

Research Article

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E-commerce and its Impact on Logistics Requirements

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Abstract: The contribution will focus on the development of e-commerce. The extent of the development of internet by age category will be assessed and the development of this factor will be monitored by correlation analysis. Analysis of logistics operators will be performed in the field courier, express and parcel shipments. Market competitiveness B2C will focus on flexibility in delivery, evening delivery or on weekends, term delivery (increasing the cost of tracking shipments and their records), use and offering banking products with secure payment system, readiness deliver the goods via its own fueling point. On the contrary, legal provision regulating the entrance to the parking are, entrance into pedestrian zone service may limit or prevent.

Keywords: e-commerce, postal item, postal parcel

1 Introduction

Opportunities for growth postal services exist, but providers of postal services must distinguish between relevant information and different interpretation of dates. Potential sources of growth in future are above all convergences of traditional items and modern technologies (innovative variable data) and profile the customers [1, 2].

Revenues of domestic e-shops 2016 will continue its rapid growth, on year rise by one fifth. Turnover Czech e-commerce could thus 93-97 billion crowns. Therefore, there will also big trend to shop on-line food for daily consumption. In popularity come categories as cosmetics and health, drugstore, food (in this case is used service same day delivery). E-commerce provides a new form distribution channels for consumer goods. Requirements are placed on the improvement and expansion of information technology [3–5]. For distribution logistics is the logis-

tics network and requirements of individual processes [6]. There are mentioned variants of models for eProcurement and suggestions for system solutions Sell-side-solve, Buy-side-solve, electronic marketplace and EDI connections [7].

In the context of e-commerce are addressed communication systems utilizing IT for distribution logistics and distribution problems of courier, express and parcel shipments, including analysis of processes with respect to the quality of logistics services [8, 9]. E-Business in Logistics introduces Networks-Catalogs and requires harmonization of complex Supply Chains [10].

In e-shops continued to grow contacts from mobile and tablet devices. 23% of all traffic in eshops consists of mobile device. Less is share of turnover, which reaches about 13%, but in future it is expected to increase.

2 Methods of examining dependencies between factors which are influencing e-commerce

Methods of regression and correlation analysis are used to understand mathematic description of statistic dependence and to authenticate theories. It goes about searching, researching and valuating connection between two and more statistic sign. The aim of the solution is to intersect into principle monitored effects and processes and to get near to casual dependences, which can come [11].

Linear regression function can be written in form:

$$\mu = \beta_0 + \beta_1 f_1(x), \beta_p f_p(x) \quad (1)$$

$\beta_0, \beta_1, \dots, \beta_p$ are unknown parameters

f_1, f_2, \dots, f_p are known (doesn't include other unknown parameters) function independence variable x

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2.1 Dependence between studies variables

To determine dependencies between the studied variables, regression analysis was used. They were investigated by following dependencies:

- Dependence of postal item on individuals purchasing over the Internet (16-74 years);
- Dependence of postal item on households with Internet access;
- Dependence of postal item on revenues of domestic e-shops;
- Dependence of postal parcel on individuals purchasing over the Internet (16-74 years);
- Dependence of postal parcel on households with Internet access;
- Dependence of postal parcel on revenues of domestic e-shops.

For the calculation of analysis, dates from Czech Post were used, which are publicly available from the Annual Report of the Czech Telecommunication Office, and others dates were taken from the Czech Statistical Office.

2.1.1 Dependence of postal item (to 2 kg) on individuals purchasing over the Internet (16–74 years)

Based on the index of determination can be seen, that model describes reality in 98.89%. From computation value F-test goes, that model can be used for describes this dependence (Table 1).

Table 1: Analysis results.

r^2	0.9889
F-test	356.7
P-value	0.0001
Deviation from zero	Significant

Figure 1 presents indirect dependence between volume of postal item and individuals purchasing over the Internet. The growth of number of individuals purchasing over the Internet is connected to decreasing interest about postal item. This means, that customers can use other operators for delivery.

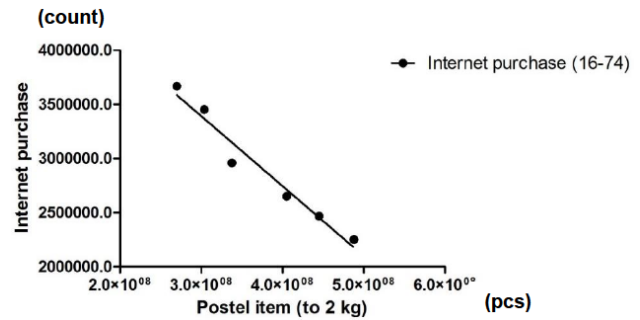


Figure 1: Dependence of postal item on individuals purchasing over the Internet.

