

LOGISTICAL ASPECTS INFLUENCING THE DECISIONS OF THE RESPONDENTS IN THE IMPLEMENTATION OF INTERNET PURCHASING

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Abstract

This article deals with an analysis of the influence of logistical aspects on the shopping behaviour of online customers and on the range of preferences of individual aspects. Attention is paid to the extent of the influence of payment method and the method of delivery of goods, which Internet shops offer, on purchasing decisions. Within these two effects the variability of responses and possible dependence of buying behaviour on the mentioned aspects are investigated. The respondents were further asked about the idea of how many days the term 'rapid delivery' meant for them. Last but not least, the amount of purchase from which postage should be covered by an e-shop was investigated by the respondents. This research was conducted on a sample of more than 500 respondents. For processing, descriptive statistics, tests of hypotheses and correlation were used.

Introduction

Within the last few years there has been a considerable expansion of Internet shopping [2], [3]. For business this fact implies the need to focus on this segment of customers and to ascertain their wishes and needs [4], [5]. Such targeting is already underway within the research NetMonitor which maps Czech Internet traffic [6]. The research is focused on behaviour, attitudes and habits of users in relation to the use of media. The vast majority of the survey respondents refer to the Internet as a medium suitable for obtaining information about products. It is the largest project of this kind attended by thousands of Internet users from all over the Czech Republic. According to the results obtained from the fourth wave of additional marketing research project NetMonitor, which was carried out by the research agency MEDIARESEARCH for the Association for the Internet Advertising, the Internet is definitely the best source of information on the supply of goods and services. NetMonitor research shows an increasing trend in the number of real domestic Internet users.

The freshness of the subject was also confirmed at the 3rd annual conference focused on electronic commerce which is being prepared thanks to great success again for 2012 [1]. This conference was held in September 2011 under the auspices of the Association for Electronic Commerce in cooperation with the Association TUESDAY Business Network. At the conference there were presented professional contributions related to new trends in communication with the customer, customer care, customer segmentation and the analysis of surveys dealing with the customer perspective.

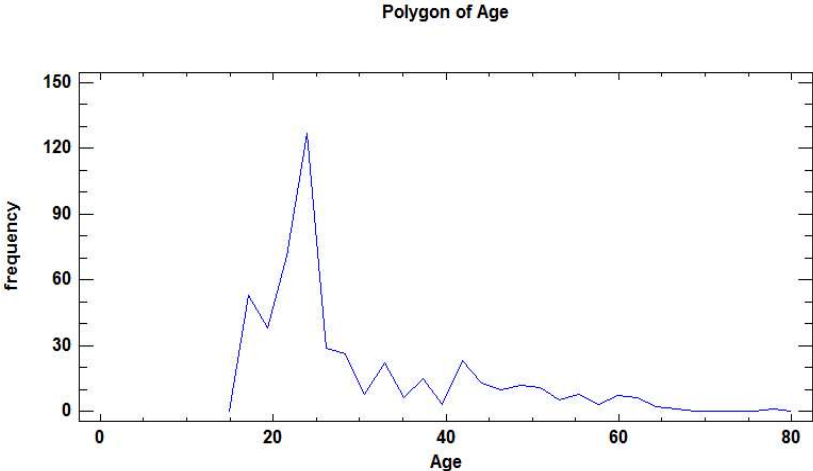
1 Research Overview

This research deals with the logistical aspects influencing respondents' decisions about making purchases on the Internet. Gradually, the effects of payment methods and delivery options are investigated. The concept of goods delivery speed is examined as well as the amount of purchase from which postage should be covered by an e-shop. The concept of the

present research is based on previous theoretical and technical knowledge gained from the research undertaken in this field by research agencies. The respondents are individuals who have already implemented a purchase via the Internet. For data collection a method of electronic polling was selected, with the use of social networks, because this target group is expected to have certain computer literacy and, at the same time, its better availability is ensured. The survey includes 503 respondents.

