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TRENDS IN LOGISTICS IN THE GERMAN E-COMMERCE AND THE PARTICULAR RELEVANCE OF MANAGING PRODUCT RETURNS

Michael Brusch[1], Eva Stüber[2]

[1)] Anhalt University of Applied Sciences, Köthen, Germany, [2)] E-Commerce-Center Köln, Cologne, Germany

ABSTRACT. Background: There are several trends in logistics Internet retailers have to face nowadays, e.g. addressing and reaching customers through different sales channels (multi- or cross-channel management), integration of new payment alternatives (combined online and/or mobile payment methods), ordering and delivery of products from an Internet retailer at the same day (same-day delivery), and allowing product returns (management of product returns). Here the question is, whether relevant factors influencing the buying behaviour of online shoppers as well as groups of these can be found.
Methods: Our contribution is analysing this area in two ways. On the hand, an overview about these major trends and the German e-commerce market will be given. On the other hand, the particular relevance of managing product returns will be discussed and through findings from an empirical investigation of German online shoppers expanded.
Results: Four relevant factors influencing the behavior of online shoppers could be identified. Applying these four factors four different groups of online shoppers can be differentiated.

Key words: E-Commerce, Empirical Investigation, Product Returns, Trends in Logistics.

INTRODUCTION

In recent years, the importance of e-commerce has been increased. In combination with an increase of competition, Internet retailers have to face several challenges nowadays. One of these challenges is strongly related to their logistics and consists of general trends, e.g. using of as well as addressing and reaching customers through different sales channels (multi- or cross-channel management) and special trends in online shopping, e.g. integration of new payment alternatives (combined online and/or mobile payment methods), ordering and delivery of products from an retailer at the same day (same-day delivery), and allowing product returns (management of product returns, see, e.g., [Anderson et al. 2009, Bonifield et al. 2010, Mollenkopf et al. 2007, Petersen and Kumar 2009]).

Our contribution is related to this area. On the hand, an overview about these major trends and some best practice examples will be given and is followed by a description of the German e-commerce market. On the other hand, the particular relevance of managing product returns will be highlighted and through results from current research for the German market analysed in detail. The aim is to identify relevant factors influencing the buying behaviour of online shoppers as well as groups of these. Our findings will assist decision makers of Internet retailers regarding the recognition and evaluation of current trends in logistics.

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MAJOR TRENDS AND BEST PRACTICE EXAMPLES

As opposed to stationary trade the customer receives the product not directly at online shopping, but must wait for the delivery which lasts according to supplier between two and five days. Studies have already shown that late deliveries lead to dissatisfaction (e.g., [Holloway and Beatty 2003]). Thus many Internet retailers would like to raise the speed of delivery. Therefore, many Internet retailers (especially in the USA and Great Britain) experiment with same-day delivery (SDD) - the order and delivery of goods of an online shop at the same day. For example, since August 2012 eBay in San Francisco works on a related pilot project: As a new service and with the help of the application "eBay Now" buyers should be enabled to order products from retail stores and to have them delivered within less hours home. Up to now, however, such services are offered always restricted to certain regions. In Germany with Tiramizoo a logistics service provider operates limited to metropolitan areas and allows above all in the Munich region online shops the delivery of products within three hours (e.g., Lodenfrey, Cyberport).

Beside the speed of delivery also the time frame of delivery is focused. Amazon offers a delivery between 17 and 21 o'clock of the same day to customers from metropolitan areas with the "Evening Express" if the goods are ordered till 11 o'clock in the morning.

Positively for Internet traders and suppliers is in this context that according to US investigations, e.g., of the Boston Consulting Group, a high willingness to pay exists for a same-day delivery. Also an investigation of eBay regarding the future of trade showed that 60 percent would buy more online or mobile if the goods would be delivered at the same day (see, e.g., [Barr 2013, Utter 2013]).

