Conflict Management in Public Administration Using Knowledge Bases and New Software Solution

Mladen Radivojevic[1], Radovan Klincov[2]

[1]University of Business Studies, 78000 Banja Luka, Bosnia and Herzegovina

[2]University of Business Studies, 78000 Banja Luka, Bosnia and Herzegovina

ABSTRACT

In this paper we examine the management of conflicts between end users and service providers of the public administration of Bosnia and Herzegovina using knowledge bases, ontologies and new software solutions. Knowledge of strategies and styles of management for conflict resolution will help all employees in the public administration establish and maintain good relationships with their customers and will ultimately contribute to a better public image of the administration and better delivery of services. A relationship free from conflicts between staff and service users will give greater satisfaction to both the users and service providers. To achieve this, it is necessary to efficiently manage and quickly resolve conflicts. Here we present a proposal for new solutions based on ontologies, which has not yet been applied in the conflict management, much less in the public administration of Bosnia and Herzegovina. We will share some results that have been achieved through the implementation of pilot projects in three local self - government units (municipality/city).

Keywords: public administration, conflict management, ontologies, new tools.

1. INTRODUCTION

Conflict management has been discussed a lot in the field of service and business communications. Numerous lectures, seminars and workshops have been organized in the public administration aimed at improving communication skills, identifying service issues and working on their solutions.

Conflict is a constant in modern life and this is also the case in the delivery of services by the public administration in Bosnia and Herzegovina. It occurs due to the diversity of views, differences of opinion and conflicting interests. It may also arise among employees and between public administration and the service users (those who seek and those who provide the service).

Disagreements among employees in public administration, their differences of opinion or of attitudes, needs and views on the service challenges are inevitable. They can be a source of strength and creativity within the public administration, but they can sometimes develop into conflicts. If we are not ready to adequately respond to these conflicts, or stop them before they fully develop, this will decrease performance and service delivery. To be able to efficiently respond to conflicts, employees need essential new knowledge and access to helpful new tools. In this paper, we propose the use of new software tools and knowledge bases for effective conflict management.

The key question is whether conflicts are desirable or not. The answer depends on how individuals react when they find themselves in a conflict situation. It can be both positive and negative. The misconception is that conflict is always a negative but properly managed conflicts can often result in positive outcomes. Therefore, in this paper we offer a different perspective on conflict management.

In the first part of this paper we deal with the basic concepts of conflict and tools that can be used, while in the second part we deal with management of conflicts, signals that indicate conflict, reasons for conflict, conflict resolution techniques, knowledge bases, strategies for conflict resolution, etc.

2. TOOLS FOR CONFLICT MANAGEMENT IN PUBLIC ADMINISTRATION

Here we will first examine the work of public administration in Bosnia and Herzegovina. Its work is based on the Constitution, laws, decrees, orders, regulations and other general acts. It is the structure of bodies and organizations and at the same time a set of jobs and tasks whose function is to interpret and apply the law, ie. application of general rules to individual cases with the existence of judicial review.

Public administration is a mix of organs, organizations, bodies, interdependent set of competencies, tasks, specifically connected and managed with a view to implement the legal norms, organizational tools, methods of management

processes and procedures in order to fully comply with the mandate of the elected government. Its main functions are: service, regulatory, organizational and executive (Kavran, 2003).

The public administration in Bosnia and Herzegovina is influenced by tradition, cultural milieu, history of relations between politics and administration and external influences. In addition to these factors, there is a process of transition and the level of development of the private sector, the relationship between society and government, and the conflicts that arise in relations between employees and service users. Public administration in Bosnia and Herzegovina provides citizens with services in 145 municipalities / cities, 10 cantons, two entities, Brcko District and at the level of the state of Bosnia and Herzegovina.

To perform high quality work, employees of the administration and bodies of local self-government units (public administration) must have appropriate knowledge of conflict management. In this paper we examine part of the required knowledge needed in order to manage this process through the use of ontologies and new software tools.

Implementing a system of conflict management should not be carried out by departments, sectors or departments. The administrative authorities, administrative organizations and local self-government units are much more than simply their sum. If conflicts were managed only within a single service or sector, public administration as a whole would not have a major strategic advantage. The resulting experience through success or failure would be available to one department or service and would not be available to all others.

In addition to the basic concepts of the public administration of Bosnia and Herzegovina, we will provide the basic concepts of ontologies and software for updating the knowledge base Protégé used in this paper.

The term ontology is quite wide and it represents a conceptual idea rather than a strictly defined formalism for expressing knowledge. In their paper, Hsu and Chi (2006) define development approach to ontologies as a process of knowlwdge inclusion and its acquiring, storage, retrieval and use.

Ontology is a description of the structure of an area of knowledge, with the formal definition of mutual relations and connections between the various elements of the area (Clare. 2011). It is used for knowledge representation, management and organization of knowledge, modeling and database design, searching and downloading the required knowledge.

Ontology is a formal, explicit specification of common conceptualizations (Borst, 1997)

Why develop an ontology for the systems of conflict management in public administration? We do this to reduce the level of conflict, and if it is already present, to resolve it much faster than before.

In this paper I would like to propose a part of the necessary knowledge required to effectively use ontologies in the process of conflict management in the public administration in Bosnia and Herzegovina. Due to the limited scope of this paper, we will single out only the critical areas of necessary knowledge for more effective conflict management in public administration using appropriate software solutions.

