

THE OPPORTUNITY OF REPLACING THE HUMAN FACTOR WITH TACTICAL AUTOMATED SECURITY SYSTEMS

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Abstract—The use of advanced technologies in daily operations of an enterprise is no longer surprising. Yet, replacing the human factor with technology is a very sensible matter in the contemporary society.

The purpose of this article is to study the security risk analysis, the physical and economic opportunity, followed by the final SWOT analysis of replacing the human factor with tactical automated security systems in the guarding and security processes of an enterprise.

Keywords—tactical automated security systems, enterprise resource planning, enterprise safety, risk analysis

I. INTRODUCTION

STATISTICAL, in the last ten years, Romania clearly shows a major discrepancy between municipalities that manage safety and public order problems only with human factor (where we have an increased level of aggressiveness of groups, decreased safety in public space and the number of accidents, the number of thefts and robberies are reaching alarming levels) and municipalities where the human factor is assisted by technology for civil security, the human factor being used to its true value, namely to centralize and analyze data, while for collecting information Tactical Automated Security Systems (TASS) are being used in field (a much more efficient evidentiary means, ubiquitous and a with a flawless memory), statistical in this municipalities, from one year to the next the security and safety incidents are exponentially dropping, reaching in the year 2015 the level of 50% the number of major incidents compared to the year 2005. [1]

Scientific observation is a methodical phase of analyzing and evaluating the results obtained in practice while projecting and implementing the Tactical Automated Security Systems in different projects on which I have worked. I will also use the experience I have in analyzing and evaluating results of the Tactical Automated Security System which I have studied for preparing this paper.

The working assumption is demonstrating the fact that implementing a Tactical Automated Security System

which will partially replace the human factor in the security and safety process of an enterprise will reach to lowering the crime level in the enterprise and will decrease the number of both internal and external risk factors that act on the security and safety of the enterprise.

II. OPPORTUNITY ANALYSIS

A. PHYSICAL SECURITY RISK ANALYSIS

In the opportunity analysis we will develop we will rely on the risk evaluation methodology implemented in Romania by the Ministry of Interior through the Romanian Police.

A very short presentation of the Romanian legislation [2]-[4], adapted to the European legislative norms, related to risk analysis.

To obtain an effective risk analysis we have to insert all the identified risks in the following matrix:

PROBABILITY	4. frequent					
	3. probable					
	2. occasional					
	1. isolated					
		1 Insignifiant	2 minor	3 moderate	4 major	5 Catastro physically
	IMPACT					

Legend:

C	Critical Level
R	High Level
Mo	Moderate Level
Mi	Minor Level

Fig. 1. The matrix representation of the identified risks

Based on this matrix the Romanian Ministry of Interior has developed 12 different Risk Level Evaluation Grids for 12 different types of objectives (banks, stores, national security objectives, etc.). For an objective to reach an accepted security level it has to prove a risk level under 60 points, 100 points meaning the highest level of risk and 30 points (+/- 5 points depending on the security objective type) meaning the minimum risk level that can be calculated in the Risk Level Evaluation Grids.

The Risk Level Evaluation Grids analyze data related to the objective type, the mechanical and physical protection (windows bars, walls, premises access, etc.), the Tactical Automated Security System present in the premises, monitoring the security systems, the human security guards and aspects related to the material values and the cash float present the objective.

B. THE PHYSICAL OPPORTUNITY

In the argumentation of the physical opportunity of using the Tactical Automated Security System instead of the human security guards we present the following arguments:

1. *The Video Surveillance Systems supplies an exact picture of the event with second precision timing. It has no memory loss and supplies exact information concerning the distances, timing intervals and other required data, for example a car number.*
2. *The security breach alarm systems have a 100% level of vigilance, they work 24/24 hours without getting tired, they never turn their back to the incident, they are never sleepy and they do not have low working capacity due a very hot day. Also, a well-projected security system cannot be neutralized without signaling before the neutralization to the dispatch the Sabotage signal*
3. *The Tactical Automated Security System, whether they are Video Surveillance Systems, whether they are Alarm Systems, or Access Control Systems, act simultaneous in several points, way more than the human security guard does: it surveys seismic or through vibrations sensors the slightest shock of an enclosure fence, it surveys movement with great precision, it surveys temperature change, floor, walls and roof vibrations resulting an impossible perimeter breach without detection.*
4. *Tactical Automated Security System cannot be corrupted and it has no feelings. The system works based on algorithms and it does not change its behavior due to some exceptional circumstances.*
5. *In opposition to this matters, the security guard has the disadvantage of being "human". For example, the human security guard has feelings. In a rainy day the human security guard may give access to a child or a pregnant woman in the premises to give shelter from the rain. This fact*

can constitute a serious security breach, the child can steal something valuable for the enterprise or can subsequent provide valuable information to criminals regarding the classifies security information of the objective.