2.1.2 Dependence of postal item (to 2 kg) on households with Internet access

Determination index is 95.94% and from value F-test means, that model captures the correlation between the variables being monitored (Table 2 and Figure 2).

Table 2: Analysis results.

r^2	0.9594
F-test	94.44
P-value	0.0006
Deviation from zero	Significant

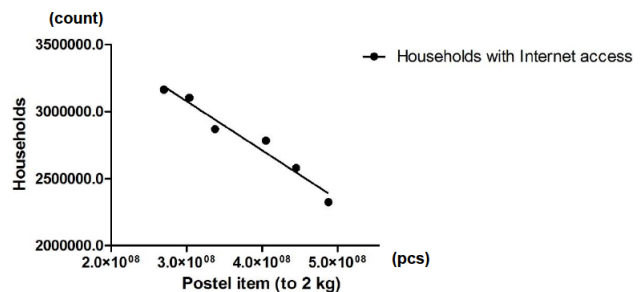


Figure 2: Dependence of postal item on households with Internet access.

2.1.3 Dependence of postal item (to 2 kg) on revenues of domestic e-shops

Determination index is 95.86% and from value F-test, it means, that model captures the correlation between the variables being monitored (Table 3 and Figure 3).

Table 3: Analysis results.

r^2	0.9586
F-test	92.54
P-value	0.0007
Deviation from zero	Significant

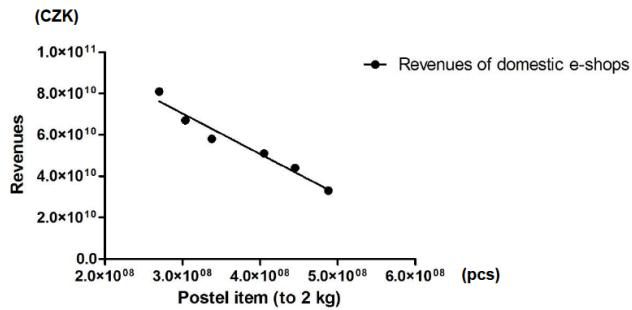


Figure 3: Dependence of postal item on revenues of domestic e-shops.

2.1.4 Dependence of postal parcel on individuals purchasing over the Internet (16–74 years)

Determination index shows, that the model describes reality in 98.89%. describe this dependence (Table 4). Computation value F-test shows that model can be used to

Table 4: Analysis results.

r^2	0.9889
F-test	356.7
P-value	0.0001
Deviation from zero	Significant

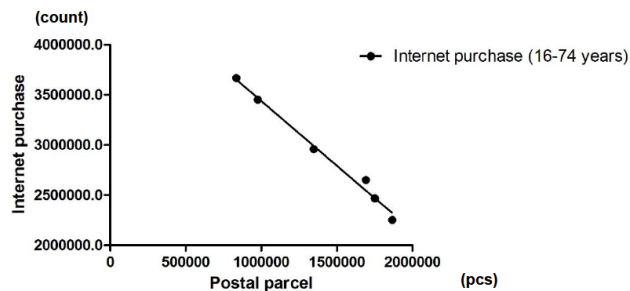


Figure 4: Dependence of postal parcel on individuals purchasing over the Internet (16-74 years).

Figure 4 presents indirect dependence between volume of postal parcel and individuals purchasing over the

Internet. The growth of individuals purchasing over the Internet is connected decreasing interest about postal parcel.

2.1.5 Dependence of postal parcel on households with Internet access

Determination index is 88.26% and from the value of F-test, model captures the correlation between the variables being monitored (Table 5 and Figure 5).

Table 5: Analysis results.

r^2	0.8826
F-test	30.069
P-value	0.0054
Deviation from zero	Significant

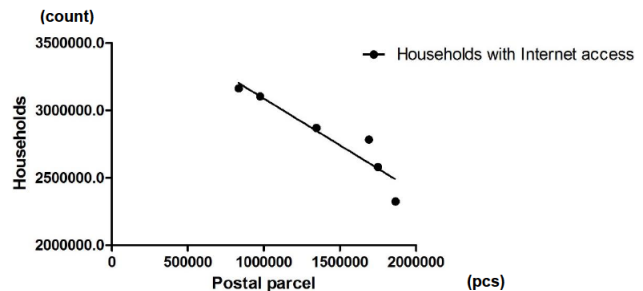


Figure 5: Dependence of postal parcel on households with Internet access.