Nowadays we have a large number of languages and tools for describing ontologies. Among ontological languages most in use is OWL (Web Ontology Language) and editing tool ontology "Protégé-OWL". Protégé is an open source platform. It is used for knowledge representation, management and organization of knowledge, modeling and designing databases, searching and downloading the required knowledge. Its purpose is to allow users to display the meaning of terms and the relationships between those terms. Protégé provides a rich set of structures for modeling and activities that support the creation, visualization and manipulation of ontologies represented in different formats. It was developed at Stanford Center for Biomedical Informatics Research at the School of Medicine at Stanford University in California. The system we have developed to support conflict management in public administration is based upon Protégé platform for reading and storing ontologies, as well as updating the knowledge necessary to manage conflicts.

3. Conflicts

Conflicts are important agents of social affairs and social development. They can be both constructive and destructive. In this region, we are much closer to their negative and destructive potential than to their positive and constructive force and the ability to stimulate the development of society. In previous systems we were taught to fear crises and conflicts, which led to the fact that we are not able to deal with them in a reasonable and rational way. The majority of people do not know how to analyze crisis and conflict situations.

Most of us cannot analyze the crisis and conflict situations, or plan and search for possible solutions. We were not taught how to apply the methods and techniques of management and conflict resolution. The obvious lack of knowledge and skills in this area often contributes to the escalation of conflict, and even the use of force and violence in their resolution (Zagar, 2006).

In order to create a clearer picture of this important topic, one must begin by understanding the term conflict. In everyday communication conflict usually has a negative connotation. A lot has been written about the tensions in relations and disputes with the emphasis on destructive consequences. The reason for this view is the fact that the scientific study of conflicts began with this point of view. Over time conflicts have lost their negative connotation and started to be viewed as a phenomenon that is neither positive or negative, depending on how they are managed. Psychology, sociology and other scientific disciplines are in search of the best way to prevent, decrease or stop them. In

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this paper we propose an approach using new technologies and more effective use of conflicts knowledge can provide a more efficient management of them. Users and service providers will be able to quickly acquire the required knowledge about the conflict so that any conflict could be resolved as quickly as possible. Not solving conflicts in a timely manner (as soon as possible) means they will continue to grow and become more difficult to solve.

Literature identifies a number of definitions of conflicts, and in this paper, we will give just a few:

The conflict is a process of social interaction and social situation in which the interests and activities of the participants (individuals or groups) are opposing and they block and hinder the achievement of the goals (Jambrek, Penić, 2008).

Conflict is a process in which person A deliberately makes an effort to prevent efforts of person B with an opposing action, which will result in frustrating person B to achieve his/her goals and interests (Robins, 1995).

Conflict is an interactive process that manifests itself in non-compliance, disagreement or discord between individuals, groups, organizations, etc. (Rahim, 2002).

From the various definitions of conflict common concepts cn be traced: "mismatch of objectives", "lack of understanding", "incompatibility" and "misunderstanding". The conflict itself is not a problem, but unresolved conflict is a major problem.

The Chinese character for conflict consists of two characters; one that means danger and one that means opportunity. For us, the word conflict is commonly associated with something negative, it reminds us of fights and we rarely think about something called opportunity. People react differently in conflict situations and are usually overwhelmed with strong emotions and are no longer able to think constructively and talk.

Conflict is also biologically wired where the preservation is the priority. Any attack on the integrity of the (direct or indirect) causes two reactions: fight (reciprocation attacks) or flight (withdrawal from the situation). The environment in which we live shapes both our view of the world and conflicts.

Poor interpersonal relationships, as a consequence of unresolved conflicts, could last for months, even years, leaving a negative impact on human resources, even long after the situation that caused the conflict had fallen into oblivion. Therefore, the conflict management is very demanding but achievable challenge for public administration.

There are currently two main research directions in conflict management:

1. If at all possible, all the factors before, during and after the conflict are taken into account .The model is given accurate and detailed formalizations in order to obtain a true image of the original. It involves very complex calculations, but gives good results.

2. All the basic factors of the conflict are known or assumed (parties to the conflict, the causes, nature, potential consequences, etc.) while only one or two parameters are done in detail. In this case the results are fast but less reliable.

The theory recommends using the second model, but we will combine both models to enable a more efficient system for conflict management in public administration.

The papers that appeared first were related to conflict analysis and relied on game theory, topology, and other areas of operations research. These areas continue to remain an integral part of the basic tools in formalizing the conflict. However, it is quite clear that the conflict requires its own approach and building completely new models, especially in solving conflicts in public administration. It is important to get to the abstract model, while at the same time at no point forget real conflicts. While monitoring the conflict resolution, one should always bear in mind the causes that led to it. This is particularly difficult in the public administration in Bosnia and Herzegovina where the consequences are often seen as causes and phenomena are translated into all forms of personal, political, class, ethnic and other interests.

The conflict is a conflict of opposing interests, aspirations, debate, disagreement, dispute, or a threatening situation.

All definitions are given from the viewpoint of the observer, or the one who does not participate in it.

Therefore, these definitions are not of much use to direct participants of the conflict, because their goal is a speedy exit from the given state with maximum possible benefits. To come out of a conflict situation quickly and successfully, it is necessary to know all aspects of the conflict in general and not binding to specific situations. It is necessary to build a conflict model that will enable the analysis of its essence and trace the optimal directions for its resolution. Therefore, we will build a general conflict model in the public administration which will be based on knowledge bases and new software solutions .

