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The Last Mile in an Electronic Commerce Business Model - Service Expectations of Austrian Online Shoppers

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THE LAST MILE IN AN ELECTRONIC COMMERCE BUSINESS MODEL – SERVICE EXPECTATIONS OF AUSTRIAN ONLINE SHOPPERS

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Abstract

Many existing research approaches on business models in e-commerce are on a high and aggregated level. Furthermore, there are few empirical insights into the appropriateness of chosen e-commerce business models. The paper at hand focuses on the empirical analysis of the last mile issue in b2c e-commerce. For this purpose a research framework for e-commerce business models is presented that serves as a basis for empirical analyses as well as for managerial decisions. The framework takes strategic decisions and conditions of an e-commerce business model into account. Based on this framework the specific issue of last mile logistics is empirically analyzed. Relevant action alternatives for physical distribution are investigated according to their appropriateness from consumers' point of view. The empirical study has been carried out on behalf of 180 face-to-face interviews. Results indicate that the product category has a strong impact on customers' expectations on an electronic retailer's last mile logistics service whereas the customers' flexibility in terms of time and location obviously does not influence their requirements for logistical services.

Keywords: e-commerce b2c; business models; logistics; online shopping; home delivery

1 INTRODUCTION AND RESEARCH MOTIVATION

Since the emergence of electronic commerce and its recognition as a way of conducting commercial business, several streams of research have developed ideas on business models for e-commerce. This shows how the Internet can be used for profit-oriented goals and forms a basis for suggestions of action alternatives for e-commerce businesses. The academic discussion on business models in e-commerce is mainly focused on classifications and the description of typologies of different e-commerce business models (e.g. Timmers 1998, 2003; Wirtz & Becker 2002; Afuah & Tucci 2001; Rappa 2004). This results in a rather descriptive presentation of possible business models. Due to a lack of empirical work in that respect (Wirtz & Lihotzky 2003), there is still little knowledge of what e-commerce businesses should take into account when designing an e-commerce business model. Furthermore, the present discussion focuses on a rather abstract reflection. This is necessary as many business model taxonomies take a wide range of relevant aspects into account. In order to reduce complexity of the developed business models, they are discussed at a high and aggregated level.

The advantage of this approach lies in its universality; high-level business models can be applied to different kinds of organizations and also to different conditions. However, the main disadvantage lies in its lack of precise suggestions for the implementation. In practice, managers often have only a vague idea of what their business models look like (Linder & Cantrell 2001). Hence, an empirical analysis is of high relevance in practice. By now, empirical work is still rare in this area. Exceptions are the empirical investigations carried out by Kinder (2002), Gebauer and Ginsburg (2003), and e-factors (2004). In these analyses, case studies have been carried out in order to evaluate existing concepts of an e-commerce business model (in the following abbreviated as ECBM).

The paper at hand addresses the lack of empirical evidence and develops precise action alternatives for a specific part of ECBM in the business-to-consumer (b2c) sector. As it is the final consumer who decides whether an ECBM is successful or not under given conditions, we carried out a consumer survey in order to evaluate the appropriateness of potential ECBM elements. In this empirical investigation, we focus on distribution issues of e-commerce b2c (electronic retailing) and investigate what an ECBM should take into account in the context of last mile logistics (Esper et al. 2003). We have decided to focus on this particular aspect (1) in order to address one specific area deeply and (2) because of its high relevance and topicality in e-commerce b2c. The following research goals are derived:

- In order to analyze relationships between the different decision alternatives of an ECBM and its conditions, we develop a research framework that forms the basis for subsequent empirical work on specific questions. In a second step, those elements of the framework that are relevant for last mile logistics are specified (Sections 3 and 4).
- Success and failure of each business model strongly depend on how well this business model is adapted to an organization's conditions. A main part of these conditions is determined by industry and the offered product categories. Consequently, we analyze the influence of different product categories on the appropriateness of an ECBM's strategic decisions. As stated above, the appropriateness is evaluated on behalf of consumers' point of view.
- Another core element of an electronic retailer's conditions are attributes of the consumer. In the context of last mile logistics, temporal and local disposability are considered as relevant. As these features are represented well by a person's employment status, we analyze to what extent employment determines the appropriateness of ECBM last mile elements.