Another big trend which online trade moves at the moment is the management of product returns. Consumers in online trade have only the possibility to examine products personally or to try on if it concerns goods of the fashion sector as soon as the order was delivered. Therefore, it should be expected that the whole delivery or parts must be sent back of it after the investigation. A technical innovation in the area Augmented Reality offers above all the possibility to fashion retailers to give assistance with regard to the correct fit to the customers in advance: Thus the enterprise UPcload from Berlin offers a virtual fitting for online shops which is offered meanwhile by about ten online shops in Germany (e.g., Otto, The North Face). Using a software application the clothes size is determined for the user free of charge, while with the help of a Webcam the body of the respective user is "scanned", afterwards his individual body measurements are calculated and suitable body dimensions recommendations provided. Here, a customary compact disk serves as reference object.

GERMAN E-COMMERCE MARKET

The number of online users and sales are still increasing in Germany (Figure 1). Because there are about 70.2 million citizens in Germany older as 14 years in 2012 and the percentage of online users amounts to 74% about 52.2 million people are online. About 74% of these uses the Internet for purchases, i.e. there are about 38.6 million online buyers. Their share and the share of so-called intensive online shoppers, i.e. persons who had at least 10 transactions during the last 12 months over the Internet, are continuously increasing within the last few years [Institut für Demoskopie Allensbach 2012].

Internet retail, i.e. the type of e-commerce used for business-to-consumer transactions, is growth driver number one in the German retail. Alone in 2012 the e-commerce with consumer goods increased up to about 33.0 billion Euros and had therefore a share of about 8% of the total retail sales (without FMCG (fast moving consumer goods) even more than 14%). Nearly three quarters of this market volume are gained by suppliers who do not have their origin in classical mail order selling: pure Internet seller, web shops of bricks-and-mortar retailer and of manufacturer are very prominent in Internet retailing. However, also the growth of the online sales of classical catalogue sellers is substantial furthermore [IFH Köln 2013].

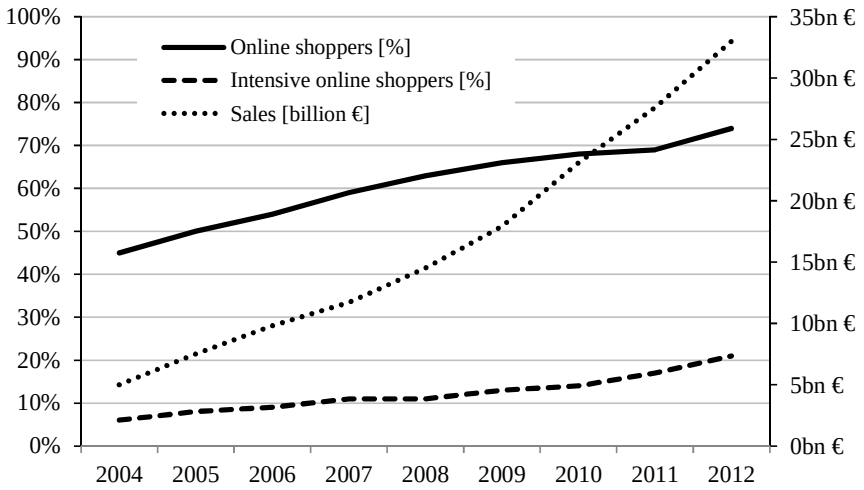

Fig. 1. Share of online shoppers and intensive online shoppers (at least ten transactions within the last 12 months) and sales volume of Internet retail in Germany
Rys. 1. Udział kupujących on-line oraz nasilenie ich aktywności (minimum 10 transakcji w przeciągu ostatnich 12 miesięcy) oraz wielkość sprzedaży detalicznej internetowej w Niemczech

The most important online bought category is fashion and accessories. With a share of about 27% of the sales in Internet retail this is meanwhile the biggest market on the Internet. Here the impulses are coming from stationary fashion chains and increasingly from pure Internet players like Zalando, and the big fashion brands. However, in other areas, like consumer electronics, do it yourself and garden as well as living and arrangement, a backlog has arisen. Especially the stationary retail chains stimulate the markets only to a limited extent. This could affect in the long term disadvantageously, because also in these assortment areas pure Internet players stand already in the starting blocks [Groß et al. 2013, IFH Köln 2013].

