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COMPETITION ON THE WHOLESALE MEDICATION DISTRIBUTION MARKET IN ROMANIA

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Abstract: Wholesale distribution of medicines in Romania was in the constant attention of the competition authority. In order to analyze the operation of the distribution system practiced in Romania, but also changes that may occur in this system on short and medium term, the Competition Council conducted a sector inquiry after which they found some malfunctioning mainly chained to distributors access to certain medications. Conducted on a sample of 23 pharmaceutical groups operating on the Romanian market and holding approximately 80% of the pharmaceutical market in Romania in 2009, the sector inquiry aimed at two objectives, namely:

- Legislation analysis with impact on the wholesale distribution of drugs;
- Market analysis of drug distribution.

Following the findings of the high concentration of markets analyzed, due to significant market shares held by innovative drugs under investigation were analyzed also the penetration of generics in the market and the factors that led to this situation.

Keywords: generic drugs, innovative drugs, competition, wholesale distribution.

JEL Classification Codes: I10, I11

1. INTRODUCTION

To achieve a representative analysis on the wholesale distribution market, the Competition Council started from the top 50 best-selling drugs in Romania, drugs that cover approximately 40% of the Romanian market, and that any distributor wants to have in the portfolio to be competitive in the market. Therefore, to achieve the objectives, we identified 92 markets at ATC 4 level, the value representing 70% of total market in 2009.

After analyzing how distributors have access to existent drugs on the 92 markets identified at ACT 4 level, but also at the best seller drug from each relevant identified market (In the situation in which on a relevant identified market exists more than 1 medicine from Top 50, has been analyzed the distribution of each medicine that is in Top, thus, finally, have been analyzed 107 medicines) has been discovered that, in general, there are no significant problems on the distribution market. Thus, in more than 55% of cases the distribution is made by a number of over 10 distributors, while in only 9,5% of the cases the distribution is made by a number smaller than 5 distributors.

Regarding the identified market, after making the analysis, has been discovered that at whole level, the exclusive distribution agreements does not cover a significant part of the market. Therefore, in 2009, the value of drug sales distributed on the basis of exclusive relations represented aprox. 8.75% from the total value of 92 analysed markets by the Competition Council. From 78 exclusive relations identified, only for 11 of them the share of exclusive

relations in total market exceeds a level of 30%, while for 49 exclusive relations the share is under 1%.

Most of exclusive relations are in class L (Antineoplazic and imunomodulators), respective 34, followed by the class J (Anti-infection and systemic use), with 12 exclusive relations, and class N (Anti-infection and systemic use), with 9 exclusive relations. Moreover, the highest share of exclusive relations, 48 from 78 identified, represents less than 1% from the total market value, being conjectural, mainly because of sporadic sales of some drugs.

After a limit of over 30% of share market it can't be supposed that vertical agreements, which enter under the incidence of article 5 line (1) from law and of article 101 line (1) from TFUE, will usually generate objective advantages of such a nature and dimension that they will compensate the prejudice that competition creates. Therefore, in the case of above identified situations in which the manufacturers use exclusive distribution systems, even if the owned shares on the market exceeds 30%, is necessary that they will make an auto-evaluation for establishing if the agreements meet the conditions from article 5 (2) from law, respective article 101 (3) from TFUE, leading to a real increase of efficiency that counters the intra-brand competition reduction.

Concluding, the access to wholesale distribution market is not limited in a significant measure by the existence of exclusive relations or by the distribution made by a reduced numbers of distributors. Even so, after investigating the case have been identified certain markets on which the access of distributors and, in general, of smaller ones, is difficult.

2. INOVATIVE VERSUS GENERIC

Provision of innovative medicines

The price of innovative drugs new-authorized for the market, inclusive the orphan ones or those that have paediatric use, is proposed by the APP owner or by the representative by comparing the price of those drugs in reference countries. If after investigations is revealed that the drug has not a registered price in the list of reference countries, the proposed price is validated, and after 1 year the situation is again evaluated by a submission from APP owner or by the documentation representative.

In the case in which, after the re-evaluation, it will be discovered that the price proposed for Romania is higher than in other paired countries, the APP owner or the representative is announced to reduce the price in 60 days. If the APP owner or representative will not accept the change, the product is excluded from the National Catalogue, with commercialisation right until the stock is finished, but not more than 1 year. Anytime in the period that the price is valid, the APP owner or the representative can decrease the price for innovative drugs that was initially validated by the Government. The reduced price will be communicating MS for establishing the wholesale price and en-detail price, with the scope of being included in the National Catalogue.

Provision of generic medicines

The generic reference price is proposed by the APP owner or representative, by comparison with their prices in other countries, without exceeding 65% from the price of innovative drug that his generic is (http://www.consiliulconcurrentei.ro/uploads/docs/items/id7162/report_on_competition_in_romania_2011.pdf).

In the case in which, after comparative analysis, is revealed that the drug does not have registered price in the comparison countries, the price is approved in conformation with the demand, without exceeding 65% from the price of the innovative drug, and when the term is expiring (1 year) the comparative situation is re-evaluated after the documentation submission by the APP owner or the representative.

Anytime when the price is still valid, the APP owner or the representative can reduce, for generic drugs, the producer price initially agreed by the ministry.

For bio-similar products, the price is agreed in the same way as the generic ones, and the reference price will be established at a maximum level of 80% from the price of the biological reference product.

After making the analysis, has resulted that, because of commercialising mainly innovative drugs, a high degree of concentration exists in some markets. Thus, from the 36 markets in which we can find drugs from Top 50:

- 29 markets contain innovative drugs;
- 3 contains both innovative and generic drugs;
- 4 contain generic drugs.

Generic drugs are equivalent with the original ones when the brevet for exclusivity period is expiring. Generic drugs offer the opportunity to obtain similar treatments at lower costs for clients, liberating in the same time budgets for financing new innovative drugs.

