Manfred SCHRENK, Vasily V. POPOVICH, Peter ZEILE, Pietro ELISEI, Clemens BEYER (Eds.)

SMART ME UP!

HOW TO BECOME AND HOW TO STAY A SMART CITY, AND DOES THIS IMPROVE QUALITY OF LIFE?

22-24 JUNE 2016, HAMBURG, GERMANY

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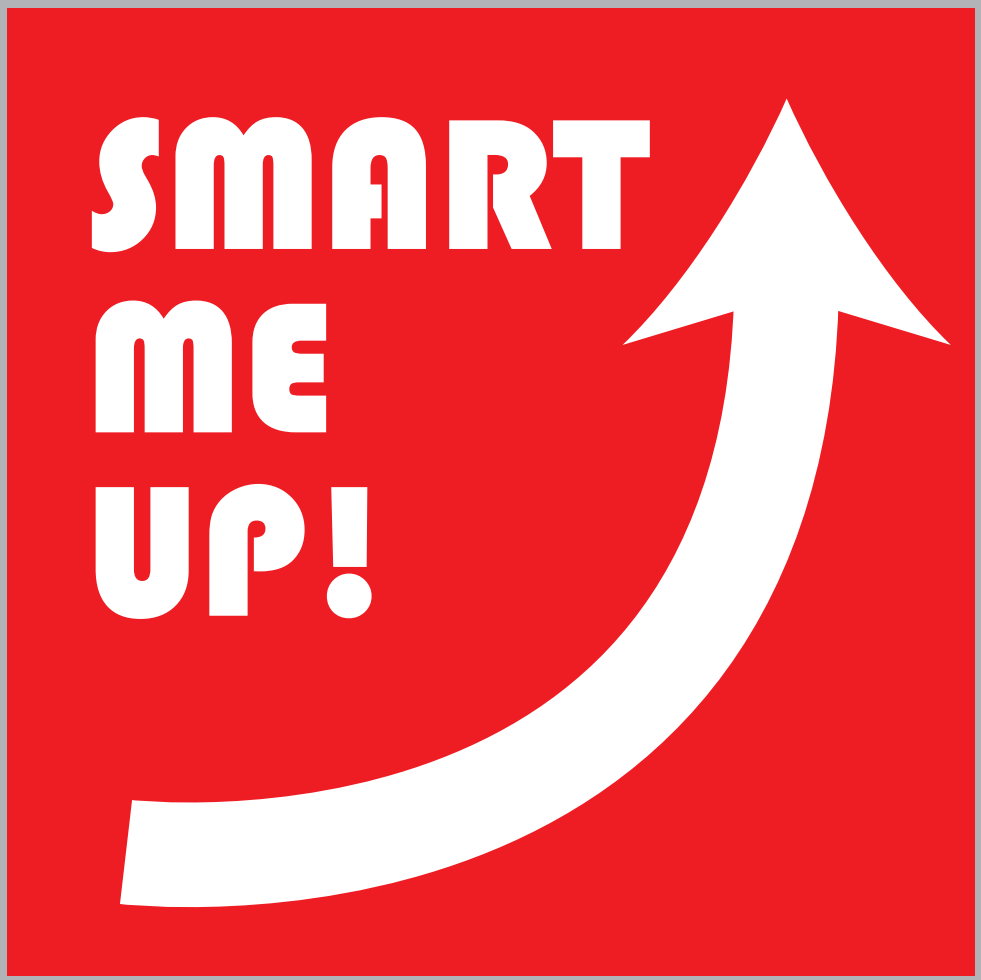

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reviewed paper

Communal Companies Merging as Smart Approach: Kikinda Town in Serbia Case Study

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1 ABSTRACT

The objective of this paper is to show that one of the possible approaches to get smart town is communal companies merging, because such venture improves municipal budget. This paper presents a case study of a new public communal company of Kikinda Town in Serbia. Following Kikinda Municipality description, previous five communal companies and the new one are briefly presented. Five public communal companies duties are merged into the duty of one compound public company named Public Company "Kikinda" (PC Kikinda).

PC Kikinda services are more efficient, less costly and provide better quality. Also, the entire business and public funds spending are more transparent. Kikinda Municipality public expenses in recent years are displayed by tables and diagrams. The expenses analysis approves that communal restructuring has improved the Municipality budget.

The restructuring of public utilities services carried out has improved Kikinda Municipality economic capacity and has allowed different allocation of budgetary resources. This is an essential prerequisite for the Municipality of Kikinda future economic and social development towards a smart town.