The last two research goals are addressed in Section 6 after the research methodology is outlined in Section 5. The results are discussed and practical recommendations are derived from the survey.

2 LITERATURE REVIEW

2.1 E-Commerce Business Models

There is no general definition of what an ECBM is. What most approaches have in common, are three basic goals of ECBM (Timmers 1998, 2003; Afuah & Tucci 2001; Magretta 2002; Rappa 2004):

1. *The architecture for the flow of products, services, and information.* This goal concerns design and determination of business transactions and affects what products/services are offered and how they are transferred to the customer.
2. *The benefits of the ECBM to the customers by value generation.* This value can be based on a significant reduction in transaction costs by declining search costs, but also on innovative application of the Internet technology, e.g. by virtual communities or personalization.
3. *The revenue source of an ECBM.* There are different alternatives to achieve revenue. Consequently, revenue is closely related to the pricing strategy of an electronic retailer.

Other approaches contain similar elements of ECBM such as *relational components* of ECBM and their *interactive aspects* (e.g. e-factors 2004; Elliot 2002; Afuah & Tucci 2001; Weill & Vitale 2001); the *benefits for business actors/value propositions* (e.g. Petrovic et al. 2001; Weill & Vitale 2001; Tapscott et al. 2000; Mahadevan 2000); and *revenues* (Osterwalder & Pigneur 2002; Elliot 2002; Afuah & Tucci 2001; Mahadevan 2000; Alt & Zimmermann 2001).

A large number of ECBM taxonomies has been developed. Timmers (1998, 2003) identifies eleven e-business models that can be distinguished from each other by their different degrees of functional integration and innovation. Rappa (2004) defines nine different models based on the source of revenue of a company. Afuah and Tucci (2001) concentrate on five ECBM (content, commerce, communication, community, and coordination). This approach has been adopted by other authors such as Wirtz and Becker (2002) who merge the two ECBM community and coordination which they call context.

Other approaches have been developed by Osterwalder and Pigneur (2002) who provide an e-business ontology which is based on four pillars (product innovation, customer relationship, financials, and infrastructure management) and their relationships. A focus on transformation processes in virtual economies has been presented by Lee (2001). The approach by Mahadevan (2000) recommends the adaptation of an ECBM to the respective market structure in a b2b or b2c segment. In addition to general and web-based ECBM, much attention has been drawn to mobile commerce recently (e.g. Teichmann & Lehner 2002).

The above-mentioned approaches argue that an ECBM can be actively designed by the electronic retailer. However, the organization's environment and its conditions are important influencing factors on the appropriateness of an implemented ECBM. From competition research we know that external factors, i.e. conditions that cannot be directly influenced by the firm, are key drivers to success (Porter 1980; Ansoff 1979). In the e-commerce world, this fact has been taken into account by the analysis approach by Hansen (1998) who considers an ECBM consisting of strategic decisions and their conditions. The framework by Hansen (1998) has been further developed and will be explained in Section 3. The e-factors consortium (2004) distinguishes between endogenous factors, controllable by the firm; and exogenous factors that are beyond the firm's influence. Alt and Zimmermann (2001) propose six elements of an ECBM that consider both the ECBM itself and its conditions and represent a process-oriented point of view.