Another example, the human security guard can have a personal problem that will affect his capacity to concentrate on his work and to analyze and evaluate the threats. For instance, his child, or a family member can be ill.

6. *A final argument would be the argument of value: if a criminal, in his attempt on breaching the secured perimeter destroys parts of the Tactical Automated Security System we have an only material loss.*

But in case he would harm or kill a human security guard, the loss of life cannot be valued.

C. THE ECONOMICAL OPPORTUNITY

In the argumentation of the economic opportunity of using the Tactical Automated Security System instead of the human security guards we present the following arguments:

We will study the hypothesis of securing of a 4000 square meters storehouse where we evaluate [2]-[4] the necessity either of a 24/24 human security guard post, either a performant video surveillance system combined with an alarm system containing optical barriers.

In case we want to study a larger space, the necessity of additional agents would be roughly the same as the necessity of additional video cameras and alarm sensors or optical barriers for the Tactical Automated Security System.

- 1) *A 24/24 human security guard post reaches an annual expense of at least 83.052 lei [5]*

TABLE I
 MINIMUM WAGE CALCULATOR IN ROMANIA STARTING
 WITH MAY 1ST 2016

Income Type	Value
Gross salary	1250
Vouchers	0
The employee pays state budgets	325
Net salary	925
The employer pays the budgets	288
The total cost of employer wage	1538

- 2) *A 16 HD Cameras Video Surveillance System has initial installing price estimated to 16.000 lei. The annual expenses are:*
 - a) *Electrical energy consumption: 400 lei.*
 - b) *Accounting amortization expenses: 3200 lei.*
 - c) *Maintenance and service expenses: 500 lei.*

- d) *Total annual expenses: 4100 lei.*
- 3) *A complete perimeter security alarm system containing optical barriers has an estimated initial installing price of 15.000 lei.*
- The annual expenses are:*
- a) *Electrical energy consumption: 300 lei.*
 - b) *Accounting amortization expenses: 3000 lei.*
 - c) *Maintenance and service expenses: 200 lei.*
 - d) *Annual monitoring, fast security response: 1800 lei*
 - e) *Total annual expenses: 4100 lei.*

Therefore, the 24/24 human security guard analyzed an pct. II.C.1 has annual costs estimated to 83.052 lei.

In opposition the two security systems analyzed at pct. II.C.2+II.C.3 would have a total cost in the first year of 40.400 lei, and in the following years the total annual costs would be only 7.600 lei.

TABLE II
COMPARING THE ANNUAL COSTS FOR 5 YEARS BETWEEN
THE 24/24 HUMAN SECURITY GUARD AND THE TACTICAL
AUTOMATED SECURITY SYSTEM

Costs (Lei)	24/24 Human Security Guard	Tactical Automated Security System
1st Year	83.052	40.400
2nd Year	83.052	9.400
3rd Year	83.052	9.400
4th Year	83.052	9.400
5th Year	83.052	9.400
5 Years Total:	415.260	78.000

We conclude therefore that is cheaper to use the Tactical Automated Security System for 5 years than it is to use a 24/24 Human Security Guard for 1 single year.

C. S.W.O.T. ANALYSIS

S - Strengths

- 1) *Increased security and safety of the objective.*
- 2) *The quality efficiency of the Tactical Automated Security System is superior to the human factor.*
- 3) *The Tactical Automated Security System costs in a 5 years cycle are only 20% of the costs required for a 24/24 Human Security Guard Post.*
- 4) *Tactical Automated Security System cannot be neutralized without sending a sabotage signal before the neutralization.*
- 5) *Tactical Automated Security System work based on algorithms and executes the processes accurate and immediately.*
- 6) *Tactical Automated Security System does not make human errors and do not take decisions based on feelings.*
- 7) *Communication with the dispatch is instant in*

opposition with the human factor which takes about 0,5 minutes.