Concentration of analysed markets can mainly have 2 causes:

- Existence of intellectual property rights which don't allow the entrance of the drug on the market and
- Generic drugs could not erode the market share of the innovative drug, even if they penetrated the market.
- There has been identified 3 different situations that concerns the generic drug position on those markets, as following:
- Generic drugs are registered and commercialised, but they don't have the same active substance as the best sold innovative drug;
- The generic drugs of the best sold innovative medicine are registered and commercialised, but the market penetration degree is limited;
- The generic drugs of the best sold innovative medicine have been registered only in 2009, and therefore, they could not earn a significant market share.

For the markets that have generic drugs with the same active substance as the innovative drug and that have been commercialised in 2009, has been analysed the price difference between the innovative drug and the less expensive generic drug with the same active substance, but also their share in the total market.

From the analyse has resulted that even if exists significant differences on the prices, up to 253%, excepting only one market (C01EB), on all the markets where exists generic alternatives for best sold innovative drugs, not only they could not penetrate the market, but the sales of the less expensive generic ones represent under 1% from the total market share. Even if in the particular case of generic drugs that conquered an important share of the market, from the analysis resulted that their price is bigger than other generics with same active substance. And in those situations, the cheaper medicines with same active substance make marginal sales, which are not bigger than 1% from the total market share.

The factors that affect the penetration of generic medicines on the market or to obtain a significant share from the total market are influenced by:

- Regulation frame;
- Intense promotion of innovative drugs ;
- The level of competition between innovative drugs and the generic ones determined the manufacturer behaviour.

Concerning the regulation frame, in 2009, the in place regulations stipulated the drug prescription for which the insured people beneficiates in the frame of insurance medical system on commercial designation, and not on DCI, which means that the doctors where the ones that determined the demand, and consequently, the structure of analysed market. Even in the case of

compensated medicines, for which clients should pay the difference between the en-detail sale price and the correspondence amount applied to the compensation percentage on the reference price, the regulations did not stipulated rules for drug sellers, which can be able to stimulate the generic prescription.

For facilitating and quicken the generic drugs consumption, the regulation frame in Romania has been modified in 2010. Thus, in the case of compensated drugs, doctors have been obliged to recommend medications on DCI and not on commercial name as in 2009, and the medicines sellers have been obliged to release the drug that gives the reference price.

But concerning the medicines settled that are offered in the national health programs, in 2009 and also in present, their prescription is made on DCI. Even so, CNAS does not support the whole value of sale price of each drug that is given in the frame of national health programs. Because patients don't support any part of the drug cost, they don't have any interest to ask for generic drugs or even innovative drug substituent, but cheaper. Also, because the government supports the maximal wholesale price for those drugs, the pharmacies don't have any stimulus to commercialise at a smaller price, even if they can obtain significant discounts from medicine dealers.

Findings related to innovative-generic relation

After analysing the identified markets, resulted the fact that exist a high degree of concentration of certain markets, mainly due to commercialisation of innovative drugs. Therefore, from 36 markets in which we can find medicines from Top 50, 29 markets contain innovative drugs, 4 are containing generic drugs, and 3 contain both generic and innovative drugs. Next, we will refer to the 32 markets that are containing innovative drugs, inclusive the 3 that are mixed.

Generic drugs are equivalent with the original ones in the moment of brevet expiring and exclusivity period of data for innovative product that already exists. Usually, those prices are much lower than the innovative ones.

At European level is well recognised the fact that public budgets, inclusive the ones allocated for covering the expenses from health sector, are put under significant constrains. The concurrence, especially the one from generic part, is essential for maintaining public budgets under control and to allow the access on a large scale of drug consumers/patients.

Generic drugs offer the opportunity to obtain similar treatments at lower costs for patients and payers, releasing in the same time the budgets for financing new innovative drugs. After how was stipulated in the Communication for a new vision on pharmaceutical sector (Commission Communication from 10th of December 2008 [COM (2008) 666 from 10.12.2008: Safe medications, innovative and accessible: a renewed vision of pharmaceutical sector), numerous member states recognise the fact that generic medicines have an important role by contributing to the expense limitation for medical assistance chained by reimbursement and prescription practices.

Competition with unprotected products by brevets allows the treatment in a durable mode of a high number of patients that have less financial resources. The savings generated ensure the necessary funds for innovative medicines. Therefore, all the interested factors should ensure the entrance of generic drugs on market, once the brevet and legal protection for exclusivity is expired, and also the competition efficiency of those medicines.

The concentration of analyzed markets can have 2 causes: 1) the existence of some property intellectual rights that don't allow the entrance of generic drugs on market and 2) the generic drugs did not eroded the market share of the innovative one, even if the penetrated the market.

Concerning the markets that have only innovative drugs, they contain medicines designated to the treatment of serious affections, as diabetic, cancer, HIV, Hepatitis, etc. These ones are usually given in the frame of national health programs. After the made analysis, have been identified 9 markets in which are commercialised only innovative drugs, as follows: A10AE, J05AE, L01XC, L01XE, L03AB, L04AB, N05AH, N07XX și R03DC.

Considering the markets that have registered and commercialised generic medicines, is noticed that in the big majority of cases, even if exists an important number of producers on each market, the innovative medicines have kept significant market share, as follows:

Table 1. Market shares for innovative products

Market ATC4	No. Of Producers	Best seller medicines	Producer	Market share
C05CA	9	Detralex	Servier	85-95%
C09BA	7	Noliprel	Servier	85-95%
N07CA	9	Betaserc	Abott	85-95%
R03AK	6	Seretide	GSK	75-85%
L01CD	5	Taxotere	Sanofi-Aventis	75-85%
C10AB	6	Lipanthyl	Solvay	75-85%
B03XA	4	Neorecormon	Hoffmann la Roche	75-85%
C04AE	6	Sermion	Pfizer	65-75%
C01EB	6	Preductal	Servier	55-65%
L01XX	10	Velcade	Jemssen - Cilag	55-65%
C03BA	14	Tertensif	Servier	55-65%
N06DA	7	Aricept	Pfizer	55-65%
N05AX	17	Rospolept	Jenssen Pharmaceutical	55-65%
J01BC	14	Augmentin	GSK	45-55%
L01BC	7	Xeloda	Hoffmann la Roche	45-55%
B01AB	8	Clexande	Sanofi-Aventis	45-55%

Source: http://www.consiliulconcurentei.ro/uploads/docs/items/id6495/raport_total.pdf pag. 141.

