Systems for Local Security: Inter operationability

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Abstract: The Federal state logic is to maximize the well-being of its citizens, which having their basic requirements fulfilled will construct a better society. The lack of effective policies to fight corruption, and high crime rates are some of police security problems. Governments must act in the maintenance of public order and in security as a manner of soften or even eliminate crimes suffered by the contributors. Developed countries have shown that strategic investment in information and communication technologies (ICT's) with intelligence systems is an effective way of crime combat. Therefore, investments in ICT's favors information cross-references in various transactional systems in its institutions, being those city, state, or federation systems. The integration of governmental systems tends to elevate collaboration and to optimize public worker's daily work, having rich data analysis from different organs, solidified in a single system. This work's goal is to provide a technological framework to making security improvement plans in a more efficient way. The integration of information systems in the Santa Catarina Public Security Bureau in Brazil is approached as an example, presenting the way these tools can be used as an important step in obtaining more efficiency in police investigation.

Keywords: Electronic Government; Intelligent Systems; decision support; Information Technology.

Resumo: A lógica do Estado Federal é maximizar o bem-estar dos seus cidadãos, que, tendo suas necessidades básicas satisfeitas irá construir uma sociedade melhor. A falta de políticas eficazes para combater a corrupção, e altos índices de criminalidade são alguns dos problemas de segurança da polícia. Os governos devem agir na manutenção da ordem pública e na segurança como forma de atenuar ou mesmo eliminar os crimes sofridos pelos contribuintes. Os países desenvolvidos têm demonstrado que o investimento estratégico em tecnologias de informação e comunicação (TIC's), com sistemas de inteligência é uma forma eficaz de combater a criminalidade. Portanto, os investimentos em TIC's favores cruzar referências de informações em vários sistemas transacionais em suas instituições, sendo os sistemas de cidade, estado ou federação. A integração dos sistemas de governo tende a elevar a colaboração e para otimizar o trabalho diário do trabalhador público, tendo a análise de dados rico em diferentes órgãos, solidificada em um único sistema. O objetivo deste trabalho é oferecer uma estrutura tecnológica para fazer planos de melhoria da segurança de uma forma mais eficiente. A integração dos sistemas de informação de Santa Catarina Secretaria de Segurança Pública no Brasil é abordado como um exemplo, apresentando a forma como estas ferramentas podem ser usadas como um importante passo na obtenção de maior eficiência na investigação policial.

Palavras-chave: Governo Eletrônico; Sistemas Inteligentes; apoio à decisão; Tecnologia da Informação.

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1. Introduction

Public security is one of the concerns of today's society, whether in developed or developing countries, for crime is not a problem only of developing countries – as it may seem at a first glance. The lack of security is a global phenomenon which takes bigger proportions every day. This may have its origin in the great reach of communication means which help diffuse crime action information from across the planet, displaying crime to people, authorities, and governments.

As a manner to soften criminal action, the public power slowly uses technology and creates a new informatized society paradigm which seeks to improve citizen services through the efficient use of technology. This article intends to intensify the notion that entering the age of information passes through G2G (Government to Government) by the adoption of intelligent electronic government systems.

This article has proposed to display the subject of citizen security in an almost innovative perspective, through the use of information technologies as a way of supporting decision making for public workers, in order to prevent and fight crime.

From the electronic government concepts, which begin by having information technology applied to database integration of local security institutions, crossing references with computer information analysis tools and later interpretation by the authorities.

The topology chosen to integrate systems will be explained to present cross-referenced data visualization strategies, through a theoric-empirical study, using document research and presenting a Brazilian study case.

2. Theoric Referential

2.1 The part of the Federation in promoting Public Security

The Federation must be present in all places, and therefore it needs a citizen answering structure, no matter the size of the country. Security however has a vital part for the maintenance of the modern law of nation and that structure tends to be affected by use of information technology, in present days.

According to the e-readiness report of the United Nations (2004), under developed country governments begin to realize the gain that could come from the synergy between the new technology information interaction and

communication, education for the population, and a proper environment for technologic development.

These economic relations which compose fund circulation in society can be categorized basically in e-commerce and e-government. In this basic division, the private and the governmental sectors are defined.

