Security and Safety Requirements for Soft Targets in Czech Republic

Lucia Duricova, Martin Hromada, Jan Mrazek
Faculty of Applied Informatics
Tomas Bata University in Zlin
Zlin, Czech Republic
e-mail: {duricova, hromada, jmrazek}@fai.utb.cz

***Abstract*— This article describes theoretical and management requirements for organizations in the safety and security sector. The aim of this article is to define the primary law framework and to propose evaluation attributes which can help to implement an effective management system in this sector. The article also proposes and describes the solution for system application of security requirements by understanding the soft targets threats. The proposal consists of technical requirements, law requirements and management requirements, as well. The system solution is different for each organization and object; however, the main structure is the same.**

Keywords- Management system; Safety requirements; Soft targets; System solution.

I. INTRODUCTION

Soft targets are objects that do not have special security and safety measures in place. Soft targets are specified objects with a large number of visitors in one place at the same time, and special security measures are not implemented at those locations. One of the main causes of danger is uncontrolled visitors moving in soft targets. People who visit soft targets are a source of risk. Examples of soft targets include: cinemas and theatres, shopping centers, schools, universities and so on [5].

In the Czech Republic, the first security and safety layer is defined by legal measures. In the proposal of the solution, the first security and safety layer is divided into four sections.

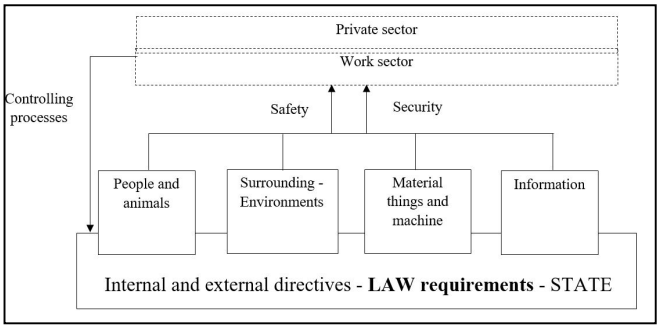

Figure 1. Sectoral breakdown of law requirements.

These four sections are identified in the following paragraphs.

- People and animals – this section is about life and health protection. First is human life, then animal life [4].
- Surrounding and environment – this section is about requirements for safety and security in the surrounding. It is divided in different sections: environment, work places, public places, crowded places and others [1].
- Material things and machines – this section is about using machines and working with things, and about requirements for use and development. Development of things, buildings, machines, as well as product requirements are included in specific requirements [1] [4].
- Information – this section is about classification, use, transfer and about removing information as well [10].

Law requirements and technical information are defined in the first security and safety layer. The technical information is present in the technical standards and European regulations. Currently, our society has a lot of approaches to security and safety solutions with some differences. These differences were identified in risk assessment in the decision making process and terminology. In this research, serious certification standards from special sectors are used, but the work could be exploited for support in other sectors; for example: evaluation of fire risk, more risk analysis, definition of workplaces and machines and others.

After its implementation, software experts could make effective decisions, consequences could be smaller and experts could know the real current status of an object; for example, a building fire. Experts work with software to see the building division, machines and economical risk, calculation of statics and others. As the result, experts could use knowledges from other experts to make a decision. This is the main advantage of this solution.

A. Typology of Objects

- Commercial objects – An owner uses legal measures and also technical requirements. Companies identify stakeholder requirements and then they are translated into internal directives. These objects have special operating rules. The commercial objects are divided

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into two zones: first, the industrial zone and second, the public zone (shops).

- State objects – The state objects are divided into private zone and public zone. Special state objects could be identified with special conditions for use and work with special information and other processes.

The commercial objects can be managed by International Standardization Organization (ISO). ISO standards are international standards that define the organization degree in terms of quality, security, processes and other categories. These degrees are identified by the number of the ISO standard. For example, ISO OHSAS 18001 defines Occupational health and safety in organizations. Every organization that has this certification, has to fulfill the requirements defined in that standard [8].

The reason for ISO certification is business opportunities. Commercial organizations want to achieve better product quality and increase economical profit.

The protective security role of the Security department in any organization is that it is the protector or guardian in charge of company's property, product or merchandise, assets, equipment, reputation, and employees. This responsibility is not limited to the company's assets and employees. It extends to nonemployees as well, regardless of whether they are guests, patrons, customers, or any other visitor on company property [8].

