MODEL FOR CADASTER OF HOUSING FACILITIES AS G2G SOLUTION FOR BETTER E-GOVERNMENT

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Abstract: *The implementation of the e-Government concept in the states worldwide has introduced significant changes in improving the functioning of the front office and the re-engineering of the existing back office. Even though the usage of ICT in public administration performance primarily was devised with the purpose of and focused on the re-engineering of the current services, in the developing countries, it instigated engineering of information systems in other areas as well, where the need for that emerged. The paper at hand focuses on the engineering of information system in the housing area. The research discusses the mapping of all the stakeholders in the housing area, the final aim being to create a role model institution in the public sector – Cadaster of Housing Facilities (CHF). The function of the new institution is to set up a data base which will include all the data related to the housing facilities and which will be of service to the rest of the institutions in the private and public sector which might need those data. The idea about this G2G solution is creating on-line public services by introducing a fundamental thinking of the way government departments and agencies work in the housing area.*

 Keywords: *Cadaster of Housing Facilities, e-Government, G2G, mapping stakeholders*

INTRODUCTION

The information and communication technologies (ICT) are regarded as the main instigator of the changes that occurred at the beginning of the new millennium. The emergence of these technologies has found application in each and every segment of human life and has made a significant contribution not only to the manner in which people function, conduct business, but also in the manner in which states function as systems.

The use of ICT in the public sector has been dubbed e- Government. "E-government is a process of introducing information and communication technologies (ICT) in the public sector for the purpose of creating a flawless, responsive, and citizen-focused government by transforming the process of delivering on-line public services and by introducing a fundamental re-thinking of the way government departments and agencies work" (Bogdanoska Jovanovska, 2016, p.20). The

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deeper meaning of this term, however, is to depict the reform in the public administration functioning in a given state, which emerges as a result of the implementation of ICT.

The focus of the reform is placed on front office, known as G2C (government-to-citizen) and G2B (government-to-business) as well as on the public administration performance with regard to the cooperation and exchange of information among institutions in the public sector, i.e. back office, also known as G2G.

Back office is a term widely used to refer to all processes, operations and information flows which are take place in the internal part of public administration institutions in order to produce and deliver the desired services (invisible to the citizens/businesses). Back office is a crucial machinery of governments. Klischewski (2004, p. 62) discusses the possibilities for achieving a solid back office in the framework of e-Government and states the following:

 "Information integration as a vision of interorganisational information systems with main task to be accomplished is information resource design; and Process integration as a vision of interorganisational process networks whose main task to be accomplished is business process (re)engineering."

Considering the above-said, the goals set before this concept can be achieved in two ways: a) by creating information systems and setting up data bases that would draw on the existing archives of the institutions in the public sector, or b) by devising brand new information systems, which implies establishing new public sector institutions, in charge of collecting, processing, preserving, analyzing and providing information to both the public and private sector, in a specific area.

The information flow in the public sector is based on legislation as well as administrative procedures which are in line with the legislation and which determine the route of the information and the manner in which the information is collected, stored, processed, used and exchanged within and outside a given institution. The implementation of ICT in the public sector, very frequently, implies that the information takes a different route, i.e. a shortcut as a result of the opportunities provided by the new technology in terms of greater optimization and efficiency of the processes, and, ultimately, enhancement of final beneficiaries' (both citizens and businesses) contentment. The optimal approach to these reforms is for the public administration to be observed as a whole. Nevertheless, unfortunately, public administration is seldom viewed as a whole within e-Government. In most cases, the solutions offered are partial, only within a single area, and normally include the linking of only few institutions.

In countries undergoing transition, it is quite common for institutions to have no information exchange procedures established among themselves, due to which in their day-to-day functioning, they face a number of problems. The overcoming of these problems stipulates engineering of information systems, which, in turn, requires the establishment of new institutions in the public sector which were previously non-existent (e.g. registers, centers, and cadasters)[4].

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[4] Example: The Republic of North Macedonia, in 2001, saw the establishment of the Central Register which is an institution which collects and intersects the information related to the business sector. Thus, a data base for the business sector was created, primarily in the context of recording information, and later on, within the framework of this institution, according to the needs that arose along the way, a larger number registers were established. Taking into consideration the fact that the creation of this register was realized by means of ICT and that was a first attempt of that kind, it is an engineering of information system in the framework of G2G in the e-Government. Within the newly formed Central Register, several other registers have been established: Register of Annual Accounts, Pledge Register, Register of Prices and Leases, Register of Direct Investments, etc. www.crm.com.mk

The housing area is one the areas that are an integral part of the public sector in the Republic of North Macedonia. The housing area is quite complex and encompasses the following: classifying and making records of the housing facilities on various grounds; management and maintenance of housing facilities; management of apartment blocks and the relationship among the owners, as well as the rights of the state and the municipalities regarding housing (The Law on Housing, 2009).