According to this classification, this paper approaches e-gov, as defined in the 'E-Government Outlook' report, in which e-gov is the systematic use of information systems and communication technologies in order to transform the relationship between citizens, companies, and government. The document affirms that e-gov is attained to the systematic use of information and communication technologies by governmental organs, in order to transform the relationship between citizens, companies, and government. (E-Government Outlook, 2005, p.1)

The UN (2004) defines e-gov in a broader view, as any service that the government offers through the Internet. According to the United Nations, e-gov has information and service offering services for citizens, businessmen, and between government organs by e-mail. E-gov can be still considered as the use of information technology to raise efficiency of governmental organs.

Regarding the relation between digital media institutions, there is still a quite usual definition by O'Brian (2004), who categorizes economic relations of digital economy according to the agents involved in the economic relations, which can be basically: business-to-consumer (B2C), business-to-business (B2B), consumer-to-consumer (C2C), and government-to-citizen (G2C), which are about information and service obtaining by the citizens, as well as interaction between citizen and government.

In addition, there is information circulating between government organs, in government-to-government (G2G). According to the concept of the Minas Gerais information technology company (2007), G2G is an e-gov initiative to integrate governmental services, whether to restructure or modernize processes and everyday work. This institution claims that there are government-to-business (G2B) activities, which are e-gov initiatives to provide information and services to businesses, as well as to develop or attract business to a certain region.

In this paper, the concept to consider is the interaction between governmental organs, in a synergic interaction of its systems – the G2G field.

3. Information Integration in Government Systems

It is known that the use of information in governmental sectors to help decision making by public workers is a strong weapon to fight bad usage of public funds. However, this information must be generated in a reliable manner, for if it is not done so, the administrator may find imprecise or incorrect data, which make the creation of necessary troubleshooting strategies impossible.

Decision making can be used by many segments of the public and private cores, but public organs still do it ignorantly. This may occur due to little governmental tradition in innovative administration methods. Unlike private organs, which invest as a tradition in efficiency through new technology and theories, making important change and improvement. It can be observed that the absorption of techniques adopted in the private sectors is slowly being taken by public management.

Other organizations within the Federation use the ICT's to expand business, such as criminal organizations. Many times, criminal groups use top of the line methods and techniques mentioned by Silva, "with the amazing advance of technology in the most significant sectors of the globe, criminal groups use the newest forms of transport and communication. They do better than governments, using advanced management, production control, and distribution techniques. This is the case of drug cartels" (Silva, 2006, p. 26).

It can be noticed the gap in existing technology usage, as well as in investments to develop other technologies to incorporate the best practices in public administration.

Research, development, and innovation are considered by many public workers as expenditures instead of investments, leaving this important part for the private sectors. This occurs due to being medium or long term investments of intangible yield. In most cases, the incorporation of new technology raises efficiency – especially when well implanted.

Globalization has diffused technologies from center economies to peripheral economies, and that has generated more information flow and knowledge sharing around the world. The process was held back by institution bureaucratics, for the benefits of technology were refuted by fear of its workers, who have a strict criterion on modernization.

However, the new knowledge based technologies led to changes in the previous criteria. Knowledge is every day more solid in the technologic society of great information flows, especially in communication means such as television, radio and Internet. That has created a great amount of information in

institutions. Though it is not interesting to only possess a great amount of information without a tool capable of helping a user to interpret that information.

According to Máximo (2004), it takes the ability of generating precise and correct information for decision making, for nations to develop. In public or private policy projects, it is consensual that the best strategic resource is generated information.

However, a problem may occur on the generation of a huge amount of information, for the use of this data without proper storage makes further access and use impossible.

It is noticed that the world is spinning too fast and Castellis (1999) gives evidence to that: the environment in which governments, companies, and communities interact is changing because of information economy. Information acquisition, treatment, and storage are changing their basis, and speed, flexibility, and innovation are the new keywords in this new environment.

Having the problem in focus, the use of governmental electronic services is being initiated in an elementary manner, for the use of e-Gov goes beyond the creation of websites for the citizens – it can also explore an enormous amount of possibilities. Zimath (2003) claims that the futuristic approach of electronic government presents G2C, G2B, and G2G.

However, before offering benefits of the information era to the external public, the government must put effort in improving existing technologies to create self-sustainability mechanisms, making efficiency in organizations its utmost priority.