After making this analysis, have been identified 3 different situations concerning the generic drug position on those markets, as follows:

- generic drugs are registered and commercialised, but those ones don't have the same active substance with the innovative drug best sold;
- generic drugs of the best sold innovative drug are registered and commercialised, but his penetration degree is low;
- generic drugs of the best sold innovative drug have been authorised in 2009, and therefore, they couldn't won an important market share.

A first situation is founded in the cases in which, even if generic drugs are on market, those ones don't have the same active substance as the innovative drug that is best seller, In the made analysis, has been identified a number of 5 markets like that- even if generic drugs exists, their share in the total market is very low, as shown in Table 2.

In the frame of sector investigation in the pharmaceutical domain made by CE in 2008, resulted the fact that, in average, in the first year from the market entrance, generic drugs obtains 30% from the market, and in the second year they win up to 45% in volume, situation in which we don't find the markets analysed by the Competition Council. Contrary, there are markets in which the generic drugs are there from over 5 years and the innovative one still own a significant share from the market.

The factors that affect the penetration of generic drugs on the market or obtaining significant market share is because of: a) regulation frame; b) intense promotion of innovative drugs, and also c) level of competition between innovative and generic drugs determined by the behaviour of manufacturers. (http://www.consiliulconcurrentei.ro/uploads/docs/items/id7162/report_on_competition_in_romania_2011.pdf)

Table 2. Market share of generic drugs

Market ATC4	No. of Producers	Best sold drug	Producer	Share of innovative drugs (%)	Share of generic drugs (%)	Share of OTC (%)
B01AB	8	Clexane	Sanofi - Aventis	[95–100]%	-	[0–5]%
C10AA	23	Crestor	Astrazeneca	[75–85]%	[15–25]%	-
		Sortis	Pfizer	[75–85]%	[15–25]%	-
C05CA	9	Detralex	Servier	[95–100]%	[0–5]%	-
L01XX	10	Velcade	Janssen - Cilag	[85–95]%	[5–15]%	-
M05BA	11	Bonviva, Zometa	Hoffmann la Roche,Novartis	[95–100]%	[0–5]%	-

Sursa: http://www.consiliulconcurrentei.ro/uploads/docs/items/id6495/raport_total.pdf pag 142.

Regulation frame

A mainly characteristic of demand in the medicine case is the fact that the patient is not the decision factor. The demand in the result of a complex relation between patients, doctors, pharmacists and the national fund for health and social insurance. In general, the decision is made by doctors that prescripts the receipt and possible by the pharmacists that release the receipt. Neither the patient nor the persons that prescript/released the drugs don't support in a direct way the high part of costs, because these are compensated or entire funded.

Therefore, in the case of drugs, the elasticity of demand correlated with the price is limited for the decision factors and patients.

The main determinant factor of demand on the medicine market based on medical prescription is the doctor that, when is choosing between different medicines, he guides mainly after the therapeutic applicability and the efficiency of diverse drugs, and not after their price. The second mainly factor can be the pharmacist and the third the patient, but only in the situation in which this one needs to support a part of the medicine cost.

In 2009, the regulations in force (The framework contract on the conditions of providing healthcare within the public health insurance system for 2009) provided the prescription of all drugs received by the insurance policyholders in the health insurance system by their brand name, which means that physicians were the ones who determined the demand hence, the structure of the analysed markets. Moreover, pharmacists had the obligation not to replace the

drugs prescribed by the physician, with the exception of the following cases, in compliance with the applicable provisions:

- if the drug recommended by the physician was too expensive and the patient did not have the financial resources required to bear the price difference between the reference price and the retail price of the respective drug;
- if the pharmacy did not have available in stock, at the time of the demand, the product prescribed by the physician and the patient did not want the pharmacy to bring it to the patient within 24, or 48 hours respectively, in compliance with the law.

Consequently, due to the regulations applicable in 2009, the physician was the determining factor of the demand for the prescription drugs received by the patients included in the public insurance system, while the role of pharmacists and patients was minimum.

Moreover, the relationship between the physician and the patient is characterised by an asymmetry of information because the patient relies on the physician's experience. Even in the case of reimbursable drugs, for the patients who had to pay the difference between the retail sale price and the amount corresponding to the application of the reimbursed percentage to the reference price, the regulations did not provide for rules for pharmacists meant to stimulate the release of generic drugs.

According to the findings of the EU sector inquiry "all medicinal products (whether originator or generic) authorised for placing on the Community market are subject to the same requirements of quality, safety and efficacy. Any campaigns that put this fact in question ignore the key principles for marketing authorisation in the EU and may mislead the public".

Consequently, under the regulations applicable in 2009, in which the physician was the determining factor for the demand, in addition of being an factor informed concerning the originator/generic drugs relationship, there is a low level of penetration of the generic drugs on the analyzed markets.

In relation to the Romanian regulatory framework, this framework was amended in 2010, in order to facilitate and boost the consumption of generic drugs. Thus, in the case of reimbursable drugs, doctors were compelled to prescribe the drugs using their international non-proprietary name (INN), not their brand name as in 2009, and pharmacists were compelled to release the drug determining the reference price, i.e. the drug with the lowest price corresponding to the therapeutic unit afferent to the same pharmaceutical form within INN and for each concentration.