Even when all the traps are avoided, there is a problem difficult to ignore: the conflict is almost always associated with some complex system and environment that is impossible to fully capture, so the obtained theoretical results are still only approximately accurate and reliable.

Here, we apply the simplified models and formal apparatus for the purpose of sufficient qualitative analysis and synthesis of the conflict as a separate phase in the management of it.

3.1 Causes of conflict

Causes of conflict among employees and employees with service users (legal and natural persons) are numerous, and can occur due to**:** non-compliance with regulations, laws and procedures, administrative workers` mistakes, inadequate management methods, injustice (cronyism), poor organization, inadequate quality services, poor technical equipment, excessive load of employees, poor working conditions (dirty, dangerous, harmful, ...), reward system, and so on (nepoštivanje propisa, zakona i procedura, greška administrativnih radnika, neodgovarajućih metoda upravljanja, nepravde (protekcije), loše organizacije, neodgovarajuće kvalitete usluge, loše tehničke opreme, pretjeranog opterećenja

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zaposlenih, loših radnih uslova (prljavo, opasno, štetno, ...), sistema nagrađivanja, i tako dalje). To view more details we used Protégé-OWL editor, see Figure 1 Causes of Conflict („Uzroci nastanka konflikta").

So that the reader could follow the use of appropriate tools and the content in the knowledge base more easily, we will leave part of the text in the Bosnian language.

Conflicts can be divided into two categories: subjective and objective. Objective causes are usually reflected in the system of values, beliefs, social roles, positions of power and the like. The subjective causes are related to anger, fear, worry, lack of trust, tolerance to frustration, etc.
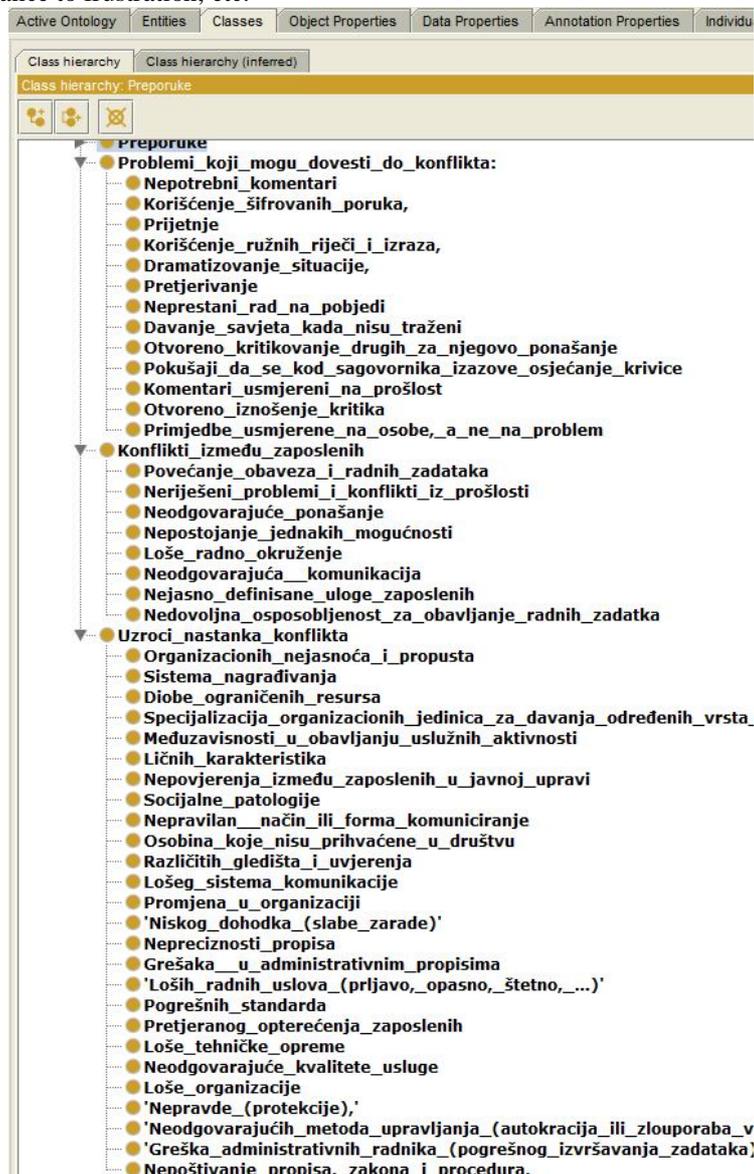

Figure 1 Causes of Conflict

The following questions may help to understand the essence of the conflict and disagreement between different parties: Who gets the most or who is the most to lose by maintaining conflict situations? Who would gain or lose the most by resolving conflict situations? Who is behind the resulting conflict situations? Who is not directly involved but contributes to its persistance? What led to conflict situations? What will be the consequences of resolving conflict situations? Will the resulting peace and good relations have a price? What aspects of the situation have to do with cultural differences that are not understood (if any)? Who can you get help from? How long does the conflict last and will it disappear by itself after some time? How does the conflict manifest itself? Are these only minor disagreements or already an open attack? When does the conflict arise? Only in certain situations or ALWAYS? Where does it happen? Only in direct contact with the users? In the Assistant Secretary`cabinet, or at the head of a department`s? Behind someone's back? WHY conflict there? Followed by another WHY? WHY? and again WHY? Some of these questions are sometimes very difficult to answer.