2.1.6 Dependence of postal parcel on revenues of domestic e-shops

Determination index is 92.76% and from the of value F-test, the model captures the correlation between the variables being monitored (Table 6 and Figure 6).

Table 6: Analysis results.

r^2	0.9276
F-test	51.12
P-value	0.0020
Deviation from zero	Significant

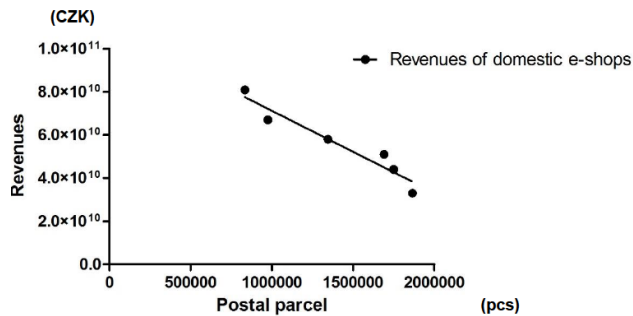


Figure 6: Dependence of postal parcel on revenues of domestic e-shops.

3 Results

Based on the regression analysis, it was found that dependency exists among various monitoring between quantities. But we cannot confirm that the growth of one variable and the second increased. Postal item and postal parcel influence other factors, which are connected with delivery. Decrease in the number of parcel delivery is related to the fact that the customer can choose between operators and their services. Factors that mostly affect the customer at the submission item or parcel are the time, cost of delivery, customer service and additional services [12]. Changes are also in service when customers can pick up their item at a branch or in terms of time saving is item ready for pick up in boxes. More customers prefer also free delivery, only in some cases (seasonality, documents or food delivery) are willing to pay extra for that service (same day delivery) [13].

E-commerce supported the expansion of e-commerce started to grow significantly after year 2000. The B2C business relationships are increasingly in demand because the system of shopping from the comfort of your home at a lower price, convenient and popular. Currently, you can buy anything via the Internet with delivery times for shipments on the second business day or even on the same day after the order. For customers still true that when online shopping must rely on proven e-shops.

The problem remains to determine the number of transported parcels. There are no statistics to such information. Development of parcel services can be seen from the increase in orders for goods or services using the Internet through private users (16 – 74 year).

Although the Czech Post, s.p. one of the largest providers of parcel shipments, despite her performance in this segment continue to fall due to the liberalization of the transport market express, letter and parcel services. In the last five years, recorded segment parcel by Czech Post decreased by 38.9%. Logistics service providers in the seg-

ment parcel liberalized market offers a wider range of services than the Czech post, s.p., for example, pick up later in the evening, at the agreed time of delivery, transportation under special conditions (slightly perishables, pharmaceuticals, medical supplies, etc.) [14, 15].

4 Conclusion

After years of strong growth in e-commerce, e-shops in 2016 for the first time also focus more on making profits. Almost a third of them will try to maximize profits. This growth is not only in our market but also abroad. Germany sent 2,95 billion items in 2015. Engine of growth is unchanged, buying over the Internet has an ever increasing tendency. Sales in the segment CEP increased by 4.6% to EUR 17,4 billion. These are the results of the study KEB 2016 Berlin presented by the Federal Association of parcel and express logistics. In this organization belong major competitors such as Deutsche Post DHL DPD, Hermes, GLS and UPS. 83% of all CEP deliveries in 2015 are the parcels. This submarket posted sales of 9,4 billion EUR. Number of parcels increased by 6.5%. Even more, namely by 10.1%, increased parcels in segment B2C (businesses to private). Items, which walk from the mailorder business to private recipients, of the medium makes 56% of all parcels, and the trend is rising.

While in the Czech Republic we are again expected to increase revenues, contrary happened in Germany. Quantities carried in the field of CEP increasing, decreasing average revenues. Average revenue per delivery item in 2015 was 5.91 EUR for service providers. In 2014 it was 5.98 EUR. This trend is justified by the increasing share of relatively low B2C deliveries. According to market observers, the buying power of on-line major players such Amazon, Zalando and the others leads to the fact that the average revenue per parcel B2C barely cover costs.

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