Soft targets are different because of different business aims. A shopping centre does not invest financial resources to implement ISO standards because the customers do not care about ISO standards; however, they care what shopping centres are selling or what the price is. The same is true for theatres, museums and cinemas. These objects do not integrate ISO standards to processes. This research paper proposes an integration to achieve better security and safety in these specific objects.

Legal measures are applied in soft targets. Legal measures consist of Occupational Health and Safety (OHS) requirements and Fire protection (FP) requirements. Secondly, camera systems for monitoring the current situation are present in soft targets. Lastly, technical systems for monitoring closed buildings are present in soft targets. The above conclusions are the results of examination of objects and consultation with the object management.

Our behaviour is the first important aspect in an object. Every visitor must know rules and obligations. This process is in relation with technology and processes that were identified in the object. It is the reason why we must know how the object works. We can identify attributes and processes that are linked with security and safety risks. Every requirement is defined in other sectors (commercial business organization). This research wants to integrate current requirements into one system and its implementation into a software solution. The software solution for soft targets could help experts define reactions to incidents. Our research concentrates on system integration that has been applied into soft targets. The system integration effectively protects soft targets from danger. The software solution contributes to the right decision making and could lead to an improvement of the current situation in soft targets.

The reminder of this paper is organized as follows. The elementary requirements for commercial buildings and legal measures for occupational health and safety are defined in Section 2. In Section 3, the elementary requirements for the fire protection sector are defined. In Section 4, the proposal of management and software solution and the primary principles of fuzzy logic are identified. The elementary principles for the software solution are identified in Section 5.

II. LAW FRAMEWORK

In the Czech Republic, the safety framework is defined in legislative documentation in Occupational Health and Safety and Fire Protection. In businesses and companies, rules are set in place for everyday work. The framework consists of technical requirements that are defined by technical standards.

The input to documentation and rules are management standards in commercial objects. These management standards evaluate companies in the world and grant the quality label. This group (commercial objects) should be divided into the following subgroups:

- Production companies
- Non-production companies = Trading companies

In this paper, the primary lines of defense for specific security and safety options in soft targets are identified. A soft target is an object or place that has borders without special security and safety preventative actions. This is the reason why they are easy targets for our society. Many people have performed uncontrolled actions in an open space or a building. Security or safety incident should occur in this situation, it could be very quick and people could be very threatened.

A. Occupational Health and Safety

The legislative framework defines obligations of the employer. The labor code defines employer responsibilities to employees and also defines the system. This part of the paper defines the primary principles which have to be fulfilled.

- If two or more employees are present in some workplace employers must inform each other about risks and measures.
- The responsibility of the employer is to ensure occupational health and safety for every person in the workplace (the employee must be informed about it in writing).
- Risk prevention includes measures that minimize risk to an acceptable level
- Acceptable risk is defined by the law, by calculation or by expert review.
- Expert review is based on experiences and knowledges.

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- Every risk must be evaluated, defined, minimized or eliminated.
- Preference is given to collective protection before individual protection.
- Every person that will work at the workplace must be informed about security and safety rules.
- Every employee has to be trained when starting at a workplace, and when changing working process due to new procedure and or introduced technology.
- The employer has to keep a record and evidence of every accident that happened at the workplace in an accident book.
- Employer has to keep evidence documentation for every accident that has been incapacity more as 3 calendar days or in case that injured employee died after accident.
- Minimum for controlling process of OHS is defined once a year [2].

This primary rules could be used to define the system security solution that could be more effective in objects. In working processes, employers have to fulfill more rules, but the only important and useful rules that could be used for every person in the object, are defined in this paper.

- The Czech law defines employees and employers, but in §12 applicable law is understood every person, who must keep this rules (self-employed persons, family of employees, sponsors of building). More law documents apply to construction activities.

In the Czech Republic, special law requirements are defined in legislative documents that have to be kept for working with machines, technical components or other pieces of equipment.

Technical rules for OHS:

- Definition of handling places for working with facilities.
- Definition of technological processes and working procedure according to the producer.
- Definition of installation and removal of protective cover.
- Definition of using operating components without risk's zones on facilities.
- Definition for using actuating devices.
- If a machine or other equipment is not specified by special law, it has to be verified once a year [3].

According to the government regulation no. 361/2007 the collection of Czech Republic laws specifying the temperature for working areas and places is defined. These are divided into three groups:

- Category A - working place with high level of quality.
- Category B - working place with middle level of quality.
- Category C - other places. This definition is known as work classes.