Under these circumstances, the patient should be the determining factor of the demand, insofar as it is correctly informed concerning his or her option, both by the doctor, as well as by the pharmacist. Given the purpose of use of drugs and the importance that patients attach to their own health, in the absence of accurate information about their options, patients will not select generic drugs and the regulation, although correct, may become inefficient.

The main beneficiary of the regulation adopted in 2010 (The framework contract on the conditions of providing healthcare within the public health insurance system for 2010) is the state who, whether the patient selects an originator drug or a cheaper generic version of it, pays the reimbursement percentage (50, 90 or 100) of the reference price. The reference price is given by the lowest price corresponding to the therapeutic unit afferent to the same pharmaceutical form within INN and for each concentration.

However, in relation to the reimbursable drugs granted within national health programmes in Romania, both in 2009, and currently, their prescription is made using the INN. Nevertheless, CNAS (the National Health Insurance House) bears the full retail selling price of each drug granted within national health programmes.

Due to the fact that patients do not bear any part of the cost of these drugs, they are not at all interested in requesting the release of generic drugs or even substitutable originator cheaper

drugs. Furthermore, due to the fact that the state bears the maximum retail price of these drugs, pharmacies are not encouraged in any way to sell them at lower price, though they can get significant discounts from the medicine dealers, as significant quantities of these drugs are sold. Consequently, by using this system, the main form of competition related to these drugs, i.e. the price competition is eliminated both at the level of the manufacturers as well as at the level of pharmacies, to the detriment of the budget allocated to national programmes and ultimately, to the detriment of the patients.

3. INTENSIVE PROMOTION OF ORIGINATOR DRUGS

A possible explanation concerning the originator/generic drugs ratio can be found in the EU Report in the case of the sectoral investigation in the pharmaceuticals market, namely the intense product promotion conducted by originator companies. According to EU, originator companies allocate a significant part of their budgets to trade products through doctors and other professional staff in the healthcare area.

As part of the marketing and promotion activities, doctors' belief that they should prescribe or use a certain drug for any therapeutic indication prevails. This activity is known as "detailing activity": a sales representative of an originator company visits a doctor to discuss the characteristics of a particular drug and convinces him concerning the safety, efficacy and quality of the product. At European level, in 2007, the "detailing activity" accounted for half of the marketing and promotion expenses incurred by originator companies.

Nevertheless, the relationship between pharmaceutical companies and physicians is a controversial one due to the conflicts of interest between the commercial interest of the pharmaceutical company and the physicians' duty to prescribe the most appropriate drugs. The sector inquiry performed by the European Commission provided proof that some originator companies intended to challenge the quality of generic drugs, within a marketing strategy, even when the generic product had been authorised by the relevant authorities and was available on the market.

At national level, Law no. 95/2006 on healthcare reform (Published in the Official Journal of Romania, Part I, no.372 of 28 April 2006, as subsequently amended and supplemented) governs the various forms of drug advertising.

This law takes over the principles provided in Directive no. 2001/83/EC of the European Parliament and of the Council of 6 November 2001, on the Community code relating to medicinal products for human use.

Art. 797 paragraph (1) of Law no. 95/2006 on healthcare reform provides: "For the purpose of this chapter, the publicity for drugs includes any kind of information through direct contact (the "door-to-door" system), as well as any kind of promotion meant to stimulate the drug prescription, distribution, sale or consumption; drug advertising shall include in particular (http://www.consiliulconcurrentei.ro/uploads/docs/items/id6495/raport_total.pdf):

- the advertising of medicinal products dedicated to the general public;
- the advertising of medicinal products dedicated to persons qualified to prescribe or dispense drugs;
- visits by medical representatives to persons qualified to prescribe drugs;
- supplying samples;
- stimulating the prescription or distribution of drugs by offering, promising or granting benefits in cash or in kind, unless they have a symbolic value.

Originator/generic drugs competition

In relation to the third factor that can contribute to the delay of the penetration of generic drugs on the market, i.e. the competition between the originator companies and the generic ones, this factor is a given special concern both by the European Commission, and by the competition authorities in the member states, thus implicitly the by the Competition Council.

In January 2011, the European Commission launched the second monitoring exercise concerning the agreements on patents that is focused on the analysis of the agreements concluded between originator drug companies and generic drug companies throughout 2010. The first exercise of this type covered the period from mid 2008 - 2009, and revealed that the number of agreements with possible anticompetitive impact was significantly reduced compared to the period analyzed in the sector inquiry (2000 - 2007).

At the same time, the agreements aimed at preventing the penetration of competitors on the market may be violations of the competition Community and national law. Amicable agreements restraining the penetration of generic drugs on the market and including a value transfer from an originator company to a generic one, or to several such companies, constitute an example of potentially anti-competitive agreements, especially if the reason underlying their conclusion is to share profit through payments made by originator drug companies to generic drug companies, to the detriment of patients and of budgets allocated to public health.

4. WHOLESALER AUTHORIZATION

Drug wholesale distribution is carried out by Romanian legal entities, referred to as drug wholesalers, in units called drug warehouses. The wholesale distribution of drugs is carried out based on an operating license for the wholesale distribution of drugs, issued by ANMDM (National Agency for Medicines and Medical Devices).

In order to obtain the distribution license, applicants must meet the following requirements:

- to have the spaces, facilities and equipment suitable and required for the provision of the conservation and distribution of drugs;
- to have staff and, in particular, a skilled person assigned as responsible person, who meets the requirements provided by the Romanian laws;
- to be able to meet the following minimum requirements:
- to allow access to its the premises, facilities, and equipment to the persons in charge with inspecting them;
- to build up stocks of medicinal products only from the persons who, in their turn, hold a distribution license or are exempt from obtaining such authorization;
- to supply drugs only to persons who, in their turn, hold a distribution license or are authorised by the Ministry of Health to supply medicinal products to the Romanian population;
- to have a contingency plan for the provision of the effective implementation of any recall from the market regulated by ANMDM or performed in cooperation with the manufacturer or the holder of the marketing authorization for the medicinal product in question;
- to maintain the records of all the transactions performed and to make it available for the Ministry of Health for a period of 5 years;
- to observe the principles and the guidelines of good distribution practice for medicinal products.

