This is an Accepted Manuscript of an article published by Taylor & Francis in **Technology Analysis & Strategic Management** *on* **05 May 2016***, available online:* **http://www.tandfonline.com/doi/full/10.1080/09537325.2016.1180357**

A Study on the Competitive Strategy of Universal Postal Service Provider

Momčilo Dobrodolac[a*], Dragan Lazarević[a], Libor Švadlenka[b] and Milina Živanović[a]

[a]*Faculty of Transport and Traffic Engineering, University of Belgrade, Belgrade, Serbia*

[b]*Jan Perner Transport Faculty, University of Pardubice, Pardubice, Czech Republic*

We analysed how the universal postal service providers could employ their specificities to achieve an advantage over the growing competition. The basic input for the model are expert opinions. We interviewed 18 experts in five stages. As a multiple criteria decision support method we used Analytic Hierarchy Process – AHP. Further we proposed a graphical method for determining the business area where a company should focus its biggest attention to achieve the best result. By implementing the proposed model, a company should obtain two types of business directions, the first related to the proposed activities and the second to the business areas. To demonstrate the applicability of the proposed methodology we tested and verified it in the case of Serbian universal postal service provider which is a state-owned company called the Post of Serbia.

Keywords: universal postal service provider; competitive strategy; decision-making, graphical method

Introduction

The adequate functioning of the postal system is a necessity for successful development of economy and in some areas a basic prerequisite for a normal life of citizens. This is the reason why postal service is considered as a service of general economic interest (SGEI) in many countries. As defined by European Commission (2013) SGEI is an economic activity that public authorities identify as being of particular importance to citizens and that would not be supplied (or would be supplied under different conditions) if there were no public intervention. Therefore an important policy objective of each state is to ensure that some scope of postal services aiming to be as high quality as possible is provided at an affordable price everywhere for everyone. This type of postal service is called universal postal service or universal service obligation.

The concept of universal service appears to have originated with Rowland Hill and the Uniform Penny Post which he introduced in the United Kingdom in 1837 (see Ince and Gikbert, 1860). Although Hill never used the term "universal service", his postal system had the hallmarks of early universal service; postal rates were reduced to

* Corresponding author. Email: m.dobrodolac@sf.bg.ac.rs

uniform rates throughout the nation which were affordable to most British. The paid postage was labelled by the postage stamp which was first introduced here in 1840 (BPMA, 2015). Hill's reforms were quickly adopted by postal authorities worldwide. Today, the universal service is also a key objective of the Universal Postal Union which is the second oldest international organization worldwide and bring together 192 member countries (Universal Postal Union, 2015b).

The countries through their institution designate the postal operator responsible for providing a universal service. Universal postal service providers (UPSPs) are typically synonymous with public postal operators (PPOs), so the terms are used interchangeably here. With respect to the characteristics of the universal postal service, it is concluded that the service cannot be offered on a commercial basis. Thus, the net financial position of a PPO when considering just the universal service reports a negative balance as a rule. This is because it is not profitable to serve everyone in every part of the country.

One of the main policy issues in the postal sector is the problem of universal service cost assessment and reimbursement. The financial mechanisms for this purpose are widely discussed in the literature (see, for example, Gautier and Paolini 2010; Oxera 2007). Regardless to the implemented mechanism, the PPO's positive financial result and business success is of particular interest to all stakeholders: the PPOs itself, other companies in the field, consumers and government. However, it is not an easy task to accomplish nowadays having in mind a very competitive market on one hand, and a constant threat of electronic substitution on the other hand. It is clear that properly designed strategy is a basic prerequisite for achieving the goal of successful PPO.

This study precisely address the question of forming this type of strategy. The aim is to demonstrate a possible methodology for the competitive strategy design and its application in the postal sector. The proposed methodology consists of three parts. The first is related to interviewing the experts. The answers were used for several purposes, to define the factors influencing the functioning of a PPO, based on which we formed SWOT (Strengths, Weaknesses, Opportunities and Threats) matrix, to assess the importance of each group in the matrix based on which we implemented AHP method, to assess the importance of each factor within two selected the most important groups. Further, the experts should give an opinion about possible activities related to the most important factors from two considered groups and finally to rank them. The second part is related to the implementation of multiple criteria decision support method (in this study Analytic Hierarchy Process - AHP) used in more stages of the proposed model. The AHP method yields analytical priorities for the SWOT groups, factors included in SWOT analysis and for the proposed activities. The third part is related to the graphical method for determining the business area where the company should focus its biggest attention to achieve the best results as well as to investigate the relationship between the remaining business areas. By implementing the proposed model, a company should obtain two types of business directions. One is related to the proposed activities and the other to the business areas. We tested and verified the proposed methodology in the case of PPO in Serbia.

The organization of this study is as follows: in the second section, a review of the literature from the field of expert opinions and the concepts of SWOT and AHP are presented. In the next section, we explained the proposed model. Then, to demonstrate its applicability, the empirical example is given in the fourth section. Here we present the results of a research carried out in the case of PPO in Serbia. Finally, we conclude with a description of benefits that could be achieved in the company where the proposed methodology was implemented.

Related literature

Expert opinions are used widely in the field of business strategy (see for example Porter, 1998). They could be used in every discipline and for variety of purposes. However, although expert opinion could be very useful, it should be kept in mind a potential risks of this research methodology described by Alger and Salanie (2006) and Lightle (2014).

We used expert opinions to define factors in SWOT analyses, determine the importance of each SWOT group, propose activities for the most important factors and to rank the proposed activities.

SWOT is a widely applied tool in the analysis of internal and external factors in order to achieve a systematic approach and support for strategic decision situations (Kotler, 1988; Wheelen and Hunger, 1995). SWOT analysis has provided good results in practice, particularly in the processes of strategy developing in the case of sudden changes in the environment. However, in the literature there can be found both positive (McDonald, 1993) and negative (Hill and Westbrook, 1997) remarks. Speaking about disadvantages, SWOT includes no means for analytical determination of factors importance or evaluation of alternatives or activities with respect to the factors. This method is mainly based on the qualitative analysis made in the planning process, and on the capabilities and expertise of the persons participating. Therefore, the result of SWOT analysis is all too often only a listing or an incomplete qualitative examination of internal and external factors without a concrete recommendation in the decision making process (Kajanus et al., 2012).

As a solution, several theoretical and practical methods of determining the significance (weight) of criteria by experts are known. Pairwise comparison of criteria is widely applied, and the most well-known, widely applied and mathematically grounded technique is the so-called Analytic Hierarchy Process (AHP). The inventor, architect, and primary theoretician of this method was Saaty (1977, 1980). Afterwards, many researchers used AHP in their studies. The combination of AHP and SWOT, a hybrid method known in the literature as A'WOT (Kurttila et al., 2000), makes a solution for the relative importance assessment of factors or evaluation of alternatives with respect to the factors. The multiple pairwise comparisons are based on a standardized comparison scale of nine levels proposed by Saaty (2008).