In this paper, two groups are defined and thse are class I. and class IIa. Class I. defines working activities with minimum movement, and it includes administration work activity, control activity, work with computer and so on (Class IIa.) [4].

B. Occupational Health and Safety Management System

This standard covers OHS management that provides organizations with the elements of an effective OHS management system that can be integrated with other management requirements and help organizations to achieve OHS and economic objectives. This standard specifies requirement for an OHS management system to enable an organization to develop and implement a policy and objectives which take into account legal requirements and information about OHS risks. This standard is intended to apply to all types and sizes of organizations. The overall aim of this standard is to support and promote good practices, in balance with socio-economic needs [9].

For this research, we have chosen the following terms and definitions from this standard:

- Acceptable risk – risk which has been reduced to a level that can be tolerated by the organization having regard to its legal obligations and its own policy.
- Continual improvement – recurring processes of enhancing the management system (for this policy, it is OHS, although our research could be applied to other groups, too) in order to achieve overall improved performance (in specified group) consistent with the organization policy.
- OHS – Occupational health and safety – conditions and factors that affect or could affect the health and safety of employees or other workers, visitors or any other person in the workplace.
- Corrective action – action to eliminate the cause of a detected nonconformity or other undesirable situation. Corrective action is taken to prevent recurrence, whereas preventive action is taken to prevent occurrence.
- Preventive action – action to eliminate the cause of a potential nonconformity or other undesirable potential situation.
- Nonconformity – non-fulfilment of a requirement [9].

For this research, the process of continual improvement will take place in all areas of activity simultaneously. These rules could be implemented into the system security and safety solution, because this standard is generally accepted in the world and organizations. This standard subscribes to the following approach to reduce the risk:

- Elimination.
- Substitution.
- Engineer controls.
- Signage, warnings and/or administrative controls.
- Personal protective equipment [9].

This framework could be implemented as a management system for solving the risk in the proposed solution. It could

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be implemented in other kinds of organizations and objects. It is the main reason for implementation. The level of security and safety in a situation in the case of soft targets depends on the correct setting of measures.

III. FIRE PROTECTION

In every building, fire protection is defined by the law requirements. In a new object, it is first present in the building documentation. Three groups are identified in the process of construction management:

- Project construction documentation.
- Expression of relevant state administration – the statement of firefighter rescue in which is technical administration fire protection.
- The dealing with construction permits.

If the building is in operation, it means that the building uses legal measures and adheres to fire protection requirements (according to purpose of the object). The purpose of the object is analyzed by fire load which is defined in the fire safety design of the building by a chartered engineer. In the Czech Republic, a fire compartment is defined as bordered unit which should stop spreading of fire to other building units. The zones are bordered by fire barriers; the fire resistance is determined by fire risk, respectively according to the expected duration of the fire. The building structure, which is not divided into fire compartments, is considered as one fire compartment. The building object has to be divided into fire compartments in the case when it exceeds the size of the fire compartment determined by calculation according to CSN 730802 (Fire protection of buildings – non-industrial buildings).

If the object is in operation, the manager has to ensure fire protection by qualified staff. In the Czech Republic, this needs to be done by a professional with qualifications in fire protection. In these processes, a qualified person has to define operation rules that are based on technical administration fire protection, laws requirements and risks in the object. Fire safety equipment, rules of using, and revision interval have to be defined in these processes. Fire management is about proposing effective protection in the object by plans and activities; however, it also involves the training and implementation processes and plans into working process. This is the connection between management of an object and management of an organization.

IV. THE PROPOSAL OF SAFETY AND SECURITY MANAGEMENT AND SOFTWARE

The current findings were described in the previous section. The main reason is that these findings were confirmed with research and practical use. Fire protection is the main field which we can use to define our new approach. The soft targets were classified in international standards for building. Building requirements in standards are justified. The problems are identified in implication. Experts use the standards as a minimum requirement and therefore they do not integrate them into the system.

The activities that are done in the object have some similar characteristics:

- The emphasis is on preventive actions.
- The four phases could be implemented: Plan, Do, Control, Act. These phrases are common with more sectors.
- Documentation must be implemented to processes and internal politics must involve required measures applied in practice.
- In the object, technical components are used and these components must be analyzed by a qualified person.
- Crisis situation training improves efficient immediate response.

The safety and security management should be effective in objects and organizations. The managers must understand processes that are in the organization and after that, they could see more types of risks. This process where input studying of ties between more as one group of security or safety risks.