Keywords: communal, company, Kikinda (Serbia), merging, town

2 SMART TOWN CONCEPT

2.1 Urbanism challenges

Contemporary *urbanism* should investigate general issues and functions, while ignoring particulars and singularities. Link of scholastic and real facts induces synthesis. If synergy is a creation of a whole which is greater than the simple sum of its parts, than simultaneous combination of theoretical research and practical experiments produces synergy. Renowned urban planner *Kevin Lynch*, in his "*A Theory of Good City Form*" (1981), distinguishes five characteristics of a city: vitality, sense, fitness, access, control.

Modern urban planning has to include and apply knowledge of other academic and pragmatic *disciplines*, such as systems theory, project management, economics and investment, real estate appraisal, ICT (Information Communication Technology). Urban design essential task is creation of functional, aesthetic, economic, social and environmental elements.

2.2 Smart city concept

History of urban development is long and complex. Famous historian *Lewis Mumford*, in the last chapter "Retrospect and Prospect" of his unsurpassed masterpiece *"The City in History"* (1961), could not have foreseen "smart city". Visionary Mumford urges for an "organic city" where not only nature has a balance with technology, but also culture prospers by technical innovations.

Sintagma *"smart city"*, and its alternative *"intelligent city"* or *"digital city"*, appears in the 1990s when ICT infrastructures raised within cities (Townsend, 2014). Planning and design of cities relates to information and communication technology, such as telegraph and tabulator were a century ago, and cellular networks and cloud computing are today. New technology impact on cities infrastructure spreads to economy, society and public institutions. Avant-garde architects, devoted to urbanism, ambitiously create cities for a smart, mobile, internet future.

There are many definitions of the term "smart city" (Albino et al., 2015). Harrison et al. (2010) declare that smart city is "a city connecting the physical infrastructure, the IT infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city." In the same manner, Bakici et al. (2012) argue: "Smart city as a high-tech intensive and advanced city that connects people, information and city elements using new technologies in order to create a sustainable, greener city, competitive and innovative commerce, and an increased life quality".

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The smart city has smart components and related urban features (Lombardi et al., 2012). These 6 components are: economy, people, governance, mobility, environment, living. Related 6 urban features, respectively, are: industry, education, democracy, infrastructure, sustainability, quality.

2.3 Smart town circumstance

There is no standard, internationally accepted – criterion for difference between town and city. Traditionally, the settlement size is the criterion for distinction. A town is a smaller dwelling place than a city. But the criterion may also be of administrative significance, or economic importance of a settlement.

Eminent architect and town planner *Constantinos Doxiadis*, in his "*Ekistics*" (1968), proposes a classification of human settlements by size. Such a classification enables discussions of various anthropological phenomenona, like life quality and others. According to Doxiadis' (1976) settlement hierarchy, town and city are distinguished by citizens. Town (over 20 000 population) is not as large as a city (over 75 000 population).

The authors of this paper think that, analogous to smart city (Harrison et al., 2010; Bakici et al., 2012), *town* can be determined as *smart* when financing of a society and infrastructure provides economic growth, life quality and sustainable development. Modern municipal stakeholders and public utilities managers recognize the importance of a smart town momentum.

In many countries of Europe, an important question is: *How to become a smart town?* There are diverse approaches to achieve smartness. The hypothesis of this paper is that *merging of communal companies* is one of the possible approaches to becoming a smart town, if that merger improves the municipal budget. In the following, a communal merging effect is studied of the case of a new compound public company of Kikinda town in Serbia.

3 SERBIA IN TRANSITION

The process of *transition* in Eastern Europe (EE) starts after the fall of the Berlin Wall (1989), when fundamental political and economic changes occurred at the same time. Multiparty political systems, with democratic institutions, replaced the communist system. The market becomes the principal mechanism for the distribution of resources, products and properties. The majority of EE states accesses gradually to the European Union (EU).

The transition of *Serbia* represents an unusual, complex, slow and delayed process. Causes of delay are internal (Yougoslavia decomposition, military conflicts) and external (international sanctions, NATO bombing) (Uvalic, 2010). A satisfactory outcome of Serbia's transition requires legal harmonisation, innovative strategies (institutions, administration, agriculture, industry, research and development) and EU financial assistance.

Experiences of EU member states that previously passed through the accession process to the EU are very important (Young, 2013). *Local government* duties are public procurements, communal services, rural development, employment reduction, social policy, energy efficiency, and environment protection. *Communal services* improvement encompasses actions transparency, greater competition, services regulation, and state subvention minimization.