By reviewing the literature on Thomson Reuters Web of Science (2015) we found several examples of using SWOT and / or AHP in the postal sector. These methods are mainly applied to assist in defining business strategy that provide a competitive advantage in the market. Kim (2007) uses SWOT analysis to suggest the competitive advantage strategies of Korea Parcel Service against small package express providers. Lee (2011) explores the situation of Chinese PDS (Parcel Delivery Service) industry and diagnoses the SWOT points of Chinese PDS companies so as to find out the logistics strategy to compete with MNCs such as FedEx, UPS, DHL and TNT etc. AHP method is used by Kim et al. (2013) to analyze the importance of reinforcement factors of competitiveness in Korea Parcel Service. Considering the postal sector, the combined SWOT and AHP model is used by Wang et al. (2014) to form some strategies and analyse and evaluate the external and internal environment factors in China Worldwide Express Mail Service. In this study, we propose a modified A'WOT method and further analyse the activities related to the most important factors from the two most important groups. The process goes in two directions, one is related to AHP methodology and the other to grouping the activities into the business areas and calculating the centre of gravity to get the directions about the points of improvement.

Proposed model

The application of multi-criteria analysis in solving the problems of strategic management is well known and widespread, but the combined use of AHP and SWOT analysis - A'WOT method is relatively new. In this study we propose a model for strategic planning based on the implementation of three methods: a modified A'WOT, AHP for activities ranking and graphical method for determining the business area where the company should focus its attention to achieve the best results.

In the field of A'WOT, the terms alternatives and activities are synonymous; however, in the proposed model we use the term "activities" to determine the possible actions related to some factor from SWOT matrix.

The part of our model related to the modified A'WOT consist of the following steps:

- Step 1 SWOT analysis is carried out. The relevant factors of the external and internal environment are identified based on the expert opinions and included in SWOT analysis.
- Step 2 Pairwise comparisons by experts are made between the four SWOT groups.
- Step 3 Pairwise comparisons between SWOT factors are carried out within two the most important SWOT groups and their priorities are calculated.
- Step 4 Detailed analysis of the most important factor in each of two groups is done resulting in the proposal of activities by experts.
- Step 5 The activities are pairwise compared by experts and ranked by using AHP method.
- Step 6 Strategic guidelines for the company are proposed.

A basic assumption of our modified A'WOT is that in reality a company may not have the time or resources to make use of all the factors influencing the business. Therefore, we should focus our attention to the most important ones. This is the reason why we analyse just two the most important groups in the step 3. We believe the best effects could be achieved by digging deeper into the relationship between the activities which refers to the most important factors in analysed SWOT groups.

The model proposed in this paper is further extended by using the graphical principles. First we graphically present the importance of each SWOT group to determine the relationship between them. After that the model includes a parallel process starting from the step 4. The proposed activities related to the most important factors are grouped by business area. We ranked the business areas by determination of centre of gravity of polygon which is designed based on the activities and their importance. By implementing this methodology it is possible to get the directions in which business area the company should put maximum effort.

The graphical method consists of the following steps:

- Step 1 Grouping the activities that belong to the particular business area.
- Step 2 Construction of frontiers of business areas.
- Step 3 Construction of regular polygon with as many vertices as there are activities. The radius of the circumscribed circle of a regular polygon is equal to the score value of the most important activity.
- Step 4 Construction of irregular polygon. Each vertex is defined on the axis going from the centre of the regular polygon to the previously constructed activity on the regular polygon, at the point which is on the distance equal to the value the score of particular activity measured from the centre of the regular

polygon.

Step 5 Determination of centre of gravity of irregular polygon.

Step 6 Based on the information in which business area the centre of gravity is, we can make a conclusion about the most important business area.

Step 7 Pairwise comparison of the remaining business areas. It is done by forming a new irregular polygon composed of points from two business areas which we are comparing. The new centre of gravity will determine the relationship between two considered business areas.

Step 8 Ranking of all business areas.

Empirical example

In order to demonstrate the applicability of the proposed methodology we tested it in the case of Serbian public postal operator, also known as the Post of Serbia. Since the proposed model implies the expert opinions in five stages, we interviewed 18 experts, 16 of them from Serbia and 2 from Czech Republic. The interviewees were university degree experts from the postal sector working in the Post of Serbia, Serbian Regulatory Agency for Electronic Communications and Postal Services, University of Belgrade and University of Pardubice.

Forming the SWOT matrix

We formed the SWOT matrix that combines internal (SW) and external (OT) factors that influence the company's success (Table 1). The factors in the matrix are defined based on the interviews carried out with experts. The complexity of the system has caused a number of internal factors, and the market liberalization many external factors; however, we classified the answers into 28 factors forming SWOT matrix.

Table 1. SWOT matrix

Strengths	**Weaknesses**
S(1) Strong brand **S(2)** Extensive network and strong infrastructure **S(3)** Diversified product and service portfolio **S(4)** Highly-skilled workforce **S(5)** Low prices **S(6)** Monopoly status continues to provide extensive reach **S(7)** Government ownership ensures support in increasing the volume of business	**W(1)** Work-related attitudes **W(2)** Global decline in volumes of traditional postal services **W(3)** Legal issues impacting additional costs for public postal operator **W(4)** Customs procedures often significantly increase a transit time of shipment **W(5)** Reliance on other postal operators in the case of international shipping services **W(6)** The complexity of procedures for users **W(7)** Low flexibility of the system
Opportunities	**Threats**

O(1) Growing European express market	**T(1)** Significant competition
O(2) Investment in facilities, equipment and processes enhances productivity	**T(2)** Economic slowdown in Serbia
O(3) Development of modern information and communications technology	**T(3)** Electronic-substitution
O(4) Growing e-commerce sales	**T(4)** Complex technical risks
O(5) Strategic acquisitions could help to grow and expand business	**T(5)** Trends indicate structural declines in document technology
O(6) Intense focus on logistics sector could enhance business performance	**T(6)** Regulation on customer postage rates
	T(7) Security
	T(8) The competence of leaders

Determining the relative importance between the SWOT groups

The relative importance of SWOT groups and pairwise comparison were carried out according to the Saaty's comparison scale and based on the estimates obtained from the experts who are familiar with the opportunities and business processes in the Post of Serbia. In this stage each expert made six comparisons which means that there are 108 comparisons in total. The average values of scores are shown in Table 2.

Table 2. A pairwise comparisons of SWOT groups

SWOT groups	S	W	O	T
S	1.00000	2.00000	1.50000	3.22222
W	0.50000	1.00000	0.30000	1.66667
O	0.66667	3.33333	1.00000	3.33333
T	0.31034	0.60000	0.30000	1.00000

By implementing the proposed procedure based on AHP method we obtained the following results (see Table 3), where 0.1>CR=0.030391, which means the level of consistency is satisfactory.