1.1 Characteristics of the sample

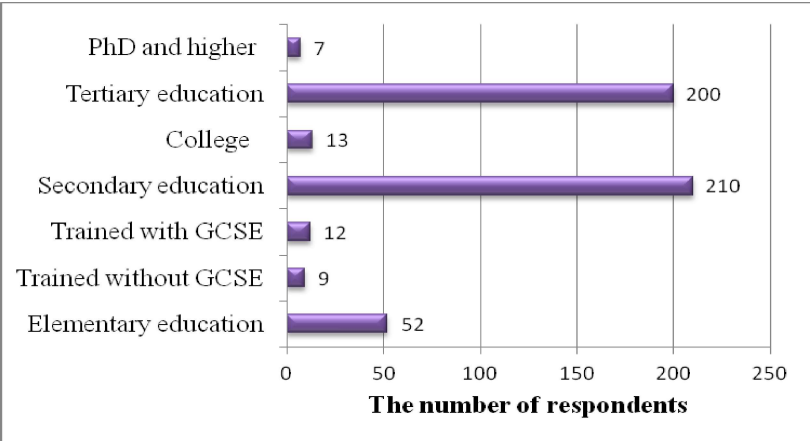
The youngest participant is 16 years old and the oldest is 79. The average age is 29.44 years. After Sturges rule there were created 28 age range intervals. The most frequent age of the respondents is in the interval from 22.75 to 25 years. The coefficient of variation reaches $V_x = 0.4048$. To illustrate the frequency, the polygon was used, see Fig. 1.



Source: Own

Fig. 1: Diagram of respondents' age

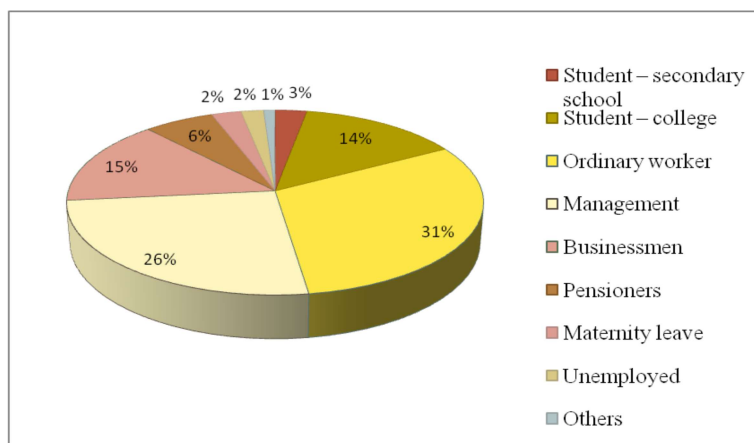
In terms of educational attainment of the respondents surveyed, secondary education is the most frequent, representing 41.75% of the total number of the respondents, and it is followed by university education that represents 39.76% of the total number of the respondents. The frequency of each educational level is shown in Fig. 2.



Source: Own

Fig. 2: Diagram of respondents' educational background

In terms of productivity, the most abundant variant (modem) is the position of the ordinary worker with 31% followed by the position of middle and senior management with 26%. Percentage is shown in Fig. 3.



Source: Own

Fig. 3: Diagram of respondents' productivity

In terms of income which the interviewed respondents reach there were surveyed the following results: after Sturges rule there were created 28 intervals with the variation range $R = 78,000$ Czech crowns, while the minimum range was 2,000 Czech crowns and the maximum was 80,000 Czech crowns. The average income is 15,800 Czech crowns. The standard deviation indicates that the individual income levels vary at a medium from the arithmetic average by $d = 8,688$ Czech crowns. The coefficient of variation reaches $V_x = 0.5498$.

1.2 The impact of payment and delivery of goods in the implementation of purchasing

In the survey the respondents were asked about stress that they lay on payment methods offered by e-shops. The respondents were gradually asked about four types of payments and the importance attached to the individual modes of payment. There was a five-point rating scale (1 = I definitely agree, definitely important to 5 = I definitely disagree, definitely unimportant). The variability of the respondents' responses to questions about payment methods was assessed by the coefficient of variation (1) which is calculated as a quotient of the standard deviation and the average:

$$V_x = \frac{s_x}{\bar{x}} \quad (1)$$

Payment by bank transfer received an average of 2.67 on the rating scale with the standard deviation of 1.33. The coefficient of variation in this case reaches 49.63%. In conclusion, we can state that 47.91% of the respondents consider this type of payment from the options menu of e-commerce payments as minimally important. 24.06% of the respondents take this way of payment neutrally and 28.03% of the respondents regard the option to pay by bank transfer as at least unimportant.

Payment online by credit card was rated 2.82 on average with the standard deviation 1.37. In this case, the coefficient of variation reaches 48.5%. The results show that 41.95% of the respondents consider this type of payment from the options menu of e-commerce payments as minimally important. 25.45% of the respondents take this way of payment neutrally and 32.6% of the respondents regard the option to pay online by credit card as at least unimportant.

Payment via specialized systems (PaySec, PayPal) was rated 3.49 on average with the standard deviation 1.28. In this case, the coefficient of variation reaches 36.79%. This value

means the lowest observed variability in the respondents' answers to the individual payment options. The results show that 20.48% of the respondents consider this type of payment from the options menu of e-commerce payments as minimally important. 29.82% of the respondents take this way of payment neutrally and 49.7% of the respondents regard the option to pay via the specialized systems as at least unimportant.