2.2 Last mile logistics in e-commerce

The strategic importance of logistics and supply chain management is undoubted in academia and practice (Ballou 2004; Shapiro 2001; Martin 2004; Bowersox et al. 2002). It is therefore not surprising that also in the context of e-commerce logistics plays a key role (Reynolds 2001). When it comes to

selling non-digital products to consumers, the big challenge of “last mile logistics” arises. The last mile is the link between an online ordering process and physical product delivery (Esper et al 2003). In contrast to store-based retailing, online shops have to organize product delivery to the consumers’ homes and not just to stores. Last mile logistics turned out to be a crucial success factor in e-commerce and is of high relevance for the marketing mix of an ECBM (Madlberger 2004). Severe delivery problems, especially during periods of high demand like holiday seasons, show that customers who are disappointed because of poor delivery service are not very likely to shop online again (Lee & Whang 2001; Bromage 2001).

Last mile logistics in e-commerce consist of the following measures (Bayles 2001; Reynolds 2001; Schulte 2005): delivery time (e.g. duration, possibility to fix delivery date); reliability of delivery (e.g. availability of goods, order handling time); flexibility of delivery (e.g. concerning delivery date, delivery address); quality of delivery (e.g. accurate delivery, condition of delivered goods); and information (e.g. on delivery date, online tracking and tracing). In order to fulfil a certain level of last mile logistics services, an electronic retailer has to decide upon different measures. So an electronic retailer must for example select the geographical area it wants to serve (Reynolds 2001) and the mode of delivery for the products (e.g. home delivery, mail dispatch, delivery to a pickup point etc.). Another important issue is outsourcing of last mile logistics as building an own logistics infrastructure is very cost-intensive under most circumstances. Important parts of logistics services are also payment handling and management of returns. Finally, key issues of last mile logistics is determination of delivery fees and development of a pricing model for logistic services (Ballou 2004). This applies not only for product delivery but also for additional services such as express delivery or delivery on Saturdays (Bayles 2001; Reynolds 2001).

As the solution of the last mile problem can be seen as a service, it is surprising that this issue has hardly been assessed with methods of customer satisfaction of service quality such as SERVQUAL (Parasuraman et al. 1988). The “classical” scales of measuring service quality are heavily based on human interaction (Bitner et al. 1990) and require adjustments to the online-environment (Long & McMellon 2004). One example is provided by Long & Mc Mellon (2004), who include some elements of last mile logistics. However their survey stays on a relatively high level, so that only limited recommendations on implementing precise measures can be derived.

3 DEVELOPING A FRAMEWORK FOR ECBM

From findings in literature we learn that it is essential that a firm takes its environment into account when it determines its ECBM. The research framework by Hansen et al. (2004) considers this fact. This framework has been developed in order to derive example industry-specific reference models that provide practitioners with precise action alternatives. In order to come up with the high complexity of an ECBM, Hansen et al. (2004) distinguish its strategic decisions and their conditions (cf. Figure 1).

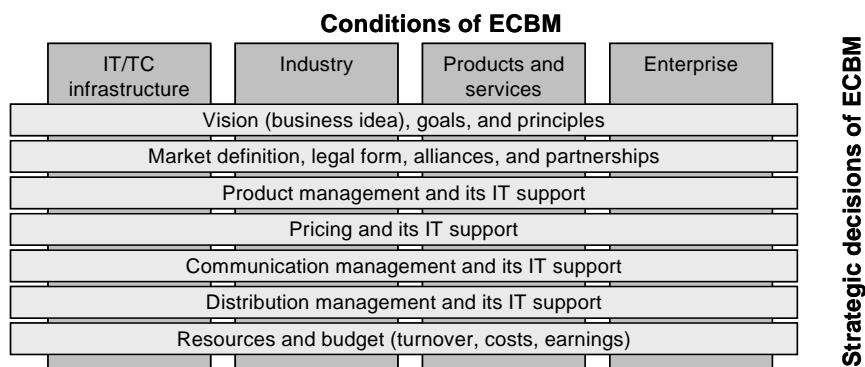


Figure 1. Elements of an ECBM

The goal of any commercial Internet-based activity is success in monetary or non-monetary terms. Success is therewith a variable that depends on the appropriateness of a chosen ECBM. In addition, e-commerce success is also directly influenced by conditions. The elements of an ECBM that are illustrated in Figure 1 are on an abstract level.

