PROTOTYPE SIMULATOR OF POLICE OPERATIONS IN CRISIS AS A TOOL USED IN THE PROCESS OF FUTURE COMMANDING PERSONNEL'S EDUCATION

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The paper presents an issue of updating methods of commanding personnel's training course on commanding police operations by means of simulator of police activities in crisis. With regard to fundamental forms of simulations used in armed forces' combat operations, the article describes a prototype of a simulator of police operations in crisis. The prototype which is under construction will be oriented at improvement of the process of commanding the Police force at all levels (as far as its function is considered) and will be used to simulate physical (real) phenomena in artificially created environment. The proposed solution is a computer system which by means of modeling and simulation techniques will present interesting for executives' training course fragment of reality. The article also presents principles of creating and applying simulation solutions by means of AI systems in trainings of security services. The presented prototype of a simulator will enable future commanding officers to become comprehensively familiar with principles of command and during simulations it will prepare them to put these principles of command into practice.

Keywords—simulation systems, crisis situations, security services, simulation training

The Polish Police have been given a difficult task of providing security and public safety, creating an image of high public trust and providing the highest level of security with the simultaneous concern for guests and competitors during the European Football Championships 'EURO 2012'. The process of preparing and carrying out the event requires from the law enforcement services improvement of the commanding personnel's training methods including the ones of commanding Police operations.

Among many principles of professional education, the one of using visual things in teaching and the other of relationship between theory and practice should be emphasized. The first one allows to understand and remember the taught material better when the reality is presented in a graphic or symbolic way. The second one is a supplement to the first one. It tells that the acquired knowledge has to combine a specific activity and its practical application. This rule, which emphasizes both theory and practice, is always respected in the professional education. That is why it is believed that the ones of the best teaching methods are simulation methods which are the most complex type of a teaching game[1].

A simulation game is both a teaching tool and a main or auxiliary part of a teaching process. Efficient simulators significantly raise the standard of education and reduce the cost of training.

Modeling and simulation of armed forces' combat operations are carried out on three planes: the first one concerns trainings for decision-makers in chosen, hypothetical or real conflict situations, the second one deals with issues of decision support during a real conflict and in the third one the nature of armed conflicts is being analyzed. Data availability, accurate reflection of a situation, cost of the operation, time of preparations and above all safety of all participants matter greatly in the each of all aspects mentioned above. The process of command's, staff's and army's training is of a particular importance because of a continuous demand for qualified commanding officers ready to manage modern systems of fight. For over a dozen years a computer simulation of combat actions has been the major method used in trainings, prediction and research. This method is understood as a method of studying or imitating a real or theoretical system through building its model and then experimenting on the model and analyzing the achieved results. [2] The above concerns also activities of law enforcement agencies.

There are three main forms of simulation in armed forces' combat operations: :

- real simulation – it embodies field and command post exercises with the use of electronic devices for recording and signaling events on the battlefield;

- virtual reality – it presents spatial scenes on the battlefield with the use of graphical processes and a copy of a human is one of the elements of theses images thanks to the application of physical, visualization and sound devices;

- constructive simulation – it is based on formal models of fight processes and it is carried out by computers with the participation of humans as operators.

Simulation environments may be configured variously depending on the purpose of exercises, scope of the experiment and types of tasks performed by the computer system. Continuous changes in computer technologies lead to synthetic environments of battlefield which use all forms of simulation.[3]

Meeting contemporary expectations, the Higher Police School in Szczytno is building a simulation prototype of Police operations in crisis, which will be oriented at improvement of the process of commanding the Police force at all levels (as far as its function is considered) and will be used to simulate physical (real) phenomena in artificially created environment. Such an action is a sine qua non of successful teaching process because causing social phenomena that the Police have to control is not possible in the reality due to both costs and citizens' security and safety. After all the main idea of contemporary actions is to achieve a particular goal without unnecessary losses.

The simulator will carry out a model procedure of a simulation game based among others on:

- establishing games principles which will enable to control its course,

- adjusting principles to players' abilities,

- preparing scenarios of situations (however, the game may develop spontaneously when more experienced players are involved),

- developing an information circulation system,

- working out rules that will limit players decisions, for instance the ones concerning effectiveness, actions in conformity with law, security etc., ,

- determining a random factor in the game,

- 7. indicating the role of an instructor

- 8. preparation of technical equipment and facilities

- 9. preparation of assessment plan and discussion on simulation after its conclusion.