However, there are several trends which will affect the retail market in Germany. An already existing trend is multi-channel management which is still enormously important for stationary retail. Here, current analyses show that there are information-related interactions between web shops and local stores. These interactions resulted in 2012 in an amount of about 32% of purchases in stationary retail, i.e. local stores, which are prepared in online shops [IFH Köln 2013]. The existence of the other introduced trends (same-day delivery and management of product returns) in Germany will be analyzed using the data from an empirical investigation.

INVESTIGATION OF GERMAN ONLINE SHOPPERS

In January, 2013 a questioning of Internet buyers was carried out by the E-Commerce Center in Cologne, Germany. Here, the buying behavior and related information was collected using a representative online survey by means of a panel. The survey occurred in Germany (n=1,000), Austria (n=500) and Switzerland (n=500). The interviews lasted between seven and ten minutes. For the following analyses only the German participants will be used. This means that a sample of 1,000 participants is used which corresponds concerning the distribution of age and gender of the German population.

The total sample consists of 52% men and 48% women and has a mean age of 39.7 years. From the total sample 2.5% buy at least once a week, 8.6 % once in two weeks and 25.4% once a month although the majority (34.4%) buys once in the quarter. The household net income is mostly (with 28.0%) in the range 2,000-2,999 EUR and followed by a group

(with 25.6%) in the range 1,000-1,999 EUR. Regarding the purchase category most often (26.9%) "consumer electronics and home appliances" is bought, followed by "books and media" (22.8%) and "fashion and accessories" (21.9%).

In a next step of data analysis, an exploratory factor analysis (using principal component analysis and quartimax rotation; see e.g. [Hair et al. 2006]) was used to identify the underlying dimensions of delivery related factors. Here, four factors (with simple structure) were found: "time and speed of delivery", "cost of product returns", "cost of delivery", "alternatives of delivery". The factors consist of three or four items which were all measured on a five-point Likert scale (with "1…strongly disagree" and "5…strongly agree"). Table 1 shows the factors and their alignment ("+" indicates that higher values represent a higher importance, "-" indicates that lower values represent a higher importance). From the table it can be identified that all factors fulfill the necessary reliability requirements. Total variance explained by all factors is about 63.5%.

Table 1. Results of the exploratory factor analysis ("+"…higher values represent higher importance, "-"…lower values represent higher importance)
Tabela 1. Wyniki analizy czynnikowej ("+"…wyższe wartości prezentują większe znaczenie, "-"…niższe wartości prezentują większe znaczenie)

Factor (alignment)	Sample item	No. of items	Factor loadings	Cronbach's α	Variance explained
Time and speed of delivery (+)	It has a great importance for me that I can choose the delivery date myself.	4	0.650-0.823	0.799	62.487 %
Cost of product returns (+)	At first I check which return costs in an online shop accrue before I have a look at the product range.	4	0.697-0.860	0.792	61.686 %
Cost of delivery (-)	I am willing to pay for a higher speed of delivery higher shipping costs.	3	0.666-0.820	0.726	65.335 %
Alternatives of delivery (+)	It is important for me to be able to select from different alternative delivery solutions.	3	0.709-0.777	0.645	58.516 %

These factors will be used to classify different groups of buyers based on a cluster analysis as a multivariate classification method to divide a total sample into subsamples. Cluster analysis is a prominent method for classifying objects into groups - so called "segments" or "clusters" - with respect to their similarity [Punj and Stewart 1983]. Here, the found factors (i.e. the factor scores) are used within such a cluster analysis (using Ward's method, no standardization due to the usage of factor scores). As optimal solution four clusters (i.e. four groups of buyers) could be identified. The results differentiated for the clusters are shown with significance information in Table 2 and 3.