Although housing as an area is placed on a central level and is under the authority of the Ministry of Transport and Communications, it is also delegated on a local level under the authority of the municipality, and its realization is monitored by inspectors.

The inspection in the area of housing (Law on Housing, 2009, article 51) is authorized to realize activities in line with the Law on Housing and when breach of legislation is detected, they initiate legal proceedings against the offenders.

The long-term monitoring of the conditions related to the results obtained from the conducted audits in the area of housing, points to a serious lack of efficiency and efficacy in their performance, which is clearly manifested in the existence of a large number of different types of offence cases which still have not been taken to the Basic Court.

The research conducted on these cases indicates that the main reasons for the unresolved status of these unprocessed cases are the following: a) difficult access to information that should be gained from the institutions in the public sector which are in possession of these data; b) long and complex administrative procedures in collecting the needed information; and, very frequently, c) lack of information (in a form and with a structure required by the inspector).

The paper at hand discusses and analyses the subject matter of housing in the Republic of North Macedonia. The paper also offers a proposal for reforms in the housing area. In Section 2, an overview of the literature on this issue is provided; whereas Section 3 depicts the research methodology. In Section 4 we present the results obtained from the research. Finally, the paper, in the last section, offers relevant conclusions as well as recommendations for further research.

LITERATURE OVERVIEW

The literature on the housing area in the Republic of Macedonia is relatively limited. It mainly consists of the following: laws (the Law on Housing, 2009; the Law on Ownership and Other Real Rights, 2001), rulebooks (Rulebook of Housing Norms and Standards in Apartment Buildings, 2010; Rulebook of the Form, Content and Manner of Managing the Register of Apartment Buildings and Apartments, and Rulebook of the Register of Apartment Buildings' Managers, 2010) and regulations (Regulation of the Criteria and Methodology for Categorization of Apartments and Apartment Buildings, 2010).

The number of other documents dealing with this issue is rather insignificant, and here we can mention the Manual for Managing Collective Apartment Buildings (2015). The regulation of the area encompasses both inspectorial and managerial supervision in the housing area regulated with

the Manual for the Form and Content of Housing Inspectors' Certification, and for the Manner in which the Certification is Issued and Suspended (2010).

On the other hand, the literature on e-Government and the changes in the back office is rather extensive. A number of studies have been published even at the beginning of the implementation of e-Government, usually tackling the topic of Inter-organizational Information Integration (Klishewski, 2004, Prado et al., 2004; Millard et al., 2004).

RESEARCH METHODOLOGY

The research for the purposes of this study commenced with the method of content analysis. The analysis of the documentation by employing the on desk approach was realized in investigating: the legislative related to the housing area; the existing literature dealing with this issue, as well as the achievements in the area of e-Government worldwide to date.

The empirical study involved field research where the research instrument employed was conducting interviews in the public sector institutions and companies in the business sector, that have been identified as possible sources or beneficiaries of information and data in the housing area.

The method of synthesis was employed to integrate the insights gained from the field research. What was created on the basis of these insights was the model for information system of a newly proposed institution in the public sector in the area of housing – Cadaster of Housing Facilities (CHF). The descriptive method was utilized in depicting the stakeholders, the input and output data and information of the Cadaster, as well as the description of the model of the Cadaster of Housing Facilities itself.

RESEARCH RESULTS

The research results present the mapping of a) the stakeholders (as source of data/information and as beneficiaries of data/information), and b) the data/information which the stakeholders would submit to or require from the aforementioned cadaster.

Initially, we set out to map the data/information related to a single housing facility. Having encompassed them all, we classified them into several categories:

1. ***Data referring to the housing facility itself***: address, street, number, city, square meters, type of housing, the floor where the apartment is located (if it is a part of an apartment building); the number of floors (if it is a house); the purpose of the facility (whether it is intended as residential area or business premises; whether the facility is equipped with an elevator, thermal insulation, the types of installations it is fitted with (electrical and water installation); the type of electricity installation (single-phase or three-phase power); whether the facility is empty or inhabited.

2. ***Data referring to the owner of facility***: name and surname of the person/people who are the owners of the housing facility; a document with their personal identification number; an address

of current place of residence if the person does not dwell in the facility; name and surname of the person who uses the facility (if the facility has been rented).