A list of questions is expandable, but only persistent asking "WHY" can get us to the essence of the conflict. A large number of WH-questions have to be repeatedly asked in order to better understand the nature of conflict.

Very often conflicts occur due to opinion differences. A battle of minds can be avoided if one is reasonable and friendly, sticks to the questions under discussion, appreciates other people`s opinions, orientates towards solving problems rather than towards winning arguments and accepts that people are different.

3. 2 Conflicts in public administration

Conflict may arise as a result of different needs and interests of service users and public administration as their provider. When customers wish to achieve their goals, and note that service provider (civil servant) stands in the way, it usually leads to conflict. Such conflicts can be personal (disagreement between the user and service provider), communicational (language difficulties) or organizational (blurred boundaries of service responsibilities).

Conflicts within the organizational units in the public administration can have short and long term consequences for the whole administration. Dissatisfaction and emotional exhaustion of employees, increased stress, poor working environment, reduced creativity and service efficiency are just some of the symptoms that occur when the conflict is not managed properly. The consequences of conflicts with service users can also have a bad effect on the organizational units of public administration (departments, divisions, departments).

What is the cost of conflict situations that arise every day in the service of the public administration? What is the cost of conflicts with service users or employees in public administration?

Conflict in the relationship between the user and the service provider itself does not have to be negative or positive. The reaction of participants and conflict (un)management by managerial staff and of staff will turn it into a positive or negative direction. It is essential that management and tstaff are aware of conflicts and to pay attention to certain signals that indicate their existence. The existence of specific signal should be cause for alarm because it clearly indicates that communication among employees is either interrupted or at a low level. Ignoring conflicts can interfere with service process, interpersonal relationships within the public administration or public administration with the users of its services. Therefore, those who make decision always have to think about the positive and negative consequences of the conflict.

What is the main goal of each participant in the conflict? First of all, obtaining complete information about the other participant (regardless of the current role). A conflict often would not have happened if one or another participant had had more complete information about the other side, but also about himself/herself. When a conflict occurs, however, both sides try to distort information about themselves or important parameters of the conflict and bring in the maximum noise and interference. The behavior of the participants in the conflict depends on knowledge of all the necessary information. In this paper and the practical implementation, we will try to deliver as much information and as much knowledge as possible as to provide conflict resolutions and what is important for us - a service advantage and satisfaction of all parties in the conflict.

If we have all the parameters required for simple operation on the conflict model and all that is required for the simple mathematical interpretation, we can accurately and correctly formalize conflicts in general.

Conflicts are a natural part of every work or service environment and their appearance results in reduced labor productivity. According to the estimates of many studies, managerial staff spend at least 25% of their time resolving conflicts in their environment. Therefore, the management and resolution of conflicts one of the biggest challenges that the executive personnel or other employees face.

What can cause conflicts? How many people take sick leave due to stress caused by the conflict? How many services have been given inappropriately because of unresolved conflicts?

It should be noted that service users in the public administration of Bosnia and Herzegovina are provided with the most services (over 90%) in the local self-government (municipalities and cities) units. Therefore, the most attention should be paid to conflicts that may arise among employees in municipalities /cities as well as the conflicts that can occcur between staff and service users (natural and legal entities). Nowadays the prevailing opinion is that without conflict there is no development of quality service delivery.

One of the most important activities of managerial capacity in the public administration is the art of maintaining regular and uniform relations between the administration and users of its services. Sometimes the public administration is not even aware of conflicts between employees or smoldering conflicts with service users (citizens and businesses). Such conflicts are a constant threat to human relations and effective service delivery. What these threats are and the reasons for conflicts in the public administration is represented in the knowledge base, part The most common reasons for conflicts („Najčešći razlozi nastanka konflikta") (Figure 2.)

The greater pressure on service providers, the greater is the possibility of conflicts. Thus, they should be noticed in time, their effects envisaged and the potential conflict situation turned into a service advantage.

3. 3. Conflict management

When implementing new solutions it is important to be careful not to build walls among employees and employees in public administration and the users of its services .

Efficiency of public administration depends on the approach and efficency of conflict management. The prevailing view is that conflicts are neither good nor bad. However, their effects can be good or bad depending on the knowledge about managing conflict situations.
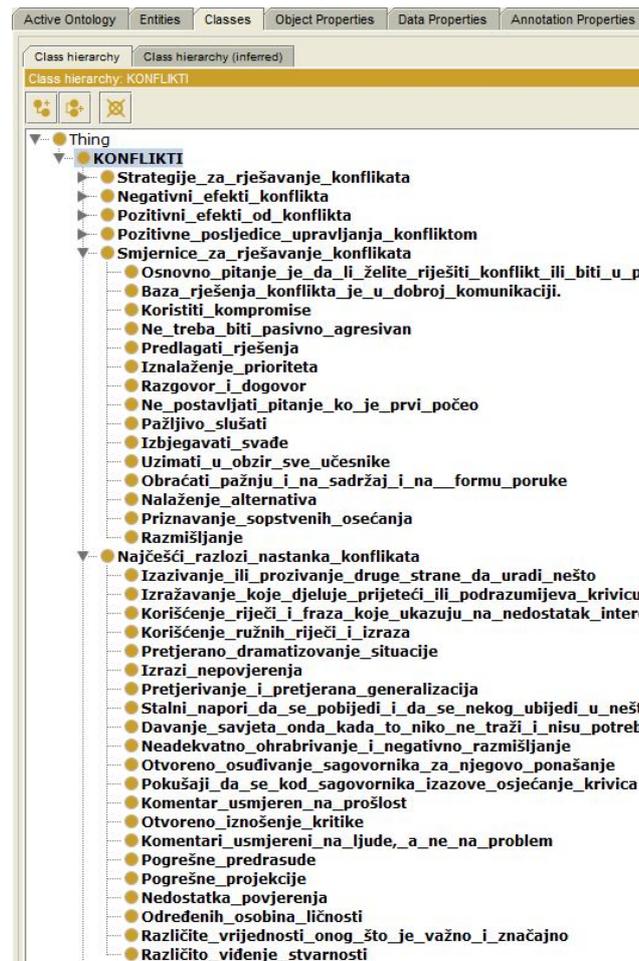
Figure 2 The most common reasons for conflicts