For example, one group of buyers (cluster 1) consists of the largest proportion of women (66.7%) and buys most often fashion and accessories. For this group the factor "cost of product returns" are very important as well as the factor "cost of delivery" (consider the opposite alignment of the factor, Table 1). In contrast to this, another group (cluster 4) which buys very frequent online (6.3% buy at least once a week) sees also a high impact of the factor "cost of product returns" but most important is the factor "alternatives of delivery" followed by the factor "time and speed of delivery".

The results of other simple items are shown in Table 3. Here, for the speed of delivery (measured directly using given scales) the respondents had to specify how fast they generally wish the delivery of their order. The expectations regarding same-day delivery were measured through the importance of the respondents that the delivery of their order

arrives on the same day (using a five-point Likert scale with "1…strongly disagree" and "5…strongly agree"). For the rate of returns the respondents had to indicate, how often they send back parts of the order or everything if they buy goods from the branch named before (using given scales). The question with respect to a too long delivery time was among the reasons why an already ordered product from the named branch was sent back (percentage of selections).

Table 2. General results of the four clusters (χ^2…χ^2 test (based on Pearson), F…F test)
Tabela 2. Wyniki ogólne czterech klastrów (χ^2…χ^2 test (oparty na Pearsonie), F…F test)

Characteristic	**Type**	**Cluster 1** (n=222)	**Cluster 2** (n=190)	**Cluster 3** (n=301)	**Cluster 4** (n=287)	**Significance** **Type**	**Value**	**p**
Factor scores								
Time and speed of delivery	M	-0.425	-0.472	0.260	0.368	F	54.785	.000
Cost of product returns	M	0.986	-0.688	-0.496	0.213	F	215.291	.000
Cost of delivery	M	-0.558	-0.469	-0.110	0.858	F	160.680	.000
Alternatives of delivery	M	-0.128	0.889	-0.911	0.466	F	290.220	.000
Factor averages								
Time and speed of delivery	M	2.492	2.383	2.904	3.415	F	84.313	.000
Cost of product returns	M	3.884	2.343	2.442	3.314	F	203.047	.000
Cost of delivery	M	1.800	1.949	2.208	3.154	F	200.855	.000
Alternatives of delivery	M	2.986	3.665	2.268	3.619	F	262.776	.000
Purchase frequency								
At least once a week	%	1.4	1.1	.7	6.3			
Once in two weeks	%	9.9	6.3	8.3	9.4			
Once a month	%	27.0	25.3	23.6	26.1	χ^2	31.811	.007
Once in the quarter	%	31.1	35.8	35.5	34.8			
Once half a year	%	20.3	22.6	21.9	15.7			
Once a year and less	%	10.4	8.9	10.0	7.7			
Age	M	37.2	41.8	41.5	38.3	F	6.343	.000
16-19 years	%	14.9	6.8	8.6	9.8			
20-29 years	%	20.3	16.8	17.9	24.0			
30-39 years	%	21.2	18.4	15.6	21.3	χ^2	33.315	.004
40-49 years	%	23.4	27.9	24.9	20.9			
50-59 years	%	13.1	16.8	18.9	18.1			
60+ years	%	7.2	13.2	14.0	5.9			
Gender								
Male	%	33.3	56.8	55.1	59.9	χ^2	41.204	.000
Female	%	66.7	43.2	44.9	40.1			
Household net income								
< 500 EUR		9.0	6.8	5.0	4.5			
500–999 EUR		8.1	13.2	10.0	11.1			
1,000–1,999 EUR		26.6	23.2	27.2	24.7			
2,000–2,999 EUR		27.5	25.8	29.2	28.6	χ^2	10.701	.907
3,000–3,999 EUR		14.9	15.8	14.3	16.7			
4,000–4,999 EUR		8.1	7.9	8.6	8.7			
≥5,000 EUR		5.9	7.4	5.6	5.6			
Purchase category								
Fashion and accessories	%	36.0	10.0	19.9	20.9			
Consumer Electronics and home appliances	%	20.3	27.4	27.9	30.7			
Sports and leisure time	%	5.9	9.5	8.6	4.9			
Books and media	%	16.7	31.6	22.3	22.3			
Furniture and fixtures	%	5.4	4.2	7.6	6.3	χ^2	85.044	.000
DIY and garden	%	0.5	0.5	1.0	0.7			
Cars and car accessories	%	0.9	2.6	2.7	2.8			
Office and writing materials	%	0.5	2.1	0.3	3.8			
Health and wellness	%	6.3	5.8	5.0	2.1			
Groceries	%	1.8	3.7	1.3	2.1			
Drugstore and perfumery	%	5.9	2.6	3.3	3.5			