It is no easy task to improve existing technologies, for the use of information technologies does not guarantee the success and achievement of objectives without intelligent collaboration based in organization competences: excellence in work processes; dynamics in relating with the community; value and motivation of human capital; simplification of management methods and swift publication of the knowledge which will avail strategies to last, and to bring benefits for the government and its society. Rocha (2000) mentions that countries, states, and local governments do not develop entirely if those do not use precise, up-to-date and fast information on the best way to optimize resources generated in its societies. The federal government has an important part in this process and it should encourage other organs, but all organs must take responsibility, especially the local governments, and the private sectors.

Rocha's view shows that the appropriate information treatment can help institutions to work on various kinds of troubleshooting, whether it may be economic, administrative, or social problems.

The use of information technology must be seen as a manner of softening one of the main social problems, and one of the most relevant problems of all times – violence in society. This can be an ingenious way of fighting this evil, which afflicts people every day stronger. According to Melo (1999): “Crime is complex in the late Twentieth century; this is the attribute which will direct the most precise and efficient manner of fighting or controlling it”.

The use of knowledge management can make a difference to prevent and fight crime in these information society days. To make that possible it is necessary to invest in mass technology, enhancing action planning and generating efficiency in fighting crime.

3.1 Planning Information Usage

The plans for information usage have strategies which focus the acquisition of information. In our opinion that information must be:

1) Confidential: guarantee that used data is accessed only by authorized personnel;

2) Integer: exact and reliable information, as complete as possible;

3) Available: security for authorized users to access information when necessary, with the help of an analytical tool.

A full and reliable system must have that kind of information. However, the appropriate information does not guarantee the success of information usage – it guarantees the adoption of reliable and successful strategies for acquisition plans, storage, and later use, of information management.

The strategy creation process and the involvement of people in knowledge construction should necessarily involve command staff – managers and supervisors of process and operational base, or else a far from ideal tool will be used, and it will not answer to the institution demands.

Institutions are under a hierarchy in which all collaborators must supply the information database with solutions to raise efficiency in its actions. However, in order to solutions to be supplied, the command staff must receive relevant information to solve on demand, to optimize work. This is a constant re-supply process of information flow, used for the institution’s best interest, to soften

possible conception errors in knowledge management. Figure 1 shows the supplying process.

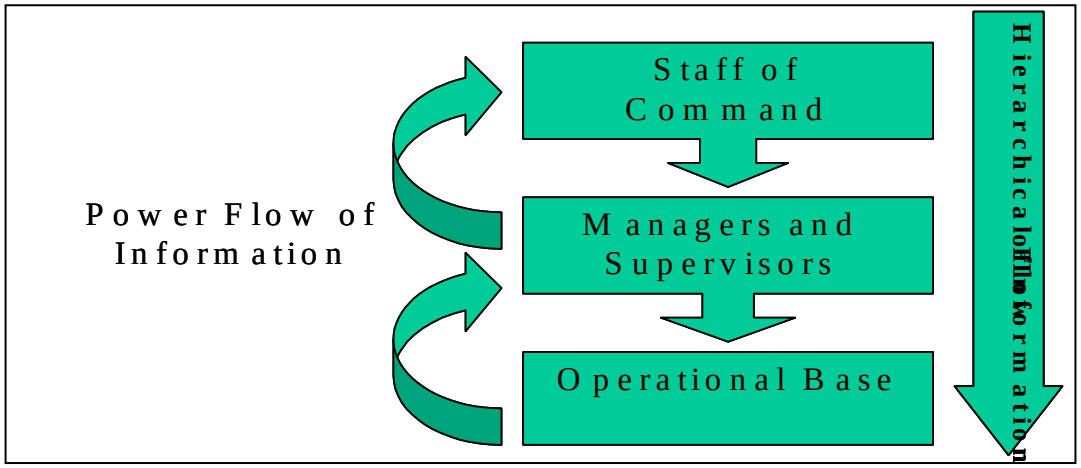

Figure 1: Information flow

Information presented by the operational base help idealize the intelligence system for decision making. Most systems used by operational base institutions are tools or systems which execute registry and control of daily work. Information is stored in idealized data banks, mostly to present simple reports without internal cross referencing or reports external to the institution. Cross referencing and information between systems generate new knowledge and give the superficial view analyzed a holistic view.