Table 3. The results of SWOT groups comparison

SWOT groups	Importance degrees
S	0.38136
W	0.15590
O	0.35848
T	0.10426

The results indicate that the greatest impact on business result of the company could be achieved by improving the performance factors in the group Strengths (0.381361).

In Figure 1 the group scores are shown graphically as the quadrilateral in the plane. We performed the calculation of gravity centre (C) by using AutoCAD and option Region properties or command _massprop (see Figure 2). The results indicate that centroid is located between O and S. This means that we should choose Strengths and Opportunities for further analysis.

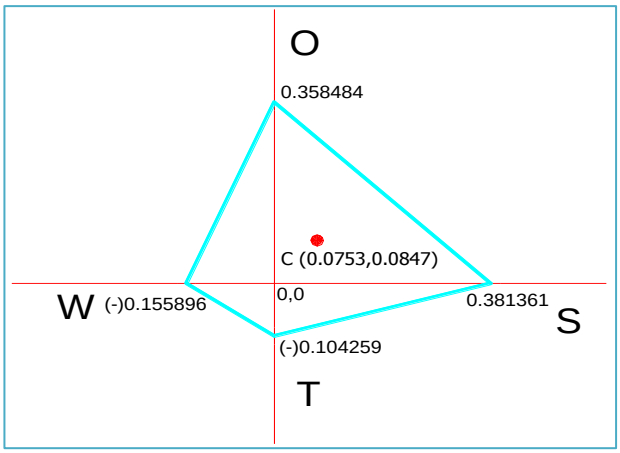

Figure 1. Graphical representation of the group scores and gravity centre (c)

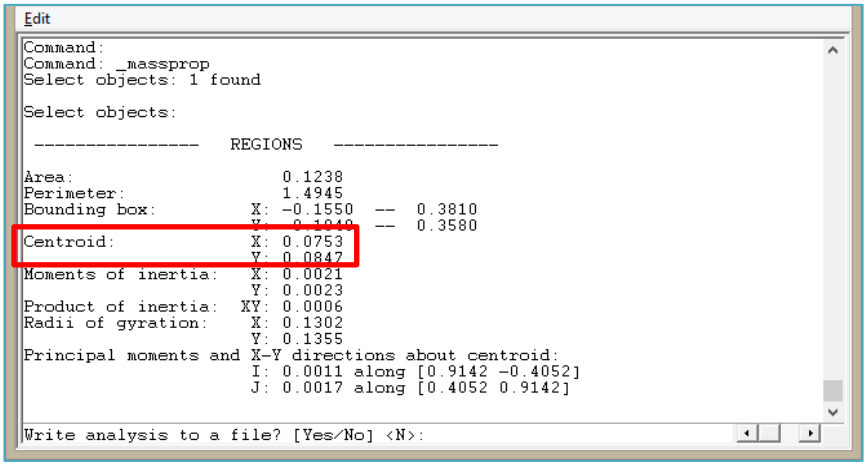

Figure 2. Window of region properties

Determining the most influential factor in the groups strengths and opportunities

The groups Strengths and Opportunities includes seven and six factors, respectively. The most influential one, in each group, is defined by using the AHP method. In the case of factor comparison in the group Strengths the experts made 378 comparisons and the processed data are shown in Table 4.

Table 4. A pairwise comparisons of factors in strengths group

Factors	S(1)	S(2)	S(3)	S(4)	S(5)	S(6)	S(7)
S(1)	1.00000	0.34537	0.69167	0.95370	0.47315	2.18519	2.38889
S(2)	2.89546	1.00000	2.16667	3.11111	2.00926	4.66667	4.77778
S(3)	1.44578	0.46154	1.00000	2.33333	1.08519	3.27778	3.22222
S(4)	1.04854	0.32143	0.42857	1.00000	0.55000	2.58333	2.86111
S(5)	2.11351	0.49770	0.92150	1.81818	1.00000	3.94444	4.16667
S(6)	0.45763	0.21429	0.30508	0.38710	0.25352	1.00000	1.26852
S(7)	0.41860	0.20930	0.31034	0.34951	0.24000	0.78832	1.00000

By implementing the proposed methodology we can make a conclusion about the relative importance between factors (see Table 5), where 0.1>CR=0.011070653, which means the level of consistency is satisfactory.

Table 5. The relative importance of factors in strengths group

Factors	Importance degrees
S(1)	0.10837
S(2)	0.31072
S(3)	0.17806
S(4)	0.11067
S(5)	0.19045
S(6)	0.05345
S(7)	0.04828

Based on expert opinions and AHP method we come to the conclusion that the most important factor in Strengths group is S(2) - Extensive network and strong infrastructure. It will be further analysed in the section 4.4.

Considering the Opportunities group there were 270 comparisons analysed and the average values of scores are shown in Table 6.

Table 6. Pairwise comparisons of factors in opportunities group

Factors	O(1)	O(2)	O(3)	O(4)	O(5)	O(6)
O(1)	1.00000	1.19444	0.59907	1.25000	2.66667	1.70370
O(2)	0.83721	1.00000	0.68056	1.48148	3.05556	2.02778
O(3)	1.66924	1.46939	1.00000	2.52778	4.00000	3.05556
O(4)	0.80000	0.67500	0.39560	1.00000	2.94444	2.25000
O(5)	0.37500	0.32727	0.25000	0.33962	1.00000	0.67130
O(6)	0.58696	0.49315	0.32727	0.44444	1.48966	1.00000

The relative importance between factors is calculated based on the proposed methodology. The results are shown in Table 7, where 0.1>CR= 0.009314752, which means the level of consistency is satisfactory.

Table 7. The relative importance of factors in opportunities group

Factors	Importance degrees
O(1)	0.18634
O(2)	0.19388
O(3)	0.30288
O(4)	0.15845
O(5)	0.06473
O(6)	0.09373

The obtained results indicate that the highest impact on the company`s opportunities could be achieved by exploring the factor O(3) - Development of modern information and communications technology. It will be further analysed in the section 4.4.

Proposed activities related to the most important factors

We set the task for experts to propose possible activities related to the “Extensive network and strong infrastructure” and “Development of modern information and communications technology”.

Considering the factor “Extensive network and strong infrastructure” the experts were asked about the benefits and competitive advantages of it. How this could be used? According to the experts, the answer could be in the introduction of new services, especially those which competitors without this type of network are not in the position

to offer. These services could be offered to all citizens in the state. These could be the following:

S(2)[1] **Various types of social activities employed by the state -** for example, citizens could apply for the state aid, the distribution of shares of the state-owned companies to the citizens, etc.

S(2)[2] **The issuance of various types certificates** - birth, citizenship, marriage certificate, the certificates from the land registration organizations, etc. All these documents could be delivered at home or business address after ordering by the customer either at Post Office or online.

S(2)[3] **The administrative part of vehicle registration procedures** - design of purchase agreements, authentication in these operations, insurance matters, delivery of license plates to the home or business address, etc.

