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N MOBILE APPLICATIONS OF LOGISTICS PROCESSES

CHYTRÉ TELEFONY V MOBILNÍCH APLIKACÍCH LOGISTICKÝCH PROCESŮ

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Abstract:

The paper is devoted to current smart-phones in connection with the possibility of their use in logistics processes. Thanks to quality processors and sophisticated operating systems of smart phones, many companies operate advanced applications in the entire logistics chains.

Abstrakt:

Příspěvek je věnován problematice současných chytrých telefonů v souvislosti s možností jejich využití v logistických procesech. Díky kvalitním procesorům a sofistikovaným operačním systémům chytrých telefonů, mnoho společností je využívá v pokročilých aplikacích u celých logistických řetězců.

Keywords:

Mobile technology, Wi-Fi, smart phones, tablets, Android, Jelly Bean, iOS, Windows Phone 8.

Klíčová slova:

Mobilní technologie, WiFi, smartphony, tablety, Android, Jelly Bean, iOS, Windows Phone 8.

INTRODUCTION

With the development of data networks of mobile operators, the space for the use of mobile terminals has been expanded beyond the enterprise gates where the wireless local area network Wi-Fi was the domain. The instant access to the information system from anywhere in the logistics chain significantly expanded the possibilities of introducing the mobile technologies.

1. MOBILE TECHNOLOGY IN LOGISTICS

The integrated barcode reader has been so far the main identification character of the original mobile terminal. The current mobile terminals usually enable two-directions wireless communication to transfer data to and from mobile and stationary devices equipped with Blue Tooth , have multiple types of bar code scanners, can be equipped with HF RFID sensor , position sensor GPS and other optional equipment enhancing logistics processes [1].

The tablets create a separate category of mobile terminals. Increasingly, the tablet is a working tool for managers both at high and mid-level management. Enterprise applications on mobile devices provide the same level of information as the classic desktops. The optimized client applications of logistics information systems are designed for senior staff. The tablets enable the staff at middle management level to have constantly updated information of the progress of sub-processes and they can use the required data whenever they need to make a decision. [2].

Not only mobile terminals and tablets are the mobile devices. In recent years, also smart phones that are capable of meeting the various phases of logistics processes have fallen into this category. They have mobile internet access, processors are getting faster, screen resolution and graphics are more and more sophisticated, new features are added and even the 3D technology is applied in new phones. With quality processors and sophisticated operating systems, smart phones, many companies operate sophisticated applications in the entire logistics chains.

2. EXAMPLES OF THE APPLICATION OF SMART PHONES.

For example, FedEx and UPS have their own mobile applications for iPhone and Android aimed for tracking and tracing. The development centre Go Canvas designs and produces wide range of mobile applications for logistics all of which may be downloaded on iOS, Android, BlackBerry and Windows Phone. For example *Travel plan* by Transportation & Logistics Mobile Apps enables drivers on the road and dispatchers to be informed about vehicle registration, departure times, arrival and travel times, while *Delivery receipt* with GPS make it possible to capture information (track) from the customers. [3] [4].

The Mobile Application Truck' enables to watch everything going on from the moment when the shipment leaves the centre, to the moment it arrives at its destination. It keeps the details of the movement and maintenance of vehicles, details of service and from the location data it can create directly in the application the appropriate PDF report [4].

There is the application Total Quality Logistics (TQL) for the operating systems iOS and Android, which allows users to manage their shipment, send documents, payments, and tracks the shipment using GPS - a city / state, search vehicles and many other features. [5].

The SOFTWARE - WORKINFIELD (Android) is an interesting system fully cooperating with the common GPS modules. It is designed for interaction of cloud environment and the mobile applications with the possibility of integration into used firm's processes. Thanks to routes record, and other factors billing the end customer is also possible. The SOFTWARE - REAL TIME GPS TRACKER (Android) provides more than monitoring in real-time. It enables the communication with the device and very detailed settings control the precision of targeting, stopping or starting the GPS receiver. [6].

3. PROPERTIES OF CURRENT SMARTPHONES

Current smartphones are generally characterized by five inches display with technology TFT, IPS, Super AMOLED, Super LCD3 and IPS-LCD, with a resolution of 1920x1080. They work with dual-core and quad-core processors with a clock speed from 1.5 GHz to 2.3 GHz. They have a storage capacity of 16 and 32 GB (exceptionally 64); capacity of the RAM memory is typically two gigabytes they are equipped with cameras from 4 to 13 megapixels. The operating systems Android 4.2.2 Jellybean, as well as iOS and Windows Phone predominate. [7], [8].

Other features of advanced smartphones include the function of rear camera (autofocus, LED for illumination, flash), G-sensor, P-Sensor, L-Sensor, FM radio, Wi-Fi, GPS & A.GPS, Glonass, Multi-touch, GPS navigation with a map of Europe, accelerometer for auto-rotation, proximity sensor, light sensor, NFC, dual-sim and more. Features of current smartphones are presented in the table 1.

As already mentioned, smartphones are undergoing the dynamic development. There is an on-going battle , who will be the first offering the 2K QHD (Quad HD) display which will have the impressive resolution of 2560 x 1440 pixels. According to initial expectations it should have been the model Galaxy S5, but in the end Chinese manufacturer Vivo scooped

with the model XPlay 3S. (Other manufacturers like HTC, Sony and Huawei will surely follow). Model XPlay 3 S and Galaxy S5 will offer five and a half inch displays. Nowadays the largest screen is offered by Sony Xperia Z Ultra, which offers up to 6.4-inch display (however resolution of 1920 x 1080 pixels)

	HTC M8	Samsung Galaxy S5	Sona Xperia Z Ultra	iPhone 5s	Nokia Lumi a920	Xiaomi Mi3
Diaplay	5"	5,1"	6,4"	4"	4,5"	5"
Display	Super LCD3	Super AMOLED	TFT	IPS	IPS	IPS-LCD
Peoplution	1920x1080	1920x1080	1920x1080	1136x640	1280x768	1930x1080
Resolution	Full HD	Full HD	Full HD	Full HD	Full HD	Full HD
Processor	2,3 GHz	2,5 GHz	2,2 GHz	1,3 GHz	1,5 GHz	2,3 GHz
Cores	4	4	4	2	2	4
Memory	16GB/32GB	16 GB/32 GB/ 64 GB	16 GB	16 GB/32 GB/ 64 GB	32 GB	16 GB
RAM	2 GB	2 GB	2 GB	2 GB	1 GB	2 GB
Comoro	Dual 4 MP	16 MP	8 MP	8 MP	8,7 MP 1080p-	13 MP 1080p-
Camera	1080p-video	1080p-video	1080p-video	1080p-video	video	video
00	Android 4.4.2	Android	Aneroid	:00.7	Windows	Android 4.22
05	KitKat	4.4.2.KitKat	4.4.2. KitKat	1057	Phone 8	JelkBean
Battery	2600 mAh	2800 mAh	3050 mAh	1560 mAh	2000 mAh	3050 mAh
Availability in ČR	April 2014	Excedent	excellent	excellent	bad	bad

TAB. 1. Basic parameters of the best-known smartphones. [9, 10, 11].

It is clear that this trend of magnification will continue. Apple went its own way, and announced the development of 4.7 and 5.5 inch 6th rounded displays for iPhone 6 which should launched in the second half of 2014. There will be two next version of Apple's smartphone. The first with 4.7 inch screen and the other with a 5.5 inch screen. These two sizes will be in Full HD, as is customary for modern smartphones. [11], [12].

The Cameras of the Model Galaxy S5, Xperia Z, and Xiaomi MI3 adhere to the border of 13 MPx and the implementation of the 16 MPx cameras are considered (with technology Samsung ISOCELL). ZTE Nubia X6 even comes with the function of OIS or optical image stabilization. RAM is increased from 2 GB to 3 GB. The new chip Qualcomm Snapdragon 800 (clock frequency approximately 2.2-2.3 GHz on four cores) which in its silicon body will offer Adreno 330 graphics chip, will be used by Galaxy S5, Xperia Z and more. Snapdragon processor 805 (Krait 450, 2.5 GHz), which can handle without much problem to stream and record Ultra HD video, is expected for new HTC phones. [12] [13].

Every manufacturer tries to pull down on their side this unstoppable technological race course. And it would not be China if it did not come up with something special. There are new details about the secret competitive weapon Hauwei on the Internet, the first phone where the user will be able to choose the operating system (specifically, Android and Windows Phone). It is one of the most important and primary criteria in which each potential customer is interested. [14].

CONCLUSION

The cheap smart phones are able to compete in the various stages of the logistic processes and replace the expensive specialized equipment, which have not got the ability to communicate with servers and information systems of the company in real time. The big advantage is the easy development of software and its adaptation to the changing needs of

logistics companies.