Payment on delivery was rated 1.49 on average with the standard deviation 1.49. The coefficient of variation in this case reaches 55.39%. The results show that 88.87% of the respondents consider this type of payment from the options menu of e-commerce payments as minimally important. 7.55% of the respondents take this way of payment neutrally and 3.58% of the respondents regard the option to pay on delivery as at least unimportant.

1.3 Survey of purchase depending on the method of payment and delivery of goods

One of the objectives of the research was to determine whether there is a correlation between the offered payment method and the actual purchase; in other words, whether the respondent – while deciding to make a purchase – is affected by the offer of payment options at the significance level of 5%. In order to determine the dependence, the correlation Table 1 was used.

Tab. 1: Correlation table – Purchase depending on the offer of payment options

	definitely yes	rather yes	neutral	rather no	definitely no	Row Total
bank transfer	125	116	121	81	60	503
online credit card	118	93	128	88	76	503
PaySec	50	53	150	103	147	503
on delivery	338	109	38	13	5	503
Column Total	631	371	437	285	288	2012

Source: Own

Null hypothesis: *The offer of various payment methods does not affect the purchase decision.*

Alternative hypothesis: *The offer of various payment methods affects the purchase decision.*

$$F = \frac{\frac{S_{ym}}{(k-1)}}{\frac{S_{yv}}{(n-k)}} \approx F(k-1; n-k) \quad (2)$$

$$W = [F; F \geq F_{0,95}(3;2008)] \setminus [F; F \geq 2,6095] \quad (3)$$

$$F = 234.29$$

The determination ratio has a value of 0.259275 which indicates a weak dependence. Based on the total variability of purchase decisions, we can ascribe only 26% to the impact of payment options. η correlation ratio = 0.50919.

The resulting value belongs to the significance level of 5% in the critical field, therefore we refuse the null hypothesis and accept the alternative one. The variety of payment methods influences respondents to a certain extent when making purchase decisions.

Another goal of the research was to determine whether there is a correlation between the methods of delivery of goods and the actual purchase; in other words, whether the respondent, in deciding to make a purchase, is affected by the ways of goods delivery at a significance level of 5%. In order to determine the dependence, the correlation Table 2 was used.

Tab. 2: Correlation table – Purchase depending on the offer of methods of delivery of goods

	definitely yes	rather yes	neutral	rather no	definitely no	Row Total
PPL	199	166	96	21	21	503
post	174	187	105	18	19	503
personal collection	152	148	119	56	28	503
delivery to the apartment	152	132	107	62	50	503
Column Total	677	633	427	157	118	2012

Source: Own

Null hypothesis: The offer of various methods of delivery of goods does not affect the purchase decision.

Alternative hypothesis: The offer of various methods of delivery of goods affects the purchase decision.

Equations (2) and (3) were used to calculate F value.

$$F = 18.13$$

The determination ratio has a value of 0.02637 which indicates a weak dependence. Based on the total variability of purchase decisions, we can ascribe only 2.6% to the impact of methods of goods delivery. η correlation ratio = 0.1624.

The resulting value is the significance level of 5% in the critical range of values, and thus we refuse the null hypothesis and we accept the alternative hypothesis. The offer of the different options of goods delivery affects the respondents weakly when making purchasing decisions.

2 Testing the hypothesis concerning the mean number of days of fast delivery of goods

Another issue which was considered by the respondents was: “If you wanted your order was delivered quickly, would you mean by ‘quickly’ a number of working days?” According to the results of piloting, there was determined the assumption that the respondents understand the notion of fast delivery of goods as the mean value of two days. The sample of 503 responses was detected with an average value of 1.97217 days and the standard deviation is 1.00953. The expected number of days was tested at the significance level of 20%. There was an assumption of normality distribution.

Null hypothesis: $\mu = 2.0$

Alternative hypothesis: $\mu \neq 2.0$

Test criterion (Z-statistics)

$$U = \frac{\bar{x} - \mu}{\frac{s_x}{\sqrt{n}}} \quad (4)$$

Definition of the critical field

$$W = \left[U; u_{\frac{\alpha}{2}} \geq U \geq u_{1-\frac{\alpha}{2}} \right] \quad (5)$$

$$W = [U; -1.282 \geq U \geq 1.282] \quad (6)$$

$$U = \frac{1.97217 - 2}{\frac{1.00953}{\sqrt{503}}} = -0.61827 \quad (7)$$

With the probability of 80 %, the mean value of the time for fast delivery of goods is in the interval ($1.91448 < \mu < 2.02986$) days.

