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**DOSSIER / ISSUE**

Pratiques logistiques et enjeux du transport de marchandises : une comparaison franco-allemande

*Logistics practices and freight transport challenges: a French-German comparison*

# E-commerce in France and Germany a comparative analysis

## Une analyse comparative de l'e-commerce en France et en Allemagne

Saskia Seidel, Corinne Blanquart

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**Résumé** Le commerce électronique a connu une forte croissance au cours des dernières décennies. De nos jours, il n'y a pratiquement aucun produit qui ne puisse être acheté en ligne. Mais comme les ventes en ligne ne réussissent pas pour tous les types d'articles, toutes les succursales ne sont pas affectées de la même manière par le développement du commerce électronique. De plus, selon le type de produit acheté, différentes manipulations de transport sont nécessaires. En outre, nous pouvons trouver différents développements du commerce électronique dans différents pays. Même en comparant les pays voisins, nous pouvons observer des différences. L'objectif de cet article est, sur la base d'une méta-étude, une étude comparative du développement du commerce électronique entre entreprises et consommateurs en France et en Allemagne, en tenant compte du comportement des consommateurs, des vendeurs en ligne et des solutions de transport proposées. Les résultats de l'analyse concernant le comportement du consommateur ont révélé que les livraisons à domicile sont l'option préférée. Néanmoins, nous constatons que les fournisseurs de transport développent des idées pour offrir des solutions de livraison alternatives, également poussés par les vendeurs en ligne qui participent fortement à déterminer et à façonner l'offre de services de livraison.

**Mots clés** commerce électronique, livraisons finales, principaux facteurs, France, Allemagne

Saskia SEIDEL (✉)

German Aerospace Center (DLR), Institute for Transport Research,  
Rutherfordstr. 2, 12489 Berlin - Germany  
courriel : saskia.seidel@dlr.de

Corinne BLANQUART (✉)

AME-SPLOTT, Univ Gustave Eiffel, IFSTTAR,  
59650 Villeneuve d'Acsg, France  
courriel : corinne.blanquart@univ-eiffel.fr

**Abstract** E-commerce experienced strong growth in the last decades. Nowadays, there is hardly any product which cannot be purchased online. But as online sales are not successful for all types of articles, not all retail branches are affected in the same way by the development of e-commerce. Furthermore, depending on the type of purchased product different transport handling is required. Moreover we can find different developments of e-commerce in various countries. Even comparing neighbouring countries we can observe differences. The aim of the paper is, on a basis of a meta-study, a comparative study of the development of business-to-consumer e-commerce in France and Germany considering also consumer behaviour, online sellers as well as offered transport solutions. The results of the analysis regarding consumer behaviour revealed that home deliveries are the preferred option. Nevertheless we see that transport providers develop ideas to offer alternative delivery solutions, also pushed by online sellers who strongly participate in determine and shaping the offer of delivery services.

**Key words** e-commerce, final deliveries, drivers, France, Germany

### 1. Introduction

E-commerce<sup>1</sup> is a dynamic market with ongoing changes. The dynamic is among others characterized by (global) sales growth, new offers of products and services, changing vendors and vendors who reposition themselves on the market. As the development has an impact on numerous fields, e.g. on the structure of the retail market,

1. The term "e-commerce" refers to online closed contracts, where services or goods are sold. This can take place between firms (B2B), between businesses and consumers (B2C) or between consumers (C2C). In this article we focus on B2C e-commerce.

consequences for the supply chain, traffic flows in cities but also consumer behaviour, it is of interest for multiple disciplines and approached from various perspectives in different surveys. The authors have been on the lookout for a comprehensive paper summarising the developments on the European, i.e. French and German, e-commerce market, the drivers for the development and consequences for transport mobility.

With regard to consumer habits there are studies focusing on consumer shopping experience and attitudes on return of items and unplanned purchases [1; 2; 3]. Also e-commerce and its consequences on transport have been studied since several years. The analyses tackle different aspects like the impacts on structural changes in the entire logistics [4], changes in supply chain [5], different e-commerce strategies and consequences on urban logistics [6] just to mention some. In context with urban logistics the pooling of flows business to consumer (B2C) logistics performance in cities [7], different strategies and new delivery solutions are analysed [8; 9]. There are also studies considering the development of new formats of collecting points, i.e. the emergence of “drives” [10; 5]. Also the consequences of online buying on consumer mobility are tried to clarify by some researchers [11; 12]. Although several works deal with various aspects of e-commerce there is no general paper providing an overview and looking at main drivers of the e-commerce development. There are also few papers that consider e-commerce developments and compare transport solutions in different countries [9]. Some papers compare developments in different markets but focus on specific branches, e.g. on e-grocery [5]. The aim of this paper is to capture the latest developments in the e-commerce market in France and Germany, to identify the (main) drivers, and to compare different transport solutions.

## 2. Methodology

Using the examples of France and Germany the paper aims to analyse the current e-commerce situation, focussing on the following questions: What are the main drivers behind e-commerce and trends in this field? Which transport solutions are there? What are the future trends in the field of e-commerce? The different realisation conditions of e-commerce also depending on product as well as on consumer behaviour will be explained by using the case studies of France and Germany. In some parts, where data is available, also other European countries like United Kingdom, which is the European country with highest online sales, will be used for comparison.

For being able to describe the development in European e-commerce and the future trends best a literature study was conducted. As there are few peer-reviewed articles describing the latest developments also newspaper articles, available statistics, corporate reports as well as other grey literature were collected and sighted. Therefore this paper represents a meta-study aiming at giving an update and overview of the latest developments in the French and German e-commerce market, the drivers and consequences for transport.

In order to assess the situation in e-commerce best the analysis was structured to the following sub-topics: general development, incl. general and segment specific sales performance, consumer, deliveries and market players (vendors having an online shop).