3. ***Data referring to the management of housing facility*** provided it has more than 8 separate units (according to the Law on Housing): whether the owners are represented by a legal entity which is in charge of managing the housing facility and its data; or the facility is run by the owners of the separate units themselves.

Table 1 (see below) presents a reliable overview of the linkages between the mapped stakeholders and the information/data regarding the housing facilities that they use, generate or share. This table also contains data regarding the sector to which the mapped stakeholders belong. Of particular importance is the section of the table which shows which of the mapped data are useful/needed to which specific stakeholder.

Table 1. An overview of the mapped stakeholders and data/information

SECTOR	INSTITUTION	USING DATA FROM STAKEHOLDERS	DATA for		
			ownership	object	manage
1	2	3	4	5	6
PUBLIC SECTOR	Municipality	*Tax collection of apartment rent	X	X	X
		*Annual Housing Progam			
		*Running an administrative-inspection procedure			
		*Registering Manager or Owners' Association			
	Basic Court	*Proof used at court proceedings (litigstion)	X	X	X
	Public Institution for Water Utility	*Water Bill Payment	X	X	
	Public Institution for Waste Utility	*Waste Disposal Bill Payment	X	X	
	Public Institution for Sewage System	*Recovery rate of used drainage	X	X	
	Electrical power ASM of RNM	*Electricity Bill Payment	X		
	Agency of Real Estate Cadastre of RNM	*Records of surveyed plots	X	X	
	Register of Managers of Housing Facilities	*Records of Managers of housing facilities	X	X	X
	Center for Social Works	*Records of facilities issued to caregivers	X		
	Central Register of RNM	*Registration of owners' communities	X		
	Public Revenue Office	*Records of earned income	X		
	Ministry of Transport and Communication	*Records of the number of energy efficient housing facilities		X	
	Ministry of Economy of RNM	*Records of the number of energy efficient housing facilities		X	
	State Statistic Office of RNM	*Records of the number of energy efficient housing facilities		X	
	Public Institution for Managing Residential and Business Premises of RNM	*Housing records of importance to the state	X	X	
PRIVATE SECTOR	Business Companies	*Charging services	X	X	
	Notary	*Record of sales contracts of housing premises	X	X	

Source: the authors

Based on Table 1, Figure 1 presents the model for information system which will be in possession of the new institution – Cadaster of Housing Facilities (CHF). CHF would be included 18 stakeholders in total, out of which 16 are institutions in the public sector and 2 are companies in the private sector.

Figure 1. Cadaster of Housing Facilities (CHF), ego-network, visualization of G2G, G2B and G2C links
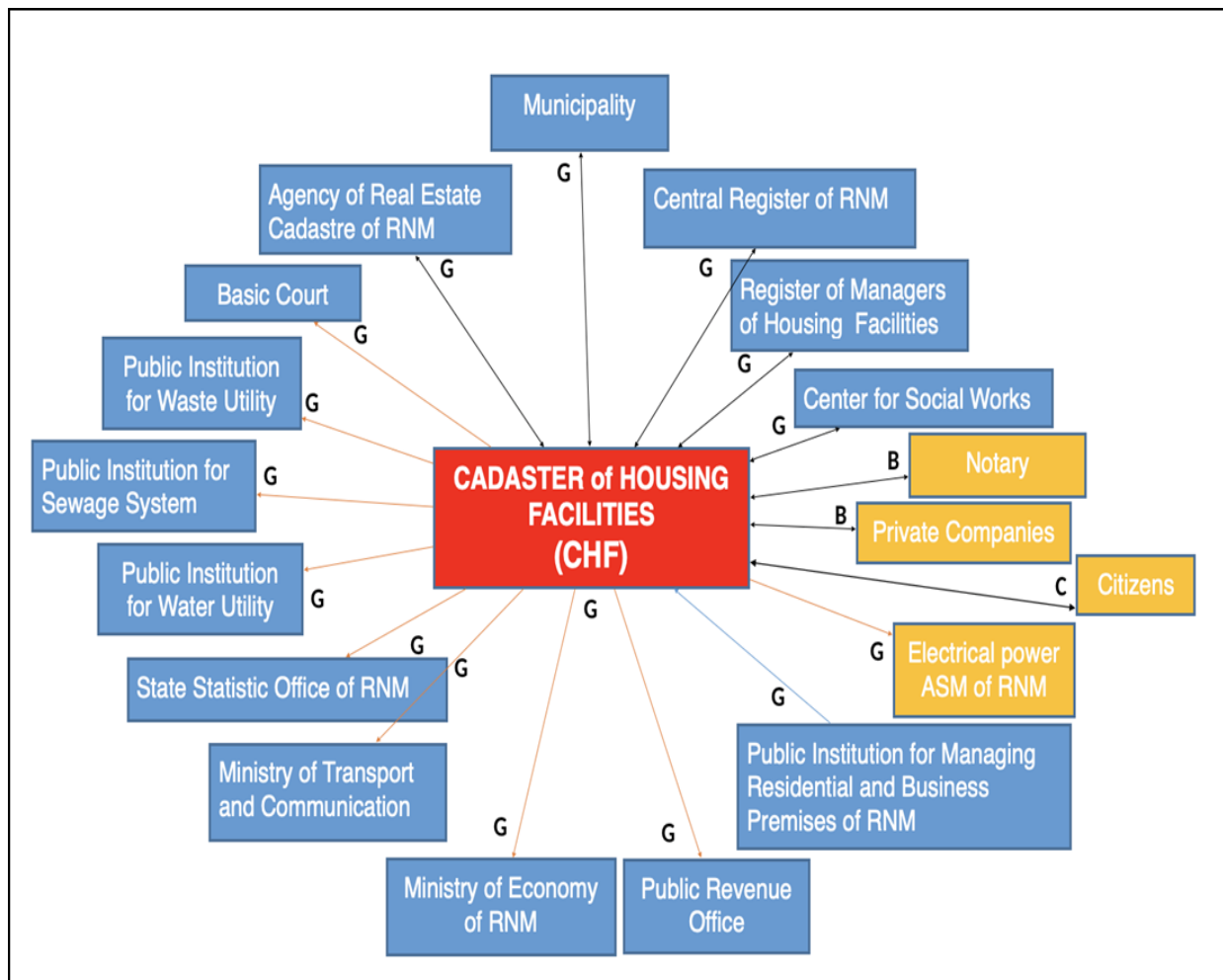
Source: the authors