However, the integration of mobile devices including smartphones into business environment has its drawbacks and limitations. The successful commercial deployment of smart phones means, not to introduce them across all activities. After careful evaluation of the benefits and losses for a given activity deploy them only where they will be the real benefit for your company

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DEVELOPMENT OF THE CARRIAGE OF GOODS BETWEEN THE EUROPEAN UNION AND ITS MAIN TRADING PARTNERS

Vývoj prepravy tovaru medzi EÚ a jej hlavnými obchodnými partnermi

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ABSTRACT

Article deals with the development of goods transported in the European Union. States the EU's share in world import and export markets. Assess the development of trade between the EU and its main trading partners. Shows the categories of the products, which are the most traded in the EU.

ABSTRAKT

Článok sa zaoberá vývojom prepravy tovaru v Európskej únii. Uvádza podiel EÚ na svetových dovozných a vývozných trhoch. Posudzuje vývoj obchodu medzi EÚ a jej hlavnými obchodnými partnermi. Uvádza kategórie výrobkov, s ktorými sa najviac obchoduje v rámci EÚ.

Kľúčové slová

Dovoz, medzinárodný obchod, obchodná bilancia, preprava, vývoz

Keywords

Export, import, international trade, trade balance, transport

1. INTRODUCTION

Exchange of capital, goods and services between countries is carried out through international trade. In most countries, such trade represents a significant share of <u>gross</u> <u>domestic product</u> (GDP). While international <u>trade</u> has been present throughout much of history (see <u>Silk Road</u>, <u>Amber Road</u>), its economic, social, and political importance has been on the rise in recent centuries. It is the presupposition of international trade that a sufficient level of <u>geopolitical</u> peace and stability are prevailing in order to allow for the peaceful exchange of trade and commerce to take place between nations. (Stopford, 2009).

<u>Industrialization</u>, advanced in technology <u>transportation</u>, <u>globalization</u>, <u>multinational</u> <u>corporations</u>, and <u>outsourcing</u> are all having a major impact on the international trade system. Increasing international trade is crucial to the continuance of globalization. Without

international trade, nations would be limited to the goods and services produced within their own borders.

2. THE EXCHANGE OF GOODS IN COUNTRIES OUTSIDE THE EU

The <u>EU-28</u> accounts for around one sixth of the world's trade in goods. The value of international trade in goods significantly exceeds that of services (by about three times), reflecting the nature of some services which makes them harder to move across borders.

EU-28 international trade in goods with the rest of the world (the sum of extra-EU exports and imports) was valued at EUR 3 481 148 million in 2013 (Fig. 1). As such, trade activity for the EU-28 registered record levels for both exports and imports. In comparison with a year before, total trade in the EU-28 increased by EUR 198 583 million in 2013.



Fig. 1 - States with the largest share of international trade (2013, € 1000 million), Source: Authors based on [7]

After experiencing a sharp fall in both exports and imports in 2009, the EU-28 saw its exports rise each year thereafter to reach a record level of EUR 1 683 076 million in 2013, an increase of 8.3 % compared with the year before. This was largely driven by increases in the level of exports of the two largest categories, machinery and transport equipment and other manufactured goods. Imports of goods rose by 4.0 % in 2013 and also reached a record level, valued at EUR 1 798 072 million, with the largest gains recorded for imports of mineral fuels and lubricant products and chemicals. Germany remained by far the largest player in relation to extra EU-28 trade in 2013, contributing 28.0 % of the EU-28's exports to non-member countries and accounting for almost one fifth (18.5 %) of the EU-28's imports (Tab. 1).

The next three largest exporters, the United Kingdom (10.9 %), France (10.8 %) and Italy (10.6 %), remained the same as in 2012, and were the only other Member States to account for a double-digit share of EU-28 exports. The United Kingdom (15.6 %), the Netherlands (14.0 %), Italy (9.9 %) and France (9.6 %) followed Germany as the largest importers of goods from non-member countries; the relatively high share for the Netherlands can, at least in part, be explained by the considerable amount of goods that flow into the EU through Rotterdam — the EU's leading sea port. The largest extra EU-28 trade surplus in goods, valued at EUR 138 674 million, was recorded by Germany, followed by Ireland (EUR 21 137 million) and Sweden (EUR 16 182 million).

	EXPO	ORTS	IMPO	ORTS	TRADE BALANCE
	(€ 1000 million)	share of EU–28 exports (%)	(€ 1000 million)	share of EU–28 imports (%)	(€ 1000 million)
EU-28	1 683,1	100,0	1 798,1	100,0	-115,0
Belgium	104,0	6,2	110,8	6,2	-6,8
Bulgaria	8,5	0,5	10,5	0,6	-2,0
Czech Republic	22,8	1,4	27,1	1,5	-4,2
Denmark	29,9	1,8	20,9	1,2	9,0
Germany	470,9	28,0	332,2	18,5	138,7
Estonia	4,3	0,3	2,8	0,2	1,4
Ireland	37,3	2,2	16,2	0,9	21,1
Greece	15,4	0,9	26,6	1,5	-11,2
Spain	83,5	5,0	120,2	6,7	-36,7
France	181,7	10,8	172,9	9,6	8,8
Croatia	4,0	0,2	6,1	0,3	-2,1
Italy	178,3	10,6	177,5	9,9	0,8
Cyprus	0,5	0,0	1,7	0,1	-1,2
Latvia	4,0	0,2	2,9	0,2	1,1
Lithuania	9,1	0,5	10,5	0,6	-1,4
Luxembourg	3,1	0,2	4,9	0,3	-1,8
Hungary	18,2	1,1	21,7	1,2	-3,5
Malta	2,0	0,1	1,2	0,1	0,8
Netherlands	122,6	7,3	251,9	14,0	-129,3
Austria	38,8	2,3	32,7	1,8	6,2
Poland	34,3	2,0	50,0	2,8	-15,7
Portugal	13,1	0,8	15,8	0,9	-2,8
Romania	13,3	0,8	14,4	0,8	-1,1
Slovenia	6,3	0,4	7,0	0,4	-0,7
Slovakia	10,0	0,6	15,8	0,9	-5,9
Finland	26,3	1,6	22,1	1,2	4,2
Sweden	57,7	3,4	41,5	2,3	16,2
United Kingdom	183,0	10,9	280,0	15,6	-97,0

Tab. 1 - Trade balance in Extra EU-28 (2013), Source: Authors based on [7]

3. TRADE WITHIN THE EU STATES

There are many approaches in the theory and practice of financial management that are very fundamentally different and allow to take into account the different business priorities - profit and cost, static and dynamic methods) or on the other hand, differ only in the translation of certain procedures. In principle their lead to the same conclusions - net present value index present value, internal rate of return, average annual costs and discounted costs. In the logistics is the economic efficiency very important, unfortunately, is not specifically defined, and reflects only the certain objective conditions for the development of the company. Trade in goods between EU Member States (intra-EU trade) was valued — in terms of dispatches — at EUR 2 840 337 million in 2013 (Tab. 2).

Tab. 2 - Trade within the EU states (2012 and 2013, EUR 1000 million), Source: Authors based on [5]

	DISPATCHES		ARRI	VALS	BALANCE		
	2012	2013	2012	2013	2012	2013	
EU-28	2 822,4	2 840,3	2 754,3	2 769,2	68,1	71,2	
Belgium	246,0	243,1	227,0	230,9	19,0	12,1	
Bulgaria	12,7	12,2	13,9	15,0	-1,2	-2,7	
Czech	97.6	00 /	81.6	83.0	16.0	16.4	
Republic	97,0	<i>99</i> ,4	01,0	85,0	10,0	10,4	
Denmark	52,5	52,2	48,4	50,6	4,1	1,5	
Germany	630,0	622,7	572,5	573,1	57,5	49,6	

Estonia	8,0	8,3	9,6	10,7	-1,6	-2,5
Ireland	52,2	53,6	33,3	32,7	18,9	20,9
Greece	12,6	12,2	24,9	22,6	-12,3	-10,3
Spain	146,9	146,3	154,0	142,4	-7,1	3,9
France	261,4	260,9	348,6	352,0	-87,2	-91,1
Croatia	5,7	5,6	10,1	10,1	-4,3	-4,5
Italy	212,9	211,9	217,2	202,8	-4,3	9,1
Cyprus	0,9	0,8	4,3	3,9	-3,4	-3,1
Latvia	6,2	7,0	9,1	10,5	-2,9	-3,5
Lithuania	12,4	14,0	13,0	14,3	-0,6	-0,4
Luxembourg	12,0	11,6	16,9	16,4	-4,9	-4,8
Hungary	62,5	62,6	51,3	52,4	11,1	10,2
Malta	1,3	1,3	3,3	4,0	-2,0	-2,7
Netherlands	369,5	386,4	199,3	207,6	170,3	178,8
Austria	90,9	90,8	106,4	106,3	-15,4	-15,4
Poland	106,0	110,0	105,9	104,9	0,1	5,0
Portugal	31,9	32,2	43,6	40,3	-11,7	-8,2
Romania	32,3	31,7	40,0	40,2	-7,7	-8,5
Slovenia	19,3	18,8	18,4	18,0	0,9	0,8
Slovakia	48,8	52,8	42,1	44,4	6,7	8,4
Finland	31,7	30,5	37,2	37,4	-5,5	-6,9
Sweden	75,4	76,6	86,7	85,0	-11,4	-8,4
United Kingdom	182,7	185,0	235,5	257,5	-52,9	-72,5