Throughout the collection of data the authors experienced some limitations and difficulties as official data on the topic is rare. Most available data regarding e-commerce is published by (online) retail associations or business consulting which consolidate data from corporate reports or from extrapolations. Also data that relate to deliveries, i.e. national parcel flows, represent a barrier. A further obstacle is that it can be assumed that there are national differences in data gathering methods as well as in definitions. In order to meet same definitions it was therefore prioritised to consider European e-commerce associations' surveys when they have been available.

The paper comprises five parts. In order to approach the topic, in a first step the development of e-commerce will be presented on the basis of available data<sup>2</sup>. In a second step the consumer side will be illuminated in terms of shopping preferences and shopping habits. In section 4 we take a look on the volume of shipments and examine the delivery systems in Germany and France. In section 5 we devote to online sellers where we can find the biggest dynamics of the market. Finally, in the conclusion, we summarise our findings and give an outlook on future developments.

## 3. Results of research

### 3.1. Development of e-commerce

Online shopping is enjoying increasing popularity and so e-commerce has recorded strong growth worldwide in recent years. The trend becomes apparent via different figures, such as growing number of online shoppers, growing e-commerce turnover or the online spending per capita/share of GDP per capita. The developed markets for e-commerce share the attributes high spread of IT

2. At this point it should be mentioned that consistent numbers for e-commerce are hard to find as numbers differ due to different reasons. First of all not all companies are transparent regarding their online sales, so often turnover of companies are estimated and the definition of online sales can differ. Another difficulty is that some statistics account only physical goods (not all consider B2C, C2C, and B2B) others also consider services sold online. Also many statistics do not declare what figures have been taken into account or excluded.

systems such as laptops or smartphones, high rates of internet penetration (> 70 %) and low internet costs [13].

The beginning of e-commerce started in the mid ninety's with the start of the very first online search engines and the creation of online companies in 1995 [14]. One of the very first online platforms has been amazon.com which started with the selling of books and the online auctioneer ebay. In the year 2000 about 9.7 % of all German consumers did even once an online purchase; one year later the business-to-consumer (B2C) online turnover amount to 4.3 million € in Germany [14].

In 2015 296 million Europeans, which represent 43 % of all European inhabitants, were shopping online [15]. United Kingdom (UK), France, and Germany represent the largest European e-commerce markets. In these three countries, a strong growth of online shoppers can be recorded in the last years. Whereas in 2013 about 60 % of all German consumers<sup>3</sup> were shopping online, ECommerce Europe [15] recorded already 73 % in 2015. A similar picture can be recorded in France, 44%

of all French consumers shopped online in 2013 and already 66 % in 2015. In the same year, about 81 % of all consumers shopped online in the United Kingdom. A further growing can be expected also in terms of online turnover.

The UK, France, and Germany are Europe-wide leading the sales statistics (see table 1). Their sales, amounting to 281.7 bn €, represent 62 % of the total European B2C e-commerce sector in 2015. In Europe, the total amount of money spent online were 455.3 bn € in 2015 [15; 16]. In 2017, 534 bn € turnover were recorded in Europe when considering not only online purchased goods but also services [17]. ECommerce Europe predicts a further annual growth for online turnover in Europe of around 12 % for the coming years. This assumption seems realistic as looking on the overall development it can be stated that with the growing spread of internet access and the online presence of retailers not only for information purpose but having online shops – also the use of online shopping and though the familiarity with digital shopping grows.

**Table 1.** E-commerce (B2C) facts in different European countries

State	Population in Million people	Online shoppers (million)		Online and mail-order turnover in bn€		Online turnover per capita (€)		GDP per capita (€)		Online spending per capita - share of GDP per capita	
		2015	2011	2015	2016	2011	2015	2011	2015	2011	2015
United Kingdom	64.9	43.4	78.6	157.1	173.7	1,248	2,420	25,600	39,400	4.5%	6.1%
France	66.4	36.0	37.7	64.9	71.4	577	977	27,900	32,900	1.9%	3.0%
Germany	81.2	51.6	35.4	59.7	66.9	433	735	30,600	37,156	1.4%	
Russia	146.3	30.0		20.5			140	31,700			1.4% (2014)
Spain	46.4	16.6	16.9 (2014)	18.2	21.0		392				1.6 % (2014)
Italy	60.8	17.7	13.3 (2014)	16.6	19.1		273				0.82% (2014)
Netherlands	16.9	12.9	12.9 (2013)	16.1			952		40,000		2.4%

source: Eurostat 2013, ECommerce Europe 2015 ; 2016a, Destatis, FEVAD

In 2014, e-commerce with physical goods represents around 7 % of the turnover of the French and German retail market with rising tendency [18, 19]. Considering only non-food retail, e-commerce turnover accounts even for about 20% of German retail sales.

Around 53% of the e-commerce turnover is made with physical goods which has generated significant demand for dedicated delivery services to the end consumer [9; 20]. Postal services in different countries reported that an increasing fragmentation of shipments in the “last mile” were recorded [21; 22; 9]. Nevertheless,

available data on volume and frequency of e-shopping for physical goods as well as data on parcel flows are short in supply which makes a comparison between countries difficult [9]. Also the data for retracing the impact of online purchased goods on the development of parcel flow is poor. In chapter 3.3 the deliveries will be examined on the basis of available data.

Looking on business-to-business (B2B) e-commerce sales turnover is considerably higher than B2C (Germany 870 bn €, UK 658 bn €, 485 bn € [16]). The electronic purchases are due to the use of EDI quite common in

3. Ecommerce Europe reference is here: Consumer = Person older than 15 years. In figures: France about 54 million people >15 years; Germany 70.7 million people over the age of 15 years.

large companies but are also made by smaller ones. According to Fevad (Fédération E-commerce at vente à distance) [16] most B2B digital purchase are spend for travel and transport (53 %). The impact of digital B2B purchases on parcel deliveries will not be examined in the following as we focus on B2C e-commerce.

