaging is then removed from storage / transferred from the external / replenishment racks. As a rule, the supplier packaging (X articles) is then stored in a storage location in the picking area.

Packaging

For a smooth and optimised storage process, the articles are usually stored in a polybag. This polybag has a sticker on it that identifies the item and is also used as a control instrument (e.g. for allocation to the customer order).

Usually, the online retailer has several shipping packaging types (such as bag and cardboard box) as well as sizes. The choice of appropriate shipping packaging depends on the actual item dimensions and product groups of the order. Household appliances and electrical appliances are usually shipped in their item packaging. Other goods in the online retailer's standard packaging.

The filling level and the number of shipping package(s) per customer order is significantly influenced by the purchase of the packaging materials, the product groups ordered and the item availability. Example: A customer order with a vacuum cleaner and a refill pack of vacuum cleaner bags usually results in two shipping packages (package 1 = vacuum cleaner in the article packaging and package 2 = shipping packaging online retailer with the bags). Whereas an order for two vacuum cleaner bag refill packs would be delivered in one shipping package.

Shipping

In the shipping process, the picked items are “married” with the shipping order, placed in the shipping packaging and then sealed. The consignment label required for the shipping service provider is printed in advance and affixed to the shipping packaging after this process. The franking is calculated earlier by the IT system on the basis of the ordered item data and made available to the shipping service provider as a pre-notification.

Transport and delivery

Depending on the specifications of the shipping service providers and the quantities of shipping packaging to be collected, the package is handed over to the shipping service provider either loose or in loading aids (e.g. pallets, corlettes). These loading aids are used by the shipping service provider to control its internal processes.

Returns

The items to be returned are handed over by the customer in their shipping packaging to the shipping service providers at decentralised locations (parcel shops, post office, etc.) and consolidated there. The return transport of all shipping packaging takes place loose or in loading aids (e.g. pallets, corlettes). This loading equipment is used by the shipping service provider to control its internal processes. As a rule, the returns are returned to the so-called dispatch warehouse, where they are assessed and put back into storage to start a new sales cycle. Depending on the online retailer, this sub-process also includes a “reprocessing process” (repair, items are placed in new item packaging, cleaning of the items). However, there is also the possibility that the returned items are delivered to an external service provider, who then takes over the sub-process of the returns inspection. Subsequently, the goods that are judged to be “saleable” are sent to the warehouse of dispatch. In both cases, goods that are “not saleable” are sent to a reseller or scrapped. The shipping packaging is then usually disposed of.

4 Type 2 – Decentralised storage with order completion at the online retailer's location

Storage

As a rule, the core assortment, so-called “fast-moving items” (goods that, according to the online retailer's forecast, sell well and quickly), or restocking from returns are kept in stock. Other product suppliers are delivered to the warehouse on a “just-in-time” basis. This means that a delivery is only made to the warehouse when an end customer has actually ordered this item. As a result, the number of parts per box fluctuates. The just-in-time items are not stored, but go directly to picking.

Order picking

Depending on the structure of the warehouse, there is a picking area with shelving and pallet spaces and pure storage areas. Everything that is usually picked daily is stored in the picking area. In the storage area, replenishment or items that are not ordered daily are stored. Before the picking sub-process can start, the stocks in the picking area are checked and replenished. For this purpose, the supplier packaging is then removed from storage / transferred from the external / replenishment warehouses. As a rule, the supplier packaging is then stored with the article in a storage location in the picking area.

In addition, in this model, certain articles are delivered just-in-time for picking and sorted according to order.

Packaging

For a smooth and optimised storage process, the articles are usually stored in a polybag. This polybag has a sticker that identifies the article and is also used as a control instrument (allocation to the customer order).

As a rule, the online retailer has several types of shipping packaging (bag, cardboard box), as well as sizes. The choice of suitable shipping packaging depends on the actual item dimensions and product groups of the order. Household appliances and electrical appliances are usually shipped in their item packaging. Other goods in the online retailer's standard packaging.