- 8) *In the case of an attack we lose an electronic equipment, not a human life.*

W- Weaknesses

- 1) *Tactical Automated Security System stop functioning if we have a 72 hours electric power failure.*
- 2) *The continues video image is saving lasts only for a short period (20 days to 6 months). For further savings the data must be stored on external storage devices.*
- 3) *At high sensibility adjustment for the sensors false alarms may appear, which increases the monitoring and fast security response expenses.*

O - Opportunities

1. *Increasing the security and safety of the objective.*
2. *Reducing the expenses to 20% of the initial costs.*
3. *A more efficient detection in attempted perimeter penetration and attempted sabotage detection and instant communication with the dispatch.*

T - Threats

- 1) *Reducing the security guard posts and dismissing employees can create a negative image for the enterprise.*
- 2) *Certain legislative measures need to be implemented regarding the new guarding plans, the new approval of the technical security projects, and for public institutions informing the National Supervisory Authority for Personal Data Processing*

III. CASE STUDY - COMPANIA DE APA ARIES S.A., TURDA

Compania de Apa Aries S.A., Turda (The Aries Water Company, Turda, Romania) serves over 100.000 persons in Cluj County, Romania.

In the year 2014, before our enterprise security policy analysis, the last public acquisition contract for security services had a value of 1.827.114 lei without VAT.

Following the evaluation of the whole enterprise security and safety policy which took place in November - December 2015 we implemented a project of investments in Tactical Automated Security Systems, the human factor being repositioned to its true value, which is to centralize and analyze the information, make decisions and fast security response to incidents.

When the project is completed the total annual enterprise expenses with security services will be 756.697 lei. We must also consider the exceptional fact that the minimal wage in Romania increased with 19% during the implementation of the project. The total

delivering and installing expenses for the Tactical Automated Security System are 604.663 lei without VAT.

To be more precise, in the 17 work sites of the enterprise, which will be further called security

TABLE III
 COMPARING THE EXPENSES BEFORE AND AFTER THE
 TACTICAL AUTOMATED SYSTEM PROJECT WAS
 IMPLEMENTED AT COMPANIA DE APA ARIES SA, TURDA [6]

Nr	Objective Name	Annual Expenses	Tactical Automated Security System	Annual Expenses
		before the implementation	Installing expenses (Lei without VAT)	after the implementation
1	Axente Sever	83052	19.189	7.038
2	Ciocarliei	332208	107.994	24.799
3	Bogata Birou	83052	15.789	6.358
4	Bogata Nr. 3	166104	49.432	96.138
5	Calarasi Gara	83052	28.925	8.985
6	Campia Turzii A. Muresanu	83052	17.614	6.723
7	Campia Turzii Barnutiu 9	83052	23.225	7.845
8	Cornesti 7	83052	15.302	89.312
9	Com.Cheia	166104	20.095	90.271
10	Mihai Viteazu	83052	25.678	91.388
11	Moldovenesti	83052	47.388	12.678
12	Poiana	83052	62.450	98.742
13	Turda Centura	83052	32.394	92.731
14	Cetatea Romana 1	83052	47.563	95.765
15	Cetatea Romana 2	83052	37.630	10.726
16	Fagariste	83052	24.403	8.081
17	Ion Ratiu	83052	29.591	9.118
	TOTAL:	1.827.144	604.663	756.697

objectives, or simply objectives, by implementing the Tactical Automated Security System we have reduced the 24/24 Human Security Guard Posts from 22 to 7, reducing expenses from 1.827.144 lei without VAT to 756.697 lei without VAT.

In the following table we will detail the expenses for each objective, and we will highlight the difference between the expenses before the Tactical Automated Security System project implementation and after the project is completed.

IV. CONCLUSIONS

Based on the conducted research in this paper it is easy to conclude that partially replacing the Human Factor with Tactical Automated Security Systems is advisable, efficient and financially profitable.

It is recommended therefore a comprehensive analysis on macro level of all the security and safety policies having the purpose of streamlining the security policies and processes considering the views presented above.

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