This was 1.7 times as high as the level recorded for exports from the EU-28 to nonmember countries (extra-EU trade). The importance of the EU's internal market was underlined by the fact that intra-EU trade of goods was higher than extra-EU trade in each of the EU Member States, with the exceptions of Greece and the United Kingdom (Figure 5). The proportion of total trade in goods that was accounted for by intra-EU and extra-EU flows varied considerably across the Member States, reflecting to some degree historical ties and geographical location. The highest shares of intra-EU trade (just under 80.0 %) were recorded for Luxembourg, the Czech Republic and Slovakia, with this ratio falling to 48.9 % in the United Kingdom and 45.3 % in Greece. (Grobarčíková, Sosedová, 2014)



Fig. 2 - States with the largest share of international trade (2013, € 1000 million), Source: Authors based on [7]

Intra EU-28 trade — measured by dispatches — increased by 0.6 % across the EU-28 between 2012 and 2013; this was a lower rate of increase than that recorded for extra-EU exports (which rose by 8.3 %). Considering arrivals and dispatches together, the biggest increases in intra-EU trade were registered for Latvia (14.0 %), Malta (13.3 %) and Lithuania (11.7 %), while Cyprus (-8.7 %), Greece (-7.3 %), Spain (-4.1 %), Portugal (-4.0 %), Italy (-3.6 %) and Luxembourg (-3.4 %) recorded the largest reductions in intra-EU trade in 2012.

4. THE MOST IMPORTANT TRADING PARTNERS

Between 2012 and 2013, the EU-28's exports of goods to the most of its major trading partners increased. The highest growth rate was recorded for exports to South Korea (up 16.2 %) and Russia (up 13.6 %), while exports to the United States grew more slowly (up 10.9 %) (Tab. 3).

However, the United States remained, by far, the most important destination for goods exported from the EU-28 in 2013, although the share of EU-28 exports destined for the United States fell from 28.0 % of the total in 2003 to 17.4 % by 2013. In value terms, the most important EU-28 exports to the United States in 2013 included machinery and transport equipment. The same group of products was also the main export category to China, which was the second most important destination market for EU-28 exports in 2013 (8.6 % of the EU-28 total), followed by Switzerland (7.9 %).

On the import side, between 2012 and 2013 the EU-28 saw an increase in the level of its imports of goods from Russia (up 6.8%), the United States (up 7.5%), Norway (up 7.6%), and especially from Switzerland (up 13.3%). China remained the most important supplier of goods imported into the EU-28 in 2013, even though imports from China fell by 1.1% between 2012 and 2013. Imports from China registered a reduction in all the main categories, with the exception of imports of machinery and transport equipment (up 0.8%).

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
EXPORTS											
Extra EU- 28	885	862	945,2	1050	1152,4	1234,3	1309,1	1094	1353,2	1554,3	1683,1
United States	248	227,4	235,7	250,8	267,0	259,6	248,1	203,8	242,7	264,1	292,8
China	35,1	41,5	48,4	51,7	63,7	71,8	78,3	82,4	113,5	136,4	144,0
Russia	34,5	37,3	46,1	56,7	72,4	89,2	105,0	65,7	86,3	108,6	123,4
Switzerland	72,9	71,4	75,3	86,3	88,5	93,1	100,6	88,8	110,5	142,1	133,5
Norway	28,2	27,7	30,8	33,7	38,4	43,5	43,7	37,5	41,9	46,8	49,9
Turkey	26,6	30,9	40,2	44,6	50,0	52,8	54,5	44,5	61,8	73,3	75,4
Japan	43,5	41,0	43,5	43,7	44,8	43,7	42,4	36,0	44,0	49,1	55,6
Brazil	15,7	12,4	14,2	16,0	17,7	21,3	26,3	21,6	31,5	35,8	39,7
India	14,3	14,6	17,2	21,3	24,2	29,2	31,4	27,5	34,9	40,6	38,5
South Korea	17,7	16,5	17,9	20,2	22,8	24,7	25,5	21,6	28,0	32,5	37,8
					IMPO	RTS					
Extra EU- 27	937	935	1027	1184	1365	1447	1585,2	1235,6	1532,1	1728,3	1798,1
United States	182,9	158,4	159,7	159,2	170,7	177,4	182,8	155,3	173,4	192,0	206,5
China	90,4	106,6	129,2	161,0	195,8	233,9	249,1	215,3	283,6	294,8	291,6
Russia	65,2	71,3	84,9	114,0	142,7	146,9	180,4	119,6	162,1	201,3	215,0

Tab. 3 - The most important trading partners (2003 – 2013, € 1000 million), Source: Authors based on [5]

Switzerland	61,9	59,2	62,2	66,7	71,6	77,0	82,6	80,9	85,5	93,5	105,9
Norway	48,1	51,1	55,3	67,2	79,2	76,6	95,9	68,9	79,0	93,9	101,0
Turkey	24,7	27,4	32,9	36,2	41,9	47,4	46,3	36,4	42,8	48,4	48,3
Japan	73,8	72,6	74,9	74,4	78,4	79,3	76,5	58,4	67,4	70,8	64,7
Brazil	18,5	19,2	21,8	24,1	27,3	32,9	36,0	26,1	33,4	39,1	37,4
India	13,7	14,1	16,4	19,1	22,6	26,7	29,6	25,5	33,4	40,0	37,5
South Korea	24,7	26,1	30,8	34,6	40,9	41,7	39,7	32,5	39,5	36,3	38,0
	TRADE BALANCE										
Extra EU- 27	-51,7	-73,5	-82,2	- 134,4	-212,2	-212,5	-276,1	-141,7	-178,9	-174,1	-115,0
United States	65,1	69,0	76,0	91,6	96,4	82,2	65,3	48,5	69,3	72,1	86,3
China	-55,3	-65,1	-80,8	- 109,3	-132,1	-162,0	-170,8	-132,9	-170,1	-158,4	-147,6
Russia	-30,7	-34,0	-38,8	-57,3	-70,3	-57,7	-75,5	-53,9	-75,8	-92,7	-91,6
Switzerland	11,0	12,2	13,1	19,6	16,8	16,1	18,0	7,9	25,0	48,6	27,6
Norway	-19,9	-23,4	-24,6	-33,5	-40,8	-33,2	-52,2	-31,4	-37,1	-47,0	-51,1
Turkey	2,0	3,5	7,3	8,4	8,1	5,5	8,2	8,0	19,0	24,9	27,1
Japan	-30,3	-31,6	-31,5	-30,6	-33,7	-35,5	-34,1	-22,5	-23,5	-21,7	-9,2
Brazil	-2,7	-6,8	-7,6	-8,1	-9,6	-11,6	-9,7	-4,5	-1,9	-3,3	2,3
India	0,6	0,5	0,7	2,1	1,6	2,5	1,7	2,0	1,5	0,5	1,0
South Korea	-7,0	-9,7	-12,9	-14,3	-18,1	-17,0	-14,2	-10,9	-11,6	-3,8	-0,2

5. EU TRADE BY MAIN PRODUCTS

Sharp increases in the level of exports outside the EU-28 were reported for all major product groups in 2013 (Tab.4). Trade balance of main product groups is outlined on the Fig. 3. The highest growth rate for EU-28 exports in 2013 was recorded for exports of mineral fuels and lubricant products, which reached the record value of EUR 125 514 million, 25.2 % higher than in 2012 (Fig.4).

	20	07	20	12	20	13
	(€ 1000 million)	(%)	(€ 1000 million)	(%)	(€ 1000 million)	(%)
			EXPORTS			
Total	1 234,3	100,0	1 554,3	100,0	1 683,1	100,0
Food, drinks & tobacco	61,6	5,0	88,5	5,7	99,0	5,9
Raw materials	30,1	2,4	45,0	2,9	47,6	2,8
Mineral fuels, lubricants	66,6	5,4	100,2	6,4	125,5	7,5
Chemicals & related prod.	196,7	15,9	255,0	16,4	275,4	16,4
Other manufactured goods	306,6	24,8	351,7	22,6	379,3	22,5
Machinery & transport equip.	546,2	44,2	648,1	41,7	705,2	41,9

Tab. 4 - Trading outside the EU-28 by type of goods (2007, 2012 and 2013), Source: Authors based on [5]

IMPORTS								
Total	1 446,8	100,0	1 728,3	100,0	1 798,1	100,0		
Food, drinks & tobacco	75,7	5,2	91,5	5,3	93,1	5,2		
Raw materials	70,0	4,8	85,4	4,9	80,7	4,5		
Mineral fuels, lubricants	338,3	23,4	493,4	28,5	548,1	30,5		
Chemicals & related prod.	120,7	8,3	155,2	9,0	163,3	9,1		
Other manufactured goods	382,7	26,4	401,4	23,2	387,8	21,6		
Machinery & transport equip.	429,0	29,7	443,8	25,7	452,2	25,2		



Fig. 3 - Trade balance of main product groups, Source: Source: Authors based on [9]

Two product groups, namely raw materials and other manufactured goods, registered a decline in imports between 2012 and 2013. Mineral fuels and lubricant products — the largest category of imports since 2011 — experienced growth of 11.1 % in 2013, driven by a 12.7 % increase in the value of imported petroleum products (Fig. 5). Almost one third (30.0 %) of the EU-28's imports of mineral fuels and lubricant products in 2013 came from Russia, followed by Norway (10.2 %), Libya (6.0 %), Nigeria and Algeria (5.8 % each).