There are different approaches to conflict management that result in different effects. In order to effectively manage conflicts in the public administration in Bosnia and Herzegovina, it is necessary to know the conflict situation, related parties to the conflict, to know the time when the conflict arose and the time available for conflict resolution. The best way to manage conflicts is avoiding them if at all possible.

The most difficult thing is to manage conflict in which neither side is by no means giving up their positions, convinced that they are absolutely right. One needs to know about communication methods and how to stop the escalation of the conflict. One needs to know how to intervene in crisis situations and how to manage conflict. The knowledge bases about conflicts that we here propose and new software tools can help all employees and all those who participate in resolving conflicts. If we effectively resolve conflict situations, we will have a reduction in the effects of stress and overcome unpleasant situations.

A good preparation and training are necessary for efficient conflict solutions in the service process. The new software tools based on the knowledge bases and the Semantic Web can enable a simpler and more effective training and better knowledge of conflict resolution. If one does not possess adequate knowledge or if one cannot quickly find them to efficiently respond to the conflict, one will face obstacles. Consequently, the conflict can be painful or even devastating for the participants in the service system. The most that can be provided is that the public administration is seen as a chance for better service and on the positive side of conflict management.

In order to efficiently manage a conflict, one should be able to: identify the causes of conflict, recognize and manage their emotions in a conflict situation, to achieve compliance with different interlocutors, take multiple perspectives in order to gain a better overview of the situation. To effectively manage conflict, one must know the very process of conflict. Dealing with the management of conflicts begins from the moment it has been noticed. Noticing requests information on the cause of the conflict, the participants, their experiences, beliefs, behaviors and perceptions, ... Noticing, and the analysis afterwards should give a clearer picture of the conflict situation and all its elements.

The key role in conflict management in public administration is in the hands of its managerial staff. Thus, in this paper we show how it can more effectively implemented using new software solutions based on knowledge bases. Managerial staff should have an active approach since avoiding leads to the escalation of conflict, disruption of work discipline and poor service activities (Fox, 2006).

Conflict management involves training in the application of styles of behavior in conflict depending on a situation. It mainly involves learning how to get the energy and competence of participants channelled towards a common solution to the problem. All this, and much more is needed for creating high-quality knowledge base that can be used in more effective conflict management.

What to do to reduce or resolve conflict in the workplace? First of all, it is necessary to implement the training of managerial staff on the best way to communicate with employees. In doing so, open expression of opinion with the definition of priorities in service should be encouraged. In conflict resolution it is necessary to focus on the characteristics of individuals and not on their functions. One should always strive for a solution that both side benefit from.

When resolving conflicts, it is important to bear in mind the existence of different versions of things and perception problems and thereby clearly define the causes of conflict and reasons for their resolution.

3. 4 Knowledge base as a basis for conflict management

The knowledge database should contain knowledge about causes of conflict, conflict resolution techniques, positive and negative effects of the conflict, the results of constructive conflict, signals that indicate the existence of a conflict, the recommendations for conflict resolution. (Figure 3). " The required knowledge." („Nephodna znanja".) (uzrocima nastanka konflikata, tehnikama rješavanja konflikta, pozitivnim i negativnim efektima konflikta, rezultatima konstruktivnih konflikta, signalima koji ukazuju na postojanje konflikta, preporuke za rješavanje konflikta).
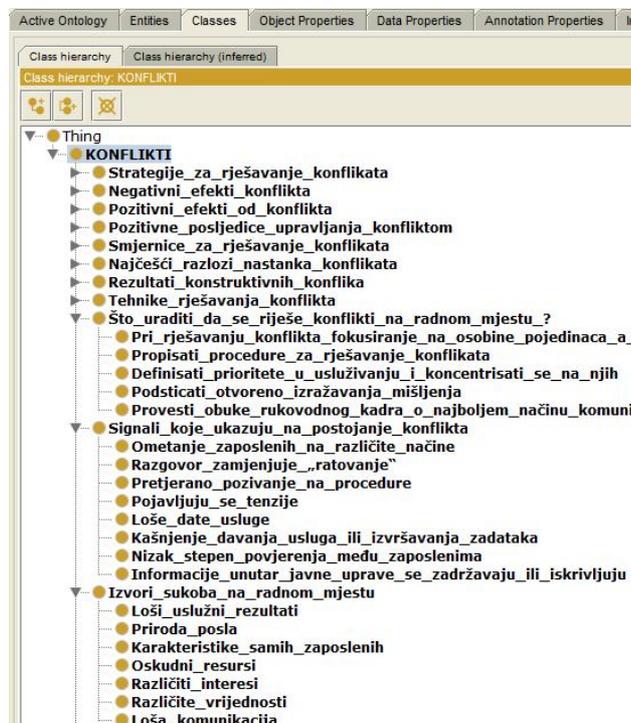