Command in Police is an oriented, intentional action of a commander, carried out within police activities, ensuring high capabilities as regards police power and resources and aiming to achieve the goal of the activities. It is also characterized by particularly effective, one-man decision-making and responsibility, precise division of and control over the progress of activities.[4] Command is such an activity of a commander who organizes, plans, coordinates and directs actions of his subordinates as well as imposes orders and objectives on them. A commander in his work is supported by staff. Command is a process which can be carried out by people with profound subject knowledge, professional and life experience as well as with adequate predispositions. In this context, command should be recognized as a form of art and therefore it is governed by some regularities. Achieving success in commanding police forces depends on a commander's (and their staff's) understanding of some rules influencing the whole process of command, including commanding principles.[5]

Commanding principles are both theoretical and practically verified general norms of rational behaviour, which describe the most rational ways of commanding (by commanders, staff members) during preparation and carrying out of police force within the confines of police actions. They are frequently a criterion for assessing correctness of activities and they also serve as practical hints allowing to choose the proper way of performing an action. Recognizing and applying those principles allows commanders to work effectively on protection of safety and public order. Neglect in that sphere may lead to failure of actions, loss in property and in extreme cases to loss of life of police officers or the outsiders. Therefore, an effort should be made during the process of training to instill in the future commanders the maximum knowledge of commanding principles and allow them to have practical training in order to gain experience. During the training, it is necessary to focus on five basic principles: unity, continuity, integration, decentralization, mutual trust and understanding.[6]

The prototype simulator built in the Higher Police School in Szczytno will allow to acquaint future commanders with commanding principles and prepare them to apply those principles in practice, thanks to simulation training.

The configuration of simulation environments may be various, depending on a purpose of training, the scope of an experiment and the type of tasks of the computer systems. Constant changes in information technologies lead to the era of synthetic environment of fields of fight, using all forms of simulation.[7] The models of combat operations of various armed forces and joined operations aim to illustrate complex processes on the battlefield, including decision-making processes such as planning and management. Similarly, the models utilized in the simulator of Police operation in crisis fill also accomplish the above mentioned aims.

The solution proposed by the Higher Police School in Szczytno will be a information technology system, which will be used to simulate reality and events occurring within this reality. The objects modeled into this simulated reality will be created with the use of parameters of objects existing in actual reality and those objects will be adequately equipped so that they will look realistically and interact with each other. Such environment will allow to simulate the majority of real events and observe the consequences of those events. The objects include such elements of environment as: trees, buildings, vehicles and people. The entire training will be carried out in accordance with the binding law and procedures.[8]

The abilities to apply the commanding principles in real life will be practised during the training on how to use algorithms and procedures prepared for the cases of crisis situations.

The first commanding principle is unity, which is understood as assigning all operations and activities to one commander. This principle allows to plan and carry out the tasks in a cohesive way. The commander makes decisions and is responsible for them and decisions of his or her subordinates.

In the simulator, the possibility of using that principle has been expressed through adequate preparation of exercises and carrying out of the tasks according to the roles ascribed to a trainee.

The second principle is continuity, which is understood as a constant, uninterrupted influence of the commander and commanding bodies on the process of planning the operations, their preparation and course. Continuity of commanding is achieved by monitoring the course of events, firm and consistent implementation of the decisions and plan of actions. However, that does not mean mindless sticking to the planned solutions. What is needed is an immediate response to the changing situation. An important element in maintaining continuity relies on comprehensible arrangement of order of commands in particular cases.

During the simulation, this principle will be applied by means of the following tasks:

- On the position of a commander of the operation – commanding of the forces, taking into consideration the possible changes resulting from the current situation on the spot and reacting flexibly to those changes;

- On the position of a commander of the suboperation – systematical identification of operational situation in the place where a given mass event takes place;

- At the staff's centre – being in touch with the commanders in order to exchange information about the operational and tactical situation and any unexpected events.