S(2)[4] **The logistic support for the citizens in sense of e-commerce** - for example, delivery of food, medicines, etc. This is particularly important for people living at rural areas or for those that cannot or do not want to visit the standard shops from some reason.

S(2)[5] **The delivery of money** – ordering the money from the bank accounts to the home of business address.

S(2)[6] **Financial services** - besides other, for the people living in rural areas.

S(2)[7] **The delivery of administrative letters by the state to all citizens** - such as tax letters, letters from the courts, various types of invitations, etc. For example, Poland's Tax Office alone currently issues 10 million certificates a year, while the National Court Register and the National Criminal Register issue about 4 million official documents a year, offering "significant" potential for Polish Post (Post & Parcel, 2015b).

S(2)[8] **The logistic services on behalf of third parties** - for example, the public postal operators employees could perform the following activities for a manufacturer of washing machines: they could deliver the machine to the home or business address, take care about the installation, testing, informing the customer, etc.

S(2)[9] **Increased time of service availability** - having in mind the high volumes of mail, public postal operators could organize value added postal services available during 24 hours a day (call center, self-service machines, designated postal units, etc.), which would allow an increase in the time availability and quality of services.

S(2)[10] **Special treatment for big customers** – arrangement of special terms and locations for access to the postal services.

It is expected from the state to give the public postal operator adequate jurisdictions to support these kind of services.

The second factor that is scrutinized by the experts is "Development of modern information and communications technology". One of the most interesting issues in the postal sector is how the new technologies can bring to development of postal services and their diversification instead to be considered as a threat. It is clear that the modern information and communication technologies should be incorporated into the business models of postal companies. This phenomenon could be analyzed in two ways:

- As a possibility of introducing the new services or quality improvement of the existing ones - O(3)(1) and
- As a possibility of postal operations improvement - O(3)(2).

By summarizing the answers of experts, we segmented the following categories of new services or the possibilities of service quality improvements:

O(3)(1)[1] **Mobile and Internet applications for postal services** - for example postage paying by mobile phone (Mail Online, 2015), postage paying by Internet (Deutsche Post, 2015b), sending MMS postcards, consignment tracking, etc.

O(3)(1)[2] **Certification Authority** - providing digital identity and signature, encrypted and secure data traffic, electronic document management, electronic billing and payments, etc.

O(3)(1)[3] **Hybrid mail** - It is mail that is delivered using a combination of electronic and physical delivery which means that it is transmitted electronically to some point as close as possible to the final delivery addresses, where it is printed and further delivered in physical form. This service could be used for delivery of bills, various types of certificates, newspapers and magazines, etc.

O(3)(1)[4] **E-delivery** – upon the request of the customer, i.e. addressee, received physical mail to be scanned and send by e-mail to recipient. On one hand, this reduces the cost of the postal operator and on the other hand, bring to higher service quality making the delivery process faster.

O(3)(1)[5] **Mailbox alert sensor** - informing customers by e-mail or SMS that the mail was placed in their physical mailbox. This eliminates repeated trips out to an empty mailbox or shorten the time between the delivery of mail and picking up by the addressee (Safety Technology International, 2015).

O(3)(1)[6] **E-commerce and postal virtual shopping center** - We are witnesses of exponential increase in volumes over the past years, and predictions for the future are optimistic as well. Beside delivery, having in mind the huge confidence in the public postal operator, there are some other opportunities, such as forming a virtual shopping centre which would be placed at the web site of postal company.

O(3)(1)[7] **Direct marketing** - A comparative advantage of public postal operators in relation to competition is a possibility of creating extensive customer database. A comprehensive and updated database is the essential prerequisite for offering a direct marketing service as one of the basic postal operators' pillars in the field of marketing. However, the possibility of certain limits due to a privacy policy in specific country should be considered.

O(3)(1)[8] **The virtual Post Office** - The aim of the virtual counter is to give Internet users faster access to the services, information and products they need. The particular advantage is that in this way the postal services could be used 24 hours a day and from any place connected to the Internet (South African Post Office, 2015).

Postal organizations intending to keep their customers and employees satisfied must continually modernize across all areas of their operations. An important issue is the use of modern machines, vehicles and equipment because their level of technological development makes an impact on customers, employees and a society in general. The use of modern information and communication technologies could lead to the following improvements:

O(3)(2)[1] **New systems of sorting and sequencing** - The sorting centres of nowadays mostly use an equipment which replaces the human work. The technological level of this equipment depends on particular postal

operator; however, the modern information and communication technologies offers the solutions much more efficient compared to those from the past. By using the new systems it is possible to collect much more information of various types. Speaking about sorting at the route level, even today the most of mail is sorted manually by the delivery agent to his or her route's order of delivery. The new equipment should pre-sequence the majority of letter mail according to the delivery agent's line of travel along the route. Because more mail will be sorted by the equipment in the plants, delivery agents will be able to leave the depot and begin their deliveries earlier. This allows for multiple start times with two delivery agents sharing the same case, reducing the need for depot real estate and reducing vehicle traffic at the dock (Canada Post, 2015). An interesting solution for sorting centres is voice-directed sorting (Optiscan, 2015).

O(3)(2)[2] **The use of green technologies in the postal sector** - Combating climate change, a major challenge for our planet, has become an unavoidable issue for the development strategies of the postal operators. Given the numerous activities run by the postal operators (collection, sorting, transport and delivery of mail, etc.), their impact on climate change has to be considered (Universal Postal Union, 2015a).

O(3)(2)[3] **Using the envelope repeatedly** - This phenomenon could be used to improve postal operations and as an environment preservation issue as well. This kind of envelope should be equipped with appropriate electronic components, for example NFC tags, etc. In this way the data about the shipment could be stored in electronic form and used for various purposes. The data on electronic components could be changed each time the envelope is newly send.

O(3)(2)[4] **Tracking -** The postal operators could significantly decrease the costs and increase the quality of its services and security by using automated vehicle tracking systems, track and trace system for postal items and system for employees tracking and monitoring.

O(3)(2)[5] **Mailbox Collection Control -** Emptying mailboxes on time is a key critical success factor for postal services in meeting their customers' expectations. Electronics systems, for example RFID based system, could be very useful (Lyngsoe Systems, 2015).

O(3)(2)[6] **Software solutions** - In order to design a technological process to be efficient to the highest possible extent, postal operators should use appropriate software solutions, for example to design delivery area, route optimization programs, geographic information system, etc.

O(3)(2)[7] **Mobile PDA** - Since postal business implies many workers to be outside the buildings, mobile communication system and its devices plays a significant role. The benefits of this service include picking without error, tracing ability of drivers and parcels and a flexible customer service.