The EU-28's trade deficit of EUR 114 996 million in 2013 was driven by the sizeable deficit in relation to mineral fuels and lubricant products, which stood at EUR 422 629 million. This was offset by trade surpluses of EUR 253 003 million for machinery and transport equipment, and EUR 112 112 million for chemicals and related products.



Fig. 4 - Export from the EU-28 (percentage share of extra EU-28 exports), Source: Source: Authors based on [9]



Fig. 5 - Imports into the EU-28 (percentage share of imports into the EU-28), Source: Source: Authors based on [9]

6. CONCLUSION

The development of trade can be an opportunity for economic growth. The EU has a common trade policy, whereby the European Commission negotiates trade agreements and represents the EU's interests on behalf of its 28 Member States. The European Commission consults Member States through an advisory committee which discusses the full range of trade policy issues affecting the EU including multilateral, bilateral and unilateral instruments. As such, trade policy is an exclusive power of the EU — so only the EU, and not individual Member States, can legislate on trade matters and conclude international trade agreements. This scope extends beyond trade in goods, to cover trade in services, intellectual property and foreign direct investment.

Statistics on the international trade of goods measure the value and quantity of goods traded between Member States of the EU (known as intra-EU trade) and goods traded by EU

Member States with non-member countries (known as extra-EU trade). These statistics are the official source of information about imports, exports and the trade balance in the EU, its Member States and the euro area.

Statistics on the international trade of goods are used extensively by decision makers at an international, EU and national level. Businesses may use international trade data to carry out market research and define their commercial strategy. International trade statistics are also used by EU institutions in their preparation of multilateral and bilateral trade negotiations, for defining and implementing anti-dumping policies, for the purposes of macroeconomic and monetary policies, and in evaluating the progress of the single market, or the integration of European economies.

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FORECASTING, PROGRAMMING AND DESIGNING IN TOURISM

Prognózování, programování a projektování v turizmu

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ABSTRACT

Methodology of planning in tourism is intensively developed in recent years. These are generally forecasting, programming and projecting, while the definition and content of these activities are manifested some discrepancies and inconsistent assessment. The arrangement of activities must be based on the fundamental structure of the tourism organization, which is implemented in the given state. The basic task of planning in the tourism industry is to ensure the correct orientation of activities at all levels of the field in terms of respecting transnational and national strategies that are in the Czech Republic rooted in the concept of national tourism policy for the period 2014 - 2020.

ABSTRAKT

Metodika plánování je ve sféře cestovního ruchu v posledních letech intenzivně rozvíjena. Obecně se jedná o prognózování, programování a projektování, přičemž v definování a náplni těchto aktivit se projevují jisté nesrovnalosti a nejednotné posuzování. Uspořádání činností musí vycházet ze základní struktury organizace cestovního ruchu, která je uplatňována v daném státě. Základním úkolem plánování v odvětví cestovního ruchu je zajištění správné orientace činnosti všech úrovní oboru ve smyslu respektování nadnárodních a národních strategií, které jsou v České republice zakotveny v koncepci státní politiky cestovního ruchu na období 2014 – 2020.

Key words

Planning in tourism. Principles of Forecasting, Programming and designing. The organizational structure of tourism.

Klíčová slova

Plánování v cestovním ruchu. Principy prognózování, programování a projektování. Organizační uspořádání cestovního ruchu.

1. INTRODUCTION

Methodology of designing activities in the sphere of tourism in recent years is intensively developed. In addition to general principles and proclamations included in the materials of Ministry for regional development (MMR) uses knowledge and methodologies of design work carried out in other areas. It should be noted that in the context of design activities in the professional materials is the forecasting, programming and projecting of tourism, with the definition and content of these activities are manifested certain anomalies and inconsistent assessment, especially in the case of programming. Generally, it is necessary to distinguish between different levels in which these activities are carried out while the arrangement corresponds to the organizational structure of tourism in the given country.

2. PLANNING PROCEDURES IN TOURISM

To understand the content and domain of planning activities by type of tourism we must first define and align their objectives and working methods.

Forecasting is systematically derived opinion on the future status of objective reality, which is rated by the degree of reliability. Compared to a simple prediction or assertion is based on scientific evidence. In essence, the assessment of the likely state of a particular object (system phenomenon) at some point in the future (time interval). Reliability (or vice versa speaking uncertainty) of forecasts depends on the amount of relevant information available and the type of task (Fig.1).



Fig.1 Relationship between the reliability of the forecasts and information available

Generally prognoses identify and detect trends in the past and to extrapolate into the future. In the sphere of tourism are estimated fundamental trends that will determine the development of activities of all interested international, national and regional entities. It is necessary to address the follow-up levels that are addressed in the programming and projecting activities of the tourism industry.

The course of the forecasting process and the subsequent use of the resulting knowledge disintegrates into a series of follow-up phases, which schematically illustrates a diagram of Fig.2.



Fig.2 Scheme of forecasting

In forecasting can be use a variety of methods. Subjective methods are based on managerial judgment and experience (different individuals may derive different results from identical information). These include both individual method (method of analogy, study of documents) as well as group method (Delphi method, brainstorming). Objective methods are based on mathematical models assume that data from the past and other relevant factors can be combined into a reliable forecasts in the future. These methods include various statistical techniques, time series analysis with a number of variants, causal explanatory and structural methods, etc. Among the most promising methods of forecasting activities rank system models. They use both objective and subjective methods expressing future as a structure in which all the sub-elements are in mutual relations and interactions. A systems approach is a way of understanding reality that does not change the basic methodological tools of

forecasting. Systematic approach to forecasting is an effective organizing principle that contributes to achieve harmony of prognosis and actual development.

Prognosis usually presents and justifies statements about alternative or variant options for future development, pointing out the various links and recommended to the competent authorities (users) the ability of optimal development (Vystoupil, 2003). During solution is recommended to start from the use of several techniques and comparing the results obtained. It must consider that the reliability of extrapolating outside the area known data is difficult to evaluate.

It can be concluded that the result of forecasting is the formation strategic documents which characterize the strengths and weaknesses a given territory, define development priorities, development targets and measures to achieve them. The term strategy is defined in the Act 248/2000 Coll. of regional development support.

Programming is by Vystoupil (2003) in the construction of basic strategies for the future, in defining the objectives in the long term. It focuses on main development trends, ideas of desirable future confronts and aligns with probable expected trends of changes. The result of programming is a program, containing a list of procedures and measures that are necessary to achieve the defined goals. As a rule, it is act in the implementation of multi-disciplinary and multi-annual programs generally defining the basic framework for the realization of projects at the broadest level. It is a concept that is widely used in the analysis of tourism development at national, regional or sector level as part of the tourism strategy within the operational programs, developing basic theses of the National Development Plan. This is based on the programming mechanisms of economic and social cohesion politics of the European Union in environment of the Czech Republic, with a focus on tourism. In operational programs are given sets of priorities dividing on the individual measures and financial framework and implementation arrangements.

The output of programming can be development plans and program documents that outline directions and procedures for development of the sector. The procedures that can be used to solve, compiling mental maps and creative thinking (brainstorming, brainwriting, Delphi method, etc.) methods are applied. In addition, you can use the logical framework method that enables briefly and clearly identify problems, define and describe the specific activities associated with the implementation of the program.

Observe that in the case of programming states other concept which consists in the fact that it is a specification of the content of programs under service packages, i.e. various programs, events and activities to increase sales and customer interest in buying prepared and offered tourism products.

It would be necessary to unify the use of the term of programming, which is used in various levels of planning in the sphere of tourism. In view of the fact that the industry is based on the materials of international organizations and the European Union consider it logical to respect the above concept. In contrast, the application of the concept as a subordinate of products creation, resp. packages appear to be illogical and redundant.

Projecting or **designing** includes creation of tourism projects that represent a large number of interconnected and logically correlated activities carried out within a limited period of time at a specified price. In the clearest sense of the word is a product marketable set of services offered by the provider (usually a travel agency). From the nature of tourism, it is clear that this is a soft (non-investment) projects. Let us emphasize that resulting product, which in most cases a set of services, also known as a package, represent a process. The

process of creating and implementing tourism products are the result of design, schematic drawing of Fig.3.



Fig.3 Designing (A) and implementation (B) of the tourism product

The initial step is to define certain intent which may arise under discussion involved employees of travel agencies, external stimulus or the customer like a good idea of the individual. The process of the product creation begins with of mental activity, thus creating mental models that can be formally converted into a mental map (Schejbal, 2011), respectively, by using the methods of creative thinking.