### 3.2. Consumer behaviour

Europe's online spending continues to increase at a rapid pace. Fevad just announced that the turnover in e-commerce has reached 81.7 bn € in 2017 in France [23]. This means an increase of more than 14 % compared to online spending in 2016. The fast growing of turnover and dissemination of online shopping is not surprising as with a growing number of internet penetration also the number of e-shoppers rises. Moreover, with the increasing spread of smartphones it is possible to shop online everywhere, also on the way. Initially smartphones and tablets were primarily used for information searches, today, the number of mobile shoppers rises. In face of this development many online providers offer an optimised website for mobile orders. According to Händlerbund and Statista, 8.8bn € were made via mobile commerce (m-commerce) in Germany in 2015 [24]. The other way around considering the percentage of all online orders, about 24% of online orders were made via smartphone or tablet in Germany [25]. Also in France, the use of m-commerce is increasing. In 2015 11%, which corresponds 6.4 bn €, of all online purchases were made via m-commerce [16]. In 2016 already 16% of French e-commerce turnover was made by a purchase via a smartphone. All together 9.3 million French people stated that they have made a purchase from their smartphone [26].

In the United Kingdom the mobile commerce is also gaining ground, in 2015 about 33.3 % of all internet sales have been m-commerce sales [27].

An analysis of all transactions made via a global payment platform revealed a further increasing since 2015. According to extrapolation from their statistics, worldwide 52 % of all online shopping is made via mobile devices in 2017. The share in France and Germany amounted to 49.7% and 41.5 % [28].

These changes in consumption habits have an influence on mobility. Online ordering enabled that the shopping experience as an out of home activity became also an indoor activity (not only dependent on catalogues). With the emergence of m-commerce boundaries increasingly blur. Consumers do not longer switch from channel to channel, but can use online and offline channels at the same time.

Looking on overall mobility behavior the assumptions that online shopping substitute the number of trips are not verified: even if some physical displacements will

actually be removed, others will be generated so that only accounting considerations (more or fewer trips) are futile [12; 29;30]. Thus e-commerce may replace physical shopping habits but by making trips for other purposes overall traffic could be increased. In this context it should also be considered that effects on mobility behavior cannot be derived directly as trips are not only made for economic but also for social reasons. Thus for making substantiated statements a differentiated consideration would be necessary. Due to returned parcels additional trips may arise.

### E-shopper spending and shopping preferences

Three quarter of German shoppers, aged 21 or younger, prefer both a physical and online shopping experience, a similar picture can be expected for most other consumer groups. Some products a likely bought online, others in shops. The share of e-commerce goods in retail goods in general is lower than 10% (only UK 15 %). Only for some specific products, consumers are looking on a priority basis in the internet (e.g. Leisure GPS, Drones) so that online sales value is for these products clearly above 50 % in some countries [24].

In general, online sales largely differ by category. In France, looking on the type of products which are sold we find most of the spending for clothing (57%) followed by cultural products (48 %), footwear (37 %), and travel/tourism (36 %). Also in Germany clothing is high ranked, approximately one third of the online turnover is made in the clothing sector [18] and accounts for more than 18 % of all parcels [31].

Considering only the categories of purchases that imply physical deliveries, clothing, and shoes as well as media and entertainment (e.g. DVD, Blu-ray, CD etc.) are most popular in Europe. In the Netherlands and Germany the product group "information technology" (contains IT hardware, computer software, USB Sticks, DVD recordable etc.) also records high sales. While the homeware, food and drink, and electronics sectors perform worse. In other words, European consumers are more likely to buy clothes, shoes, or electronic equipment online. Other types of product, such as groceries, toys, and medicine are less commonly bought online. The biggest European online grocery market is UK, followed by France. In UK, 5.5 % of all grocery shopping are made online [32] whereas in France 3% of all grocery turnover is made online. In Germany, only 0.8% of the grocery turnover is made online in 2015 [33]. But fast moving consumer goods (FMCG) such as soft drinks and food can be considered as one of the fastest growing products. According to the German E-Commerce and Distance Selling Trade Association, behv [25], FMCG have a share of 13.48% with around 3.22 bn € in Germany. The differences in the success of online groceries can among others be traced back to different market structures in the

countries, i.e. share of discounters, size and density of grocery stores [5].

The average spending by e-shopper are 3,625€ in the United Kingdom 1,780 € in France, and 1,157€ in Germany in 2015 [15]. In these figures expenses for services are included.

In Germany a study was carried out, which considered the online order frequency of e-shoppers. The study findings revealed that 41 % of e-shoppers order at least once a month online, around 22 % order at least once every two weeks, 19% order at least once a week or even more and around 18% order every 3 month or less often goods online [25]. The most important criteria for shopping online are easy return of goods, low shipping costs and fast delivery service [15; 34] The UPS survey revealed that while most consumers expect to see a range of shipping options, 60 % of European shoppers expect two days transit until receiving their product; in the UK even six in ten expect a next-day delivery [35].

The payment preference differs in various countries. Despite an increasing share of payments via EC card, Germany is, with around 51% payment in cash, a very cash oriented country at POS. According to consumer surveys the favourite online payment is PayPal even though in 2017 most online payments are made on account, followed by direct debit and only then PayPal (survey with online traders) [36]. Whereas 30 % of all German online orders are made on account, French customers pay their products before they receive their products [9]. In 2015, 80 % of all French consumers used their credit/bank card to pay the purchased product [16]. A reason for the difference in methods of payment could be that German consumers may be more worried about data misuse or may want to reserve the right to easily return the ordered articles.

## Returns

In most countries, more than half of all online shoppers said they have returned an online purchased good [37]. The situation in France and Germany differs with 57 % and 77 % in terms of returned parcels. Even though there are no official numbers and only estimated figures, it is commonly known that the rate of returns is quite high in Germany. A German distributor survey from behv revealed that more than a third of interviewed distributors have an average return rate of over 20 %. The rate for some product groups, i.e. for clothing with about 40 %, is even higher [38]. Some fashion retailers even claim that about 70 % of women's fashion is returned [39]. University of Bamberg estimates the number of returned shipments in 2012 for about 286 million in Germany, which would mean that about 28% of all B2C shipments in 2012 would have been returned parcels [40]. The high rate of returned goods is favoured as most returns are free of charge in Germany. Also purchases on account

- which means a payment has to be done within two weeks after receiving the product - may favour returns. A study revealed that many consumers order knowingly more fashion products than needed so called "intentional returns", e.g. multiple items in different sizes or colours are often ordered from the outset [41]. The ordering behaviour results in high volumes of deliveries and returns for the fashion segment.