The intelligence system helps the exploit and analysis of tactics and management information of public or private institutions, simulating and prospecting traceable and reliable data. In this sense, the system cannot produce new information, for it is dependant on the build, but it can create new administrative and operational perspectives for efficien applications or actions.

The intelligence system makes the process swifter and assures data access, making coordination fast because it does not need to use many systems to acquire precise information, making a more consistent data analysis available. Diniz emphasizes that the information manager may act more reliably with technology: “(…) One of the main state modernization paths is the result of strategic, intensive use of communication and information technologies (ICT’s) in the internal relation of governmental organs, and also in the relation of public sectors and citizens or companies (…)” (Diniz, 2002, p.5)

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Inside this institutional informatization process through the adoption of a system which makes data cross reference possible, it is fundamental to respect technologic autonomy of sectors, organs, or institutions. One of the advantages the knowledge era has proportioned is the possibility of integrating various databases, and various market technologies. If appropriately studied, it is possible to cross reference data and have results displayed in a dynamic manner to the final users who access it.

It is important to have an intelligence environment which follows a certain sequence, face an environment of multi-faced technologies. It is prudent to have a filtering layer. This is a treatment area in which data extracted from systems is sent for storage, in which the solid base of various, previously selected information is available for utilization of the methodology and specific tool interface, which have acted on the storage structure. This interface displays information through dynamic reports, statistic data, or a relation network.

It can be informed that most tasks tend to be done by obtaining or treating information from institutions. Figure 2 shows an idea of system architecture.

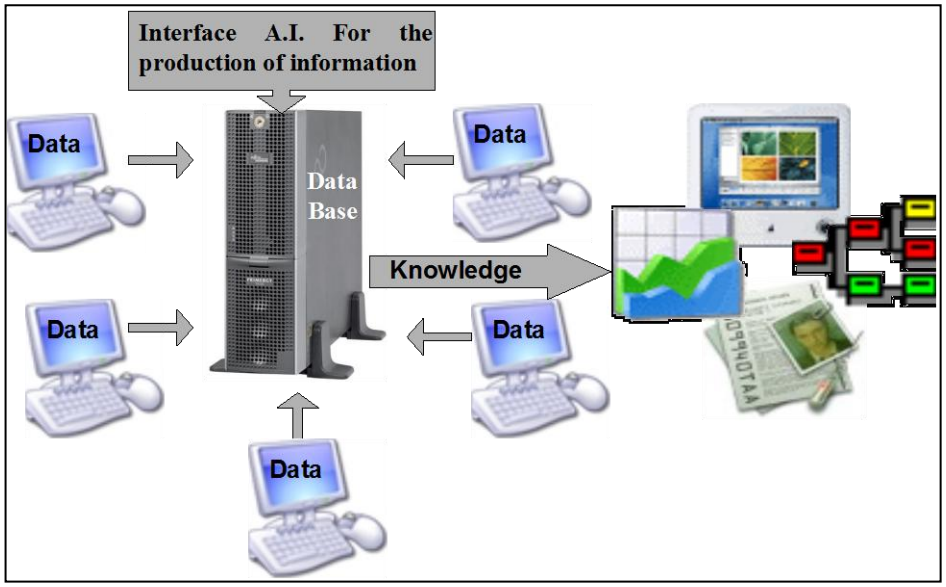

Figure 2: Artificial Intelligence and Knowledge Management

However, to get to this development stage of an intelligence system to manage information, some steps cannot be neglected as exposed, not necessarily in this order – the order of steps depend on the point of the process in which the organ currently is.

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- Software Implementation

Establishes the implementation, migration, and adoption of solution strategy, based on specific, previously analyzed, appropriate to objective software.

- Digital Inclusion

Establishes procedures and coordinate information control institutional action strategies.

- System Integration

Establishes procedures and governmental organs system integration paths.

- Inheriting Systems and Usage Permission

Establishes criteria to evolve from inherited systems and establishes norms and paths to renegotiate contracts to big suppliers to reduce costs and diminish dependence.

- Management of Websites and Online Services

Establishes paths and policies to integrate and optimize online governmental services and information.

- Network Infrastructure

Establishes retrieval and creation of existing network infrastructures to integrate voice, data, and image in the government.