At the request of the European Commission or of a Member State, ANMDM must provide all appropriate information concerning the individual authorizations issued. ANMDM suspends or withdraws the distribution authorization if the authorization requirements are no longer met and notifies it.

5. CONCLUSIONS

Price competition has long been a strategy of larger companies seeking to gain a significant market segment. Companies engaged in a "price war" over a determined period of time, which had the effect of eliminating competitors. In some cases, setting a price below costs can be a strategic option pursued when the purpose is to penetrate a new market, to attract a segment of consumers, to eliminating the stock of products, to develop promotional campaigns, etc.

The healthcare system is essential for any country in the world. The drug distribution sector holds a special place in this system. In order to talk about the situation of the competition in a certain market, the respective market must first be defined. In relation to the medicinal product market, in the competition cases the ATC3 class is used as starting point in defining the relevant market. The Anatomical-Therapeutic-Clinic system (ATC) is organized hierarchically and consists of five levels.

From the point of view of the demand, the distribution of drugs includes three categories of customers (the figures represent the share of sales to the respective customers in the total drug sales, in 2009):

- pharmacies (retail sales) – 93.5%;
- hospitals – 6.5%;
- sales to other distributors - negligible.

Given the significant growth recorded in the case of the expenses with the reimbursable drugs, the Competition Council recommended the introduction of a reference price system, c at least in the cases when there are several drugs with the same INN.

The introduction of this system will lead to the reduction of the expenditure on drugs, the stimulation of the price competition from the manufacturer level to the pharmacy level and, ultimately, to charging lower prices. The proposal of the Competition Council was taken over by the Ministry of Health and included in Order no. 1275/2011. The Ministry of Health proposed that the method of calculating drug reimbursement prices for the drugs granted to patients included in national health programmes nominated by government decision, in compliance with the law, should be determined in such a way as to allow for obtaining savings to the health budget. Thus, the wholesale price would have been the manufacturer price decreased by 15%, to which the distribution margin would have been added.

The Competition Council pointed out that this method of calculation may result in increasing the attractiveness of exports of such drugs. Consequently, this step could lead to obtaining a drug deficit on the Romanian market, with potential consequences for the health condition of the of chronically ill patients included in national health programs. Moreover, from the point of view of the impact on the availability of drugs, the decrease by 15% of the manufacturer price could influence the commercial strategies of the manufacturers, by reducing/renouncing the sale of drugs whose low price determine diminished profit margins.

The Competition Council recommended as an alternative solution to the 15% manufacturer price decrease the implementation of this reduction of the price CNAS reimburses to its insurance policy holders. The "Sensitivity" of the distribution of drugs and its effects on the

market lead to attaching special importance to this topic in the future as well, with the purpose of eliminating the possibility of the occurrence of such potential anti-competitive practices.

In order to have a sustainable health system, each country tries to balance the expenditures generated by the operation of the system and the available revenues. For this purpose, the aim is generally to decrease of the costs of drugs. A solution would be to increase the consumption of generic drugs (when such drugs are suitable for the patients' needs) to the detriment of originator drugs (which are more expensive).

Starting with 2010, the prescription of drugs granted to the insurance policyholders within the public health insurance system is made by their international non-proprietary name (INN) and not by their brand name (As an exception, the prescription of drugs in the outpatient system is made using the international non-proprietary name, with the exception of the medically justified cases in the patient's health record, when the prescription is made using their brand name). The effect of this measure should be the increase in the consumption of generic drugs and also the decrease of the consumption of originator drugs (more expensive). Nevertheless, in order to obtain a significant effect, it should be correlated with a better co-involvement of pharmacies to release generic drugs when their INN allows that.

However, we should take into account the fact that this competition must be present at the level of each relevant market (defined according to the functional substitutability of drugs), which, more often than not, is defined at the ATC3 or ATC4 level.

From the point of view of the number of agents on the market it can be said that the Romanian pharmaceutical market is a developed one.

The first manufacturers on the Romanian market accounted in 2009 for a market share of 77.80%, or 77.20% respectively in 2010. Currently, on the drug wholesale market 350 wholesale units were authorised to operate. Taking into account that, generally, each distributor has several warehouses, a much lower number of companies operate in this market. The largest 29 distributors control 95% of the market.

At the end of 2010, according to the Ministry of Health, 6708 open-circuit pharmacies operated in the Romanian market. In addition to these pharmacies, there are the pharmacies operating in hospitals, and the companies selling OTC drugs. Both in the drug manufacturing segment and in the drug wholesale segment, the pharmaceutical market is a domestic one from the point of view of the competition principles. In the drug retail segment, the pharmaceutical market is local. An extremely important characteristic of any health system is sustainability. For this purpose patients' needs must be carefully balanced with the available resources.

It is difficult to compare various countries, because the differences in the health policy generate different systems. Nevertheless, a common element that is often used in such comparisons is the cost generated by the drug consumption.

In 2009, the total value of drug sales in Romania was 8.1 billion RON, i.e. approximately four times higher than the value recorded in 2000.

According to Business Monitor International, the value of prescription drugs and OTC sold in 2010 through pharmacies and hospitals was 11.9 billion RON.

From the point of view of the value of the drugs sold, the Romanian pharmaceutical market is a developing market, recording annual increases of more than 10% starting with 2007. On the Romanian market there are approximately 7000 drugs, but the most sold 50 drugs account for approximately 40% of the total value of the drugs sold.