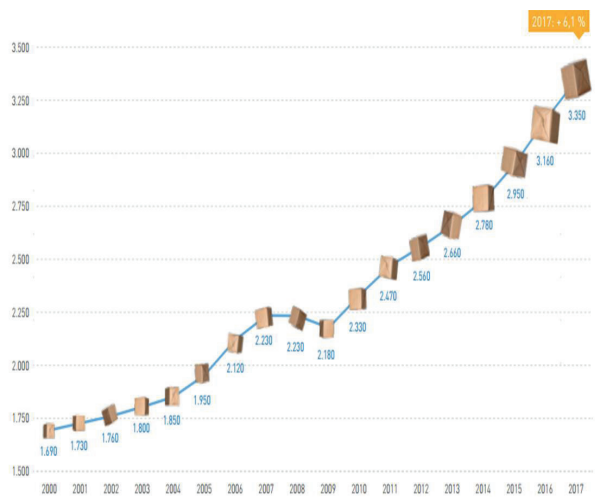
In France returns numbers are with overall at six per cent comparably low, but rises up to 20 % in some specific retail categories, such as fashion.

Looking into other European markets, like UK the estimated number for returned fashion items is with about 25 % also quite high [39; 42]. About 20bn£ (converted 23 bn €) per year are estimated for returned items bought over the internet [39]. Despite the high costs, companies are cautious about the cost of returns and see it as a necessary evil for securing online sales. But there are some retailers who try to face the return problem, e.g. by setting up an account for return quotas: if the customers' return quota is low the return is for free – if a certain percentage is achieved there are expenses for the return. An UPS survey of 2016 even revealed that there are consumers who review returns policies before purchasing an item and about 81% would be likely to complete their purchase if free store returns were in place or a free pre-paid label was provided by the trader [33].

## 3.3. Deliveries

Unlike traditional store shopping, online purchased items need to be transported to the customer. Thus the growing share of online purchases is reflected in strong growth in the CEP (courier express parcel service) market as e-commerce of physical goods generates demand for dedicated end-user delivery services. Beside the B2C business, CEP captures the B2B and C2C (consumer-to-consumer) area. In the last years the B2C segment grew enormously so that today it could be considered as the most important segment of the CEP sector.

The Ecommerce report estimates the number of send out parcels for B2C for about 4.2 bn in 2015 in Europe and expects a further increasing, whereas the figures for parcels differ extremely in various countries [15]. Fevad estimates that around 450 million parcels have been send out in France in 2015 [16]. There are around 2 500 delivery vans making 376 000 shipments per day in Berlin only according to a study of the German international express association [43]. The total volume of mail in Germany in the CEP market rose by 74 % between 2000 and 2015 to 2.95bn, of which around four out of five consignments were packages/parcels (see figure 2). The share of B2C grew from 45 % in 2009 up to 56 % in 2015 [43]. A further increase can be recorded since then; in 2017 3.35bn parcels were transported in Germany [44].



**Figure 1.** Development of shipment volume in Germany in million parcels 2000-2017

source : BIEK 2018

CEP companies expect a further growth of the consignments by 6.4 % per year to just fewer than 3.8bn consignments by 2019. Considering that B2C had a share of 56 %, about 1.65bn parcels were sent out in Germany in 2015. The high number of sent out parcels in Germany can maybe among others be explained by high rate of returns in fashion sector (see section 3-1, 3-2). But there are also studies like a study of MRU which estimates that (only) around 7 % of all send out parcels in Germany have been returns [31].

Though, the reasons for the huge difference in numbers of shipment volume in various countries become not apparent via numbers. Hence, further research is needed to clarify and answer the question of big differences.

Looking on delivery times, Fevad published a figure which states that it takes on average about 5.3 days from the product order to receiving the product [16]. In Germany most service providers make, after receiving the product from the seller, the delivery in one or two days; so that the delivery time is in particular depending on the availability at the warehouse and the processing of order.

### Who is making the deliveries?

The success of e-commerce business is often strongly related to the ability to offer efficient and effective delivery to the customer, i.e. “last mile delivery” [42]. Therefore most e-commerce businesses fall back to delivery services with existing networks. The biggest delivery services in Germany are DHL, DPD, UPS, GLS and Hermes whereas DHL has with around 45.4% the highest share in the CEP-market in 2017 [46]. Considering only B2C, BdKEP estimates the share of

DHL with 69 % of the B2C turnover and 57% share of B2C deliveries even higher. Hermes is with 23 % of the turnover and 30 % of send all parcels the second largest transport provider. DPD and UPS have with around 5 % and 3 % a quite low market share [47].

Beside LaPoste which offers the two services Colissimo (main service) and Chronopost (express service) TNT, DHL and UPS are the biggest transport service providers in France. Smaller service providers are among others Transflex or Liefery in Germany or Geodis and Mory Ducros in France.

In the respect of transport, e-grocery has a kind of special position. A German survey revealed that 26 of 35 interviewed companies use their own vehicles for the delivery of online ordered groceries to consumers [48]. Only for German-wide deliveries national transport service providers are used; above all DHL, which has due to an own online grocery website experience in shipping fresh products to consumers. The transport with companies’ own vehicles are mostly done with cooled vans whereas the deliveries via transport providers are made primarily with cooling elements.

### Destination of delivery

Deliveries are not always successful at first try; to avoid deliveries which fail on the first attempt many transport operators are developing ideas to improve delivery quotes. Automated parcel stations (APS) so called ‘packstation’ and pick-up points (PP), which are stores providing parcel drop-off and pick-up services, have been fast-growing solutions for final delivery location [9]. Since 2012 the number of PP remains more or less static in France and Germany (see table 2).

