



## Possibilities of the spatial information system usage by the Internal Security Agency

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### ABSTRACT

The article concerns the possibilities of the spatial information system usage by the Internal Security Agency. We are currently living in the age of informational society. The progress in the fields of technology and IT, which has been taking place over the last years, has expedited and facilitated access to information. Exchange of information is important in all forms of activity, also in the activity of the Internal Security Agency. The ISA's operational-fact-finding and analytical-informational actions include obtaining, gathering, processing, and analysing information. A useful tool for performing these actions is the spatial information system, which is the combination of information with geographical location. Databases, which are an integral part of the geographic information system, are also helpful.

**Keywords:** ISA; GIS; security; databases

### 1. INTRODUCTION

Spatial information is an important element for security services while performing actions aimed at providing security in the broad sense. There are many possible ways of usage

of the spatial information system by security services, e.g. by the Internal Security Agency. One of the main tasks of security services, not only of the ISA, is obtaining different kinds of information. The spatial information system is a helpful tool while obtaining information as well as while processing it.

## **2. THE POSSIBILITIES OF THE SPATIAL INFORMATION SYSTEM USAGE BY SECURITY SERVICES**

### **2. 1. The Internal Security Agency**

The Internal Security Agency is a service the main goal of which is to realise tasks connected with the protection of the security of the state and the constitutional order<sup>1</sup>. The overall principles of its operation were regulated by the law of 24<sup>th</sup> May, 2002 about the Internal Security Agency and the Foreign Intelligence Agency. The ISA's statutory tasks include: recognition, prevention of threats to state's security and order or prevention and recognition of crimes and pursuit of criminals. The examples of crimes belonging to the area of the ISA's operation are: espionage, terrorism, corruption, illegal production and trade in arms, explosives and intoxicants [2]. One of the main tasks of security services, not only of the ISA, is obtaining different kinds of information, e.g. about the mentioned threats and crimes, in order to secure the state's interests. This implies that a very important role is played by the analytical-informational actions, which are basically about obtaining and processing information [3] being significant for the statutory goals, as well as the operational-fact-finding actions. Though the exact methods and tools used by the ISA's agents are not commonly known, the possibilities of the spatial information system usage may be indicated.

### **2. 2. Spatial information system**

The spatial information system (SIS) obtains, process, and makes available all data containing spatial information and accompanying descriptive information about objects distinguished from a spatial area under the operation of the system [4]. The SIS is also called the geographic information system (GIS). Access to information is essential in the times of rapid technological development and shaping new life standards. An inherent part of the spatial information system is a dataset containing spatial and descriptive information about objects of the real world. An important consequence of the spatial information occurrence in the SIS is the possibility of cartographic presentation of the databases' elements and making analyses leading to conclusions about the real world [5,19].

### **2. 3. Operational-fact-finding actions**

The operational-fact-finding actions are one of the most efficient ways of obtaining information by the ISA. The legislator has not created any legal definition yet. The operational actions are defined in the doctrine as the security services' activities connected with fighting criminality. According to the definition of the Polish security services' dictionary, operational actions are all non-public activities taken up as part of security services' operational work, aimed at acquiring certain knowledge concerning cases of interest

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<sup>1</sup>Ustawa z dnia 24 maja 2002 r. o Agencji Bezpieczeństwa Wewnętrznego oraz Agencji Wywiadu, Dz. U. 2002 nr 74 poz. 676.

for given services [6]. They constitute a crucial ISA's tool for the realisation of its statutory tasks. The operational-fact-finding actions are also treated as a system of documented in writing (not minuted) activities of services performed on the bases of the principles of law, criminal knowledge, and internal regulations [7]. These activities are supposed to lead to the reconnaissance of criminal environments, thanks to which it is possible to reveal crimes and criminals. It is worth noticing that apart from obtaining information the services also analyse, process, and protect the information.

It should also be highlighted that, next to classic observation or operational analysis, one of the forms of the operational-fact-finding actions is making use of sets of information. Having appropriate information is very important, and the way of using and finding it is equally significant. The mentioned analytical-informational actions also applies here. Their aim is to process information and pass it on to certain units for the protection of security [8].

#### **2. 4. Databases**

Databases constitute a huge, interconnected electronic dataset which enables the access to the information contained in the set and the possibility to process it [9,11].

A database has a specific internal structure; four basic types of databases can be distinguished:

- Hierarchical (HDBMS – *hierarchical database management system*) – a database with a tree structure of connections (data with one distinguished top). Records of this type of database have one-way connections and may be related to many “daughter records”, while a daughter record indicates connection with only one initial record. A drawback of this structure is hindered data modification. The first hierarchical databases were created by an American company IBM to the needs of the Apollo mission in the 1960s [10].
- Network – this database model is a modification of the hierarchical model. Net database model was created in order to solve the problems connected with the latter. Just like in the hierarchical model, there is a tree structure of data. An advantage and a difference at the same time is the fact that many trees may share branches; every tree constitutes a part of the general database structure.
- Relational – data stored in tables. Each one consists of records (tuples) and fields (attributes). In the relational database model the order of the records and fields does not matter. Every record is distinguished by a unique value (primary key). As a consequence, a user does not have to know the physical setting of the record he wants to read. In this matter the relational model differs from the hierarchical or network model, in both of which an emphasis is put on structure [11].
- Object-oriented – a basic element of an object-oriented database is an object, which is a basic unit representing information. Objects have properties called fields. Object's fields may obviously change [12].

For database operation a database management system (DBMS) is used. Such system provides creation of databases, communication with databases in order to search information and administer an existing dataset. The most common database management systems are: ORACLE (created by the CIA), Microsoft (Access), My SQL [13].