Figure 3 The required knowledge

It should be borne in mind that conflicts are natural, normal, inevitable and sometimes necessary in the service of public administration system. Employees and clients need to know the differences, respect and use them effectively (Savvas. 2009). If it is necessary, one should take time to "step back" and think. Involving other employees of public administration and other service users in a conflict shouls be avoided because, most often, it does not contribute to a solution. On the contrary, it creates a greater conflict and strife because the cause of the conflict is usually unknown. One should communicate "face to face" and at the same time focus on the problem and not the people. If a conflict arises, it should not be neglected or avoided, but accepted and immediately addressed. Users and service providers should always think positive and assume that others have had good intentions. One should also bear in mind that there are people who have not learned the basic skills of good communication. This is only part of the recommendations that are appropriately designed and entered into the knowledge base. (Figure 4, "Recommendations for conflict resolution").

3. 5 Conflict management effects

Conflicts can have many negative consequences in public administration if they occur between the staff and the service users. They can lead to a drop in motivation, dissatisfaction, creating a division between organizational units, poor communication, loss of working time, increase in the number of sick leave and absenteeism and reduced service effectiveness. If it happens among employees, its resolution may become more important than a successful service.

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Figure 4 Recommendations for conflict resolution

In addition to negative consequences of a conflict, we have positive consequences resulting from successful conflict resolution. Out of those, the most important are the improvement of service quality, increases in the ability to adapt to changes, expression of ulterior motives or hidden emotions, new knowledge related to conflict resolution, creativity, innovation, etc.

Can anything good come out of well and constructively resolved conflict? Figure 5. Conflict Management Effects („Efekti upravljanja konfliktom") provide some of the results. Above all, these are better communication, personal growth, progress of the whole service system, better adjustment and more satisfied service users. Such conflict resolutions brings to light issues that really exists and that are effectively solved.
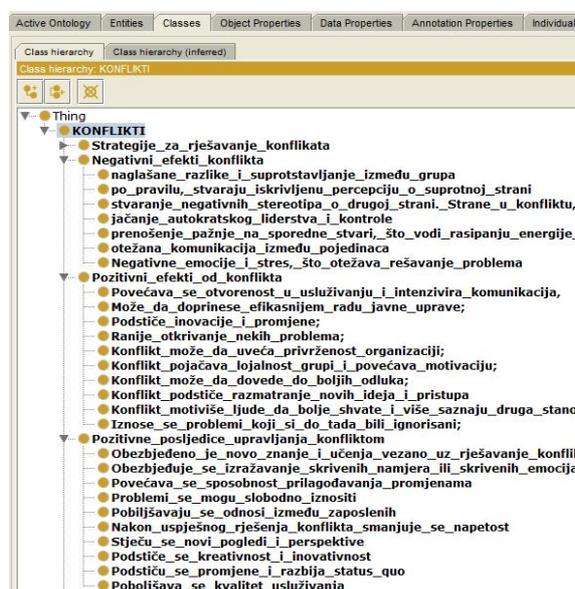

Figure 5 Conflict Management Effects

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The public administration in Bosnia and Herzegovina can benefit or suffer from conflicts, which depends on whether it is on the optimum, low or high level.

Conflict management in these circumstances is a process in which executive personnel and leaders take action. They will, in a situation of high conflict level, reduce or resolve conflicts, while in a situation of low level or absence undertake activities for their stimulation and encouragement. New tools and knowledge bases can provide them with a more efficient approach to the problem and more efficient resolutions.

4. NEW TECHNOLOGICAL SOLUTIONS FOR CONFICT MENAGEMENT

Modern public administration, which the public administration in Bosnia and Herzegovina also models on, is faced with the question how to manage and resolve conflicts. Bearing in mind the consequences of conflict situations, there must be a constantly accessible automated system that would provide a satisfactory answer to conflict sutuations.

In this paper we suggest three approaches (automated strategic tools) to manage conflicts: negotiation strategy, strategy of a superior goal and the strategy of mediation (strategija pregovaranja, strategija nadređenog cilja i strategija posredovanja). The required knowledge to use these strategies is entered in the knowledge base (Figure 6). Strategies for Conflict Management („Strategije za upravljanje konfliktima")
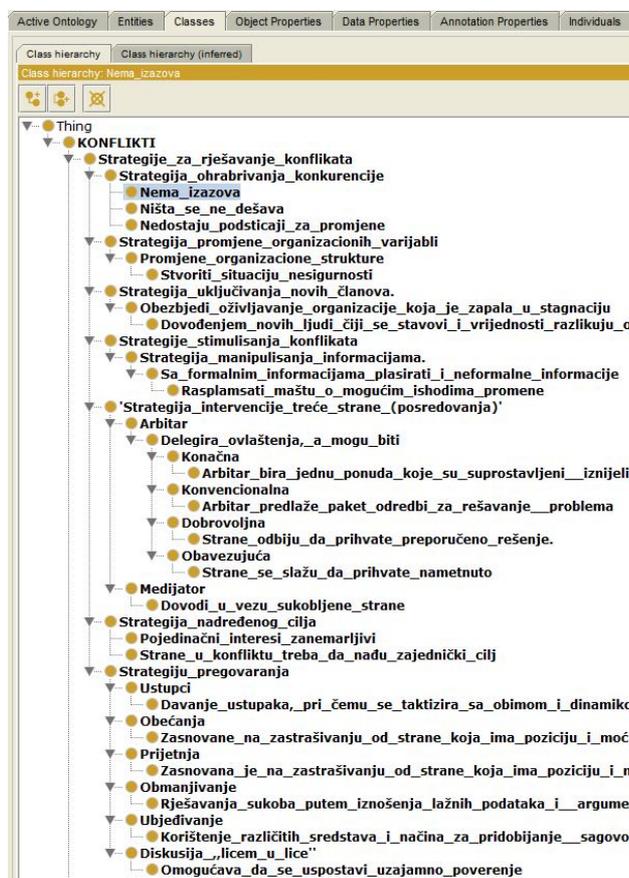