As successful deliveries are also on the agenda of online sellers many delivery solutions are developed in cooperation with them (see section 3.4). New alternative delivery options may affect places, like delivery to the trunk of the consumers’ car or a direct delivery into the consumers’ apartment (vision of Amazon), or include temporal optimization solutions like for example the offer of time window delivery, same-day or next-day-delivery services.

The acceptance of some of these alternative offers is analysed in different surveys. In France, Fevad conducted a survey where consumers were asked to answer questions regarding their received deliveries in the last six month: 86 % of the buyers received delivery straight to their door (home delivery), 65 % used a delivery service to a pick-up point, 25 % used withdrawals or release in the brand’s store, another 25 % received their parcel via a post offices, and 12% got a delivery to their workplace [16].

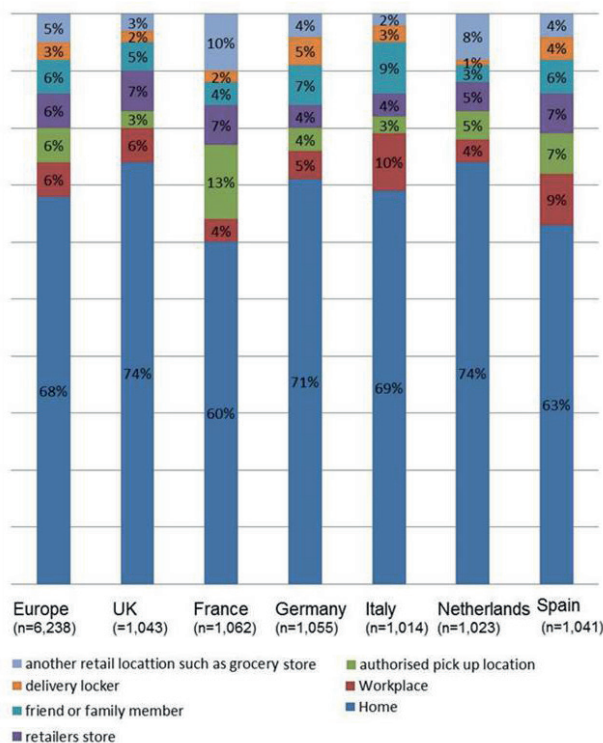
**Table 2.** Reception networks of selected transport providers in France and Germany

Company	Service type*	Country	No.sites 2008	No.sites 2012	No.sites 2017
PackStation (DHL)	APS	Germany	1,000	2,500	3,000
Paketshop (Hermes)	PP	Germany	13,000	14,000	14,000
GLS	PP	Germany	0	5,000	5,000
UPS	PP	Germany	0	0 (2,000 in 2013)	2,900
Kiala/UPS	PP	France	3,800 (incl. M.R.)	4,500	4,000
PickUp (DPD, Chrono-post, Colissimo)	APS	France	-	-	350 (200 at railway stations, 150 Post office)
Relais Colis		France	-	-	4,700
Mondial Relay (M.R.)	PP	France	3,800 (incl. Kiala)	4,300	5,300

source: Morganti et al 2014; company’s website

According to a survey of UPS Europe 2015, which was conducted in six European countries, most deliveries are sent to consumers’ home. Only 35 % of purchases are sent right away to alternate delivery locations such as retailers’ store, friend of family member, workplace, package delivery lockers or others. The use of deliveries in a certain time window or equal was not covered [35].

UPS also questioned which delivery option consumers would prefer [35]. Also with the result that the preferred delivery option is the home delivery service (see figure1). According to a UPS around 70% of all European consumers use this option.



**Figure 2.** Preference in delivery location (UPS 2016)

Considering alternative delivery networks it can be stated the number of lockers and pickup point networks is growing in Europe [9]. Beside lockers also a set-up of ‘Drives’ can be recognised. Drives are mainly set up by (multi-channel) grocers and offer the possibility that consumers can pick up their e-grocery orders at special sites themselves (mainly) by car.

Considering alternative deliveries, French consumers prefer delivery of parcels via local shops and collection points [49]. German consumers appreciate the announcement of a delivery in a certain time slot whereas free deliveries have a higher priority in France.

**Improvement measures for successful deliveries and latest developments**

To improve successful delivery, and avoid 2<sup>nd</sup> or 3<sup>rd</sup> try delivery, information via email about day of delivery, parcel tracking, contact to change day or time or place of delivery is offered by many transport providers. Furthermore, to extend the service more and more retailers prepare in cooperation with transport providers for same-day delivery or even deliveries within the next 30 minutes (Saturn Germany) /2 hours. Here it should be mention that the delivery within short time is above all an additional service expedited by Amazon to bring pressure to competitors but is meanwhile adopted by other retailers and may improve the successful delivery.

The very latest developments are the delivery to customer’s car and into customers’ apartment/house. DHL Germany started a test phase where a delivery to the trunk of the car is possible. The delivery to the trunk is in the meantime approached for different automotive brands from different service providers. The delivery into the apartment is pilot project from Amazon, using a smart door lock and a camera. The customers’ acceptance for these solutions remains open.



Another new trend is that transport service providers go on the offensive to offer retailers a (an express) delivery service to consumers. The appealed retailers concern, besides big customers like Zalando or Amazon, often small shops which are located in inner cities. As one example for such a logistics provider 'Liefery' in Germany can be mentioned. Liefery is a same day service transport providers who offers a delivery from the shop to consumers within the next 90 minutes<sup>4</sup>. This service enables point of sales as well as online sellers to offer consumers an express home delivery. Hermes just bought around 30 % of Liefery's shares and is now holding the majority of shares [50]. The latest developments document that transport providers try to widen their service offer.

### 3.4 Who is selling online?

The number of companies that sell their products via the internet is increasing. Today, they take a variety of forms, online-only distributors (internet pure-players), multi-channel retailers (click & mortar), mail-order businesses with an online-platform, online marketplaces, online shopping clubs (only for members), teleshopping, and manufacture-shippers [9]. The biggest online retailers on the European market are Amazon, Otto, Apple, Tesco, Home Retail Group, CDiscount, Zalando, E.Leclerc, Shop Direct, Next Pic, Carrefour, Vente Privée, Asda, Metro Group and John Lewis [15]. With a total annual turnover of 24.2bn €, Amazon is clearly ahead of the other online retailers which are grouped around 6 to 1.5bn € turnover in 2014.