O(3)(2)[8] **The use of drones for shipment delivery in the final phase of transfer** - This phenomenon should be further defined by the state authorities to regulate the operation of civil drones, covering issues such as safety as well as privacy and data protection. For example, the drones currently used by the (Deutsche Post, 2015a) has the following characteristics: they can travel up to 18 meters per second at a height of 50 meters

depending on wind speed. It has a total weight of below 5 kilograms and can carry a load of up to 1.2 kg.

O(3)(2)[9] **Self-service terminals -** In order to optimize the cost of its network and in the same time to achieve a higher quality level, postal operators introduce self-service terminals. As consumers are not always available at home during delivery, the terminals with 24-hour access seems to be a solution to manage this. With touch screen facilities and parcel alerts through messages this idea of automation of last mile places delivery in a modern age reducing costs of operation (Post & Parcel, 2015a).

Determining the most influential activities

Further the experts were asked to rank the specified activities in terms of the largest usefulness for the public postal operator.

Determining the most influential activity related to the S(2)

To define the relationships between the activities related to the "Extensive network and strong infrastructure" we used 810 comparisons which are sublimated as shown in Table 8.

Table 8. Pairwise comparisons of activities related to the S(2)

Factors	S(2)[1]	S(2)[2]	S(2)[3]	S(2)[4]	S(2)[5]	S(2)[6]	S(2)[7]	S(2)[8]	S(2)[9]	S(2)[10]
S(2)[1]	1.00000	0.24537	0.33611	0.25794	0.68519	0.76852	0.32130	0.25185	0.27870	0.26481
S(2)[2]	4.07547	1.00000	2.88889	0.72222	3.66667	3.55556	2.22222	0.62963	1.94444	0.54167
S(2)[3]	2.97521	0.34615	1.00000	0.29537	2.55556	2.05556	0.75000	0.36111	0.46296	0.31111
S(2)[4]	3.87692	1.38462	3.38558	1.00000	5.66667	4.94444	3.44444	2.36111	2.61111	2.66667
S(2)[5]	1.45946	0.27273	0.39130	0.17647	1.00000	0.87037	0.55093	0.28519	0.32500	0.27130
S(2)[6]	1.30120	0.28125	0.48649	0.20225	1.14894	1.00000	0.48611	0.26574	0.42130	0.30278
S(2)[7]	3.11239	0.45000	1.33333	0.29032	1.81513	2.05714	1.00000	0.36111	0.75000	0.38889
S(2)[8]	3.97059	1.58824	2.76923	0.42353	3.50650	3.76307	2.76923	1.00000	2.47222	1.91667
S(2)[9]	3.58804	0.51429	2.16000	0.38298	3.07692	2.37363	1.33333	0.40449	1.00000	0.66667
S(2)[10]	3.77623	1.84615	3.21429	0.37500	3.68601	3.30275	2.57143	0.52174	1.50000	1.00000

By implementing the AHP method we can make a conclusion about the relative importance between activities (see Table 9), where 0.1>CR= 0.024275705, which means the level of consistency is satisfactory.

Table 9. The relative importance between activities related to the S(2)

Factors	Importance degrees
S(2)[1]	0.03185
S(2)[2]	0.13545
S(2)[3]	0.06329
S(2)[4]	0.22817
S(2)[5]	0.03617
S(2)[6]	0.03845
S(2)[7]	0.06904
S(2)[8]	0.16513
S(2)[9]	0.09261

S(2)[10]	0.13985

It turns out that the most important activity is the logistic support for the citizens in sense of e-commerce. PPOs could certainly achieve a success in this field since a global e-commerce market has recorded a constant growth in the previous years. On the other hand, having in mind the possibility to serve all the citizens this could be seen both as a business chance and part of a state policy to provide balanced regional development.

Determining the most influential activity related to the O(3)(1)

As previously described the factor "Development of modern information and communications technology" could be seen in two ways. In this subsection we consider the activities related to the possibilities of introducing the new services or achieving quality improvements of the existing ones. The experts made 504 comparisons which are shown in Table 10 at the aggregate level.

Table 10. Pairwise comparisons of activities related to the O(3)(1)

Factors	O(3)(1)[1]	O(3)(1)[2]	O(3)(1)[3]	O(3)(1)[4]	O(3)(1)[5]	O(3)(1)[6]	O(3)(1)[7]	O(3)(1)[8]
O(3)(1)[1]	1.00000	0.89815	0.39352	1.77778	2.44444	0.31852	0.36111	2.27778
O(3)(1)[2]	1.11340	1.00000	0.59259	2.55556	3.22222	0.37037	0.48611	2.83333
O(3)(1)[3]	2.54118	1.68750	1.00000	2.77778	3.61111	0.59259	0.72222	2.94444
O(3)(1)[4]	0.56250	0.39130	0.36000	1.00000	2.05556	0.36111	0.47222	2.16667
O(3)(1)[5]	0.40909	0.31034	0.27692	0.48649	1.00000	0.24590	0.25926	0.56481
O(3)(1)[6]	3.13954	2.70000	1.68750	2.76923	4.06670	1.00000	1.50000	3.83333
O(3)(1)[7]	2.76923	2.05714	1.38462	2.11765	3.85714	0.66667	1.00000	3.61111
O(3)(1)[8]	0.43902	0.35294	0.33962	0.46154	1.77049	0.26087	0.27692	1.00000

By using the AHP method we obtained the following results of relative importance between activities as shown in Table 11, where 0.1>CR= 0.020830818, which means the level of consistency is satisfactory.

Table 11. The relative importance between activities related to the O(3)(1)

Factors	Importance degrees
O(3)(1)[1]	0.09447
O(3)(1)[2]	0.12090
O(3)(1)[3]	0.17141
O(3)(1)[4]	0.07670
O(3)(1)[5]	0.04228
O(3)(1)[6]	0.24614
O(3)(1)[7]	0.19575
O(3)(1)[8]	0.05236

It is evident that the most important activities are related to e-commerce and direct marketing. Having in mind a huge customers` confidence that public postal operator gained due to a very long tradition, establishment of the postal virtual shopping center could bring a significant business growth. Considering the available resources of PPOs, they could take a leading position on the market of direct marketing. This type of marketing has several advantages compared to other marketing sectors, for example the price, direct relationship with customers, the privacy of transmitted message, the message could be stored and read more times since it is in physical form, etc. Since almost all companies need marketing services this service offers a huge potential.

Determining the most influential activity related to the O(3)(2)

The other segment of the factor "Development of modern information and communications technology" is related to a possibility of postal operations improvement. 648 sublimated comparisons are shown in Table 12.