In the framework, the **four conditions** are split up on two levels into a total of approximately 150 single factors (Hansen 1998, Hansen et al. 2004). The *infrastructure of information and telecommunication technology* determines which customers can generally be addressed by an online shop or a web presence. As a consequence, an online shop's target group is always limited to those population groups that have access to the Internet. Other influencing factors are network attributes, Internet access costs, and Internet usage behavior. The *industry* is a significant determinant of e-commerce success as it influences the competitive landscape, legal regulations, and market development. Key factors are customers and their behavioral patterns, expressed by socio-demographic attributes as well as buying behavior. The third condition denotes the *nature of products and services* sold online. It affects physical distribution costs and consumers' willingness to order online. Consequently, customers might be willing to buy online certain product categories more likely than others. Finally, characteristics of the *enterprise* itself are a condition. Main factors are size and financial power, the existing IT infrastructure of a company, but also organizational issues, top management commitment, and managerial skills.

Also **strategic decisions** are disaggregated on two levels and consist of more than 300 single management measures (Hansen 1998, Hansen et al. 2004). This dimension consists of a structured overview on relevant managerial decisions. This starts with overall strategic decisions on the ECBM like vision, potential alliances or market and target group selection. From these predefinitions, marketing-relevant decisions in the context of product, price, distribution, and promotion management (Kotler 2003) are derived. For e-commerce, also the respective support by information technology is an important issue. Finally, resources and budget determination are integrated parts of the framework.

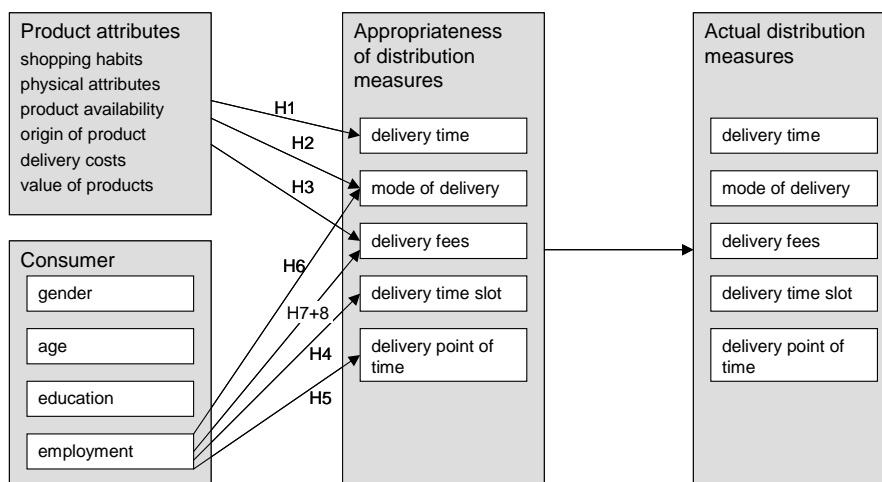


Figure 2. Analyzed relationships between ECBM conditions and ECBM strategic decisions

On the basis of this framework, relationships between each single factor of conditions and strategic decisions can be analyzed empirically according to appropriateness perceived by consumers and potential success. Figure 2 illustrates how the framework can be applied for model development. We use this approach as the basis for the empirical investigation in Section 5.

The model above shows the interdependencies between selected conditions and strategic decisions that are part of an ECBM. In the context of last mile logistics, product and consumer attributes as well as several distribution measures have been considered relevant. Among the consumer attributes, we exemplarily analyze relationships between consumers' employment and perceived appropriate distribution measures although also other socio-demographic issues might be relevant. Finally, as an online shop is advised to take only measures that are considered appropriate by consumers, the appropriate-

ness of ECBM decisions is included in the model. In a following step, the framework can be used to build reference models for specific industries, product categories and/or company types. This is shown in the right part of Figure 2.