With an eye on the national markets we see that almost all big retailers have internet presence. A study of Xerfi-Precepta quotes that more than 75 % of the French retailers have an ecommerce site. But there are some well-known retailers that still not offer e-commerce in France, such as Lidl, Aldi or Printemps [16]. The biggest French online sellers are Amazon and Cdiscount. In total we find more than 200.000 active online shops (+12 % compared to 2015) and more than 1bn transactions (+ 23% compared to 2015). E-commerce represents 7 % of the French retail market share [16].

In Germany 73 % of all retailers offer an online shop. Most online turnover is made via are online platforms such as amazon or ebay, followed by multi-channel-retailers, producers, shopping clubs, and others [25]. The three biggest online sellers are Amazon.de, Otto, Zalando biggest online sellers in Germany [48].

Also in the UK Amazon is the biggest online retailer, followed by Tesco, Argos, John Lewis, and Next.

### Online players- latest developments

The online world is fast moving where every day changes can be recognised. Borders between online and offline shops blur. More and more former permanent retailers start opening online shops. Not only retailers enter internet also the other way around. Some internet pure players started first steps to enter the city. Amazon recently opened a convenience store under the label 'Amazon Go' and a bookstore in Seattle [51]. According latest plans, the online giant plans also to open two grocery shopping sites in Seattle and another bookstore in New York. There are currently 29 Amazon pop-up stores in the US to "experience the full range of Amazon devices (Echo, Fire TV, Fire Tablets, Dash Button, and Kindle)". It might be reasonable assumed that with a success in the US market Amazon will launch similar efforts in Europe. In Germany, Zalando as one of the very first online pure players started a first initiative to enter the city by taking over the store network of a small retailer with 15 point of sales [52].

In Europe Amazon offers in more and more cities, e.g. London, Paris, Milano, and Berlin, a premium service named 'prime now'. Via this service, several thousand products can be received within a day or partly in an hour or less. The fast delivery times were primary offered via currier services, but supplemented little by little by own logistics and even crowd logistics (Amazon flex). Amazon just announced that they are planning to widen their 'prime now' assortment by adding new product lines. Today, already selected groceries are available in Munich and Berlin. According to latest plans amazon plans to sell pharmaceuticals. In a first step Amazon plans to work with existing pharmacies together but there are already speculations about a planned cooperation with pharmaceutical manufactures [53]. Amazon fresh, a delivery service for online ordered groceries, started in 2016 in London. Amazon announced that other European cities will follow. In light of these developments it can be stated that one of the biggest drivers if not the major driver is the online giant amazon who initiates developments - thus for example in the food market. With the announcement of Amazon that they will start to enter the food market by selling groceries online, many companies also started to make efforts regarding selling groceries online. Many providers hope by offering e-grocery before Amazon, and thereby being part of the early movers, they will succeed to stay in the market or to be at least one step ahead of Amazon [5]. Today we find around 250 online shops for grocery in Germany. 'Amazon fresh' entered in June 2017 the Germany grocery market and is expected to gain big market strength soon.

Cross-border e-commerce is another current development. The cross-border e-commerce is a possibility for companies to expand faster than focusing only on

4. Around 10% of all transport is made by Liefery's own drivers, the other 90% are forwarded to other express courier service providers.

domestic markets. In Germany cross border e-commerce from UK or the United States have the biggest share. But also Chinese firms enter European market, enhanced by platforms like 'alibaba' which enable Chinese producers a fast delivery. Today, China is already the third biggest cross-border seller for Germany. Chinese firms also try to be faster than domestic platforms by storing selected products in European warehouses, owned by the online marketplace that enable the contact between seller and consumer. In Germany, a loophole enables foreign companies to avoid customs as long as products have less value than 26 €.

Cross border e-commerce is enhanced by existing payment methods. Meanwhile it is easy to buy from abroad as consumers often do not see a difference in the offered payment compared to domestic sellers. As a result consumers often do not think about where products come from as the product itself is in the centre of their interest.

A study of DHL express expects that cross-border e-commerce will grow twice as fast as inland e-commerce. Currently we see a growing cross border activity in the B2C sector. ECommerce Europe reports that we see a growth of 16 % in cross-border e-commerce all over Europe [23]. The increase is even bigger in France (+21 %) and UK (+20 %). In Germany about 12% compared to 2014, whereas most products have been shipped from UK, US and China.

### **Retailer ordering and delivery service trends**

Convenience for the consumer is in the centre of companies' interest. In this context the delivery is one core competence which actually starts with the ordering options for consumers. To be precise: the online seller offers during the ordering process different delivery opportunities. A few years ago it was quite common that after the consumer chose and ordered a product, the average delivery took - depending on the seller, origin and type of product – two to five working days, while the transport provider was set by the seller. Today, many online retailers offer the opportunity that beside a delivery time also the transport service provider can be selected by the consumer. In Germany often free shipping is offered if the delivery is expected to take two to five day while consumers are paying for a premium or faster delivery.

The delivery service is also in the focus of Amazon. With 'prime now' amazon offers a same-day delivery service. The service is already available in 20 German cities whereas the availability of products differs in the cities. The biggest product range is (with about 15 000 articles) currently offered in the cities of Berlin and Munich. In France the service is offered in Paris using a logistics centre of 4 000 m<sup>2</sup> in Paris region [54].

A further new development is that Amazon builds own APS for parcels. After first lockers were implemented in UK, the service is now, with already 400 lockers in 2018, also available in Germany. The automatic parcel lockers which are personalized and named like 'Franka' or 'Rolf' are mostly located at petrol stations but can sometimes be found on grounds of supermarkets. The French Amazon lockers seem to address more the non-motorised shoppers as they are preferably located in shopping centres.

