DELIVERY PLANNING IN CITIES FOR CEP ITEMS

Dragana Šarac [a*], Jovanović Bojan [a], Kopić Miloš [a], Dumnić Slaviša [a]

[a] University of Novi Sad, Faculty of Technical Sciences

Abstract: *Planning the delivery and distribution of courier, express and parcel (CEP) items has tend more-than-current i.e. implicit connection with the development of information society inside which telecommunications progress lead to restructuring delivery time and space in a way to ensure the sustainability of classic postal services in a longer period of time. Implementation of new technologies in the delivery process of CEP items deserves more attention in urban planning and development of the information society and e-commerce. Standard delivery of CEP items is no longer satisfactory. This paper deals with planning the delivery of CEP items in cities by automated postal booths. The paper will consider examples of the application of this technology in the world. It will present the results of customer survey and it will propose location parameters for automated postal booths. The aim is to propose concrete solutions and consider the justification for using them.*

Keywords*: planning, delivery, courier, express, parcel*

1. INTRODUCTION

Global electronic market is developing rapidly. As the number of e-users grows, so does their expectations. It is forecasted that in the next three years the international electronic commerce will increase by 150%, while the sales through e-commerce will reach several trillion US dollars by 2016. Growth of e-commerce impacts surge in popularity of alternative ways of delivery and distribution of CEP items.

Alternative ways of delivery and distribution of CEP items are growing and they provide easier collection of items. According to research in the post office, users want a 24/7 solutions that are fast and affordable. Standard delivery of CEP items is no longer satisfying.

The market of e-commerce is turning toward self-service devices for the delivery of items.

These devices eliminate most common problems faced by users, postal operators and other. There is no need to wait for a courier, delivery is successful in the first attempt, shipping costs are decreased and the availability of postal services is increased because customers can collect their item on the way home or at a convenient location, within 24 hours, 7 days a week. Using modern technology to deliver CEP items resolves problems of returning items, fees and problems of reverse logistics.

This paper deals with planning the delivery of CEP items in cities by the implementation of automated postal booths. The paper will consider examples of the application of this technology in the world and present the results of a customer survey. We have analyzed the savings in: the

* dsarac@uns.ac.rs

cost of operators who provide this service, in the costs of operators who would use these devices on the basis of a contract which allows network access, the cost of users collecting their items due to failed delivery. The aim is to propose concrete solutions and consider the justification for using them.

2. 24/7 SOLUTION APPLICATION IN THE DELIVERY OF PACKAGES

Postal network of automated postal booths is the largest international network of self-service machines which enable dispatch and collection of packages at a convenient location for 24 hours a day, seven days a week.

These solutions can already be found in 21 countries: Australia, Chile, the United Kingdom, Ireland, Iceland, Italy, France, Latvia, Lithuania, Ukraine, Estonia, Poland, Russia, Cyprus, Slovakia, Czech Republic, Colombia, Saudi Arabia, Costa Rica, Salvador and Guatemala. There are currently more than 3,500 units of postal booths that are based on postal technology. In the near future, additional 6,000 automated postal machines will be put in Europe, Asia, America, North Africa and the Middle East (www.postaltechnologyinternational.com).

In the last 12 years, the company Keba AG has released around 3000 KePol packet machines with over 250.000 boxes. KePol machines are considered the best in the market due to the largest number of installed machines in the world, top quality and a high level of safety and value retention. The creation of automated solutions for the first and last mile is a milestone in the logistics of item transportation. Kepol system is present in Germany with more than 2,500 devices (DHLPackstation), Denmark (Doegnposten) with over 300 devices as well as in Norway (Postautomat), in Vienna, Austria, Russia, Turkey, Spain, Lithuania, the Czech Republic and other countries.

By automating item delivery, costs of delivery services are being reduced while providing a more comfortable delivery to users. The concept of this delivery system using postal booths is simple and acceptable from the standpoint of both users and the postal operators. User can order goods over the Internet and package with his goods will be delivered through a system of postal booth. Via e-mail or SMS message, the user sets requirements on how they want the package to be delivered. Collecting your package is independent of the working hours of the post office and delivery service. Systems contain compartments of various sizes, whose number can be adapted to user needs.

Automating product delivery has numerous advantages both for users and post offices:

- it complements the classic way of delivery and physically separates the courier from users;
- system is independent of the post office working hours and is available 24 hours, seven days a week;
- one system may be used by various delivery services and
- system is easily integrated into existing delivery system including track & trace system to monitor the shipments.

Almost a year ago, Austrian Post has decided to provide users with additional possibilities of their self-service with a so-called "Pick - up stations". "Pick-up station" actually represents parcel automats that are specially designed in accordance with Keba standards for indoor use. They are optimized in terms of size and design for installation in locations such as self-service areas, shopping centers or postal shops.