The public sector reform is a key determinant of transition in Serbia (Veselinović, 2014). At the present time, in spite of all the years spent on the transition process, there remain many *state companies* (**Table 1**).

COMPANY TYPE	Companies	Employees
Companies controlled by the Privatization Agency	600	100 000
Large public and state companies	50	110 000
Local public companies	650	70 000
TOTAL	1300	280 000

Table 1: State and public companies in Serbia (2012). (Compiled by the authors, source: Arsić, 2012)

Local public companies (LPC), which are 50% companies (and 25% employees) of total (Table 1), differ not only in size, but also in market conditions which are natural monopolies (water supply and sewerage), non commercial services (parks, street cleaning), or commercial services (market maintenance, parking).

Among LPC, the most important are local public *communal* companies, which employ circa 80% of the total number of employees in LPC (Arsić, 2012). The usual problems of LPC companies are weak management, low efficiency, nonprofit prices (heating, public transport), and local budget substantial subsidies.

4 KIKINDA – TOWN AND MUNICIPALITY IN SERBIA

4.1 Kikinda location and data

Kikinda is a town (**Figure 1**) and a municipality (**Figure 2**) located in the Banat district, in Vojvodina - autonomous province of Serbia. *Kikinda Town* and *9 villages* in its surrounding constitute *Kikinda Municipality* (**Table 2**). The town of Kikinda, with circa 38000 population, is the economic and social centre of North Banat.

Figure 1: Kikinda Town in Serbia (Redrawn, source: Jovanović, 2015)

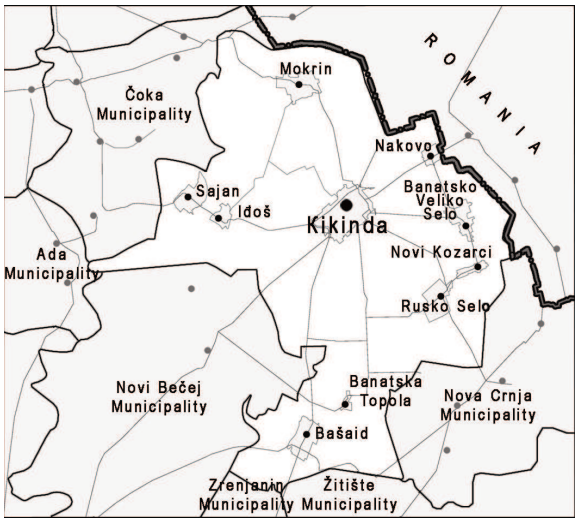

Figure 2: Kikinda Municipality map (Redrawn, source: JPKZS, 2015)

Total area	783 km^2
Agricultural area (2013)	70 538 ha
Population (2011)	59 453
Number of population per 1 km^2 (2011)	76
Population average age (2011)	42.4
Natural increase per 1.000 inhabitants (2014)	– 6.8
Number of employees (2014)	13 679

Table 2: Kikinda Municipality essential data (Compiled by the authors, source: SORS, 2014)

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4.2 Infrastructure and economy

Kikinda, established as a modern settlement in the 18th century, is a well *planned* town (Ilijašev, 2002) with wide streets orthogonally laid, a central square, city hall, churches, public edifices, market, et cetera. Town urban *infrastructure* is basically founded for the flow of people, goods, water, energy, and information.

Regional *roads* connect Kikinda with adjacent towns and villages in Vojvodina. Kikinda is 10 km from the Romanian border, 65 km from Hungarian border, and 130 km from Belgrade, the capital. The town is connected by *rail* with the Romanian border, with Subotica, and with Belgrade via Zrenjanin. There is a dock for *waterway* industrial transport by Danube – Tisa – Danube Canal passing through Kikinda Municipality.

Banat's fertile farmland ensured successful *agriculture* (wheat, sunflower seeds, soybean, fruit and vegetables) and existence of natural raw materials (oil, gas, quality clay) provided the development of *industry* (oil derivates, metal tools, chemical products, tiles and bricks) in the 1980s, before Yugoslavia broke down. Both agriculture and industry were devastated almost completely during the transition process which was long lasting and not finished in Serbia yet.

The present economy crisis, however, does not change Kikinda *investment* opportunities. Fertile land, natural raw materials, location near borders, road and rail connections, an urbanised town, existing infrastructure and agricultural and industrial traditions offer a favorable combination for investors. Nowadays Kikinda offers *brownfield* and *greenfield* investment locations (CKIK, 2016), which are private propriety and others owned by the Municipality of Kikinda.