- Government-to-Government

Establishes creation of integration paths for inter and intra organ application of federation persons, state, city, and other powers.

- Knowledge Management and Strategic Information

Establishes analysis and creation of paths to generate and manage knowledge database in institutions to generate strategic knowledge.

It is evident that these stages do not guarantee success in informatization process by integrating existing systems, though those help setting action goals to execute through knowledge management.

As a manner to present good practice while developing a process by adopting a decision making management system through knowledge management, a Brazilian example is presented – the Public Security Office of Santa Catarina state, which started the process of using an intelligent system.

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4. Integrated Knowledge System in Public Security

Crime is every day more engaged in using whatever they can to continue succeeding in their criminal actions. Authority actions are every day more necessary to neutralize such actions against society.

The usual manner with which the government acts on this problem requests a strategic re-adaptation, and the use of more efficient paths to fight and prevent crime. Technology has been marking society, every day more intensively in the last few decades, so its employ in government makes pragmatic means more solid to face difficulties from criminal groups.

In order to supply authorities (being federal, state, or city authorities), as well as constituted powers (executive, legislative, and judiciary powers), government anticipates adversary actions through criminal and civil information cross referencing and analysis through scenario projections, assembling criminal action neutralization strategies.

Some states put efforts in generate the missing differential in security actions to fight crime through information management.

The initiative of Santa Catarina state is described by the creation of the Public Security Integrated System (SISP – Sistema Integrado de Segurança Pública) which acts on the utilization of an intelligence environment to obtain information on various institution systems in the Security Office (Military Police Department, Civil Police Department, Prison Administration Department, Military Fire Department, State Traffic Department and General Forensic Institute).

4.1 Information Management in Public Security

The public security office had stank transaction systems without inter operability, which stored daily community service. Now it is based on knowledge diffusion and information management, which enhances quality by integrating information through the use of a work system which cross references information related through networks. This technology helps information visualization and its analysis.

The system selects relevant data in the various security office systems by a group who coordinates the process. The information from the office's organ systems has been later stored in a filtering and information treatment database. The information comes from the jailing system, military police occurrences, civil police information, traffic department, fire department occurrences, and from the identification and criminal forensics system.

In the system database information is stored in data bank tables and the system treats inconsistencies by organizing data for later consulting. Due to the differences found between technologies existing in organizations, a few systems have been developed to collect information, and others have been re-structured to fit the information management adopted philosophy. This may occur in places in which there are no systems, and in which some community services must be informatized to obtain a great number of citizen information.

To assure security in the process, a manager must be elected to conduct methodology. In Santa Catarina state, the Director of Information and Intelligence, who managed the information management process, has been in charge of that by providing inter institution information, and controlling information access, obeying the current legislation of intelligence activity (usage and control rules).

The system reads the database according to request and presents the institutions information found in an organized manner. Visualization can be made through reports or relation networks called hyperbolic tree, as presented in Figure 3.