Consequently, the Romanian drug market is a developed one, but with a high concentration level. According to IMS Health (Intercontinental Marketing Services Health), the cost of drugs accounts for approximately 10% of the costs of a health system, and within them the cost of generic drugs is 18% (although their consumption exceeds 50% of the drug consumption).

From the analysis of the data (Data source – the CEGEDIM report) on the drug consumption in Romania in 2010, generic drugs are 60% of the quantity of prescription drugs and 32.4% of their value.

Originator drugs are more efficient (state-of-the-art drugs), but they are also more expensive at the same time. Moreover, the originator drug market is monopolistic. From the above-mentioned facts it appears that in terms of the degree of propensity for generic/originator drugs, the degree of competition on the Romanian pharmaceutical market is high. Another difference in the price of drugs is given by their type: originator or generic. The reference price for generic drugs is the equivalent of maximum 65% of the price of the originator drug whose generic it is. Moreover, it must be less than or at most equal to the lowest price of the same drug from a list of 12 countries published by the Ministry of Health.

In the most sold 50 drugs in Romania, originator drugs prevail and the number of the generic ones is low.

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CHARACTERISTICS OF MARKETING IN PROFESIONAL SERVICES DELIVERED BY THE HEALTHCARE SYSTEM

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Abstract: *Equilibrium position of a competitive market must necessarily be an „pareto optimal”: with every transaction made, people get rich without anyone else to deplete. If there is no increasing income - economies of scale or proportion - in the production system, then each „pareto optimal” condition is a competitive equilibrium position, depending on the distribution of purchasing power. Where there are concerns about income distribution and hence of goods and services between individuals, the state can interfere by changing this algorithm of purchasing power distribution, within the economy. On the other hand, if some individuals are reluctant to risk (theory contradicted by the existence of gambling), then providing insurances is incumbent on mutually beneficial exchanges, because people are willing to pay for the convenience of not having to worry about the future events that may affect their existence. Another problem of the insurance field is that of “moral hazard”: since signing an insurance contract, the insured is no longer trying as hard to prevent accidents against which they have been insured, therefore the likelihood of occurrence for such accidents increases.*

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JEL Classification Codes: I11, I18

1. INTRODUCTION

Every society needs a public service, whose *primary function* is to define the operating principles of society. *The second role* of the state government is to provide public services of vital public interest. *The third role* is to provide the necessary public services that neither private, nor nonprofit sector will not or can not provide with the existing resources. Unfortunately, many people critic public services and what they consider to be irrational purchases and practices, lack of necessary services and perversion of administration functions by the powerful interest groups: taxes are high and we do not get as it is necessary for the money we pay; outrageous prices are paid for trivial things, public institutions are often slow and inflexible, because of excessive bureaucracy and rules, etc. Consequently, the public sector needs to improve its image and work to increase public confidence and satisfaction¹.

An argument in favor of state intervention as a supplier of goods and services is the concern for the compliance with the *equity* principle. Distribution of resources must be made at an optimal level. Another problem would be the ability of public services become vulnerable to the influence of some interest groups: public service may be managed in the interest of such group, rather than in the general interest of the whole society. In this respect, some accuses refer to seizing the „*Welfare State*” by the middle and lower social classes and then the provision of services by the state on equity principles of equity reflects a *nonsense*. Another risk of state

¹ Philip Kotler, Nancy Lee - „*Marketing în sectorul public*” (Marketing in the public sector), Editura Meteor Press, Bucharest, 2008, pages 15-16.

intervention in the provision of some services refers to *legislative rigidity*, in which situation the government can not have a fast and flexible reaction, as it happens in a competitive market. Even if the right decisions are taken on the spot, putting them into practice takes time and resources, often exceeding the right time. In fact, it is also fiscal matter: when a policy comes to be implemented, is no more compliant with the reality.

A company or organization must consider four special characteristics of services, when designing their marketing programs: intangibility, inseparability, variability and perishability². Achieving the appropriate role of the state in the delivery of health services is a subject of meditation, given the existence of failures on the market of such services, but also to avoid failure of state intervention through the creation of alternative markets for medical services.

2. LITERATURE REVIEW

Marketing is going through a process of ongoing progress. At the same time, marketing has been one of the most exciting topics in the business world in the last six decades, aiming to three major disciplines: product management, customer management and brand management. *Current marketing criticism is due especially to poor response capacity of some firms, rather than a failure of a theory itself or a low capacity to assimilate in practice.* Extension of activity of marketing also upon non-profit areas, has opened a wide horizon of its action, with specific objectives and working methods for each area. Over the past 60 years, marketing has moved from being centered on products (**Marketing 1.0**) to consumer orientation (**Marketing 2.0**). **Marketing 3.0** is the stage when companies move from focusing on the consumer to humanism and profitability is put into balance with corporate responsibility. Product value is defined by the consumer, but the consumer preferences differ and vary between very wide limits. The firm collects its profits from creating a superior value for its customers and partners. The company considers its customers as a strategic point of view, approaching them in all their aspects as human beings, paying attention to their needs and concerns. Current marketers are trying to reach the minds and hearts of consumers. To a growing extent, consumers seek solutions to their anxieties about their capability to do a better place out of the globalized world. In a world full of confusion, they seek to appeal to those firms that addresses the deepest human aspirations in terms of social, economic and environmental justice, in what they aim to, as mission, vision and values. They are not just looking for functional and emotional satisfaction, but also fulfillment of the human spirit, through the products and services they choose. Current marketing philosophy requires companies to think about their own achievement, beyond material goals. They need to understand what they are and why they exist, as well as what they will become. These issues are desirable to be included in the corporate mission, vision and values. Profit will result from the appreciation by the consumers of the contributions brought by the companies to human welfare. In stage 3.0, marketing should be redefined as a harmonic triangle of the brand, positioning and differentiation, i.e. **The 3i** - brand identity, brand integrity and brand image. Thus, collaborative marketing is the first constructive element of Marketing 3.0³.