4 INFLUENCING FACTORS ON PERCEIVED DELIVERY SERVICE LEVEL

As explained in Section 3, product attributes and consumers' employment are analyzed as potential influencing factors on appropriate distribution measures in an ECBM.

4.1 Product attributes

Product attributes have a major impact on logistical requirements, e.g. product protection and packaging requirements, refrigeration requirements or appropriate means of stock keeping and transportation. Also different buying and order cycle times directly influence appropriate logistics processes. Unlike store-based retailing, online shops are faced with extremely transparent logistics processes in product delivery (Madlberger 2004). The following product attributes are supposed to influence the consumers' expected service level of last mile logistics:

- For different product categories, shopping and consumption habits can differ. Convenience goods such as groceries are often consumed shortly after buying. Shopping goods require more extensive buying decisions and are more durable. Usually, they are not consumed immediately (Li & Gery 2000). We can conclude that convenience goods are expected to be delivered faster than shopping goods.
- Physical attributes of products such as size and weight, perishableness or the degree to which a product is damageable influence consumers' expectations of delivery, especially the appropriate mode of delivery. For many products, the possible mode of delivery is restricted to some few alternatives.
- Product availability and shopping alternatives are related to the perceived convenience advantage of online shopping (Dach 1999). E.g., if a physical store is difficult to reach, home delivery can improve the customer's convenience. If, however, there is a dense distribution grid of stores or the products have to be delivered anyway, home delivery does not increase shopping convenience.
- As transportation is one of the core processes in logistics, the geographic origin of a product considerably influences customers' expectancies concerning delivery time and delivery costs.
- Delivery costs can influence consumers' expectations on last mile logistics. If delivery fees are perceived high, consumers are likely to expect a superior level of last mile logistics in different dimensions, e.g. delivery time, flexibility in terms of delivery etc.
- Further product attributes that influence customer expectations are reasons for buying and the value of the ordered products. Furthermore, the importance of returns can affect the expectations on last mile logistics as well as on delivery fees. (Hansen 1998).

In order to find out to what extent consumers have different expectations on different product categories, we investigated consumers' perceptions of required components of last mile logistics. The examined product categories are *groceries*, *books/music*, *computers and accessories*, and *apparel/shoes*. Groceries are typical convenience goods that often require careful handling (short delivery time and refrigeration). Books and music are homogeneous shopping goods that are easy to deliver as they can be dispatched via mail. Computers and accessories are also considered being homogeneous shopping goods but their delivery requirements are more complex and their value is rather high. Finally, apparel and shoes are heterogeneous shopping goods. They are easy to dispatch but returns and varying price levels are of major issue.

An electronic retailer has numerous opportunities to design its last mile logistics concept. An industry survey on logistics in e-commerce revealed that delivery accuracy, delivery frequency, and delivery

time are crucial issues of increasing importance (Auramo et al. 2002). Among the different modes of delivery, types of unattended delivery are considerably more favorable for the electronic retailer (Punakivi et al. 2001; Kämäräinen & Punakivi 2002). Delivery costs are perceived as a price increase by consumer (Koch 2003), thus they can have a considerable impact on buying behavior and expectations on delivery.

Delivery time

As stated above, expected delivery depends on the consumption habits of a product category. As groceries are classified as convenience goods, whereas the other categories are considered being shopping goods, we assume that consumers expect shorter delivery times for groceries than for the other categories.

- H1: Consumers expect different delivery times for different product categories.

Mode of delivery

The physical characteristics of the investigated product categories and their different levels of availability in physical stores lead to the conclusion that consumers prefer different modes of delivery. We distinguish between home delivery, delivery to the working place, and three alternatives of delivery to a pickup point (stores, railway or gas stations with extended opening hours, and deposit boxes). Additionally, we generally asked about the acceptance of dispatch by mail and dispatch by messenger.