Figure 6 Strategies for Conflict Management

Part of the necessary skills for conflict management are: For discussion „face to face " - establish mutual trust, For persuasion - use different means and ways to win over the interlocutor, For Deceiving - Conflict resolution by presenting false information and arguments , For Threats - It is based on intimidation by the party who has the position and power, For promises – the party who has the authority assures the opposing that the promise will be fulfilled, For concessions - giving concessions with carefully chosen scope and pace (Diskusiju „licem u lice" – Omogućiti da se uspostavi uzajamno poverenje, za Ubjeđivanje – Koristiti različita sredstava i načina za pridobijanje sagovornika, za Obmanjivanje - Rješavanje sukoba putem iznošenja lažnih podataka i argumenata, za Prijetnje - Zasnovana je na zastrašivanju od strane koja ima poziciju i moć, za Obećanja - Strana koja ima autoritet uvjerava suprotstavljene da će obećanje biti ispunjeno, za Ustupke - Davanje ustupaka, pri čemu se taktizira sa obimom i dinamikom davanja ustupaka), etc. A small part of the required knowledge is presented in OntoGrafu. (Figure 7). Part of knowledge (Dio znanja):

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In addition to these strategies for conflict resolution represented in the knowledge base, the base also includes techniques for conflict resolution. Some of the techniques are: negotiation, competition, integration, kindness, domination, avoidance, compromise, third party intervention, (pregovaranje, takmičenje, integracija, susretljivost, dominacija, izbjegavanje, kompromis, intervencija treće strane,) induction of superior goals, discussions, threats and coercion, coalition building, adaptation, collaboration, etc. The required knowledge for the application of the techniques are provided in the base. (Figure 8). The techniques of conflict resolution („Tehnike rješavanja konflikta"). For conflict resolutions other means can also be used. Some of them are increasing resources, smoothing relations between the conflicting parties, coercion, directive troubleshooting, change in behavior of employees, changing the characteristics of the organizational structure. Avoiding tactics can be applied if a conflict is low level.
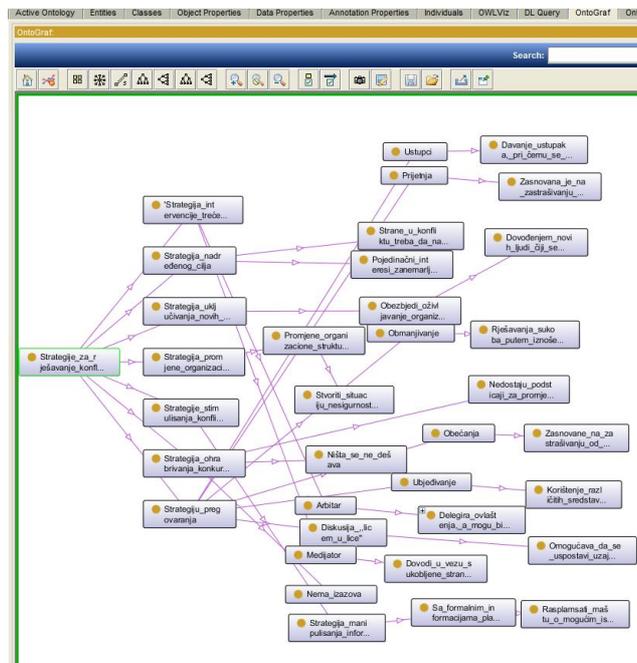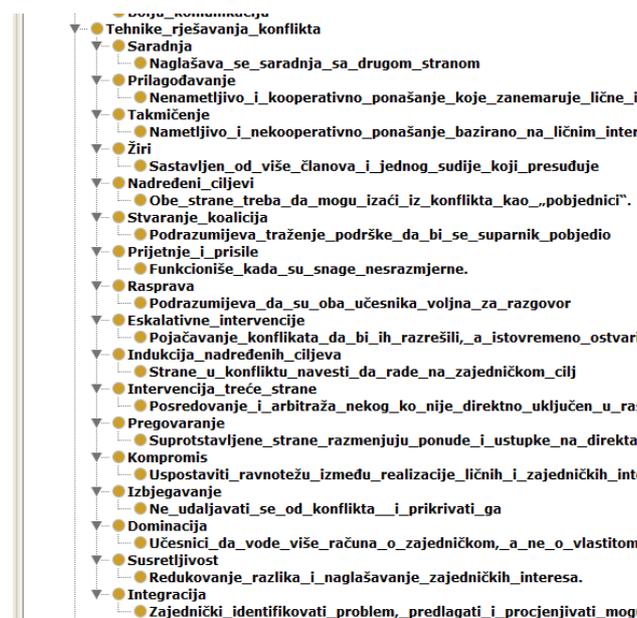