Holistic marketing concept is an extension of the marketing concept due to the digital revolution. It is a dynamic concept, resulting in the ability to electronically access and interaction of the company with its customers and collaborators. It integrates activities of value analysis, value creation and value delivery to establish mutually long-term satisfactory relationships and ensuring prosperity of stakeholders. According to the concept of holistic marketing, the starting

²Philip Kotler, Gary Armstrong - „*Principiile marketingului*” (Marketing principles), Third edition, Editura Teora, Bucharest, 2004, page 433-440.

³ Philip Kotler, Hermawan Kartajaya, Iwan Setiawan - „*Marketing 3.0. De la produs la consumator și la spiritul uman*” (Marketing 3.0. From product to consumer and human spirit), Editura Publica Bucharest, 2010, pages 11-12, 18-19, 39-40, 45, 51, 57-58, 99.

point is the customer's individual requirements⁴. Thus, marketers have included in the services marketing a number of specializations of social marketing, such as educational marketing, sports marketing, clerical, environmental marketing, political marketing, healthcare marketing, etc. *Healthcare marketing* is the part of social marketing aiming to implementation of specific policies and strategies in order to improve the health condition of the population by causing a behavioral change⁵.

Health marketing, marketing healthcare refers both to healthy, as well as sick people, being developed differentiated strategies of action for each of them, thus having both a prophylactic role, as well as a proper medical role. In the field of health, social marketing is used to reduce alcohol⁶ and tobacco consumption, increase physical activity, prevent heart attacks, limit the spread of HIV / AIDS, control diabetes, detect breast and colon cancer in good time, prevent adolescent pregnancy, prevention of driving under the influence of alcohol, domestic violence⁷, stopping drug use⁸, sexual assault prevention etc.

3. BODY

Health condition of a population is adversely affected by lack of access (or a limited access) to medical services, to medication and health prevention and education programs, as well as lack of access to living conditions needed to maintain an optimal health condition: access to drinking water, to a healthy and balanced diet, to a housing with sanitation facilities, inhabitable and heated in winter and so on, all these being in challenge with the social justice principles regulated by the health legislation.

Health care is a very important activity in the national economy, being delivered to everyone: children, adults, employees, retirees, government and budget, health insurance houses. Competitiveness of this system consists in an increase of healthcare costs, but the principles of quality and continuous improvement are also applicable to the health field, also being stated facts about the imminence of a health reform.

⁴ Philip Kotler, Dipak Jain, Suvit Maesincee - „*Marketingul în era digitală. O nouă viziune despre profit, creștere și înnoire*” (Marketing in the digital era. A new vision profit, growth and renewal), Editura Meteor Press, 2009, page 40.

⁵ Transilvania University of Brașov, Interdisciplinary Doctoral School, Center for Economic Research, Ec. Anca-Ramona Pralea in „*Politici și strategii de marketing social utilizate în sănătatea publică*” (Social marketing policies and strategies used in public health), http://www2.unitbv.ro/LinkClick.aspx?fileticket=0m_5Ng2BrOc%3D&tabid=4579, page 14

⁶ Tangible costs related to alcohol consumption in the EU were estimated at 125 billion EUR in 2003, including 59 billion EUR due to lost of productivity through absenteeism, unemployment and working years lost through premature deaths. Intangible costs of alcohol (which present the value of personal suffering and deaths) in the EU were estimated at 270 billion EUR. Alcohol is a health determinant, responsible for 7.4% of all disabilities and premature death in the EU. Source: http://ec.europa.eu/health-eu/doc/alcoholineu_sum_ro_en.pdf Almost 10% of young people in Romania consume soft drugs, according to a survey ordered by the National Authority for Sport and Youth. Romanians are European champions at alcohol consumption, exceeding by three liters the European average consumption, according to the latest survey of the World Health Organization (WHO). Source: <http://www.ziare.com/stiri/consum-de-droguri/aproape-10-la-suta-dintre-tinerii-din-romania-consuma-droguri-usoare-sondaj-1208428>, 20th of December 2012

⁷ Official statistics show that 10% of the Romanian families are single parent families. They occur more frequently in the contemporary society, as a consequence of change in the socio-economic and environmental parameters. Source: PUBLIC HEALTH AND AMT HEALTH CARE MANAGEMENT, second vol., no. 2, 2010, page 23, MONOPARENTAL FAMILY AND ITS ECONOMIC PSYCHO-SOCIAL IMPLICATIONS, authors ANDREEA ILIEȘ, CRISTINA RAȚIU, VIOLETA FRÂNCU, <http://www.amtsibiu.ro/Arhiva/2010/Nr%202/Francu-ro.pdf>

⁸ EU report: New worrying trends regarding illegal drug smuggling and consumption. Source: <http://www.amosnews.ro/raport-ue-noi-tendinte-ingrijoratoare-ceea-ce-priveste-contrabanda-si-consumul-de-droguri-ilegale>, 31ST OF JANUARY 2013

Health care is a predominant public service, with specific characteristics: it can not only be subject to the market laws, but also to an administrative economy. Health sector difficulties can not be solved without state involvement (through regulations, financing and distribution of these services to the people), that means the expression of government health policy. The purpose of this health policy is represented by the good health condition and longevity of population⁹.