- H2: Consumers expect different modes of delivery in the different product categories.

Accepted delivery fees

Next, we investigate the influence of categories on accepted maximum delivery fees. Physical attributes of the product categories differ considerably, but also the product categories have different product values and packaging and handling requirements. Groceries show a low value but require careful handling and delivery. Computers are valuable and also require careful handling. Apparel shows different price levels but is easy to deliver, books show few price differences. Thus, we analyze whether consumers are willing to pay different amounts of delivery fees for different product categories.

- H3: There are different maximum acceptable delivery fees for the different product categories.

4.2 Consumer attributes

The characteristics of the consumers who place online orders are another influencing factor of last mile logistics expectations.

Employment

From the logistics point of view, the spatial and temporal availability of the customers plays a major role. The necessity that the customer must be present at the point of delivery can considerably affect the perceived convenience of last mile logistics. The consumer's ability to be present at a point of delivery or pick up the ordered goods at an agreed place depends on how a consumer is engaged by his/her profession. Employment must therefore be considered an important time-related constraint for last mile logistics service components and customer expectations.

First, we assume employed persons have stricter requirements on delivery time slots and also prefer different delivery times than people who are not employed.

- H4: Employed people accept only shorter delivery time slots than non-employed people or people who are being educated.
- H5: Employed people prefer delivery time in the evening to a higher extent than non-employed people.

As employed people are also less flexible related to picking up consignments at certain agreed delivery points we assume that they prefer these modes of delivery less than the other target groups.

- H6: Employed people prefer picking up goods to a lower extent than non-employed people.

At last, due to time restrictions employed people are faced with, we assume that this target group is willing to pay more for improved delivery service. So we formulate the following two hypotheses:

- H7: Employed people are ready to pay more for short delivery time than non-employed people.
- H8: Employed people are ready to pay more for fixed delivery time than non-employed people.

5 RESEARCH METHODOLOGY

For the empirical investigation, 180 face-to-face interviews have been carried out in a two weeks period in May 2004. The questionnaire was pretested with ten people and resulted in re-formulation of some questions. The interviews took place in popular shopping areas in and around the city of Vienna. To ensure that the sample is comparable with Austrian online shoppers, tourists have been excluded from the interviews. Additionally, the survey was restricted to people who had already shopped online.

Compared to online shoppers in Austria, the structures of gender (Plattform Versandhandel 2005a) and education (Plattform Vershandhandel 2005b) are satisfyingly representative. We also identify a similar age structure except for the age group below 20 years (Plattform Versandhandel 2005b). This is mainly due to the survey strategy that avoided interviews of underaged persons according to the ESOMAR guidelines (ESOMAR 2005). Compared to online shoppers in Austria, the sample contains more people who are taking part in education measures (e.g. school, university) or who are not employed (Plattform Versandhandel 2005b). At last, more than two thirds of the interviewees live in Vienna. The sample structure is depicted in Table 1.

gender	male	60.5%	education	primary school	5.7%	
	female	39.5%		secondary school	45.7%	
age	below 20 years	6.7%		apprenticeship/vocational school	22.3%	
	20-29 years	39.4%		university	21.7%	
	30-39 years	37.8%		others	4.6%	
	40-49 years	10.0%		hometown	Vienna	77.2%
	50-59 years	4.4%			more than 50.000 inhabitants	6.1%
60+ years	1.7%	more than 10.000 inhabitants	8.3%			
occupation	employed	57.6%		less than 10.000 inhabitants	8.3%	
	not employed	18.1%				
	education	24.3%				

Table 1. Sample structure

6 STUDY RESULTS

In order to analyze differences between the consumers' expectations related to the different product categories (hypotheses H1 to H3), we carried out the non-parametric Cochran Q test method. This test is appropriate for the analysis of differences in the distribution of nominal variables under different conditions. Cochran Q is applied if there are more than two matched samples or if repeated measures of a single sample are compared. This test method is an extension of the McNemar test that is used for the analysis of two related samples. The application of a non-parametric test method is appropriate because the variables are nominal-scaled. Additionally, non-parametric tests are ideal for small sample sizes (Siegel & Castellan 1988).