Table 3. Delivery and product returns related results of the four clusters (χ^2…χ^2 test (based on Pearson), F…F test)
Tabela 3. Wyniki dotyczące dostaw i zwrotów towarów czterech klastrów (χ^2…χ^2 test (oparty na Pearsonie), F…F test)

Characteristic	**Type**	**Cluster 1** (n=222)	**Cluster 2** (n=190)	**Cluster 3** (n=301)	**Cluster 4** (n=287)	**Significance**		
						Type	**Value**	**p**
Speed of delivery								
Within one to two hours	%	0.5	0.0	1.0	0.7			
Within 24 hours	%	14.4	13.2	14.0	28.9			
Within two to three days	%	67.1	67.9	70.4	61.3	χ^2	41.575	.000
Within a week	%	17.1	18.4	13.6	9.1			
Within more than a week	%	0.9	0.5	1.0	0.0			
Same-day delivery	M	2.005	1.779	2.389	3.066	F	77.359	.000
Rate of returns								
At every order	%	5.0	0.0	1.7	2.1			
At every second order	%	11.7	2.1	2.7	4.9			
At every third order	%	12.6	2.6	5.0	8.7			
At every fourth order	%	9.0	0.0	3.3	8.4	χ^2	135.994	.000
At every fifth order	%	4.5	2.6	2.7	4.2			
Less frequent	%	46.8	60.0	59.8	63.1			
Never	%	10.4	32.6	24.9	8.7			
Too long delivery time	%	9.9	5.3	4.3	9.8	F	3.323	.019

Regarding delivery and product returns related results (Table 3) it can be identified that the majority of all clusters would like to have a delivery within two to three days. Also the rate of returns is in general and at all cluster mostly less frequent than at every fifth order. However, there are significant differences between the clusters. So, e.g., within cluster 4 more than a fourth (28.9%) would prefer to receive the ordered products within 24 hours. A too long delivery time is especially relevant for cluster 1 and cluster 4 (stated by 9.9% and 9.8% of respondents). The same-day delivery is mostly preferred by the frequent buyers of cluster 4.

CONCLUSIONS

From the existing trends in logistics Internet retailers have to face nowadays especially the same-day delivery and the management of product returns are analysed against the background of different buyer segments (four clusters found in a cluster analysis). It can be identified that a same-day delivery has not this high importance up to now. The same is valid for product returns. But there is a positive relationship between the number of purchases and the number of returns. This means that more intensive online shoppers prefer respectively expect these options. Furthermore, the majority of online buyers wishes to receive their ordered goods within two to three days. The presently achieved standard is therefore for most buyers satisfyingly. However, it exist customer groups whose satisfaction can be increased by a faster delivery. These groups are not the largest ones up to now but these are the frequent buyers (whose number will increase within the next years). Decision makers in logistics should consider these expectations and preferences of this increasing portion of buyers.