4.3 Communal problems

Communal services are related to urban infrastructure and have direct influence on the living standard of the inhabitants. The contemporary economy *crisis* deteriorates the already inefficient transition process in Serbia. The crisis amplifies communal problems common to many of Serbia's towns, especially in recent time. Poor running of utility services has an unfavorable impact on economic progress in general.

There were many public communal companies in Kikinda Municipality. These companies had similar obstacles. Typical *problems* of the utility company were: excessive company size, weak management, employees inadequate qualifications, technological obsolescence, political parties interference, irrational consumption, accumulated loss, considerable dependence on municipal budget, lack of own funds for large investments.

Kikinda communal problems are increased over the last years and effective solution finding becomes more complicated. Bearing in mind existing problems, Kikinda public communal companies ask for comprehensive *reform* as soon as possible. The reform aim is utility services amelioration and development. Also, the reform of communal companies is very important for towns people and local businesses.

5 COMMUNAL MERGING IN KIKINDA

5.1 Historical background

The modern history of Kikinda starts with the *Habsburg Monarchy* in the second half of the 18th century (Ilijašev, 2002). Communal infrastructure development in Kikinda is influenced by a variety of natural, historical, economic and social circumstances (Gedl, 2013).

After the First World War (WW I), a new geopolitical division of Europe took place. The *Yugoslavia Kingdom* establishment was soon succeeded by an economic crisis. As a result of that crisis, Kikinda communal infrastructure advancement was lagging. Regular supply of healthy drinking water, storm water drainage and wastewater treatment appear as the main communal obstacles. Street and road construction and urban infrastructure develop more slowly than expected.

After the Second World War (WW II), the *Yugoslavia Republic* constitution founds a socialist state ruled by the communist party. The transition of the political system from capitalism to socialism involved the complete nationalisation of many goods (land, resources, industries, etc.) and state planning and control of the national economy. As a result of private property abolition, the entire communal infrastructure in Kikinda town and municipality became the property of the state and the local government.

In the last quarter of the century (1990-2015), when disintegration of Yugoslavia occurred and the *Serbia Republic* is established, Kikinda communal infrastructure was chiefly split into component elements.

5.2 Communal companies history

Kikinda public communal companies' *history* (**Figure 3**) shows changes over time. Name of each company, (in Fig. 3 intentionally translated from Serbian into English), ilustrates clearly communal activity.