Figure 7 Part of knowledge

Figure 8 The techniques of conflict resolution

4. 1. Pilot implementation

It must be borne in mind that in Bosnia and Herzegovina about 90% of all services citizens and business receive from public administration are performed by local self-government units (municipalities/ cities). Therefore, the implementation of a new software solution "Conflict management in the public administration of Bosnia and

Herzegovina", a new software solution, based on ontologies, was piloted in the three municipalities (local self-government units). Each have a large number of contacts between the service users and the public administration, so there is a high number of potential conflict situations.

When we understand the causes and consequences of a conflict and when we receive and assume all the required parameters, we can move on to build the model, or complex mathematical structures in particular algebra. **Determination of functional areas such algebra and all rules and variables assume the following:**

- Taking into account all functional and other links between users and service providers. In doing so, we followed a metric that allows the flow and exchange of information with all the necessary forms of communication;
- Realization of complete topological network;
- Ability to track all changes of action and update the knowledge base.

In order to define the issues of conflict more effectively, we will implement appropriate mathematical tools. We did not use G. Crown`s tensor analysis, but extremely simple matematical appliances. Therefore, we can not claim that we are 100% set in the right way as something unexpected might happen. However, we feel that the tools are good enough to be effectively used for efficient management of conflicts in the public administration of Bosnia and Herzegovina. We also understand the fact that the language of the theory of conflict can never be absolutely identical to the real behavior, service or a conflict situation.

If the research were carried out in laboratory conditions with strictly passive object where all parameters are under full control, all the results and behavior of the participants would be well-known in advance. This is something we can implement in an experiment, but in the public administration is very difficult due to unknown parameters and those that are not under full control. The situation changes dramatically when the object of the conflict ceases to be passive and when provides active resistance or dissent.

Since the projects were implimented in October 2014 it is too early to draw any significant conclusions on the application of the tool. The employees claim that the process of moving to the new software certainly helped reduce the number of conflicts. They suggest that it created positive psychological effects and these led to a significant reduction in conflicts. A basic problem that needs to be overcome is evaluating on conflicts and their resolution. In the past little time was spent on the topic. There is also no data about the number of conflicts and the impact of their resolution. This could be fertile ground for future research.

Everyone who uses the system can select the strategy and adopt the most appropriate recommendations. Since people differ, specific strategies and recommendations can be good in some situations and bring good results in conflict management, while in some other situations it may not be the case.

5. CONCLUSION

If we accept the reality that conflict will always arise from everyday interactions between individuals with different goals, ambitions, requirements, characteristics and traits, it brings us to the position that we then must manage the consequences of these conflicts. Since these consequences (stress, poor communication, distractions, autocratic leadership, stereotyping) can leave long-term negative effects on service delivery, a timely and proper managment of conflict is essential.

It should be noted that effective conflict management based on knowledge bases and new technological solutions does not necessarily mean their reduction or elimination. The tools only provide knowledge about conflicts and how to resolve them thus generating the potential for their reduction amongst the population.

Mastering the strategies and techniques of conflict management is one of the conditions of successful service delivery. The Selection of which strategies of conflict management to use can depend on several factors.

Conflicts can be seen an integral part of interpersonal relations in public administrations, and as such conflict management is a requirement of successful service activities. Conflicts cannot be avoided, but it can be managed by the successful use of strategies and techniques. Importantly, one should be careful in the choice of strategy because there are many factors that influence which strategy is best in a particular conflict situation. The chosen strategy has be the most effective for solving that particular conflict. New technological solutions based on ontologies can snable its users to respond timely and effectively.

Conflicts are a very important social phenomenon with all its different types, causes and consequences. They can be a catalyst for change in public administration and improvement in services.

The consequences of conflicts must not be forgotten. The task of all employees, and in particular managerial staff in the public administration in Bosnia and Herzegovina is to manage conflicts, and here we present an appropriate and helpful knowledge base and software solutions.

Accurate identification and proper use of new software solutions provides employees and service users with the ability to approach conflict in the correct manner that will increase the changes of them receiving a positive outcome. This, and other software solutions can certainly contribute to a better image of the public administration (Radivojevic, 2014).

In conflict management the consequences resulting from conflict situations should be managed to ensure that they are constructive. Despite the large number of papers, books and research that exisits on this topic, it is clear that this area is

one that still requires additional work and the direction of the debate can be changed. With this paper we have pointed out some of the possibilities of these changes.

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AUTHOR

Radivojevic Mladen, Ph.D Since 2000 I work with the Ministry of Administration and Local Governance and as the professor for informational group of subjects at the Faculty for business studies, Banja Luka Collage, Law Faculty in Banja Luka and at the Faculty of Economy at Sarajevo University. Doctoral theses titled „Methodology for implementation of e-Government concept in BiH public administration reform" were successfully finished in 2005 at the Faculty of Informational Technologies in Mostar and I gained scientific degree as „Doctor of informational science". I published 27 books and 171 papers in various scientific and public publications.