Table 12. Pairwise comparisons of activities related to the O(3)(2)

Factors	O(3)(2)[1]	O(3)(2)[2]	O(3)(2)[3]	O(3)(2)[4]	O(3)(2)[5]	O(3)(2)[6]	O(3)(2)[7]	O(3)(2)[8]	O(3)(2)[9]
O(3)(2)[1]	1.00000	3.55556	4.27778	2.05556	4.38889	1.58333	3.05556	4.61111	2.33333
O(3)(2)[2]	0.28125	1.00000	1.72222	0.36111	2.11111	0.32315	0.67593	2.61111	0.40278
O(3)(2)[3]	0.23377	0.58065	1.00000	0.36111	1.50000	0.30926	0.68519	2.22222	0.35833
O(3)(2)[4]	0.48649	2.76923	2.76923	1.00000	3.38889	0.74074	2.00000	4.16667	1.60185
O(3)(2)[5]	0.22785	0.47368	0.66667	0.29508	1.00000	0.30185	0.36574	1.77778	0.30185
O(3)(2)[6]	0.63158	3.09456	3.23353	1.35000	3.31288	1.00000	2.88889	4.61111	2.11111
O(3)(2)[7]	0.32727	1.47945	1.45946	0.50000	2.73418	0.34615	1.00000	3.66667	0.69444
O(3)(2)[8]	0.21687	0.38298	0.45000	0.24000	0.56250	0.21687	0.27273	1.00000	0.28981
O(3)(2)[9]	0.42857	2.48276	2.79070	0.62428	3.31288	0.47368	1.44000	3.45048	1.00000

By implementing the same methodology as previous, we come to a conclusion about the relative importance between activities (see Table 13), where 0.1>CR= 0.016919409, which means the level of consistency is satisfactory.

Table 13. The relative importance of activities related to the O(3)(2)

Factors	Importance degrees
O(3)(2)[1]	0.24271
O(3)(2)[2]	0.07010
O(3)(2)[3]	0.05608
O(3)(2)[4]	0.15307
O(3)(2)[5]	0.04410
O(3)(2)[6]	0.18912
O(3)(2)[7]	0.08972
O(3)(2)[8]	0.03292
O(3)(2)[9]	0.12217

The new information and communication technologies could bring to significant reduction in costs of functioning. The results indicate that these technologies could achieve the greatest effect in the systems of sorting and sequencing. The reason lies in the fact that the organization of sorting impacts not only the processes in the sorting centres, but also the processes of collection, transportation and delivery of postal items.

Graphical method for comparison of business areas

The proposed model includes a parallel process to the defined activities. The task is to group the activities into the business areas and then to discover the relationship between them. The relationship is based on graphical method and activities importance previously assessed by the experts.

Comparison of business areas related to the factor S(2)

There were 10 activities defined related to the factor S(2). We grouped them into four groups:

- Services on behalf of the state, composed of 4 activities: S(2)[1], S(2)[2], S(2)[3] and S(2)[7];
- Logistics services, composed of 2 activities: S(2)[4] and S(2)[8];
- Financial services, composed of 2 activities: S(2)[5] and S(2)[6];
- Quality improvement, composed of 2 activities: S(2)[9] and S(2)[10].

By implementing the proposed graphical method, we obtained the following images (see Figure 3). Based on the location of centre of gravity, we come to the conclusion that the most important business area is the Logistics services (see part "a" in Figure 3). By comparing the Services on behalf of the state and Financial services (see part "b" in Figure 3), Services on behalf of the state and Quality improvement (see part "c" in Figure 3) and finally Financial services and Quality improvement (see part "d" in Figure 3) we are in position to rank the remaining business areas in the following order: Services on behalf of the state, Quality improvement and Financial services. This result is in accordance with the previous ranking of activities.

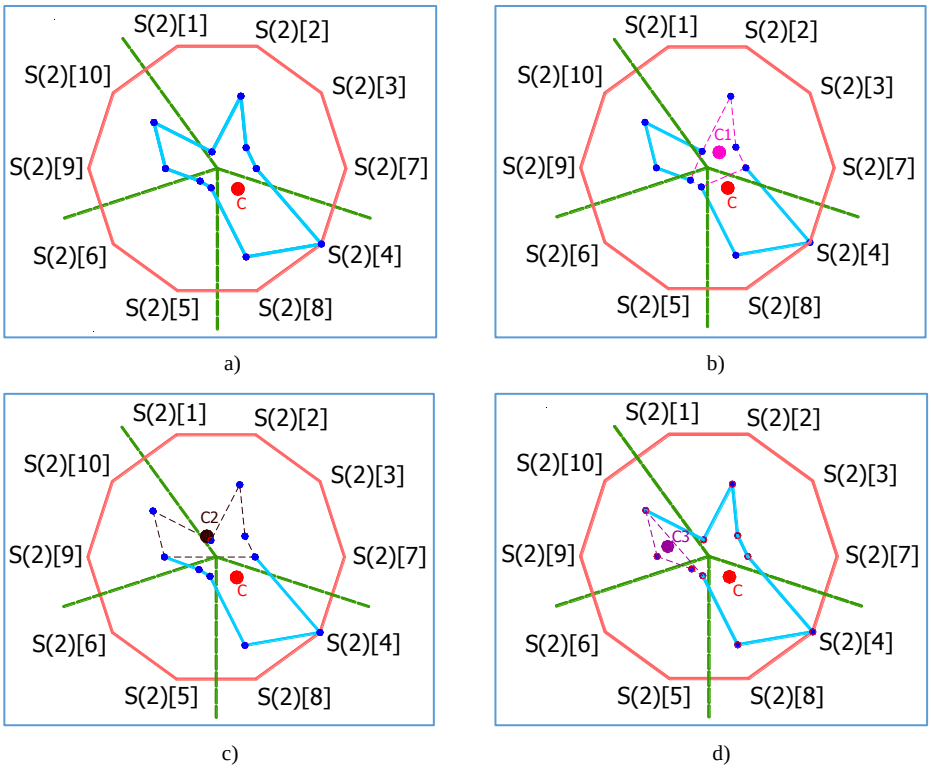

Figure 3. Implemented graphical method for S(2) activities

Comparison of business areas related to the factor O(3)(1)

There were 8 activities defined related to the factor O(3)(1). We grouped them into four groups:

- New services based on mobile and Internet applications, composed of 3 activities: O(3)(1)[1], O(3)(1)[2] and O(3)(1)[3];
- Higher quality achievements, composed of 3 activities: O(3)(1)[4], O(3)(1)[5] and O(3)(1)[8];
- E-Commerce, composed of 1 activity: O(3)(1)[6];

- Marketing services, composed of 1 activity: O(3)(1)[7].