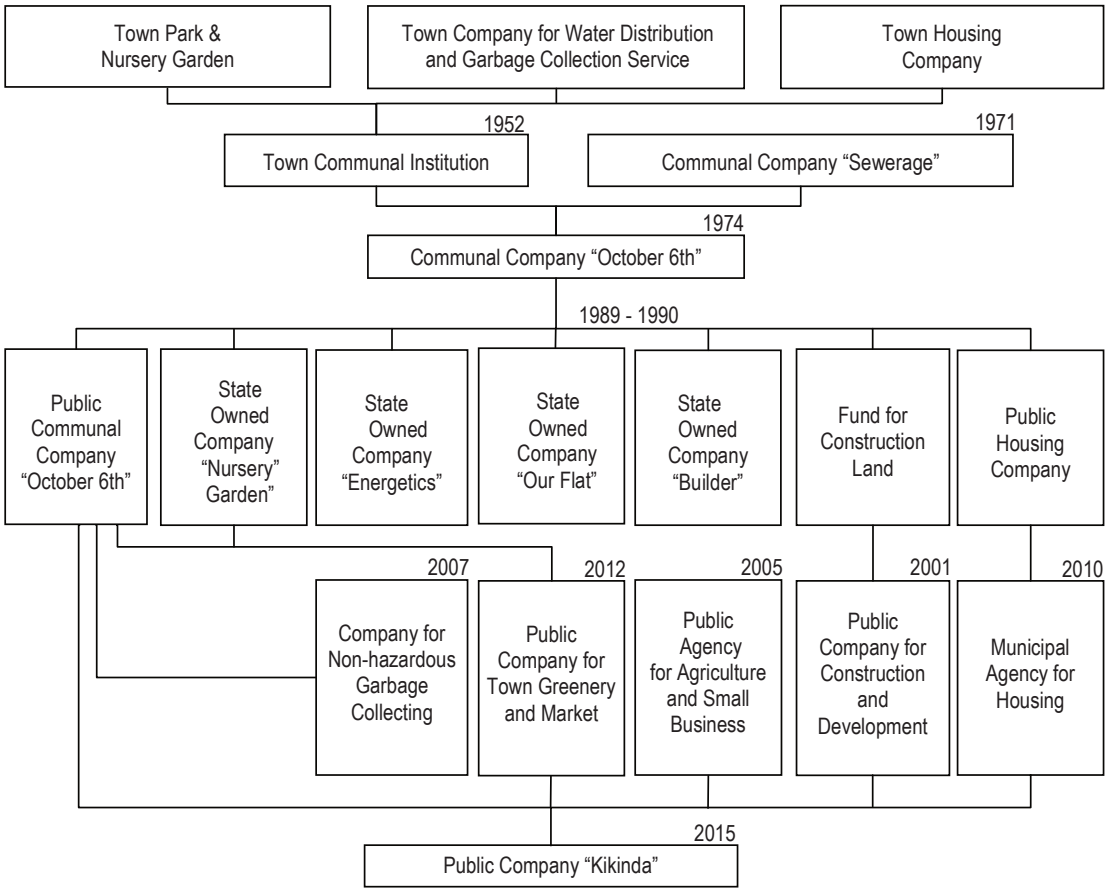

Figure 3: Kikinda communal companies' history (1952-2015). (Compiled by the authors)

Three communal companies (*Town Park & Nursery Garden*, *Town Company for Water Distribution and Garbage Collection*, *Town Housing Company*), established after WW II, are merged (1952) into one company (*Town Communal Institution*). This single company (*Town Communal Institution*) later (1974) is not only enlarged with another company (*Communal Company "Sewerage"*) established earlier (1971), but it is also renamed (*Communal Company "October 6th"*).

One company (*Town Communal Institution*), it should be remarked, worked for *22 years* (1952-1974). If enlargement (*Communal Company "Sewerage"*) and renaming (*Communal Company "October 6th"*) are ignored, it can be noticed that *one basic company* (*Town Communal Institution – Communal Company "October 6th"*) worked for *37 years* (1952-1989). Previous facts indicate that later *splitting* (Figure 3) of communal companies (1990-2012) is not business necessity, but it is a result of other circumstances, mainly political, happening during transition in Kikinda.

In two years (1989-1990), the existing company (*Communal Company "October 6th"*) split into *7 companies* (*Public Communal Company "October 6th"*, *State Owned Company "Nursery Garden"*, *State Owned Company "Energetics"*, *State Owned Company "Our Flat*", *State Owned Company "Builder"*, *Fund for Construction Land*, *Public Housing Company*). Except company *"October 6th"*, which keeps the predecessor activity explained by origin (Figure 3), the other 6 companies' names in English describe their main communal tasks. These 7 companies are changing name or/and activity in the next years (2001, 2005, 2007, 2010, 2012).

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5.3 Five companies replaced

On the base of long time (1989-2014) experience, Kikinda residents' common opinion is that communal companies splitting (Figure 3) did not bring any improvement. Available communal resources use is not reasonable, utility services are not efficient, works quality is not sufficient, services prices are too high. Companies are not sustainably organised. Therefore, they are considerably dependent on municipal subsides. Local government cannot provide investment capital for large infrastructure projects important for the community.

Unfavorable communal circumstances, explained above, inspire and encourage *radical reform* of utilities services in Kikinda. As communal companies *splitting* produces worse results in the case of Kikinda, it is obvious that communal reform should be: *merging* of companies.

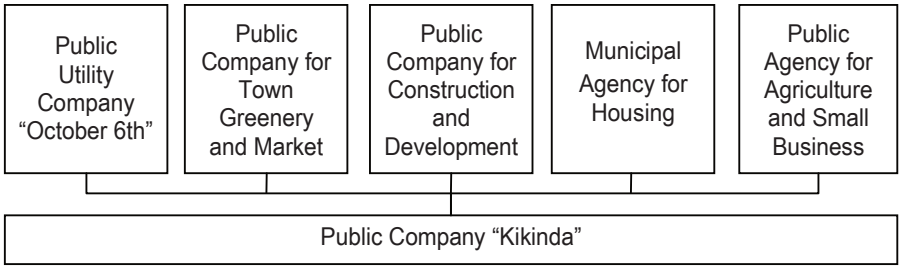

Figure 4: Kikinda communal services merging (2015). (Compiled by the authors)

After utilities services substantial analyses, managed by the first author of this paper and lasting few months, it has been decided to *reform* public communal services in Kikinda and to apply an organising structure adopted after several iterations and required calculations. Activities of five communal companies (*Public Utility Company "October 6th"*, *Public Company for Town Greenery and Market*, *Pubic Company for Construction and Development*, *Municipal Agency for Housing*, *Public Agency for Agriculture and Small Businesses*) are merged into the activity of one compound company (*Public Company "Kikinda"*) (**Figure 4**).