The resulting value of the test criterion is not in the critical field of values. The significance level of 20% has not proved that the assumption was not correct, and therefore, the null hypothesis is not rejected and the alternative hypothesis is not accepted. There is no evidence that the average speed delivery of goods was not 2 days.

Conclusion

In conclusion, it is possible to say that the most preferred payment method is clearly payment on delivery which is considered minimally important by 88.87% of the respondents when deciding to make a purchase. The least preferred payment, with the lowest response variability, is the method of payment via the specialized payment systems PayPal and PaySec, which is considered as minimally important by only 20.48% of the respondents.

In examining whether the offered payment method affects the realization of the purchase, there was found only weak dependence according to the result of the ratio determination value 0.259275. In examining whether the method of goods delivery affects realization of the purchase, there was found only a very weak dependence according to the results of the ratio determination value 0.02637.

According to the research findings, it has not been disproved that the mean number of days which the respondents take as the notion of “quick delivery” was not 2 days.

According to the investigation of the dependence of the amount of money, from which postage -according to the respondents- should be paid by the supplier, on the income, it is possible to say that we can ascribe only 7% of the total variability to this effect.

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LOGISTICKÉ ASPEKTY OVLIVŇUJÍCÍ ROZHODOVÁNÍ RESPONDENTŮ PŘI REALIZACI INTERNETOVÝCH NÁKUPŮ

Tento příspěvek se zabývá analýzou vlivu logistických aspektů na nákupní chování online zákazníků a na rozsah preferencí jednotlivých aspektů. Pozornost je věnována rozsahu vlivu způsobu platby a způsobu doručení zboží, které internetové obchody nabízejí, na nákupní rozhodování. V rámci těchto dvou vlivů je zkoumána variabilita odpovědí a možná závislost nákupního chování na zmíněných aspektech. Respondenti byli dále dotazováni na představu o tom, kolik dní pro ně znamená pojmem „rychlého dodání zboží“. V neposlední řadě byla zkoumána výše částky nákupu, od které by mělo být dle názoru respondentů poštovné a balné hrazeno e-shopem. Tento výzkum byl proveden na vzorku více než 500 respondentů. Pro zpracování byla použita deskriptivní statistika, testy hypotéz a korelace.

LOGISTISCHE ASPEKTE, WELCHE DIE ENTSCHEIDUNGEN DER BEFRAGTEN PERSONEN BEI DER IMPLEMENTIERUNG VON INTERNETEINKAUF BEEINFLUSSEN

Dieser Artikel handelt über die Analyse des Einflusses von logistischen Aspekten auf das Kaufverhalten von Online-Kunden sowie auf die Spannweite der Präferenzen individueller Aspekte. Besondere Aufmerksamkeit gilt dem Ausmaß des Einflusses der Zahlungsmethode und der Lieferungsart der Ware, welche die Internetläden anbieten, auf Kaufentscheidungen. Innerhalb dieser beiden Effekte wird die Variabilität der Antworten und der möglichen Abhängigkeit des Kaufverhaltens von den erwähnten Aspekten untersucht. Die Umfrageteilnehmer wurden weiters befragt, wie viele Tage für sie der Termin „schnelle Lieferung“ beinhaltet. Schließlich wurde untersucht, ab was für einer Kaufmenge das Porto vom E-Shop getragen werden sollte. Diese Untersuchung wurde an einer Auswahl von mehr als 500 Respondenten durchgeführt. Dazu wurden deskriptive Statistiken, Tests von Hypothesen und Korrelationen verwendet.

LOGISTYCZNE ASPEKTY WPŁYWAJĄCE NA DECYZJE RESPONDENTÓW PODCZAS DOKONYWANIA ZAKUPÓW INTERNETOWYCH

Niniejszy artykuł poświęcony jest analizie wpływu aspektów logistycznych na zachowania klientów podczas dokonywania zakupów on-line oraz zakresowi preferowania poszczególnych aspektów. Uwagę poświęcono kwestii wpływu oferowanego przez sklepy internetowe sposobu płatności oraz sposobu dostarczenia towaru na decyzje o zakupie. W ramach tych dwóch wpływów badano zmienność odpowiedzi oraz możliwą zależność zachowania klienta od wymienionych aspektów. Ponadto respondentów pytano, ile dni dla nich oznacza pojęcie „szybka dostawa towaru”. Badano także wysokość sumy zakupów, od jakiej – zdaniem respondentów – sklep internetowy powinien finansować opłatę za przygotowanie i wysłanie przesyłki. Badania przeprowadzono na próbie ponad 500 respondentów. Do opracowania danych zastosowano statystykę deskryptywną, testy hipotez oraz korelacji.