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TRENDY W LOGISTYCE W NIEMIECKIM E-HANDLU ORAZ ZNACZENIE ZARZĄDZANIA ZWROTAMI TOWARÓW

STRESZCZENIE. **Wstęp:** Aktualnie można wyróżnić kilka trendów w logistyce handle internetowego, tj. poszukiwanie i osiąganie klientów poprzez różne kanały sprzedaży (zarządzanie multi- oraz cross-kanałami), integracja nowych metod płatności (połączenie metod płatności on-line oraz mobilnych), zamówienie i dostawa w przeciągu tego samego dnia oraz możliwość dokonywania zwrotów (zarządzanie zwrotami towarów). Tutaj rodzi się pytanie czy można zdefiniować czynnik wpływającej na zachowanie się konsumenta dokonującego zakupu poprzez Internet.
Metody: Badania przeprowadzono na dwa sposoby. Przedstawiono przegląd najważniejszych trendów występujących w niemieckim e-handlu. Następnie poddano szczegółowej dyskusji zagadnienie zarządzania zwrotami towarów na podstawie przeprowadzonych badań empirycznych.
Wyniki: Zidentyfikowano cztery czynniki wpływające na zachowanie się konsumenta dokonującego zakupu poprzez Internet. Wpływ tych czynników na cztery różne grupy klientów internetowych jest zróżnicowany.
Wnioski: Uzyskane wyniki wspomagają proces decyzyjny w e-handlu w obszarze określenia i oceny aktualnych trendów logistycznych.

Słowa kluczowe: e-handel, badania empiryczne, zwroty towarów, trendy w logistyce.

LOGISTIK-TRENDS IM DEUTSCHEN E-COMMERCE UND DIE BESONDERE BEDEUTUNG DES RETOURENMANAGEMENTS

ZUSAMMENFASSUNG. Einleitung: Im Bereich der Logistik haben sich Online-Händler heutzutage einer Reihe verschiedener Trends zu stellen, z.B. der Ansprache und Bedienung der Kunden über verschiedene Verkaufskanäle (Multi- und Cross-Channel-Managemen), der Bereitstellung neuer Zahlungsmöglichkeiten (Zahlung mittels online- bzw. mobile-basierter Methoden), der Bestellung und Lieferung von Produkten eines Online-Händlers am gleichen Tag (Same-day-Delivery) und dem Erlauben von Warenrücksendungen (Retourenmanagement). Hierbei stellt sich die Frage, ob relevante, das Einkaufsverhalten von Online-Käufern beeinflussende Faktoren und, darauf basierend, Gruppen von Online-Käufern identifiziert werden können.

Methode: Unser Beitrag analysiert dieses Thema in zweierlei Hinsicht. Einerseits wird ein Überblick über aktuelle und zentrale Trends für den deutschen Online-Handel gegeben. Andererseits wird insbesondere das Retourenmanagement diskutiert und anhand der Daten einer empirischen Untersuchung von deutschen Online-Käufern ausgewertet.
Ergebnisse: Es zeigt sich, dass vier Einflussfaktoren für das Kaufverhalten von Online-Käufern relevant sind. Werden diese vier Faktoren zugrunde gelegt, können vier verschiedene Käufergruppen identifiziert und analysiert werden.
Fazit: Unsere Ergebnisse unterstützen Entscheidungspersonen in Unternehmen des E-Commerce hinsichtlich der kundenseitigen Wahrnehmung sowie der adäquaten unternehmensseitigen Berücksichtigung von aktuellen Trends im Bereich der Logistik.

Codewörter: E-Commerce, Empirische Untersuchung, Logistik-Trends, Retourenmanagement

Michael Brusch
Anhalt University of Applied Sciences
Köthen, Germany
e-mail: m.brusch@emw.hs-anhalt.de
Eva Stüber
E-Commerce-Center Köln
Cologne, Germany
e-mail: e.stueber@ifhkoeln.de