Communal services, being split into 5 companies, *merging* into 1 compound company join together real estates, resources, equipment, staff, knowledge, management. For example, 5 administrative divisions, one in each of 5 companies, are substituted with 1 division, in 1 company. It is obvious that such merging provides transparent business, reduces expenses and contributes to a municipal budget improvement.

Merging of communal companies reduces the number of necessary *employees* and some of them lose their job. During the transition process, needless administrative working places were opened in the public sector in order to solve the *unemployment* problem. Unproductive administration was considerably developed using the municipal budget. That reduced investing into agriculture, or industry. Frequently incompetent personnel was employed under the influence of political parties. From that stand point, communal merging only uncovers artificial employment hidden inside the public sector and supported by the whole society.

5.4 New company established (PC Kikinda)

Communal activities are activities of *service* or *production* character (ZKD, 2011), which serve to satisfy basic needs of the population in the town and surrounding area. Local government defines scope, quality and continuity of communal activities, and control of prices. A *public company* (ZJP, 2014) can perform communal activities, which are financed from sales of services income, or from the municipal budget.

The Public Company for Communal Infrastructure and Services "Kikinda", with its shorter name: *PC Kinkinda* (**Figure 5**), is established at the end of 2014 (OAJPK, 2014) and the statute is enacted (SJPK, 2014). PC Kikinda is not the legal successor of any of the previous 5 companies (Figure 4), which started liquidation.

PC Kikinda is created by applying a *systems approach* (Kerzner, 2009) and *project management* (PMBOK, 2013). The mission of PC Kikinda is to perform *compound* communal services, sustainable technologically and economically. The company is divided into sectors, services, and departments (Figure 5). A lower number of employees is carrying out the job of the five merged companies.

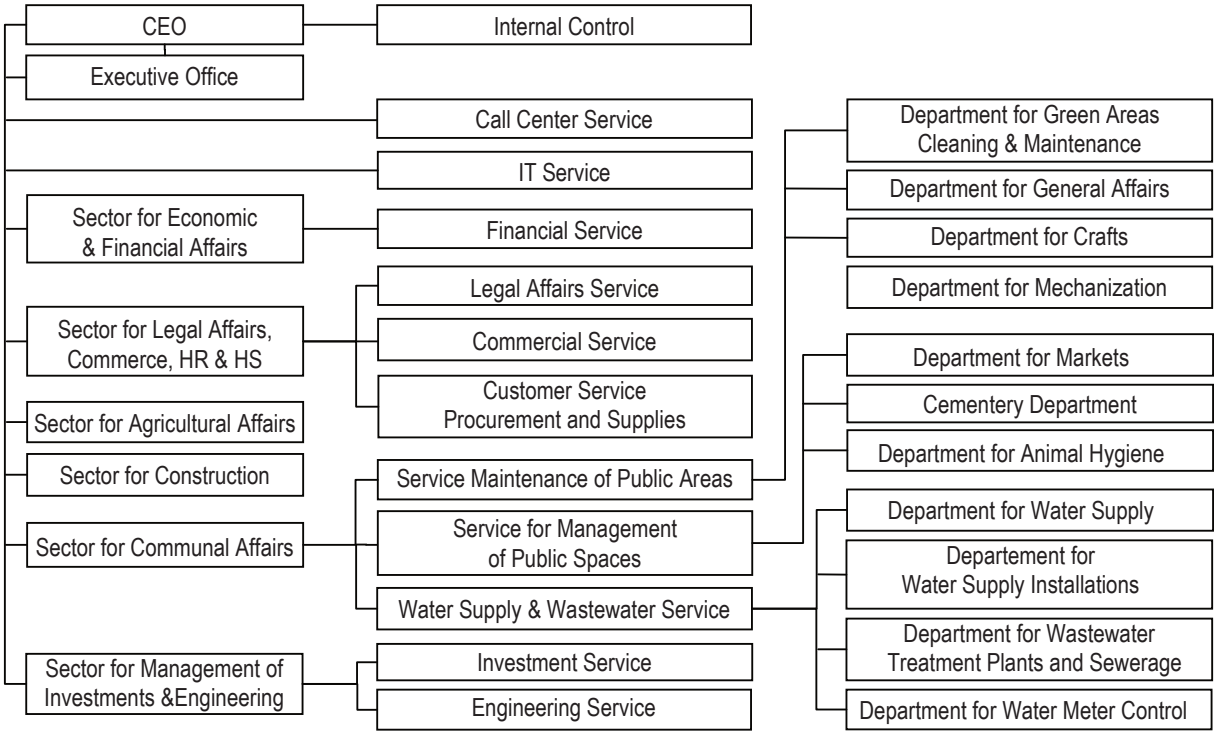

Figure 5: PC Kikinda organigram (Compiled by the authors)