Currently the relational-object-oriented databases are gaining popularity. They constitute a compromise between the relational and the object-oriented databases. The infrastructure of the relational databases is elaborate. They allow users to treat data as objects, but they have an internal mechanism of data storage, which is the element of the relational data. Such databases may have a very essential feature, being spatial data. An example of a system operating the relational-object-oriented databases is *Oracle Spatial*. It provides the structures and functions enabling gathering, processing, and presenting spatial data. The Oracle Spatial module gives the possibility of storing the whole object's geometry. Thanks to this, on the objects located in the database standard questions as well as those including spatial aspects may be asked. At this point it is worth highlighting that that both spatial and descriptive data are located in one database. The abovementioned databases are operated by the Structured Query Language (SQL). The language provides searching data in a database, operating data, defining it, and navigating it in a database. Simple form of queries in SQL is used for searching records in tables which fulfil particular conditions [14].

It is worth highlighting that spatial data can be displayed, manipulated, and analysed thanks to spatial attributes. A spatial attribute indicates a position on the Earth. This spatial feature is usually delivered by a pair of coordinates which enables the setting and the shape of an object. Spatial data is gathered and stored in two basic forms: raster and vector [15]. Such a system may be then extremely helpful in shaping the state's security while making strategic, preventive, or protective decisions. The queries in SQL provide such analysis by creating connections in the database management system, thanks to which different kinds of relation, not only between people, can be easily found.

With the use of the SIS it is possible to find connections, e.g. between given events taking place in a specific area. An advantage of such a database is also a cartographic representation of events. Sometimes "tables" present little information, while showing an event in space provide us with much more. An example of a situation in which the ISA may use such databases is performing informational and investigatory actions in order to detect an organised criminal group of arms dealers. Having appropriate information about the members of the group it can find connections between them thanks to proper queries. Different kinds of data may be used here, e.g. locations from which they log in to social networks, using public Wi-Fi spots, withdrawals from ATMs. Thanks to this it is easier to plan an operation.

A new term is developing intensively around the world: Big Data. Big Data stands for an immense amount of data (terabytes, petabytes of data) which is impossible to process in traditional ways. The definition of Big Data is still being shaped; it used to stand for volumes of data but currently Big Data is treated as a set of unstructured data. Standard database systems store data of certain structure, most often it is the relational model, the object-oriented model, or the combination of the relational-object-oriented structure. However, it is difficult to store some data in the abovementioned structures; this may be data e.g.:

- coming from numerous sources,
- having various structures, incoherent, impossible to present in a table,
- dynamic,
- of great volume.

In the aspect of providing security, Big Data has been developing since 2011, when the Big Data analyses contributed to locating Osama bin Laden. The effect of the application of the geospatial analyses depends mainly on gathering, sorting, and final use of data. Every day the amount of remote sensing and other geographical data increases, which makes the traditional analyses in the GIS insufficient [16]. More and more extensions are being made, which are able to analyse immense sets of unstructured data. Such extensions are:

- GeoEvent makes it possible to react to events in real time. When the location of a monitored object changes or certain criteria are fulfilled, automatically and simultaneously a notification to the key personnel will be sent, the map will be updated and added to the database. Notifications can be sent very fast on many channels, like e-mails, texts and messages. GeoEvent is an extension being able to trace dynamic assets which change their position all the time (like cars, planes, ships) or fixed assets. Thanks to this security services may get the information about current location of the objects of interest [18].
- MapLarge is a fully functional map platform created to visualise data, analyse Big Data and simultaneously publish datasets. Using MapLarge, security services are able to gather great amounts of data in one place.
- GeoXray uses intelligent filtration of e.g. messages on online blogs, maps, or photos according to place, time, and topic. This extension may give security services more time to analyse obtained information, instead of manual searching through the Internet. GeoXray is able to monitor immense amounts of unstructured data which may be used to predict results and human behaviour [17].

### **3. CONCLUSIONS**

While performing operational-fact-finding actions and analysing obtained information not only the Internal Security Agency can use such an information searching and processing system but also many other services, e.g. the Foreign Intelligence Agency, CBA (*Centralne Biuro Antukorupcyjne* – Central Anticorruption Bureau), or SKW (*Służba Kontrwywiadu Wojskowego* - Military Counterintelligence Service) [19]. This is because of the fact that the majority of laws concerning security services mention tasks connected with obtaining information and its exchange, which means that its role in the activity of security services is significant. The spatial information system provides the possibility of visualising gathered data e.g. in the form of maps, which is very helpful and expedites decision making [20].

What is more, an important task of the ISA (as well as of other security services) is sharing essential information, significant for the protection of the state's security, with proper institutions (e.g. police) as part of cooperation. When it comes to the relations between police and the ISA, these were regulated by the order, according to which the two institutions are obliged to exchange or make available information to the extent necessary for the realisation of statutory tasks, or comparing information and checking its completeness or validity<sup>2</sup>.

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<sup>2</sup> Rozporządzenie Prezesa Rady Ministrów z dnia 28 grudnia 2010 r. w sprawie przekazywania informacji, udostępniania dokumentów oraz udzielania pomocy służbom i instytucjom uprawnionym do prowadzenia poszerzonych postępowań sprawdzających, kontrolnych postępowań sprawdzających oraz postępowań bezpieczeństwa przemysłowego, Dz. U. 2010 nr 258 poz. 1750.

It was not specified there by what means the services could exchange certain information. The abovementioned SIS and relational-object-oriented databases could make the cooperation run efficiently. And when it comes to a particular agent of any other service, he can easily find needed information using queries in SQL, thanks to good database administration [21].

The spatial information system may be then used in many ways in the action of the Internal Security Agency, thanks to which it expedites the realisation of the services' tasks.

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