Integration is the next commanding principle which is included in the simulator. This principle assumes such a commanding structure which provides a commander with the capability to achieve the aims in a decisive and effective way. Organizational structures of command should be constructed in a way that would meet requirements of every operation and integrate its particular components by means of functional and effective commanding system. This system is understood as a set consisting of people, rules, material resources and methods of behaviour, which are included in the organizational framework of this system. The system should compose of the following components: organization of command, command resources and a command process.

An interesting modern principle of command is decentralization. Despite the fact that the first principles that has been mentioned involves one-person responsibility for the made decisions, the decentralization principle allows to transmit powers to some particular commanders of lower levels. That makes it possible to act more freely and react more quickly in the places where the problem occurs. Decentralization in command develops the sense of responsibility in commanders of lower level, by necessitating creative actions, frequently under time pressure.It is simultaneously a driving power of development of the future commanding staff, because a properly dosed responsibility for overcoming the difficulties causes the formation of the proper habits useful in a self-reliant work as a commander. Commanders, who will decide to transfer authorization, should clearly determine their intention and the borders of free actions for a commander of the lower level, his powers and restrictions. The correct determination of aims, which are to be achieved, is also important. Nevertheless, a necessary condition of the correct decentralisation remains still a complete knowledge of situation in the responsibility area, at every moment of a lasting action.[9] The realisation of this rule in practice causes also the isolation of some forces and means at the disposal of a commander of the lower level.

During the seminars with the use of the simulator, while preparing the documents, police officers will determine first a correct organisation of the commanding system. During the preparation stage a division into sub-operations may take place.[10] This division has to secure the commanding efficiency within the approved system of commanding an operation in order to reach the highest efficiency and effectiveness of actions. It causes also an isolation of forces and means as well as setting task assigned to the commanders of sub operations. During simulation, the commanders of sub operations will be obligated among others to perform the following tasks:

1. elaboration of the own working plan by a sub operation commander and presenting it to the operation commander for approval,

2. elaboration of a commanding system, coordination and supervision over the plan realisation of a sub-operation commander,

3. a current elimination of factors, which hinder a proper preparation and realisation of a sub-operation, an immediate report to the operation commander about any potential threats, which might have an influence on quality during realisation of the sub-operation aim,

4. preparation, planning and commanding the Police forces within the confines of a led sub-operation in a situation of collective violation of the public security and order.

Apart from the theoretical knowledge, it is essential in the preparation stage to join theory with practice. The right theory is a simulator of the rational practice[11]. Therefore, during the exercises with the use of a simulator prototype, the emphasis will be placed on the correct relations between the operation commander and his staff. In this cooperation, it is also very important to be open for new ideas and solutions because often duplicating without thinking 'old and verified'

methods (even if they were effective) causes the decrease in operations' effectiveness.

Thanks to the modern simulator solutions, the trained officers will be able to practice repeatedly all variants of actions in an identical or very similar environment to that, they will have to work in during 'Euro 2012', together with the opportunity to evaluate the used solutions and taken decisions. It would discard too much simulated actions (exercises), which finally not always satisfied both an instructor as well as a student, often leaving the conviction of being too unrealistic.

Simulations will be created in a form of predefined scenarios, supervised by an instructor – teacher leading the training. The instructor will also be allowed to modify a scenario or to generate additional situations. It will enable the creation of diverse decisional situations on the basis of one scenario depending on the level of a trained person. It would be possible to combine the scenarios and to play them in a real time, what will enable the complete calibration of the difficulty level of a performed task. This kind of exercise preparation will enable the participants of a training to develop skills such as applying the commanding principles, thus predicting the consequences of own decisions in the further situation course and not only simple studying the cause-effect compounds with an exactly defined assumptions.

Training with the use of a designed simulator, first of all should practice the commander's activity in searching for simple and simultaneously effective solutions for decision problems. The training participants, having the opportunity to work in a team and to observe own reactions in the terms of emotions similar to the real ones, should also acquire positive thinking and develop their attitude towards success.

The solutions used in the simulator will be fully flexible – changes in structure, commanding organisation as well as responsibility of the services will not influence the system work and simulations will be immediately adapted to the new needs. In fact it will cause the engagement of a significant number of instructors leading the exercises as well as intensification of organisational efforts but a strong motivation of the training participants, formation of positive attitudes of the future commanders, thus the ability of efficient decision taking according to the current law is an educational virtue which is worth taking efforts[12].

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