The filling level and the number of shipping package(s) per customer order is significantly influenced by the purchase of the packaging materials, the product groups ordered and the item availability. Example: A customer order with a vacuum cleaner and a refill pack of vacuum cleaner bags usually results in two shipping packages (package 1 = vacuum cleaner in the article packaging and package 2 = online retailer shipping package with the bags). Whereas an order for two vacuum cleaner bag refill packs would be delivered in one shipping package.

Shipping

In the shipping process, the picked items are “married” with the shipping order, placed in the shipping packaging and then sealed. The consignment label required for the shipping service provider is printed in advance and affixed to the shipping packaging after this process. The franking is calculated earlier by the IT system on the basis of the ordered item data and made available to the shipping service provider as a pre-notification.

Transport and delivery

Depending on the specifications of the shipping service provider and the quantities of shipping packaging to be collected, the package is handed over to the shipping service provider loose or in loading aids (e.g. pallets, corlettes). These loading aids are used by the shipping service provider to control its internal processes.

Returns

The items to be returned are handed over by the customer in their shipping packaging to the shipping service providers at decentralised locations (parcel shops, post office, etc.) and consolidated there. The return transport of all shipping packaging takes place loose or in loading aids (e.g. pallets, corlettes). This loading equipment is used by the shipping service provider to control its internal processes. As a rule, the returns are returned to the so-called dispatch warehouse, where they are assessed and put back into storage to start a new sales cycle. Depending on the online retailer, this sub-process also includes a “reprocessing process” (repair, items are placed in new item packaging, cleaning of the items). However, there is also the possibility that the returned items are delivered to an external service provider, who then takes over the sub-process of the returns inspection. Subsequently, the goods that are judged to be “saleable” are sent to the warehouse of dispatch. In both cases, goods that are “not saleable” are sent to a reseller or scrapped. The shipping packaging is then usually disposed of.

5 Type 3 – Decentralised storage with order completion at the online retailer's location and additional direct shipping by product supplier

Storage

In addition to type 2, other product suppliers are connected to the online retailer via IT. The orders for their articles are transmitted to them daily.

The share of the assortment in stock goods, just-in-time suppliers and direct shipping depends on the business model of the online retailer.

Order picking

Depending on the layout of the warehouse, there is a picking area with shelving and pallet spaces and pure storage areas. Everything that is usually picked daily is stored in the picking area. In the storage area, replenishment or items that are not ordered daily are stored. Before the picking sub-process can start, the stocks in the picking area are checked and replenished. For this purpose, the supplier packaging is then removed from storage / transferred from the external / replenishment warehouses. As a rule, the supplier packaging (X parts/articles) is then stored in a storage location in the picking area.

In addition, in this model, certain articles are delivered just-in-time for picking and sorted according to order. In parallel, there are picking processes ex product supplier that process their part of the customer order.

Packaging

For a smooth and optimised storage process, the articles are usually stored in a polybag. A sticker is attached to this polybag, which identifies the article and is also used as a control instrument (allocation to the customer order).

As a rule, the online retailer has several types of shipping packaging (bag, cardboard box), as well as sizes. The choice of suitable shipping packaging depends on the actual item dimensions and product groups of the order. Household appliances and electrical appliances are usually shipped in their item packaging. Other goods in the online retailer's standard packaging.

The filling level and the number of shipping package(s) per customer order is significantly influenced by the purchase of the packaging materials, the product groups ordered, the item availability and the proportion of direct shipping.

Shipping

In shipping processing, the picked items are married with the shipping order, placed in the shipping packaging and then sealed. The shipping label required for the shipping service provider is printed in advance and attached to the shipping packaging after this process. The franking is calculated earlier in the IT system on the basis of the ordered item data and made available to the shipping service provider as a pre-advice.

At the same time, the product supplier hands over his part of the order to a shipping service provider.

Transport and delivery

Depending on the specifications of the shipping service provider and the quantities of shipping packaging to be collected, the package is handed over to the shipping service provider either loose or in loading aids (e.g. pallets, corlettes). These loading aids are used by the shipping service provider to control its internal processes.