Denmark Post has over 300 parcel automats which mean that automated postal machines almost completely cover the country throughout. Joint cooperation between Denmark post and leading retail chain "Coop" has opened a brand new office space for Keba machines. Parcel automats in stores with 35,000 employees and sales revenue of nearly 6.7 billion euros have

made that "Coop" Denmark becomes the largest retail chain in the country. "Pakkeboksen" (Figure 1.) have been installed in 300 "Coop" stores and are managed by Denmark post, i.e. they allow users to collect and send their packages. In December 2014, they have reached an all-time high in volume of packages in transfer - more than 10,000 parcels a day at parcel automats. Clients of Danishpost can collect and send their packages during shopping in Coop, while "Coop" customers can collect products that they ordered online at their local store. "Coop" Denmark has also been clearly defined in the market through this service. The plan is to expand this system to a total of 490 locations (www.keba.com).

Following the example of Germany, Austria, Denmark, Luxembourg, Lithuania, Switzerland, the Czech Republic and France, the national postal service of Spain Correos has decided to expand its services with Kebaparcel automats. They will operate under the name "CityPaq"(Figure 2. (www.postaltechnologyinternational.com)) and a total of sixty-systems will be installed in 2015. Parcel automats will be installed in gas stations and in other similar places in Madrid and towns throughout Spain (www.keba.com).

Figure 1. "Pakkeboksen"

Figure 2. "CityPaq" (www.keba.com)

"Kouzelné Almara" (Magic Box) is the solution of the Czech Republic, which has been on the market since April 2013 and is designed for future expansion (Figure 3). It is used to deliver the products of the selected e-shop partners. The market of e-commerce in the Czech Republic is growing rapidly, which corresponds to the current increases in the volume of items. Kouzelné Almaraprovides its customers the possibility to take their products at a time that is most convenient, 24 hours a day, seven days a week.

Figure 3. "Kouzelna Almara" (www.keba.com)

Figure 4. "Alza Box" (www.logistika.ihned.cz)

This solution uses KePol FS/08 system where each cabinet is fitted with 54 boxes. The biggest internet shop in the Czech Republic (Alza) opts for Keba system. Alza is the largest store of electronic goods but also a pioneer in e-commerce in the Czech Republic. The success of Alza'sinternet shops is based on the growing market of e-commerce in the Czech Republic and

Slovakia, which strongly influenced the company to become one of the largest in Europe. Alzahas actually launched their own business model with online store for electronics, but now offers goods of all descriptions. Until recently, Alza customers had to pay for the delivery or to personally collect their packages from one of the company stores, which also have limited working hours. However, the company recently decided to offer customers the option to collect their package at package stations which are called "Alza Boxes"(Figure 4.) whenever they want (24/7). Since the beginning of 2011, the Lithuanian Post has established the largest network of 71 self-service terminals called "Express LP 24" in 41 cities in Lithuania (www.keba.com).

3. THE DEVELOPMENT OF ELECTRONIC COMMERCE IN SERBIA AND USER ATTITUDES

Assumptions about the development of electronic commerce and information technology, as specified in the paper of Tomić and Petrović (2011) can be divided into five categories. First category is based on technical assumptions, electric power supply and development of telecommunications network (speed, the Internet quality and coverage in urban and rural areas),representation of ICT devices (computers, mobile phones, etc.), availability (price) of ICT infrastructure and equipment, development of roads and logistics in the country, in the paper of Vukićević and Drašković (2014). Second category consists of legal and political assumptions in the form of laws and regulations in the field of e-commerce: adequate legal protection of participants in e-commerce, existence of the law on e-document and the legality of digital signatures, the judiciary and legislature follow the development of e-commerce, promoting e-commerce by government institutions. The third category consists of instrumental assumptions, which are realized through the prism of services. The fourth group consists of utilitarian assumptions, the usefulness of e-commerce for customers. The fifth category includes socio-cultural assumptions: personal preference of electronic communication or communicating in person; willingness to accept new trends; the existence of initiatives, willingness to take risks, trust in abstract systems, government institutions, the judiciary, people, law enforcement and confidence in the data confidentiality, age and financial capabilities of customers, need to see the live product which is being purchased.

A survey of users for this paper was conducted in order to comprehend the significance of all these categories from the view point of user himself. The aim of the survey was to analyze the attitudes of users towards the influence of certain factors on the use of e-commerce. The purpose of this survey was also to show how many of existing users of postal parcel and express services is ready to replace the traditional method of delivery with a new method of postal delivery. Based on the data obtained from a survey sample, we have obtained the estimated number of users who would use the method of delivery via automated postal booths.