6 MERGING ECONOMIC ECHO

6.1 Companies list and notation

With the aim to simplify and to brief analysis of economic echo caused by communal merging in Kikinda, overview list of companies and its units is presented in **Table 3**, where *key words* and *symbols* associated are also given. Sign of *asterisk* (*) denotes company entirely financed by the municipal budget. Average official exchange rate (NBS, 2016) is used for conversion of dinar [RSD] into euro [€].

#	COMPANY NAME	Key word	SYMBOL
1	Public Communal Company "October 6th"	October	PC1
2	Public Company for Town Greenery and Marketplace	Greenery	PC2
3	Public Company for Construction and Development*	Construction*	PC3
4	Municipal Agency for Housing*	Housing*	PC4
5	Public Agency for Agriculture and Small Business*	Agriculture*	PC5
3-5	Three companies* (PC3, PC4, PC5)	Three*PC	3PC
1-5	Five companies (PC1, PC2, …, PC5)	Five PC	5PC
∑	Public Company "Kikinda" – PC Kikinda	Kikinda	PCK

Table 3: Kikinda communal companies list (name, key word, symbol). (Asterisk * denotes budget dependence entirely)

6.2 Costs non comparability

Five communal public companies merging feasibility can be estimated by comparison costs of these five companies (5PC) and PC Kikinda (PCK). As a matter of fact, *cost* is one of the key economical factors for each company. The cost has a crucial impact on business success and company development.

Unfortunately, cost comparison of relevant companies (5PC and PCK) is not possible in reliable and trustful manner. This *costs non comparability* is because relevant companies financial statements are not done in a single way and meaningful comparison of costs is impossible.

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6.3 Cash outflow

Cash is the basis of every business. Without information on *cash flow*, a company cannot adequately make business decisions. In view of the fact that costs comparison of merged companies (5PC) and compound company (PCK) is not possible, *cash outflows* are analyzed in this paper. In order to evaluate feasibility of communal companies merging, available cash outflows *before and after merging* are compared.

OUTFLOW	BEFORE MERGING: Five companies (5PC) 2014 (state)		AFTER MERGING: PC Kikinda (PCK) 2016 (plan)		DIFFERENCE: (5PC–PCK)
	Cash [million €]	Share [%]	Cash [million €]	Share [%]	Cash [million €]
Operating activities	5.410	73	2.119	86	3.291
Investing activities	1.838	25	0.358	14	1.480
Financial activities	0.162	2	0	0	0.162
TOTAL	7.410	100	2.477	100	4.933

Table 4: Cash outflow of Five companies (5PC) & PC Kikinda (PCK). (Compiled by the authors, sources: BSP, 2014; PPJPK, 2015)

In **Table 4**, the cash outflow of the five companies (5PC) – in the time *before* merging and with available data for 2014 (BSP, 2014), is compared with the cash outflow of the compound company (PCK) – in the time *after* merging and with available planned data for 2016 (PPJPK, 2015).

As it can be seen (Table 4), Five companies (5PC) realized total outflow (€7.410×10^6) is *lower*, for respectable difference (€4.433×10^6), than PC Kikinda (PCK) planned total outflow (€2.477×10^6). In other words, outflow difference (5PC–PCK) presents remarkable 67% of outflow (5PC) before merging. Operating activities outflow reduction produces that difference. After merging, lower operating activities outflow provides fund for investing activities.

OUTFLOW	BEFORE MERGING: Five companies (5PC) 2014 (state)	AFTER MERGING: PC Kikinda (PCK) 2016 (plan)	DIFFERENCE: (5PC–PCK)
	Cash [million €]	Cash [million €]	Cash [million €]
Employees' expenses	2.249	1.392	0.857
Supplies & services	2.854	0.581	2.273

Table 5: Part of cash outflow comparison of Five companies & PC Kikinda. (Compiled by the authors, sources: BSP, 2014; PPJPK, 2015)

In **Table 5**, five companies (5PC) cash outflow part in time *before* merging (BSP, 2014), is compared with compound company (PCK) cash outflow part in time *after* merging (PPJPK, 2015). Presented outflow part includes employees' expenses and supplies & services expenses (Table 5).