In the case of the type and content larger projects it is advisable to prepare a project of solutions and apply the principles of project management using a variety of tools, from simple Gantt chart type to complex systems. Pre-project preparation is important, the purpose of which is to explore opportunities and assess the feasibility of the project, which includes competitor analysis, analysis of the external and internal environment, demand analysis, etc. The results of the analysis can be structured as SWOT analysis, confrontational matrix, SLEPT analysis, etc. When processing is need to focus on thematic, temporal, cost and experience optimization of product.

Mutual relations of discussed activities and corresponding outputs can be represented as follows (Fig.4).



Fig.4 Relationship of forecasting, programming and designing in tourism

It is clear that the planning processes in the sphere of tourism are extensive and in terms of orientation and content vary greatly. It should be noted that it is a continuous process that requires constant attention and the necessary controls and innovation. Care must be discussed at all levels to respect the fundamental trends that are affecting and will affect tourism. Stress that constantly increasing emphasis on the quality of processed products and their harmony with the human and natural environment.

3. ORGANIZATIONAL STRUCTURE OF TOURISM

Generally, it is necessary to build on the basic structure of the organization of tourism, which is implemented in a given state and which can be simply represented by the following scheme (Table 1).

level	tourism organization	territorial unit	founder	
1	national	Czech republic	Ministry for regional development	
2	regional	region	regional office	
3	local	tourist area	municipalities, businessman	

Tab.1 Scheme of organizational levels of tourism (Studnička 2012)

It is therefore clear that in the sphere of tourism, we must distinguish between several types of design activities, namely:

- 1. design of tourism in destinations:
 - a. at the national level;b. at level of tourist regions;c. at a local level;
- 2. design on the level of private entities:
 - a. in travel agencies;
 - b. in non-profit organizations;
 - c. the design of tourism products.

A distinction is made the programming and designing of tourism within destinations that depend on the level of interest, i.e. in cases where the local destinations (administrative units - municipalities, natural areas, etc.), tourist regions or micro-regions or the entire country, is considered a destination for the entire national territory. Such access is necessary because at each of these levels apply different material, organizational and optimization point of view. These activities are carried out by specialized units of state administration in the management of destinations at the level of administrative units (municipalities, regions or ministry).

type	territory		founder	tourism unit
1-a	state	state	MMR	CzechTourism
1-b	region	administration and	regional authority	regional tourism organization
1-c	tourism area	autonomy	municipality	local tourism organization
0		private	business and non-	travel agency
2	2 by focus sphere		governmental non- profit organizations	associations, cooperatives, etc.

Tab.2 Diagram of structure of tourism organizations

Programming and design of tourism at the central level, i.e. within the Ministry for Regional Development (MMR), is focused on:

- a) prioritization of tourism in inland and foreign areas and ways of their realization;
- b) establishment of rules in the activities of the tourism industry at lower levels and in the private sector;
- c) creation of a legal framework for tourism organizations and their activities;
- d) procedure for securing funding for tourism development from State resources and resources of the European Union.

⁽on material MMR Tourism in the Czech Republic 2010)

Strategic documents and tools for tourism development at the Czech Republic deals with the Tourism section on the MMR, which provides legal, conceptual and methodological conditions for tourism development, including the use of structural funds and the coordination of international activities related to tourism development. The section ensures the responsibilities of the Ministry as a central authority in matters of tourism. The section is divided into the Department of communication and international cooperation in tourism and the Department of interventions in tourism. The following problems devoted to specialized Agencies Czech Tourist Authority - CzechTourism and partly Centre for Regional Development. Project planning, idea generation, problem analysis, situational analysis, financial analysis, risk analysis, project development, implementation and control is part of the design.

At lower levels destination for these purposes are created both the tourism departments aimed at managerial administrative units (cities, counties) as well as specific organizations, such as regional tourism agencies. The management varies from region to region. The particular scheme depends on the conditions in each region, as evidenced by the following Fig. 5. At present are used the four approaches (Studnička, 2012), namely:

- the regional authority has a separate department of tourism (Karlovy Vary);
- tourism is assigned (such as division) to other departments (Plzeň, Ústí nad Labem and Olomouc regions);
- the established service organization of tourism in the region (Zlín Region Tourist Eastern Moravia);
- The established service organization of tourism in the region and there is also a separate department / division of tourism (South Moravia Region).



Fig.6

Scheme of tourism management in the Olomouc Region

As it is evident from these organizational schemes are therefore relevant departments categorized under various departments of regional offices. Their activities are usually broad and general tasks arising out of national guidelines are influenced just by including them under the superior departments. The task of these departments or divisions is to coordinate activities interested subjects, so that the tourism in certain destination is fluently and seamlessly developed.

Designing at the level of travel agency is focused to determining the orientation of a travel agency, therefore on selection of the appropriate segment of the tourism market, as well

as to designing the organizational structure of the agency and the proposal of the cluster of cooperating organizations, both needed to ensure the activities of the office (transport, accommodation and catering services) and organizations complementary services (banking, legal, methodological, etc.).

At the lowest level, the aim of design activities is to create new tourism products, respectively to adapt existing products or creation new variants. These activities are essential and necessary job description of travel agencies, which substantially determines the degree of success of the office market.

Rules for creation of tourism products are set out in the Concept of state tourism policy in the years 2007-2013 both for the creation of national and transnational tourism products, both for the production of specific regional tourism products. It should be emphasized that the creation of products requires a well-defined and long-term implementation of the marketing strategy, not only within a particular travel agency, but also at the regional and national level (Galvasová et al. 2008).

4. CONCLUSION

The basic task of planning in the tourism sector is to ensure the correct orientation activities at all levels of industry in terms of respecting multinational and national strategies that are in the Czech Republic rooted in the concept of national tourism policy for the period 2014 - 2020. To do this it is necessary that tourism organizations worked well together with other partners operating in the tourism sector and promote competitiveness programs and products in all destinations considered. The main challenges for tourism organizations can consider the formulation of a tourism development strategy, promote the development of tourism offer in line with changing market conditions and the implementation of marketing activities.

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TEACHING ENGLISH TO LOGISTIC SPECIALISTS

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ABSTRACT:

Logistic specialists need to use English on everyday basis for communication on several levels. They need to use general English for communication with foreign partners, they need to master business English to be able to solve business situations and write business correspondence in a competent way; and also technical English in order to solve technical details of their work. The field of English language to study largely depends on the specific job the specialist will be assigned to. Thus we focus on the most common fields of logistics and technical working positions and provide our clients English language background for the positions. We select most common business communication situations and through modern educational methods help students to internalize adequate linguistic responses. On College of Logistics we train our graduates in all the three above mentioned fields of English language studies.

ABSTRAKT:

Absolvent logistiky potřebuje aktivně zvládat angličtinu pro komunikaci na několika úrovních. Potřebují užívat obecnou angličtinu pro komunikaci se zahraničními partnery. Potřebují znát obchodní angličtinu, aby byli schopni zvládat obchodní situace a psát obchodní korespondenci kompetentním způsobem, a také technickou angličtinu, aby byli schopni řešit i technickou stránku své profese. Oblast studia angličtiny z velké části závisí na konkrétní pozici, kterou absolvent logistiky bude vykonávat. Tudíž se v angličtině zaměřujeme na základní logistické a technické oblasti a profese pro něž poskytujeme našim klientům jazykové pozadí. Vybíráme nejčastější situace v obchodní komunikaci a s využitím moderních výukových metod pomáháme studentům internalizovat adekvátní lingvistické odpovědi. Na Vysoké škole logistiky vzděláváme naše absolventy ve všech třech výše uvedených oblastech jazykových studií.

KEYWORDS:

English language teaching, Logistics English, Business English, Technical English

INTRODUCTION:

Nowadays the graduate of a tertiary education system to be able to suit the job market is supposed to speak at least one foreign language, while the tendency is to prefer applicants with an active knowledge of more than one foreign language. European Commission claims that many companies in EU every year lose businesses because their employees do not have sufficient knowledge of foreign languages and understanding of different cultures. Thus European Commission established a Business Platform for Multilingualism to try to solve the situation claiming that language knowledge is one of the ways to improve competitiveness of European economies.¹

Even though there has been an obligatory English language training since the third year of elementary schools, continuing in obligatory English language classes on secondary schools, governmental support of language teaching in tertiary education and the lifelong learning programs, overall mastering of the second language is reportedly on decrease, which

¹ <u>http://ec.europa.eu/public_opinion/archives/ebs/ebs_386_en.pdf</u>, p.7/147

is rather an alarming piece of information. "Almost all respondents in Luxemburg (98%), Latvia (95%), Netherlands (94%)... say that they are able to speak more than one language in addition to their mother tongue. ... In contrast the proportion able to speak at least one foreign language has decreased in the Czech Republic – 12 points to 49%.²

These results of the survey are rather alarming. It is obvious that improvements of education system have to be done, however, it seems that activity from both directions is necessary. Not only should we rely on our government to offer solutions, the educational institutions themselves need to constantly search for new methods and approaches, how to "open up" the students to the language, how to help them "feel comfortable" with language so that they are able to effectively use it on everyday basis.

In our institution (College of Logistics) we realized that our students need language skills on three levels. They need to speak general English on conversational level, and depending on their actual specialization in the field of logistics they need to speak and write business English or speak and write technical English.