Hypothesis 1 states that consumers' expectations concerning delivery time differ with the investigated product categories. Table 2 shows the results of the Cochran Q test.

	delivery time	< 1 h	1 to 4 h	5 h to 1 day	2 to 3 days	4 to 7 days	8 to 14 days	14 days +
frequency in prod- uct category	groceries	49	73	51	2	0	0	0
	books/music	0	2	5	71	62	37	2
	computer	0	1	6	37	75	47	9
	apparel	0	2	5	27	73	55	12

Cochran Q	147.000	199.148	103.740	108.520	118.524	88.270	21.906
p	.000	.000	.000	.000	.000	.000	.000

Table 2. Cochran Q tests for expected delivery time in different product categories

As Table 2 shows, there are highly significant differences in expected delivery time across the product categories. So Hypothesis 1 is supported by the data. Whereas groceries are expected by most respondents to be delivered within four hours or at least within one day, delivery time periods of two to seven days are expected by most consumers for books and music. Computers and apparel show a similar structure, most users expect these product categories to be delivered within four days to one week.

According to Hypothesis 2, consumers expect different modes of delivery in the different product categories. In Table 3, the results are summarized.

	delivery time	home	work place	store	gas/railway station	deposit box	mail	messenger
frequency in prod- uct category	groceries	172	49	30	17	7	28	73
	books/music	138	57	24	21	30	136	92
	computer	147	37	19	19	14	110	91
	apparel	142	32	56	17	25	128	96
Cochran Q	52.887	23.322	49.010	1.886	40.750	218.703	13.175	
p	.000	.000	.000	.596	.000	.000	.004	

Table 3. Cochran Q tests for expected mode of delivery in different product categories

Table 3 shows that H2 is mainly supported by the data. Except pickup at railway or gas stations, there are significant differences in the preference structure across the product categories. However, home delivery is most preferred for all product categories. This is especially true for groceries where more than 95% stated that they would prefer home delivery of groceries. Delivery to the work place is more accepted than delivery to pickup points. The other modes of delivery are far less popular for groceries. Books and music CDs are also mainly expected to be delivered via home delivery but a larger portion would also accept delivery to the workplace. Interestingly, there is a relatively high acceptance of pickup solutions for books, especially for deposit boxes. Computers are expected to be delivered home to a larger extent than books. Delivery to the work place and delivery to pickup points are less accepted for this product category than for the other ones. Finally, apparel is also preferred to be delivered home but we also identify a rather high acceptance of pickup solutions, especially at stores.

Hypothesis 3 assumes different maximum acceptable delivery fees for the different product categories. For this purpose the respondents were asked to disclose the maximum accepted delivery fees for a respective basket with a value of 50 Euro. Table 4 shows the descriptive results.

maximum delivery fees for	mean (in Euro)	standard deviation	variance	maximum (in Euro)
groceries	2.08	3.152	9.933	20.0
books/music	1.66	2.238	5.007	10.0
computers	2.28	2.781	7.732	10.0
apparel	1.69	2.206	4.867	10.0

Table 4. Descriptive results for the maximum willingness to pay delivery fees

A paired t-test shows that there is no significant difference in maximum accepted delivery fees between books/music and apparel as well as between groceries and computers. All other differences between means are significant. So Hypothesis 3 is partly supported and leads to the conclusion that consumers are generally willing to pay higher delivery fees for computers and groceries than for apparel and books/music.