Returns

The items to be returned are handed over by the customer in their shipping packaging to the shipping service providers at decentralised locations (parcel shops, post office, etc.) and consolidated there. The return transport of all shipping packaging takes place loose or in loading aids (e.g. pallets, corlettes). This loading equipment is used by the shipping service provider to control its internal processes. As a rule, the returns are returned to the so-called dispatch warehouse, where they are assessed and put back into storage to start a new sales cycle. Depending on the online retailer, this sub-process also includes a “reprocessing process” (repair, items are placed in new item packaging, cleaning of the items). However, there is also the possibility that the returned items are delivered to an external service provider, who then takes over the sub-process of the returns inspection. Subsequently, the goods that are judged to be “saleable” are sent to the warehouse of dispatch. In both cases, goods that are “not saleable” are sent to a reseller or scrapped. The shipping packaging is then usually disposed of.

6 Type 4 – 100 % Dropshipping model

Storage

The various product suppliers are connected to the online retailer via IT and are informed of the orders for their articles on a daily basis. The online retailer has no physical stock of its own. Each product supplier stocks the items it offers to the online retailer. The physical process is analogous to that of the other types.

Order picking

Analogous to the previous types, the picking of ordered items is order-related. The special feature of the "dropshipping/marketplace" model is that this sub-process is carried out several times for a customer order. Example: A customer orders three different branded articles. This customer order becomes three individual orders for three product suppliers in the background. These carry out the picking process in parallel (three times).

Packaging

For a smooth and optimised storage process, the articles are usually stored in a polybag. On this polybag there is a sticker that identifies the article and is also used as a control instrument (allocation to the customer order).

As a rule, product suppliers have several types of shipping packaging (bag, cardboard box) as well as sizes. The choice of a suitable shipping packaging depends on the actual article dimensions and product groups of the order. Household appliances and electrical appliances are usually shipped in their item packaging. Other goods in the (neutral) standard packaging of the product supplier.

The filling level and the number of shipping package(s) per customer order is significantly influenced by the number of ordered items per product supplier, product groups and item availability. From the example mentioned under "Picking", three shipping packages with a quantity of 1 are generated in this model. Whereas according to distribution model type 1-3 they would have been combined into a single shipping package. Provided they are similar product groups.

Shipping

In shipping processing, the picked items are only "married" to the shipping order if several items from the same product supplier have been ordered. Otherwise, quantity 1 goes into shipping.

The consignment label required for the shipping service provider is printed in advance and affixed to the shipping packaging after this process. The franking is calculated earlier by the IT system on the basis of the ordered item data and made available to the shipping service providers as a pre-notification.

Depending on the number of product suppliers per customer order, the product supplier(s) hand over their part of the order to one or more shipping service providers.

Transport and delivery

Depending on the specifications of the shipping service providers and the quantities of shipping packaging to be collected, this is handed over to the shipping service provider either loose or in loading aids (e.g. pallets, corlettes). These loading aids are used by the shipping service provider to control its internal processes.

Returns

The items to be returned are handed over by the customer in their shipping packaging to the shipping service providers at decentralised locations (parcel shops, post office, etc.) and consolidated there. The return transport of all shipping packaging takes place loose or in loading aids (e.g. pallets, corlettes). This loading equipment is used by the shipping service provider to control its internal processes. As a rule, the returns are returned to the so-called dispatch warehouse, where they are assessed and put back into storage to start a new sales cycle. Depending on the online retailer, this sub-process also includes a "reprocessing process" (repair, items are placed in new item packaging, cleaning of the items). However, there is also the possibility that the returned items are delivered to an external service provider, who then takes over the sub-process of the returns inspection. Subsequently, the goods that are judged to be "saleable" are sent to the warehouse of dispatch. In both cases, goods that are "not saleable" are sent to a reseller or scrapped. The shipping packaging is then usually disposed of.

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