Number of employees after merging is decreased by circa 30%. Because of that, and in accordance with Table 5, employees' expenses (€2.249×10^6) before merging are decreased (€1.392×10^6) after merging, what makes a significant difference (€0.857×10^6). Supplies and services expenses before merging (€2.854×10^6) are also decreased (€0.581×10^6) after merging, what makes very significant difference (€2.273×10^6).

Both Table 1 and Table 2 indicate indisputably that five communal public companies (5PC) *merging* into one compound communal public company (PCK) is *ecomically approved* in Kikinda case. Financial savings realized already create space for improving Kikinda's municipal budget.

In addition to finances, the new PC Kikinda establishment through the merging process, managed with a systems approach (Kerzner, 2009), enables the layout of a modern company with a matrix structural organization (PMBOK, 2013) and corporative management of utility services and other business.

6.4 Municipal budget relaxation

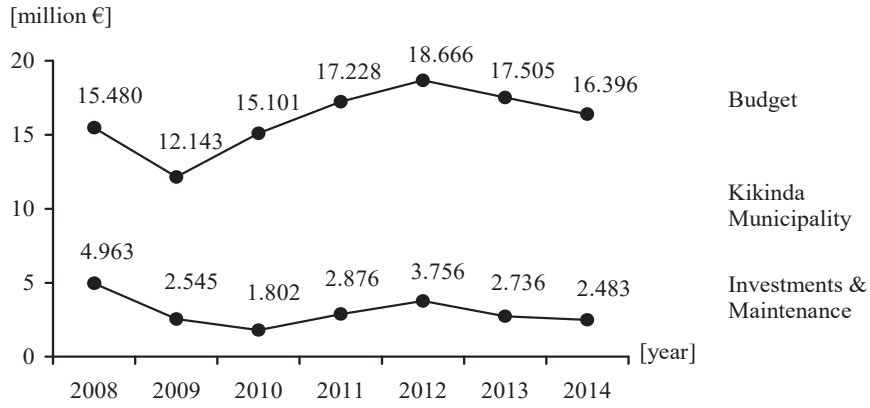

Figure 6: Kikinda municipal budget (2008-2014). (Compiled by the authors, source: ZRBOK, 2014)

		BEFORE MERGING						
	Year:	2008	2009	2010	2011	2012	2013	2014
BUDGET	[million €]	15.480	12.143	15.101	17.228	18.666	17.505	16.396
Investments & maintenance	[million €]	4.963	2.545	1.802	2.876	3.756	2.736	2.483
Share	[%]	32	21	12	17	20	16	15

Table 6: Kikinda municipal budget and investments with maintenance (2008-2014). (Compiled by the authors, source: BSP, 2014)

Kikinda municipal *budget* and *investments & maintenance* recent history (2008–2014) (**Figure 6**, **Table 6**) reveals that budget increase is not accompanied with adequate investments increase. In the observed period (2008–2014), for which it can be easely calculated (Table 6), annual average share of investments and maintenance is only 19% of the budget. It is obvious that during the observed years, the budget surplus is not used for investments (developing purpose), but rather for current expenses (consuming purpose).

			BEFORE MERGING							AFTER	
#	BUDGET	Year:	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Municipal	[million €]	15.480	12.143	15.101	17.228	18.666	17.505	16.396	20.645	18.996
2	Three*PC	[million €]	5.939	3.533	3.153	4.313	5.110	4.374	4.218	2.049	1.191
3	Share	[%]	38	29	21	25	27	25	26	10	6

Table 7: Kikinda municipal budget and three* companies (before and after merging). (1 – Municipal budget costs; 2 – Three*PC total costs in budget; 3 – Participation in budget). (Compiled by the authors, source: ZRBOK, 2014; PPJPK, 2015)

Municipal budget and three* companies (3PC, Table 3) expenses are jointly presented (**Table 7**). Before merging, 3PC are completely financed from the Municipal budget. After merging, however, 3PC activities are fully melted into PCK and are not any more financed from the Municipal budget.

7 CONCLUSIONS

Public Company "Kikinda", established through merging five communal company activities, has reduced immediately utilities expenses and contributed to municipal budget.

Kikinda communal companies merging presented is, as the authors believe, *pioneer venture* in Serbia these days. Results achieved promote Kikinda merging case as a template useful for towns of similar size.

Nowadays economy is a chief key of a successful urban planning. Communal services merging can be considered as one possible path towards smart town creation.

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