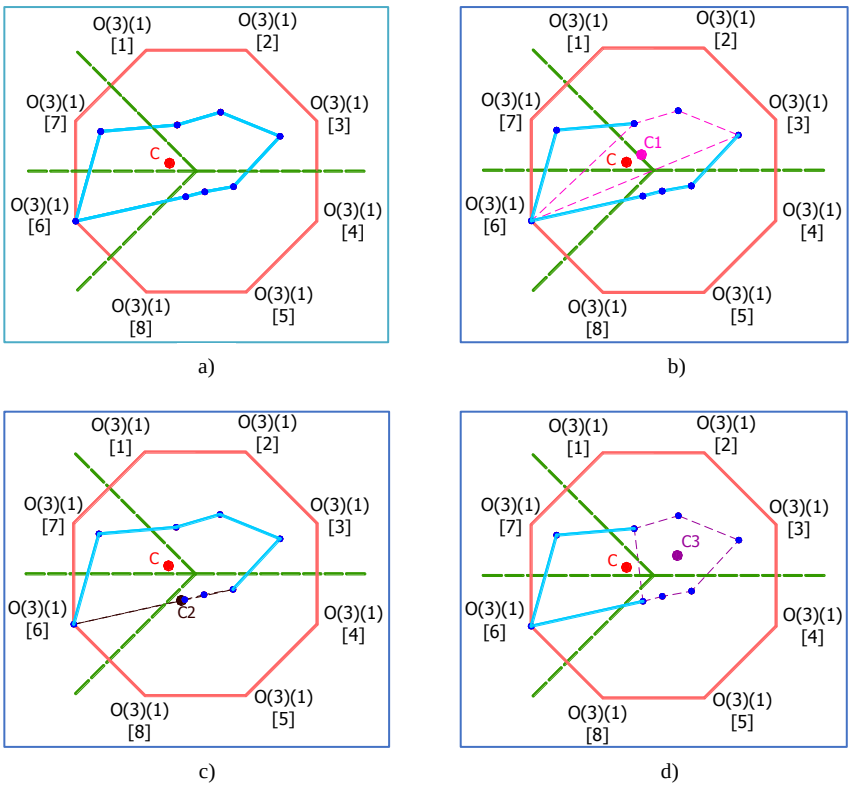

Figure 4. Implemented graphical method for O(3)(1) activities

Corresponding images are shown in Figure 4. The results show that the most important business area related to the factor O(3)(1) is Marketing services. This is slightly different from the result of activities ranking where at the first place was E-commerce and postal virtual shopping centre. However, both sectors are very important for the public postal operator and in the case we need the information about the exact one sector of business that is the most important, further examinations would be necessary. Considering just business areas in this case, the remaining are ranked as follows: New services based on mobile and Internet applications, Higher quality achievements and E-Commerce. The fact that e-commerce is the last, bring us to the conclusion that all the analysed business areas are quite important and there is no huge difference between them. Further, the case that some business area turns out to be very important and the activities which belong to this area are not well ranked, could also mean that we should consider the proposal of new activities which would be part of this business area.

Comparison of business areas related to the factor O(3)(2)

There were 9 activities defined related to the factor O(3)(2). We grouped them into four groups:

- Workforce optimization, composed of 4 activities: O(3)(2)[1], O(3)(2)[7], O(3)(2)[8] and O(3)(2)[9];
- Energy and material savings, composed of 2 activities: O(3)(2)[2] and O(3)(2)[3];
- Inspection system, composed of 2 activities: O(3)(2)[4] and O(3)(2)[5];

- Software applications for improved operation, composed of 1 activity: O(3)(2)[6].

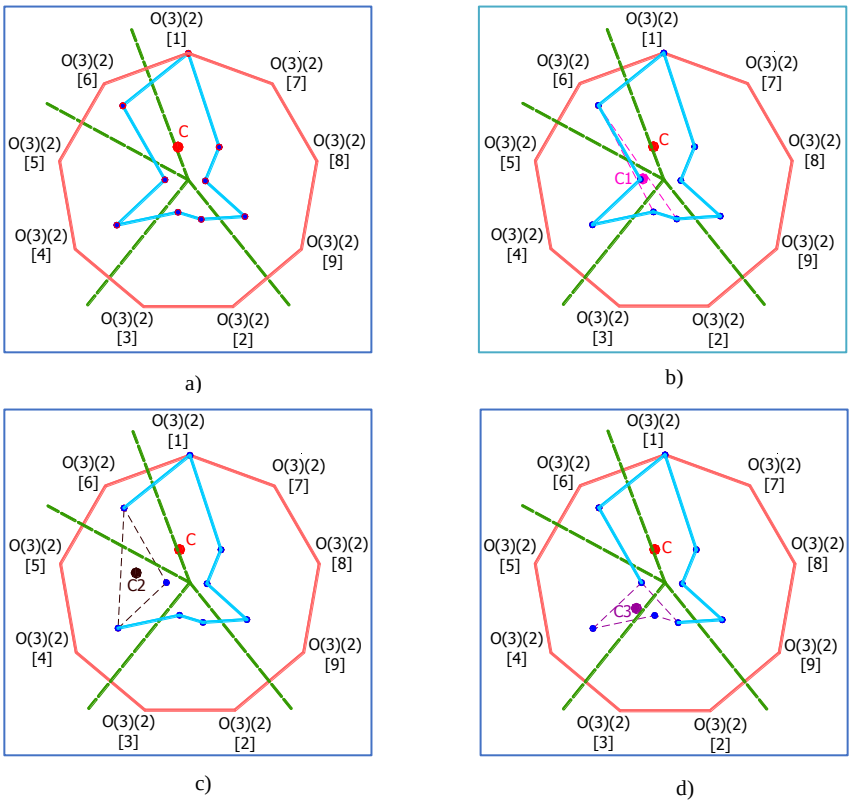

Figure 5. Implemented graphical method for O(3)(2) activities

The proposed graphical method gives the images as shown in Figure 5. Business areas related to the factor O(3)(2) are ranked in the following way: Workforce optimization, Inspection system, Software applications for improved operation and Energy and material savings. This is in accordance with the ranking of activities within the analysed group.

Conclusion

Today's public postal operators face a huge challenge to survive on the competitive postal market and to fulfil the obligations imposed by the state related to the universal service obligation. Besides that, in most countries letter volumes have decreased steadily in recent years. Mainly because customers increasingly communicate electronically. Although there are potential external mechanisms to support the functioning of PPO, it is expected from them to operate efficiently, to be market oriented, to generate new areas of business, to offer innovative products and services tailored to the needs of its customers. To achieve this aim, it is necessary to develop appropriate business strategy. The model proposed in this paper could be a possible solution.

We tested the model in the case of public postal operator in Serbia. However, it could be used by any other postal operator and even in the companies from other fields. The main benefits that could be expected from its implementation are the following:

- Achieving a wide basis for strategic planning;
- Analyses of internal and external factors influencing the functioning of a

company;
- Getting the relationship between the factors;
- Proposal of activities that could bring the greatest effect;
- Getting the relationship between the proposed activities;
- Proposal of business areas in which a company should act;
- Getting the relationship between the proposed business areas.

Beside the mentioned benefits related to a wide range of companies, this study could be of a great interest especially for the postal industry. We proposed various strategic directions for the postal operator and suggested which are the most important according to the contacted experts and implemented methodology. The results show that public postal operators should seek the opportunities to exploit the advantages of extensive network and strong infrastructure. Nevertheless, the postal operators aiming to keep and expand their market position should take the advantage of modern information and communication technologies, not to consider them as a threat. These should be used both to modernize the operations and to offer the new services or to improve the existing ones. Business areas that come to the fore are certainly logistic services, marketing services and workforce optimization.