We may take into consideration various jobs in logistics where our graduates often build their careers.

Starting with logistics of transport, our graduates often find jobs in companies as freight forwarders, carriers, transport supervisors, dispatchers. In order to prepare our students for those fields, we cover the following topics: Planning and arranging transport, transport options, transport and handling equipment, and the actual shipping of goods. Our graduates know what transport solutions to offer according to the types of goods, what documents are necessary for shipping the goods, they are able to give shipping instructions, loading instructions, they know International Commercial Terms, they can issue advice of shipment.

Regarding Logistics of services, our graduates find jobs with 3PL providers working in administrative positions. Therefore they need to be well versed in offering value added services, selling services, they know customs procedures and documentation that is necessary in foreign trade. Graduates know how to issue commercial, consular and customs invoices, packing lists, air waybills, certificates of origin etc.

Inventory management and procurement is yet another common field where our graduates assert themselves. They may work as supply chain specialists, purchasing specialists, project specialists. Therefore we train them in inventory management methods such as continues replenishment, category management, vendor managed inventory system, quick response system. They know how to request quotations, give quotations, what payment methods may be used in international business.

For the career in warehouse management we introduce some warehouse management programs for optimization of warehouse processes, cross docking method, automated storage and retrieval systems, RFID systems, tracking and tracing systems.

For more technical fields where our masters' degree graduates find their opportunities we cover some technical fields such as construction of bridges and tunnels, alternative energy, housing, mass transportation, environmental engineering, robotics and defense technologies.

As it was already mentioned above, we implement the tree level approach to the language studies. General English should never be marginalized, as in common contact between companies the communication is never purely professional, using only the business

² <u>http://ec.europa.eu/languages/pdf/business_en.pdf</u>

or technical terminology. We take the fields hereinbefore described and on their backgrounds we practice various typical communicational situations in business world.

As far as didactic methods are concerned, we use role-play methods, lead pair and group dialogues where students practice how to describe their job, introduce the products and services their company provides, describe features of specific products. Partner dialogues method is used to practice making enquiries and requests, to learn how to advice somebody politely and how to offer alternatives. We use group discussion methods to practice asking for opinions, giving opinions, making suggestions, agreeing and disagreeing. We use project tasks method for students to practice describing processes, explaining how to do things; case studies are utilized to draw students into the situations such as organizing shipping of goods, where realistic problems occur. Staging method is used for practicing how to suggest improvements, deal with mistakes and apologize.

As specialists in companies are often expected to present results of their work, we practice making presentations and presenting for a group of colleagues, so that to acquire certain self-confidence and ability to concentrate in stressful conditions.

As the businesses carried out internationally are not limited to countries where English is spoken as a native language, it is inevitable that our graduates come to contact with nonnative speakers. To help students prepare for communication with non-native speakers we use authentic materials from the internet. We even use U-tube videos in order to cover as large variety of speakers as possible. In order to make accessible the English language used by professionals, we utilize not only BBC editions on science and technology, but also National Geographic Editions and Discovery Channel.

To help students to find their positions in the European labour market, our college offers a large variety of optional language courses, namely German, Russian, and Chinese, believing this will strongly increase their chances to find corresponding jobs.

On College of logistics we believe our graduates are professionals well equipped with language tools that suit many potential employers.

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LOCATION TAXI RANKS IN THE URBAN AGGLOMERATION

Lokace stanovišť taxislužby v městské aglomeraci

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ABSTRACT

The paper proposed deployment taxi ranks and assignment of customer service in the boarding place. At the start of the problem is defined and a theoretical analysis of the role of location. Then, through a mathematical model of the proposed location of taxi ranks in the town of. Finally there is an evaluation.

ABSTRAKT

V příspěvku je navrhováno rozmístění stanovišť taxislužby a přiřazení obsluhy zákazníků v nástupních místech. Na začátku je definován problém a uveden teoretický rozbor lokační úlohy. Poté je prostřednictvím matematického modelu navržena lokace stanovišť taxislužby na území města Přerova. Na závěr je provedeno vyhodnocení.

Key words

Location, Mathematical Model, Departing Point, Taxi Ranks

Klíčová slova

Lokace, matematický model, nástupní místo, stanoviště taxislužby

1. INTRODUCTION

On the urban agglomerations are provided for the citizens of public transport modes usually by public transport or by taxi. In the case of public transport passengers can be transported only at selected times and on specified routes and in the event that you need to carry with regard to individual requirements, access time due to unsatisfactory depart, higher transport time and the unavailability of the site by public transport to use taxis, which allows for a higher price taking into account the individual requirements of passenger. Price for taxi use, however, is usually several times higher than the price for the use of public transport. It is therefore appropriate to consider the possibility of reduced prices for use taxis from the perspective of a passenger. One of the ways through which we can reduce the cost of using taxis, respectively costs for the operator is appropriately distribute the taxi so that the range to the customers as quickly as possible while coasting time in boarding areas will be as low as.

2. THE DEPLOYMENT TAXI RANKS

The deployment taxi ranks are among the locational problems, because decisions about placement or habitat Registered taxis to the sites for the location of taxi ranks and then assigned or unassigned customer habitats taxis. To solve the problem locational selected from a variety of methods use a mathematical model of location task, which is characterized both clarity and ease of application in optimization software. The mathematical model locational job consists of the objective function, through which we seek optimal solutions serving customers in taxis, and the system of restrictive conditions, which defines the permissible solutions serving customers in taxis. The optimization we need to know the cost of the taxi operation in the area and the cost of assigning each customer habitats taxis to obtain the total cost of which will form the optimization criterion and by the objective function is minimized we. For real terms by restrictive conditions must take into account that customers will be served only from sites which were located in the taxi and individual customers will be served by only one of the taxi. In the following part of the paper will be described in more detail mathematical model of location tasks of the issue in specific terms (Daněk - Teichmann, 2005).

3. MODELING DEPLOYMENT TAXI RANKS

Layout of taxi ranks will be modeled in terms that serve the purpose of effective business decisions about the location of their vehicles in the city Přerov. For the location of vehicles to the taxi company has designed the site to which it is possible to place planned the taxi on the basis of internal data about customers' requirements has information about boarding places with the most common frequencies customer service, which will take into account when deploying habitats (Skácel, 2014).

3.1 Input data

Before starting the mathematical modeling will first be defined sites for taxi ranks in the city Přerov including the operating costs of the location of these sites in various locations (Tab. n. 1). Subsequently, the defined starting place with the most common operating frequencies and the cost of assigning the starting point of each site, which can be placed in the taxi (Tab. n. 2).

Locations for the location of taxi ranks in the city Přerov:

- Bratrská 5,
- Husova 1,
- Kojetínská 10,
- Tovární 3248.

Sites for the taxi	Marking the site for the purpose of modeling	Daily rental sites for the taxi [Kč]
Bratrská 5	1	0
Husova 1	2	10
Kojetínská 10	3	0
Tovární 3248	4	10

Tab. n. 1	1: Operating	costs on the	e location	of the taxi
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Starting the place with the most common operating frequencies:

- Brabansko 2,

- Čechova 12,

- Čechova 26,
- Dvořákova 75,
- Hranická 12,
- Husova 1,
- Kojetínská 10,
- Komenského 35,
- Lipnická 4,
- náměstí T. G. Masaryka,
- Tovární 3248,
- Žerotínovo náměstí.

Marking the starting point for modeling needs	1	2	3	4	5	6	7	8	9	10	11	12
The cost of assigning the starting point of habitats taxis [Kč]	Brabansko 2	Čechova 12	Čechova 26	Dvořákova 75	Hranická 12	Husova 1	Kojetínská 10	Komenského 35	Lipnická 4	náměstí T. G. Masaryka	Tovární 3248	Žerotínovo náměstí
Bratrská 5	6,2	9,2	11	25	18	12	9,3	6,2	18	2,1	14	15
Husova 1	16	6,6	13	29	29	0	2,9	5,9	28	14	1,2	19
Kojetínská 10	14	9,9	12	26	26	10	0	3,1	25	11	11	16
Tovární 3248	17	5,8	11	30	30	1,2	3,6	6,8	29	15	0	15

Tab. n. 2: The cost of assigning the starting point of habitats taxis

3.2 Mathematical model

At the beginning of the modeling will first be defined input quantities and will subsequently created a mathematical model of location tasks for deployment taxi ranks at the Přerov.

Input variables:

 f_i costs of operating the *i*-th the taxi,

 c_{ii} the cost of assigning *j*-th place of embarkation *i*-th station taxis,

 y_i variable modeling the decision on the placement or registered *i*-th the taxi,

 x_{ij} variable modeling the decision to assign or unassigned *j*-th place of embarkation *i*-th station taxis.

The mathematical model specific tasks to shape:

$$\min f(x, y) = \sum_{i=1}^{4} f_i \cdot y_i + \sum_{i=1}^{4} \sum_{j=1}^{12} c_{ij} \cdot x_{ij}$$
(1)

conditions

$$\sum_{i=1}^{4} x_{ij} = 1 \qquad \text{for } j = 1,...,12$$
(2)

Condition (2) ensures that every starting point will be assigned to only one taxi ranks.