As can be seen in Figure 1, there are defending primary groups of security and safety objects. Managers implement protective measures to processes to ensure better security and safety situations in the object. The application of these measures is similar with other measures that are described in international standards and state laws.

People are the main reason security and safety measures are implemented into process or activity. In the analytical part, the ties between people and other attributes are analyzed. Ties are depicted in Figure 2.

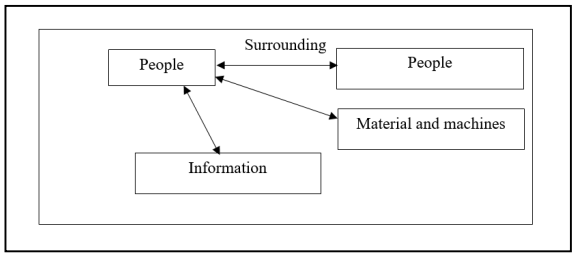

Figure 2. The linkagess beetween four groups of objects.

In these four categories, two procedures that must be identified are proposed. The first procedure is the definition of characteristic and classification. The classification defines attributes which are similar and different. The second procedure is the definition of practice and processes and it has to be followed. The security and safety attributes have to be defined for this security and safety analysis. It means that every process, which could be connected with people and these other four groups of objects, has to be reconsidered according to security and safety attributes. After the definition of the main cause and other causes, the process has to be edited and reintroduced to operation. This solution has analytical part number 1, analytical part number 2 and the last predicting part number 3.

The first part is the study of objective situation and the past actions. The proposed analytical part has the following next steps:

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- The analysis of the current state of the object – familiarity with processes in organization.
- The definition of the risks.
- The definition of the main cause and other causes.
- An assessment of the impact of other processes for risk.
- The proposal of permanent corrective action and immediately corrective actions.

The second part will be designed for immediate management in the object. It means that it will be supported with immediately actions, but in real time. This part will be in a continuous process. This part will be similar to the first one; however, inputs will be extended of technical values from technical components. There is a connection with integrated technical measures.

The third predicting part will predict situations and conditions that could happen when operators or managers change attributes, e.g. introducing new machine to object (requirements for using, safety, fire protection, high level of security and others). Each of these solutions shall have a technical and a management part.

V. SOFTWARE SOLUTION

The disadvantage of this solution is that, for managers and owners to implement this system solution, they must know a lot of specific knowledge and also have experience. This could be solved by one software and systematical solution.

This is the main factor which influences the software solution; therefore, the authors propose fuzzy logic as a tool for realizing software support. Fuzzy logic is based on more options for a solution and supports more experts for solving. It minimizes requirements for managers and operators because managers will be supported by the system. This solution could reduce the incidence of human errors.

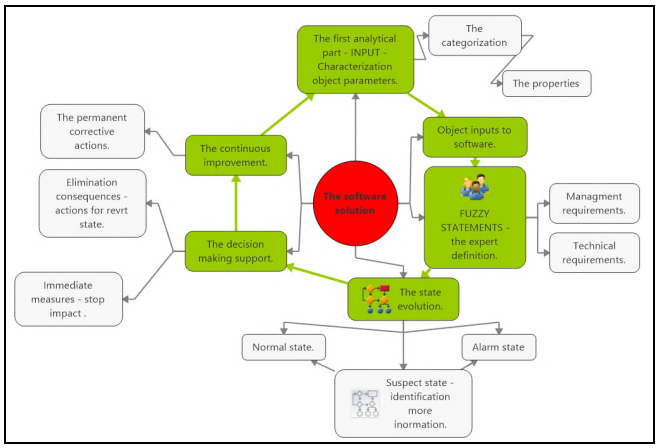

Figure 3. The proposal of software solution.

The proposal integrates management principles and software support into one solution. The proposal of software solution is presented in Figure 3. Fuzzy logic studies a whole range of values in the interval between 0 and 1. The classical logic studies two states. These states can be true (1) or false (0). The expert knowledges and experiences can be coded by fuzzy logic. Fuzzy logic works with fuzzy statements. These fuzzy statements represent degrees of support for the rule.

VI. CONCLUSION

In this paper, we proposed a software solution for soft targets. The main advantage of our proposal is in the system approach that manages security and safety situations inside an organization. System integration could increase the effectiveness of more security and safety processes, as well as of manager processes. In the presentation of our safety and security solution, we considered different groups of attributes.

The utilization of fuzzy logic is the subject of further research. The proposal takes into account the realization of a software tool that would replace the need for a large number of experts in individual objects by fuzzy logic.

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