Finally, we could conclude that universal service providers implementing an appropriate strategy will certainly have a significant role on the postal market in the future as well. This is particularly evident if we have in mind that demand for services at the point where the physical and electronic worlds meet is on the rise.

Acknowledgements: This research was supported by the Czech project CZ.1.07/2.3.00/30.0058 and Serbian Ministry of Science and Technological Development with project TR 36022.

References:

Alger, I., and F. Salanie. 2006. "A theory of fraud and overtreatment in experts markets." *Journal of Economics & Management Strategy* 15(4): 853-881.

BPMA. 2015. "Rowland Hill's Postal Reforms." Accessed February 17. https://postalheritage.wordpress.com/2009/08/21/rowland-hill%E2%80%99s-postal-reforms/

Canada Post. 2015. "New model for delivering the mail." Accessed February 25. https://www.canadapost.ca/cpo/mc/aboutus/corporate/postaltransformation/news.jsf

Deutsche Post. 2015a. "DHL parcelcopter launches initial operations for research purposes." Accessed February 27. http://www.dhl.com/en/press/releases/releases_2014/group/dhl_parcelcopter_launches_initial_operations_for_research_purposes.html

Deutsche Post. 2015b. "Stampit Software included." Accessed February 21. http://www.dpdhl.com/en/media_relations/press_releases/2006/stampit_software_included.html.

Dobrodolac, M., D. Markovic, M. Cubranic-Dobrodolac, and N. Denda. 2014. "Using work stress measurement to develop and implement a TQM programme: a case of counter clerks in Serbian Post." *Total Quality Management & Business Excellence* 25(11-12): 1262-1279.

European Commission. 2013. "Services of general economic interest - public services." Accessed February 27. Internet: http://ec.europa.eu/ competition/state_aid/ overview/public_services_en.html.

Gautier, A., and D. Paolini. 2010. “Universal service financing in competitive postal markets: one size does not fit all.” Accessed June 30. http://www2.ulg.ac.be/crepp/papers/crepp-wp201004.pdf.

Hill, T., and R.Westbrook. 1997. “SWOT Analysis: It’s Time for a Product Recall.” *Long Range Planning* 30(1): 46-52.

Ince, H.,and J. Gikbert. 1860. English History. London: W. Kent & Co.

Kajanus, M., P. Leskinen, M. Kurttila, and J. Kangas. 2012. “Making use of MCDS methods in SWOT analysis - Lessons learnt in strategic natural resources management.” *Forest Policy and Economics* 20: 1-9.

Kim, J.H., C. Lee, and S.B. Ahn. 2013. “Analyzing the Importance of Reinforcement Factors of Competitiveness in Korea Parcel Service.” *Korea Logistics Review* 23(5): 31-49.

Kim, Y.M. 2007. “A Study on the Competitive Advantage Strategies of Korea Parcel Service.” *Korea Logistics Review* 17(2): 183-203.

Kotler, P. 1988. Marketing Management: Analysis, Planning, Implementation, and Control. New Jersey: Prentice-Hall International Edition.

Kurttila, M., M. Pesonen, J. Kangas, and M. Kajanus. 2000. “Utilizing the analytic hierarchy process (AHP) in SWOT analysis - a hybrid method and its application to a forest-certification case.” *Forest Policy and Economics* 1(1): 41-52.

Lee, N.Y. 2011. “A Study on the Logistics Strategies of Parcel Delivery Service Providers in China at e-Commerce era.” *Korea Research Academy of Distribution and Management Review* 14(3): 5-34.

Lightle, J.P. 2014. “The Paternalistic Bias of Expert Advice.” *Journal of Economics & Management Strategy* 23(4): 876-898.

Lyngsoe Systems. 2015. “Mailbox Collection Control.” Accessed March 1. http://www.lyngsoesystems.com/postal/Mailbox_collection_control.asp

Mail Online. 2015. “Denmark to ditch stamps and allow payment for post by text message.” Accessed February 27. http:// www.dailymail.co.uk/ sciencetech/ article-1365307/ Denmark-ditch-stamps-allow-payment-post-text-message.html.

MarketLine. 2014. “Company profile - Austrian Post.”, Available from: Business Source Premier, Ipswich, MA. Accessed December 20.

McDonald, M.H.B. 1993. The Marketing Planner. Oxford: Butterworth - Heinemann.

Optiscan. 2015. “Why Voice Technology.” Accessed March 1. http:// www.optiscangroup. com / solutions / postal-sorting/ voice- directed- sorting

Oxera. 2014. “Funding universal service obligations in the postal sector.” Accessed June 29. http:// www.oxera.com/ Oxera/ media/ Oxera/ Funding-the-USO-in - the-postal-sector.pdf?ext=.pdf.

Porter, M. E. 1998. Competitive Advantage: Creating and Sustaining Superior Performance. Free Press, New York.

Post & Parcel. 2015a.” Cleveron launches new CleverBox 2 automated collection and delivery terminal.” Accessed February 27. http:// postandparcel. info / 63296/ news/ cleveron-launches-new-cleverbox-2-automated-collection-and-delivery-terminal/.

Post & Parcel. 2015b. “Polish Post seeks central role in e-government services.” Accessed March 1. http://postandparcel.info/54402/news/it/polish-post-seeks-central-role-in-e-government-services/.

Saaty, T.L. 2008. “Decision making with the analytic hierarchy process.” *International Journal of Services Sciences* 1(1): 83-98.

Saaty, T.L. 1977. “A scaling method for priorities in hierarchical structures.” *Journal of Mathematical Psychology* 15(3): 234-281.

Safety Technology International. 2015. “STI Wireless, Transmitters and Sensors.” Accessed February 23. http://www.sti-usa.com/pdf/specs/34400.pdf

South African Post Office. 2015. “The Virtual Post Office.” Accessed February 23. https://www.virtualpostoffice.co.za/vpo/General/html/index1.html

Thomson Reuters Web of Science. 2015. http://apps.webofknowledge.com. Accessed January 25.

Universal Postal Union. 2015a. “About Environment.” Accessed March 1. http://www.upu.int/en/activities/sustainable-development/environment/about-environment.html

Universal Postal Union. 2015b. “Internet presentation of Universal Postal Union.” Accessed January 29. http://www.upu.int/en/the-upu/the-upu.html

Wang, X.P., J. Zhang, and T. Yang. 2014. “Hybrid SWOT Approach for Strategic Planning and Formulation in China Worldwide Express Mail Service.” *Journal of Applied Research and Technology* 12: 230-238.

Wheelen, T.L., and J.D. Hunger. 1995. Strategic Management and Business Policy. Reading, MA: Addison Wesley.