 $x_{ij} \le y_i$ for i = 1,...,4 a j = 1,...,12 (3)

Condition (3) ensures that every starting point will be assigned only taxi ranks, which was placed in the site.

$$x_{ij} \in \{0,1\}$$
 for $i = 1,...,4$ a $j = 1,...,12$ (4)

$$y_i \in \{0,1\}$$
 for $i = 1,...,4$ (5)

Conditions (4) and (5) are obligate conditions.

3.3 Development of mathematical model

To obtain the results of the mathematical model for the role of locational deployment taxi ranks at the Přerov transformed into a programming language with which it operates Xpress optimization software, which was processing the mathematical model used. Development of a mathematical model in software Xpress shown in Fig. n. 1 (Fair Isaac Corporation, 2008), (Fair Isaac Corporation, 2009).

```
model Lokace_stanovist_taxisluzby
uses "mmxprs"
declarations
vrchol1=1..4
vrcho12=1..12
f:array(vrchol1)of real
y:array(vrchol1) of mpvar
c:array(vrchol1,vrchol2)of real
x:array(vrchol1,vrchol2)of mpvar
end-declarations
f::[0,10,0,10]
c::[6.2,9.2,11,25,18,12,9.3,6.2,18,2.1,14,15,16,6.6,13,29,29,0,2.9,5.9,28,14,1.2
EF:=sum(i in vrchol1)f(i)*y(i)+sum(i in vrchol1, j in vrchol2)c(i,j)*x(i,j)
forall(j in vrchol2)sum(i in vrchol1)x(i,j)=1
forall(i in vrchol1, j in vrchol2)x(i,j)<=y(i)</pre>
forall(i in vrchol1, j in vrchol2)x(i,j) is_binary
forall(i in vrchol1) y(i) is binary
minimize(EF)
writeln('EF=',getobjval)
forall(i in vrchol1, j in vrchol2)
writeln('x(',i,',',j,')=',getsol(x(i,j)))
writeln((y(i), i, j) = j, getsol(y(i)))
end-model
```

Fig. n. 1: Development of a mathematical model of locating jobs for deployment taxi ranks at the Přerov

4. EVALUATION

After processing, the mathematical model of locating jobs for deployment taxi ranks at the Přerov was running the optimization calculation, based on the results which were obtained. The results of the optimization calculation shows that the minimum cost of a taxi when serving customers in boarding areas with the most common operating frequency will be 115,40 Kč per day, taxi will be placed in locations Bratrská 5, Kojetínská 10 and Tovární 3248 and assignment of these habitats taxi boarding places will be following:

- from the taxi station located in Bratrská 5 customers will be served in starting points Brabansko 2, Čechova 26, Dvořákova 75, Hranická 12, Lipnická 4, náměstí T. G. Masaryka a Žerotínovo náměstí,
- from the taxi station located in Kojetínská 10 customers will be served in starting points Kojetínská 10 a Komenského 35,
- from the taxi station located in Tovární 3248 customers will be served in starting points Čechova 12, Husova 1 a Tovární 3248.

5. CONCLUSION

The paper deals with optimization of cost taxi service to our customers at the starting point of the Přerov. Cost minimization was solved by locating jobs within that minimize

operating costs on the location of the taxi with regard to fees for the site to which it is possible to place the taxi and the cost of assigning the starting point of habitats taxis with regard to the distance traveled between taxi ranks and the starting point. Based on the optimization of costs for customer service set up three taxi stop at four sites that have been assigned twelve starting points, while the taxi placed in Bratrská 5 will operate seven starting points, taxi placed in Kojetínská 10 will operate two starting points and the taxi located in Tovární 3248 will operate three boarding point. In addition to minimizing the cost of servicing customers that were subject to optimization, results for the customer from optimal solutions also minimize inbound time, which is related to the minimum distance traveled. Location taxi ranks thus allows you to get a comprehensive solution that will lower the costs for companies operating taxi services and increase customer satisfaction with regard operated at a lower price, the range time on a traffic point.

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BANK SERVICES WITH THE OFF-BALANCE SHEET CHARACTER OF THE CZECH BANKING SECTOR

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ABSTRACT

This paper is focused on the field of off-balance sheet services provided by commercial banks of the Czech Republic. The goal of the paper is to provide an objective overview of actual off-balance sheet banking services and also development trends in recent years. The first part of the paper contains the characteristics of banking services with the offbalance sheet character and their categorization. In the following parts of the paper, the provided off-balance sheet banking services are analyzed and compared from the volume and time point of view. From the logistics of services point of view the paper is focused on the logistics aspects relating to time and volume. The outputs of the paper are graphically illustrated in pie, bar and line charts. During the paper, the results of the survey are commented and assessed.

Abstrakt

Tento článek je zaměřen na logistiku bankovních služeb v souvislosti s environmentálním bankovnictvím. Cílem článku je provést analýzu logistického procesu poskytování bankovních služeb z hlediska jeho vlivu na okolní prostředí banky. V první části článku jsou definovány základní pojmy, které se zkoumanou problematikou souvisí. V navazujících částech je provedena analýza logistického procesu poskytování bankovních služeb a posouzení, jaký dopad mají jeho jednotlivé části na okolní prostředí banky. Výzkum bude zaměřen pouze na negativní vlivy, neboli na identifikaci tzv. environmentálních rizik. Na závěr jsou tyto dopady (resp. environmentální rizika) zhodnoceny a předloženy doporučení, jak případné nepříznivé dopady omezit či odstranit.

Keywords

Bank; off-balance sheet; logistics of services; bank guarantee; term operations.

INTRODUCTION

From the accounting point of view the bank services can be divided into balance sheet services and off-balance sheet services. Balance sheet services have direct reflection in the balance sheet of the bank - in its assets and liabilities. For example granting a credit (which influences the bank assets) and accepting the deposits or mortgage bonds issue (which influences the bank liabilities).

Specific type of banking services is off-balance sheet (OBS) services that do not have their direct reflection in the balance sheet of the bank. These services influence balance sheet of the bank only in the indirect way, it means through the returns and costs that are made out by the off-balance sheet services. Thanks to this, the off-balance sheet services determine the profits of the bank as an item in the list of banking liabilities. The off-balance sheet services can be directly reflected in the balance sheet only with a certain time-lag after meeting some conditions (which is typical for bank guarantees or open credit lines that can be transformed in balance sheet assets or liabilities).

Moreover, the off-balance sheet services can be categorized according to their ability to be evidenced in the accounting. Not all off-balance sheet activities are able to be evidenced in the accounting. Services that can be evidenced in the accounting are evidenced in the offbalance sheet of the bank which is one of the most important financial statement of the bank (after the balance sheet). Off-balance sheet of the bank is consisted of two sides (analogically to balance sheet), i. e. off-balance sheet assets and off-balance sheet liabilities. Generally, the off-balance sheet assets can be considered as a future potential or fixed assets of the bank, the off-balance sheet liabilities as a future potential or fixed liabilities of the bank (Dvořák, 2005).

OBS assets are influenced for example by given bank guarantees or open credit lines, loan commitments etc. On contrary, OBS liabilities are influenced by asset management services or services related to bank safes. By offering bank safes to customers the banks receive values into asset management or custody. OBS liabilities can be influenced by bank guarantees of credit lines too, however, the services have to be received, not given by the bank.

Figure 1 displays a simplified structure of bank off-balance sheet.

Off-balance sheet assets	Off-balance sheet liabilities
Commitments and guarantees given	Commitments and guarantees received
Pledge given	Pledge received
Receivables from spot transactions	Liabilities from spot transactions
Receivables from futures, forwards, swaps etc.	Liabilities from futures, forwards, swaps etc.
Receivables from options transactions	Liabilities from options transactions
Write-off receivables	Values received to asset management
Values given to asset management	Values received to the custody
Values given to the custody	

Figure 1 Simplified structure of banking off-balance sheet assets and liabilities

Source: CNB

Because the banking off-balance sheet is a financial statement, it is structured in the way to give an evidence of future potential or fixed assets and liabilities. Not all of the items of banking off-balance sheet are made out by providing bank services to customers, however. Some of them are made by the bank itself, so as to hit its own targets. For example, receivables or liabilities from spot transactions of futures, forwards, swaps etc. These receivables and liabilities are generated by the bank so as to eliminate market risks (currency risk, interest rate risk etc.), or for speculation. Only some of the OBS assets and liabilities are generated by providing a service to customer (e. g. received or given bank guarantees, received or given values to custody and so on).

The other category of OBS services are services that cannot be evidenced in the accounting. Their impact into accounting is only indirect, it means that providing of these services reflects in the profit of the bank or in the change of another balance sheet asset or liability. It is typical for currency exchange transactions. Exchange transactions increase or decrease the value of banking crown or foreign currency assets and liabilities (cash or deposits), the service itself, however, is not evidenced in the financial statements (only in the form of a provision paid by the customer etc.). Similar principle can be found in the other

banking services of this character – selling of non-banking services (e. g. bancassurance), payment transactions, advisory etc.