The aim of Amazon is to build up their own logistics, the offer of 'prime now' is thereby used for being able to analyse the order behaviour of consumers better. Currently amazon uses not yet own transport providers for enabling the same day and within next hour deliveries but small service providers like Liefery, Rico Logistics, Interkep, Systemlogistik, Krae Transport, or AZ Logistik. The appliance of own logistics divisions with own sorting systems and cooperation with courier services called 'amazon logistics' testimony amazons plans for a greater independence. General it can be stated that a same-day delivery service becomes, at least for cities, more and more a standard feature for leading online retailers. With this development also the need for inner city warehouses will grow as long as providers cannot refer to an existing network of point of sales.

Three quarter of the top 500 UK retailers offer next day deliveries in 2015, about 29 % of the retailers give the opportunity that consumers can choose a day for their delivery, and 13 % offer a time slot to be chosen by the consumer and about 5% offer a same-day delivery option [55].

Most parcels are sent out via transport providers, but depending on which type of product is shipped also e-retailers have created their own network and use own transport fleet e.g. food sold online (see section 3.3).

Another trend is the set-up of 'Drives'. In France the offer is with more than 2 000 sites already nationwide established but it can be assumed that the offer will be spread in other European countries. The service is mostly offered for groceries and enables the consumer to pick up their online ordered products themselves by avoiding to collect the product one by one in the supermarket and to que up at the cash desk. For other product groups than groceries the 'click & collect' in shops is increasingly offered.

Latest developments include that some online retailers have subcontractors or even offer an own transport service only for their products, like Zalando has one for selected products in the area of Berlin.

#### 4. Synthesis of results, discussion and conclusion

The aim of the present paper was to summarise the current development and future trends in the field of e-commerce

considering consumer behaviour, transport aspects as well as the main drivers for the development, focusing on the French and German market. Table 3 summarises the similarities and differences in France and Germany.

**Table 3.** Summary of similarities and differences in France (F) and Germany (G)

	Similarities	Differences
<b>e-commerce development</b>	<ul style="list-style-type: none"> <li>- the market share in retail increases</li> <li>- development towards short delivery periods</li> </ul>	<ul style="list-style-type: none"> <li>- higher turnover in G</li> <li>- higher e-commerce share of GDP in F</li> </ul>
<b>Consumer behaviour</b>	<ul style="list-style-type: none"> <li>- number of e-shoppers is growing steadily</li> <li>- growing m-commerce, clothing and media/entertainment/ electronics are the most popular physical product groups</li> </ul>	<ul style="list-style-type: none"> <li>- higher average spending by e-shopper in F</li> <li>- use of click and collect (especially for grocery) in F</li> <li>- most common payment method in <b>F</b>: credit card; in <b>G</b>: payment on account, direct debit and via paypal (online)</li> <li>- e-grocery more advanced in F</li> <li>- higher number of returns in G</li> </ul>
<b>Delivery structures</b>	<ul style="list-style-type: none"> <li>- home delivery most favoured</li> <li>- establishment of alternative delivery points</li> <li>- e-grocers use own delivery services</li> <li>- delivery services active in both countries: DHL, UPS,DPD, TNT (FedEx), GLS</li> </ul>	<ul style="list-style-type: none"> <li>- click &amp; collect are especially according to drives well established in F</li> <li>- according to statistics, number of shipments is 3 times higher in G</li> <li>- rapid delivery times further developed in G</li> <li>- delivery services<sup>5</sup> only active in <b>F</b>: LaPoste with Colissimo &amp; Chronoposte, Mondial Relay<sup>6</sup>, Geodis; in <b>G</b>: Hermes<sup>7</sup>, smaller companies like Liefery</li> </ul>
<b>Market players</b>	<ul style="list-style-type: none"> <li>- online platforms have biggest turnover and sales growth</li> </ul>	<ul style="list-style-type: none"> <li>- (more ) brick and mortar grocers have online shops for food in F</li> </ul>

Europe experienced a large increase in online sales in the last decades. The neighbouring countries France and Germany have with UK leading sales statistics in Europe. Beside common features in context with e-commerce there are differences (table 3) for example in consumer behaviour when using click and collect which result in different consequence for transport. Regarding the situation today it can be stated that even though France has fewer inhabitants it is more money spent online there than in Germany (table 1,3). In future, due to expansion of offered products and service as well as comprehensive internet availability, online spending will grow further not only in both countries but Europe wide. Current developments show that m-commerce will drive the merge of on- and offline forward so that soon shopping will not only be considered as an outdoor or indoor activity but on the way. Also the barriers between online and physical shops, information and purchase will blur. In this context the authors see a need for surveys asking what is when how frequently purchased online.

Regarding the companies that offer products online, we see more and more specialized online retailers, focused on particular categories, which often sell through online

market places. Similarly the segment of e-grocery grows. For multichannel retailers, including e-grocers, the ‘click-and-collect’ system as well as the implementation of drives will probably become a key part of their strategy. Thereby it can be stated that ‘Click & Collect’ is just one of the phenomena that show that online shops and local presence do not always exclude themselves but can be a good match.

Beside national also international traders are looking for new costumers. The globalisation pushes new players into the national markets and with the help of the internet sellers can get easily contact to consumers in foreign markets. Also in this context a successful delivery is, especially in terms of foreign companies, besides marketing one key element of costumers’ satisfactions and so in the end for success. Premium services like fast delivery will be challenging for international transport providers like UPS or DHL. But beside the big players also other foreign service providers, like Chinese logistics provider ZTO express, will benefit from the cross-border development.