In order to increase the visibility, Figure 1 is represented an ego network (Petrevska Nechkoska, 2019) with bi-directorial edges featuring different colors: a) in depicting the diverse types of institutions according to the sector they belong to (blue is used for marking the institutions of the public sector; orange is used for marking the companies in the business sector, whereas the new institution in the public sector – the Cadaster of Housing Facilities, is marked with red color and it is presented in the center of the figure); b) in presenting the relations among the institutions/companies and CHF (the black lines with arrows pointing to both directions depict the two-way information exchange and the delivery of data to CHF as well as using information

provided by CHF, the blue arrows present information that CHF collects from institutions, whereas the orange arrows stretching from CHF to the institution/company show the institution which would get information from CHF).

CONCLUSION AND RECOMMENDATIONS FOR FUTURE RESEARCH

More than 15 years ago it was noted that there is "a bottleneck in electronic government is the co-operation between front office and back office and between back offices, which obstructs the seamless exchange of information" (Klishewski, 2004).

The housing area, as one of the areas which are part of the public sector of the Republic of North Macedonia, is faced with a clear lack of connection among the institutions that are directly related to the issue of housing.

The analysis of the results gained from this research point to three main conclusions:

- The establishment of Cadaster of Housing Facilities via making use of the opportunities offered by the novel ICT in terms of provision of comprehensive records of the housing facilities will contribute to the rise in the efficiency and effectiveness of the functioning of all stakeholders (institutions in the public sector and companies in the business sector) in the housing area, particularly, when it comes to the realization of the activities in the domain of auditing in this area;

- Most if the stakeholders pinned down that are also proposed for inclusion in CHF, are not even mentioned in the Law on Housing, which points to the fact that the current legislative should not be taken as a signpost in creating new ICT- related solutions. On the contrary, what is needed is thinking 'outside the box' and open-mindedness in order to offer user-friendly solutions;

- The two-way communication in terms of input of data in CHF and output – usage of information from CHF by the institutions in the public sector or the companies in the private sector showed that as many as 79% of the stakeholders would demand information from CHF out which 47% would only use the information and 32% would provide as well as use information, which indicates that there exists a solid basis for sustainability of CHF. Only 21% of the stakeholders would merely submit information to CHF without using any information from CHF whatsoever. These insights clearly confirm the greatly pronounced need for the establishment of such a register.

The recommendations for further research in the housing area related to CHF could go in two possible directions: a) firstly, following the example of the Central Register of the Republic of North Macedonia, it is expected that CHF will serve as a role model for the establishment of other registers, as the need arises, in the course of the functioning of CHF; and secondly, since CHF is envisioned as part of G2G relation within the implementation of the e-Government, which at this stage merely points to the improvement of G2G functioning of e-Government, consequently, the future research endeavor could be directed at studying the effects of this role-model on the functioning of G2B and G2C.

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