Categorization of bank services according to their accounting reflection is contained in the Figure 2.





Used methods

In the article, there are used these scientific methods – description, analysis and comparison. Description is used for explanation of basic concepts and characteristic of offbalance sheet services. In the following parts of the article, there are used analysis and comparison. Off-balance sheet services offered by the Czech banks are analyzed. Data published by the Czech national bank are compared from the time and volume point of view.

Importance of the research

The article provides an overview of actual situation in the field of off-balance sheet services of Czech commercial banks and their development in the recent years. The article answers the question what type of the off-balance sheet services are offered by the Czech banks and what is their volume. Moreover, trends of the provided off-balance sheet banking services volume is the output of the article.

The author of the article aims to contribute to scientific literature focused on providing of off-balance sheet banking services in the Czech Republic. The results of the research can be beneficial also for general public interested in financial markets and banking in the Czech Republic.

1. LOGISTICS OF OFF-BALANCE SHEET SERVICES

According to Mojžíš (2011), logistics puts in relation people, merchandise, production capacity and information. Logistics of services has to be set in the right way so as to comply with the rules so-colled "7R Rules"³ (seven aspects of logistics of services). Particularly:

- right service,
- right price,
- right volume,
- right place,
- right quality,
- right customer,
- right time.

³ In Czech, the rules are translated as "7S Rules".

These rules apply, except others, for providing of off-balance sheet banking services.

In principle, the logistics in the providing of off-balance sheet banking services is the same as the providing of balance sheet banking services. From the distribution point of view, it means that they are provided by traditional distribution channels (branches, telephone, internet and other forms of electronic distribution channels).

Off-balance sheet services, however, differ from the balance sheet services in the fact that they represent a future potential deals (and consequently assets and liabilities). Thanks to this, it is necessary to estimate probability of transformation of off-balance sheet item (provided service) to balance sheet item (provided service).

This probability is expressed by Credit Conversion Factors (CCF). CCF can vary from 0 to 100 %. If the volume of off-balance sheet item is multiplied by CCF, the off-balance sheet item is transformed to balance sheet equivalent.

Banks are required to define a CCF to every off-balance sheet item. Conversion factors are legally regulated by Annex No. 20 to Decree No. 123/2007 Coll., stipulating the prudential rules for banks, credit unions and investment firms.

2. OFF-BALANCE SHEET SERVICES OF THE CZECH BANKING SECTOR IN THE TERMS OF TIME AND VOLUME LOGISTICS ASPECTS

This part of the article contains trends of off-balance sheet services provided by Czech commercial banks from 2004 to 2013.

The comparison is focused only on the off-balance sheet services evidenced in the accounting. The other off-balance sheet services are not able to be compared from any point of view. According to CNB statistics, the volume of OBS services from 2004 developed as follows:

	2004	2005	2006	2007	2008				
Off-balance sheet assets	4 642	4 999	6 869	9 646	10 791				
Off-balance sheet liabilities	6 304	6 725	8 820	12 121	13 236				
	2009	2010	2011	2012	2013				
Off-balance sheet assets	6 942	6 344	6 694	5 796	5 849				
Off-balance sheet liabilities	9 851	9 734	10 057	9 286	9 885				

Fig 3 Off-balance sheet assets and liabilities of the Czech banking sector (in billions of CZK)

Source: own processing based on the data of CNB

One of the characteristic feature of the aggregated Czech banking off-balance sheet is the predominance of off-balance sheet liabilities. The volume of OBS liabilities exceeds the volume of OBS assets through the whole period from 2004 to 2013. The difference varies from 2 000 to 4 000 billions of CZK.

From 2004 to 2008, the volume of OBS assets and liabilities was rising. In the second half of the year 2008 a financial crisis began. The deeper impact of the crisis was in 2009 when the volume of off-balance sheet assets and liabilities plummeted. It was caused especially by revaluation of forwards, futures, swaps and options. The value of these operations was reduced. These type of operations was one of the source of financial crisis. (Bučková, 2009, 2010).



Fig. 4 Volume of off-balance sheet assets and liabilities of the Czech banking sector (in

Source: own processing based on the data of CNB

Both sides of the aggregated off-balance sheet developed in a similar manner. They have the same periods of rising and decreasing. On the other hand, the growth and drop rate are different. Growth and drop rates of OBS assets and liabilities of the Czech banks is displayed in Fig. 5. Higher growth and drop rates can be found on the side of off-balance sheet assets.

Fig. 5 Growth rate of off-balance sheet assets and liabilities of the Czech banking sector (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013
OBS assets	7.69	37.40	40.44	11.86	-35.67	-8.61	5.51	-13.41	0.92
OBS liabilities	6.68	31.14	37.43	9.20	-25.57	-1.19	3.31	-7.67	6.45

Source: own processing based on the data of CNB

In comparison the aggregated off-balance sheet and the aggregated balance sheet, certain differences in the development trends can be found. While volume of the OBS assets and liabilities went through steep increases and declines, the volume of the balance sheet passed through relatively steady increase. In 2004, the volume of balance sheet reached to 2 636 billions of CZK, in 2013 it was 5 143 billions of CZK.

Form the period from 2004 to 2013, it is typical that the volume of aggregated banking off-balance sheet exceeds the volume of aggregated banking balance sheet. In 2008, the difference was most significant. The OBS liabilities came up to 266.8 % of balance sheet assets, the OBS assets even 327.26 % of balance sheet assets.

Fig. 7 Proportion of off-balance sheet assets and liabilities of balance sheet assets of the Czech banking sector (in %)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
OBS assets/ assets	176.1	169.2	217.9	257.2	266.8	169.5	151.3	149.5	125.1	113.7
OBS liabilities/ assets	239.2	227.6	279.8	323.2	327.3	141.9	232.1	224.7	200.4	192.2

Source: own processing based on the data of CNB



Fig. 6 Comparison of aggregated off-balance sheet and balance sheet

Source: own processing based on the data of CNB

Figure 1 displays simplified structure of banking off-balance sheet (i.e. items of OBS assets and liabilities). Their proportions in aggregated banking off-balance sheet in 2013 is graphically illustrated in the following graphs. The below-mentioned proportions were almost constant through the last period. In the last 10 years, relatively significant increase was evidenced for example in the case of given credit commitments and guarantees (in 2004 they shared 10.5 % of off-balance sheet assets, in 2013 shared 12 %). The proportion of given pledge increased many times, however, this item shares only a relatively small part of the off-balance sheet assets (at the end of 2013 it was not more than 1 %).

On the side of OBS liabilities, relatively high increase of proportion was evidenced for example in the case of values received to asset management and custody. Proportion of spot transaction decreased on the both sides of the aggregated off-balance sheet.

At the end of 2013, OBS assets were composed of receivables from futures, forwards and swaps (81 %), given credit commitments and guarantees (12 %) and receivables from options (3 %). The remaining items reached only 3 % of the off-balance sheet assets.



Fig. 8 Structure of the Czech banking aggregated OBS assets in 2013 (in %)

Also in the case of off-balance sheet liabilities, the futures, forwards, swaps etc. shared the major part of the total volume. Off-balance sheet liabilities were composed mainly of liabilities from futures, forwards and swaps (48 %), values received to the custody (23 %) and received pledge (21 %). Credit commitments and guarantees do not share such an important part of the OBS liabilities (in respect to the OBS assets). Received commitments and guarantees shared only 5 % of total OBS liabilities. The other items reached up to 3 %.



Fig. 9 Structure of the Czech banking aggregated OBS liabilities in 2013 (in %)

CONCLUSION

Off-balance sheet banking services are not directly reflected in the balance sheet of a bank. These services can influence the balance sheet only in the indirect way, especially through returns and costs generated by providing these type of banking services. Returns and costs have an impact on the banking equity.

Off-balance sheet services differs from balance sheet services in many aspects. The main difference is that when a bank provides OBS services, no asset (receivable) or liability occurs to the bank. These services produce future or fix potential assets and liabilities. If certain conditions are met then these potential assets and services are transformed into balance sheet assets and liabilities. Thanks to this fact, the logistics in providing of OBS services have some specific features. Provided off-balance sheet services that are evidenced in accounting have to be transformed in credit equivalents (through Credit Conversion Factors).

The aggregated off-balance sheet of the Czech commercial banks consists especially of receivables or liabilities from futures, forwards, swaps or options operations. Their predominance is a long-term characteristic feature of the Czech banking sector. Another typical feature is that the volume of off-balance sheet (both assets and liabilities) exceeds the volume of balance sheet.

Some types of off-balance sheet services, and especially forwards, futures, swaps or options, are in decline. In author's opinion it is a positive trend because some of them (e. g. swaps, collateralized default obligations etc.) were one of the causes of worldwide financial crisis. It cannot be said to which extent the banks limited these operations after their own decisions, or whether they were coerced into this by circumstances. Nevertheless, the last events in recent years show that these operations are very risky. According to the opinion of the author, it would be appropriate to minimize these banking operations so as to achieve greater stability of the banking sector. The bank should invest into less risky investment assets (or provide less risky banking operations and services).

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