The next hypotheses are related to last mile logistics preferences depending on the employment status. Hypothesis 4 states that employed people prefer shorter delivery time slots to a higher extent than non-employed people or people who are being educated. Hypothesis 5 assumes that employed people wish delivery time in the evening to a higher extent than non-employed people. Finally, Hypothesis 6 states

that employed people accept delivery to a pickup point to a lower extent than the other target groups. The results for these hypotheses are summarized in Table 5.

Relationship between	Chi square	df	p
employment and delivery time slot (H4)	4.785	6	.572
employment and delivery in the evening (6 p.m. to 12 a.m.) (H5)	3.853	2	.146
employment and acceptance of pickup solutions (H6)	.910	2	.635

Table 5. Chi square tests for last mile logistics preferences and employment status

As Table 5 shows, all three hypotheses have to be rejected. There are no significant relationships between employment status and the discussed last mile logistics service components.

Finally, Hypotheses 7 and 8 investigate whether employed people are willing to pay a higher amount for short delivery time slots and fixed delivery time than non-employed people. The results of the ANOVA analyses are depicted in Table 6.

Willingness to pay more for short delivery time (H7)	sum of squares between groups	sum of squares within groups	df between groups	df within groups	F	p
groceries	2.970	1189.516	2	157	.196	.822
books/music	13.550	1837.450	2	157	.579	.562
computers	13.570	1073.481	2	154	.973	.380
apparel	8.193	968.282	2	158	.668	.514
Willingness to pay more for fixed delivery time (H8)						
groceries	33.429	1517.590	2	155	1.707	.185
books/music	5.084	1481.665	2	153	.262	.769
computers	4.866	971.306	2	153	.383	.682
apparel	10.553	786.516	2	156	1.047	.354

Table 6. ANOVA results for willingness to pay depending from employment status

As Table 6 shows, there are no significant differences between the different target groups according to employment. Employed people are not willing to pay more for an improved last mile logistics service. In the light of the rejected previous hypotheses, this result is not surprising. If employed people do not have stronger requirements concerning last mile logistics they are also unlikely to pay more for an improved service level. As a consequence, restrictions concerning timely and spatial availability do not influence consumers' expectations on last mile logistics issues.

7 DISCUSSION AND FURTHER STEPS

As the results above show, the product category has a strong impact on consumers' expectations concerning last mile logistics. According to the survey, the groceries business is faced with most challenges in last mile logistics. This is not only due to the specific physical product attributes but also to the requirements from the consumers' point of view. Consumers expect groceries to be delivered home quickly. But consumers are also aware of the high complexity of last mile logistics in the groceries industry. On average, they are willing to pay approximately two Euro for a food basket worth 50 Euro, an amount that is only exceeded by delivery fees for computers. Expected delivery conditions for books and music CDs seem to be influenced by the business model of Amazon; many requirements are similar to what the leading online bookstore offers. The other investigated industries are confronted with less strict requirements but also have to take into account that delivery time should never exceed two weeks. Interestingly, the analyzed consumer attribute of employment does not show any significant influence on consumers' expectations. Consumers who are less flexible in terms of time and location obviously do not honor facilitating logistics services such as shorter delivery time slots. This turns out to be a challenge for online shops that point at their convenience advantages of home delivery. But it should be mentioned that there are considerably more unemployed or currently edu-

cated people in the sample than among Austrian online shoppers in general. As a consequence, the average Austrian online shopper might assess this service to a higher extent than revealed in this study. On the other hand, as people younger than 20 years are underrepresented, this might lead to a lower importance of convenience advantage as young people are usually more flexible and mobile.

Certainly, the discussed study has some limitations. One issue are the sample size and the mentioned age and employment biases in the sample. Furthermore, the study should include more conditions and also more strategic decisions that might be relevant. In this context, the underlying research framework should be further refined for this specific research question. The focus of the analyzed industries should be extended and ought to include other relevant industries as well. Also the geographic focus should be broadened in order to elaborate cross-cultural differences and further conditions. Finally, an individual online retailer also has to take its own situation and conditions into account.

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