Users were supposed to provide answers to 10 questions (statements). Answers took the form of Likert's 5-point scale of attitudes ("1-strongly disagree", "2-disagree", "3-neither agree nor disagree," "4-agree "," 5-strongly agree"). Questions are grouped into five categories, according to factors influencing the development of e-commerce. The results of the survey will not be displayed individually. It is important to note that statements in the category of socio-cultural assumptions have the lowest level of agreement. The statement "I am willing to take some risk of buying over the Internet," had the smallest degree of agreement, only 2.6. The statement "It is not necessary to see the live product before purchasing it," only 3.4. Users have agreed with the statement from the category of usefulness of services to users, so that the statement "Electronic commerce is a comfortable way of buying goods and services" got the score of 4.3. The answers to questions from the first category of technical assumptions are certainly worrying. Most users especially in rural areas are not satisfied with the development of telecommunications infrastructure, speed, reliability of links and services. Therefore, our research will continue its focus on urban areas of cities in Serbia. When it comes to the development of transport and logistics infrastructure, attitudes were divided, and based on the additional questions during the

direct contact with customers, it was concluded that attitudes depend on previous experiences of users and operators with whom they collaborated. Most objections relate to the deadline to deliver the item (longer than three days), the possibility of collecting shipments in the premises of operators (some operators do not have their branches in smaller towns and the delivery is done solely at the user's address at the time when it is not convenient to the user), pay extra postage for the next delivery, etc. Most of the users, namely 98% of those who use the services of e-commerce, have agreed that the use of postal booth would positively influence their decision to purchase in the future. While according to the survey of RAPUS, 90% of users have agreed that their postal item with personal delivery can be delivered to a member of the same household, however according to our research 100% of users have agreed to receive mail via automated postal booth (RAPUS, 2014).

Having completed the survey, we have concluded the following:

- it is necessary to reduce the risk of buying over the Internet;
- is necessary to provide the option of returning the product,
- is necessary to provide greater access to ICT,
- it is necessary to conduct regular quality control of postal and logistics services,
- it is necessary to increase the availability of networks and services of postal and logistics operators,
- it is necessary to reduce the cost of product delivery and introduce alternative ways of delivery.

4. DELIVERY OF CEP SHIPMENTS IN CITIES THROUGH AUTOMATED POSTAL BOOTHS

Currently in the Republic of Serbia, only PE Post of Serbia is licensed to provide the universal postal service and therefore is obliged to provide these services throughout the country. Development of alternative modes of delivery of shipments to customers has a special significance to Post of Serbia. However, the Postal Services Act does not allow delivery of shipments to be done via self-service machines, such as packet automat (Republic of Serbia, 2005). Therefore, further development of automated delivery depends on changes in the legal framework. However, recently adopted Regulations on access to the postal network (RATEL, 2014) is in favor of the application of these devices, which makes it possible for the Post to offer the resources of public network to other postal operators. Postal automated booths should be part of the public postal network, designed to deliver the package (which falls within the scope of universal service) and other items, such as express shipments or logistics shipments. The possibility that the Post of Serbia offers units of public network to other operators is in favor of the sustainability of universal postal service. The Post of Serbia has about 5.2 million express and package items per year. Other postal operators have approximately 10,800,000 express items per year. Participation of private postal operators is around 68% which is higher compared to The Post of Serbia. The cost of the first delivery of CEP shipments in cities is lower than the costs of CEP delivery of shipments in rural areas. However, successful first delivery in rural areas is almost 100%. Number of items to be delivered in repeated delivery in urban areas is over 7%. Delivery costs comprising the price of the consignment are 45%, about 50 dinars per shipment. Of the total number of items 1,200,000 parcels are delivered in repeated delivery, which annually cost operators in Serbia an extra 60,000,000 dinars. For users, regardless of whether their item was delivered in the first or repeated (second) delivery, waiting for the courier means waste of time and money. The potential market for these services and the number of end users is much larger than customers who receive shipments in the second repeated delivery. Size of the market is proportional to the number of users that receive CEP shipments. Most CEP shipments come from electronic commerce (about 70% of shipments), and in our survey these people have declared that this service was crucial for them. The conclusion is that

more than 11 million shipments per year may be delivered via packet automats, and shipping costs will be reduced to a minimum.

5. CONCLUSION

The increase in postal services has caused the constant improvement of the quality of serving customers, which is related to the development and deployment of cutting-edge technical equipment in the units of the postal network. The growth of e-commerce contributes to a growing number of parcels which requires implementation of new services, such as delivery system of parcels twenty-four hours seven days a week, which is the basis of this paper. Automation of the delivery process of postal items contributes to reducing costs and saving a lot of time which in the postal activity is the most important quality parameter. With this service it is no longer necessary to wait for courier at the home address. The package can be collected at any time at the convenient location for the user. When introducing new technologies, The Post of Serbia can take advantage of their existing network infrastructure and market coverage. The Post must adapt to the modern way of doing business, primarily by investing in new technical solutions.

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