5. List of companies does not claim to be complete, only the biggest players are listed

6. Mondial Relay has a cooperation with Hermes for deliveries from G to F

7. Mondial Relay has a cooperation with Hermes for deliveries from G to F

Despite some national differences the future developments will be similar in France and Germany regarding transport issues: the growing online shopping is generating an increasing demand for dedicated delivery services. This development accompanies with logistics challenges and will bring changes regarding

- time critical delivery (same-day-delivery and next day deliveries),
- size of shipment (on going trend towards smaller shipments),
- online purchased items (FMCG as one of the fastest growing products),

having effects on locations for distribution centres and warehouses, traffic flows and delivery concepts. The delivery services will thereby play a special role both in metropolitan areas and in rural areas. In particular, the growth of e-commerce has influenced the increasing fragmentation of the consignments in the last mile to the commercial supply market, and contributed to increasing urban freight traffic and traffic jam – the latter especially through parking in the second row. Accessibility represents an increasing problem. Therefore a further increase of urban deliveries along with a possibly intensification of the traffic situation can be seen critically, not only from city dweller and municipality but also from transport service provider perspective. Considering that for the transport service providers “time” (not only size of route but time at stop), “number of stops” and “a successful delivery” can be seen as essential for keeping costs for last mile low, solutions in these fields have been of interest in the last years. As a result there have been efforts to improve successful deliveries at first try or to bundle shipments, just to mention some. Currently there is still especially a demand for home deliveries but it can be expected that the acceptance and usage of alternative delivery solutions like the delivery to parcel lockers or shops will grow. The authors assume that consumers need time to get used to new services and that it needs time to adopt them in their daily life as well as to their daily routines. As the network and the possibilities are there consumers will soon integrate offers into their everyday life. These alternative solutions have often bundling effects and can reduce the number of stops. The use of ‘drives’ is already well established in France, at least for e-groceries. Nevertheless it should be rethought what happens if these alternative delivery solutions will not be accepted - do supply concepts have to be reconsidered?

Currently micro consolidation-hubs are seen as an alternative solution, also enabling the delivery with alternative vehicles such as cargo bikes. Admittedly, the establishment of micro consolidation hubs sounds revolutionary but will only work on the very last miles. On the basis of the survey of Gruber et al., that estimated the mean distance for cargo bikes with around 5 km, it can be assumed that cargo bikes are useful for the delivery on the very last 2-5km (depending on their

load) [56]. Facing up to 10 million parcels a day a dense concentration of micro-hubs would be needed though. Although the establishment of micro-consolidation hubs seems to be no comprehensive solution, it will be useful at hot spots and in inner city centre areas and can bring punctual release. In connection with political measures, such as bans on certain types of vehicle entering cities or creation of low emission zones, inner-city micro-consolidation depots are also highly discussed. ‘No drive zones’ and the establishment of packing stations close to residential areas lying in these zones are conceivable, too. The concepts to handle growth in shipments shouldn’t be limited to specific areas but strive for a systemic approach, e.g. making use of rail and rivers for inner city deliveries, bundling of shipments, delivery restrictions to certain days or hours, area-specific delivery times. And in light of the local goods transport the question arises: Is it possible to reorganize the current decentral delivery structures? And how can research help to alleviate today’s situation best?

The authors identified beside the big market players, i.e. Amazon, also the transport service providers as main drivers which shape the current e-commerce and delivery situation, whereas municipalities act recently more reactionary. This may be changed in nearby future with regulations such as to traffic prohibitions or others. An example for service providers who already rethink their concept of deliveries and develop ideas for improving their delivery success and to bundle good flows, one German transport service provider can be mentioned here: Hermes is planning to make home deliveries only for surcharge, only a delivery to a parcel shop will be without surcharge.

Small depots in inner urban areas are on the on the agenda of (transport) service providers but also vendors like Amazon who are searching -due to short time deliveries – the proximity to end-consumer, too. To avoid costs for inner city rents and for being able to react within short time also moving micro depots emerged (currently Amazon runs a few for ‘amazon prime’). Depending on the segment, the distribution for online ordered products has different start of departures. Currently often POS used as consolidation centres for e-grocery, but with further growing there will be a need for distribution and consolidation centres close to cities and /peri-urban areas for supplier depots. Thus a research on differences of location for distribution in the different online segments seems interesting.

Looking on click-to-possession, we see from retailers’ perspective room for improvement as it takes on average 5.3 days from the product order to receiving the product in France [16]. The click-to-possession is especially for online pure players of interest to gain a competitive not only to physical stores but also to market leaders like Amazon. Subsequently, logistics is becoming more and more consumer oriented, facing greater demands

regarding deliveries. Same day delivery will be one big topic at least for some product groups as for example groceries. But attention should be paid as fewer lead times result in less efficient logistics (individual shipments not bundled) and thus in more delivery traffic.

The authors see a need on research to link the shape of delivery solutions to consumer behaviour in different countries, especially for e-grocery as this is currently the segment with strongest growth rates. Thereby the effects of consumer behaviour on traffic require a special consideration. The impact of online shopping on individual (shopping) trips and the use of alternative delivery options and its impact on individual trips (e.g. additional ways for using click and drive?) are not yet sufficient examined. Likewise, consequences of new networks and new delivery concepts on pre-existing logistics structures should be more investigated. In context to traffic flows the authors see also a gap in translating generated turnover or purchased items to number of parcels or generated delivery trips. On a general note, the increasing e-commerce turnover can be linked to increasing shipments and delivery traffic, surely, but not to concrete figures. With a growing in shipment volume the delivery networks, e.g. in form of parcel lockers and shops but also in terms of urban freight centres, were widened for being able to enable an increase in delivery performance. The construction of these new networks which means more and smaller delivery areas and the increase in performance go along with a growing number of delivery trucks. Do these smaller delivery areas provide good opportunities for alternative delivery vehicles? And what about congestions, alternative delivery vehicles may be helpful in context with air pollution but as they often go along with more and smaller vehicles, are they also helpful for avoiding congestions? In this respect, the question should be addressed how the current decentralised delivery system can be (more) bundled? Longer lead times from ordering to the delivery may help for optimising the logistics efficiency from retailerside but what other possibilities are there to manage the overall situation? Another interesting issue is that the growth in e-commerce accompanies new urban space requirement; what does this mean for urban transport/traffic? Altogether many research questions are still not sufficient investigated. Research to explain the huge differences in overall shipment volume in France and Germany would also be of relevance (section 3.3).

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