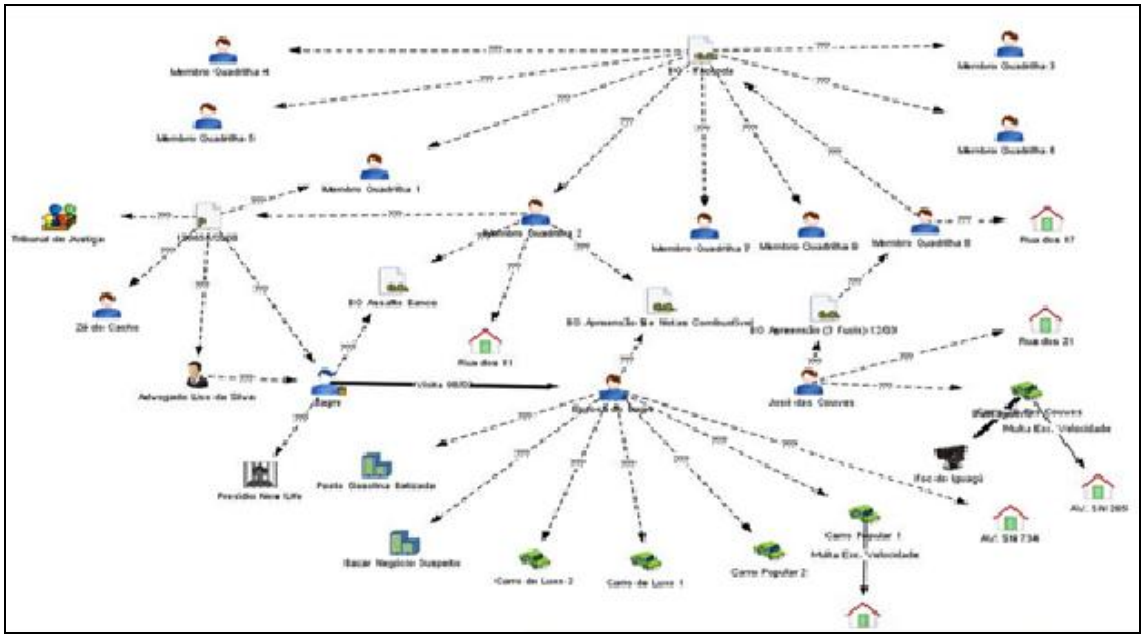

Figure 3: Relation Tree

This exhibition makes analysis easier for it shows information grouped by institution, which means concentration is shown by the institution which made data available, and the inter-relation is shown by every data every institution has on an individual or group in a search.

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The integration of registered data of regional police stations is an example, as well as the cross referencing of information between local organs. This will make authorities to make better investigations, plan better police actions, and have more effective prison actions. In Santa Catarina state, if one crosses information of the identification institute with the jailing system, it is found a considerable amount of people arrested with false documents.

Integration between police stations is a long term action, accessing information on occurrence registry of various police stations, previous prison time, and forensic investigations. This information is presented at the same time, without the security analyst having to enter various systems, spending time when looking for suspects, or waiting for information.

Although the Santa Catarina state security office system is already running, it is far from being completed, for the information which can be aggregated will make this tool an icon of investigation and intelligence operations, making information search through internal public security office institutions, external organs, or international organs possible.

The next step after the incorporation of all institutions' information is to join the Judicial and find its information online. Arrest warrants, lawsuits, and other data will be cross referenced to jail visitor information as a manner of limiting the search area for a possible fugitive. Without extrapolating the possibilities that a tool such as this can do when put to public security services, it can also be mentioned that information from public service companies, including its consumers, could identify even money laundry businesses.

Undoubtedly governments have used the benefits of information management in public security areas. This is only the beginning, and the integration of databases on federal or even international levels will bring even more benefits to society. One can only believe that investments in this area will occur.

5. Conclusion

This article has approached the use of information technology tools by the area of Public Security. It has noticed the historical lack of security caused one of the main problems of contemporary society. Even the Federation, which is responsible for citizen security, is facing problems to fight crime.

Through history, the private sectors of economy have been more dynamic and therefore have been investing more capital volume in information technology. A great part of criminals also use technology to manage their illicit business, making citizen security actions even more difficult.

Reality begins to alter as the Federation notices the need of investing in communication and information technologies, looking for synergy gain which comes from the use of such technology. The use of information technology helps the interaction between government and citizen, government and companies, and even government and government.

Regarding government-to-government relations, it is important the use of information to fight crime. In the case of the Santa Catarina state Public Security Office, the use of knowledge management with artificial system in the Public Security Integrated Knowledge System is reference.

The philosophy on the system has been developed with the goal of improving interaction between databases between the Santa Catarina state Public Security institutions. Development took stages related to software implementation, digital inclusion, system integration, inherited systems and usage permission, website management, and network structures, into account. The system allows data analysis by its analysts, and it also helps the elaboration of anti-crime strategy reports.

Information management in the public security office more precisely selects relevant data, treats inconsistencies, and organizes a knowledge database. From that point, information is exposed in a relation network manner, which makes knowledge representation easier.

The Santa Catarina state Public Security Office takes an important step in a delicate moment of society, in which crime uses information technologies to profit from the Federation's high level of bureaucracy.

The initiative is valid for it does not focus only more efficient anti-crime actions – it also saves time and funds spent in an investigation process. This intelligent war on crime should be disseminated by the various government levels, especially local governments, which would act more effectively against criminals, and citizens would feel more secure, and have better life quality.

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