The health sector is composed of a number of specific entities, such as hospitals, nurseries, medical consulting rooms, home care agencies, suppliers of medical equipment, health care organizations, pharmaceutical chain, etc. Only to the category of hospitals we may include hospitals for treatment of acute diseases, specialized hospitals, university hospitals, nonprofit hospitals, but also private hospitals, clinics and medical rooms. Below, it is worth to be highlighted some *features of the health system*, compared to other organizational activities:

- *Health services market demand is a derived demand.* Although some people obtain personal financial benefits from health care, the main reason for which this type of care is desired is represented by the intention to be healthy. So, this is not a purpose in itself, but a way to achieve a specific purpose, in which case the market becomes more complex, than in the case of a non-derivative demand.
- *Healthcare is entirely different from competitive system, because people are concerned about the health of the others.* While companies develop themselves on competitive markets, government organizations are often monopolies; companies aim to maximize investors' profits, while state government is meant to serve the interests of citizens. Companies enjoy a better division of labor, while state institutions often do not understand what is their competence, their functions being the result of chance, with frequent overlaps and duplication. While a company focuses on goods and services it produces, government is involved in almost all areas of life¹⁰. Health condition of an individual also affects others, bringing the catching diseases as example: an effective vaccine brings benefits not only for the infected persons, but also for those of their proximity. The social value of influenza vaccination service is higher than the private value, as an argument for government intervention. Tobacco advertising was prohibited. There is a clear mutation, from competition sports to physical activity of improving health condition. As from February 2013, young people in Romania will do more physical exercise, by introducing such classes in the curriculum. People are concerned about the health of the others for reasons of altruism, in which situation utility derives from the fact that other people benefit from a proper medical care. This can be solved also by charity of some companies and individuals, but the following question arises: why are some people trying to get rid of their obligation to contribute themselves to these actions, then to take advantage free of charge by the utility initiated and provided by others? "*Transfer of Costs*" means that providing medical services for the uninsured is supported to some extent by all the private patients, who must pay higher prices. It results in an under-funding, which is a reason for the state intervention. The average life expectancy of the Romanians is 5 years lower than of the other Europeans. Life expectancy is directly related to investments in the health system. EFPIA latest report shows that globally, between 40-59% of the increase in life expectancy for a period of 10

⁹ Revista „Marketing-Management. Studii-cercetări-consulting” (“Marketing-Management. Studies-researches-consulting”) Magazine, Romanian Marketing Association, Bucharest, XVth year, vol. 6/2005 (90), article „*Considerații cu privire la reforma instituțională a asistenței medicale în România*” (Considerations on health care institutional reform in Romania), authors Valerică Topliceanu and Mircea Duică, pages 440-447.

¹⁰ Philip Kotler, Nancy Lee - „*Marketing în sectorul public*” (Marketing in the public sector), Editura Meteor Press, Bucharest, 2008, pages 17-19.

years are due to innovative drugs and access to these drugs. In Romania there are more than five years since new therapies¹¹ have been introduced to compensation or gratuity. Some studies conducted have revealed the following conclusion: although not the middle and lower social classes are exclusively suffering from various diseases, they enjoyed rich medical services of the system and the delivery of health services by the State on grounds of fairness, was not justified. The difficulty of integrative approach of this market also emerges from the risk that some members of society have a probability of getting sick close to the unit level.

- *Quality of medical care is difficult, even impossible to measure*, being performed on the basis of some intangible criteria. Patients rely on their confidence in the doctor and this is the only criterion for assessing the quality. "Service mark "is stated on the nameplate.
- *Information asymmetry on the health services market*. People go to the doctor to find out information that they do not possess, regarding their own health. Nature of the relationship between doctor and patient is one of asymmetry of information, the patient empowering the doctor to take the necessary steps with of view of improving his health condition. Finally, the patient delegate the doctor with a part of the responsibility for making decisions. A special case is that, due to the desire for increasing income, doctors prescribe certain treatments excessively, which would lead to over-production of certain medical services, requiring their supervision and remuneration accordingly, so that the demand induced by the supplier might not be encouraged.
- *Non-profit character*, generating a completely different mentality in the health system than in a company. In most industries there are databases to be used. This rule does not apply in the medical field, where, due to the fragmentation of the system, local nature of health services and restrictions on the use of patient data, it can not set up such a common database. Medical professionals are not used to thinking in terms of "products" and "services". Due to lack of data in the medical field, marketer may face confusing information about customer profile and target public. The medical field has no information about customer characteristics, a problem that also occurs due to restrictions on the use of patient data¹². Hospitals enjoys reimbursement of expenses, regardless of their volume. Incentives, motives which private entrepreneurs are seeking, were absent in the health field. Currently, there is a need for financial discipline, efficiency and performance being economic governing laws applicable also in this sector. In public hospitals, the patient is examined by several doctors, this type of relationship can be considered as being largely impersonal. Private clinic patients may establish specific relations for a personalized service, because doctors consider them entitled to be treated as any customer who pays. Therefore, patients participate more actively in the consultation, including asking questions about the experience and competence of doctors, being able to evaluate and comment on performance and being able to choose another clinic anytime¹³. Improving customer service and satisfaction, institution may benefit from many advantages: increase of income, greater support to obtain funding, increase in operational efficiency and improving business indicators. This approach is facilitated by the following key practices: (1) supporting staff in the provision of an irreproachable service, (2) providing infrastructure and systems to help (not hinder) service, (3)

¹¹ <http://www.ghiduldesanatate.ro/01-sanatate/romanii-traiesc-cu-5-ani-mai-putin/>, 21st of February 2013

¹² <http://www.medicalmarketing.ro/articole/2-Produse-Medicale/35-Principiile-marketing-ului-aplicate-in-domeniul-medical>, 14-06-2010

¹³ D. S. Pugh și D. J. Hickson - „*Managementul organizațiilor*” (Organizational management), Editura Codecs, Bucharest, 1994, page 209

- development of systems for "customer relationship management", (4) application of the "total quality management" principles¹⁴.
- In the hospital, *the physician is in charge of procurement operations*: it orders the type of investigation to be conducted, establishes a demand of services to be provided and has a word to say in relation to the time of admission of the patient. On the other hand, doctors are not materially co-interested by the efficiency or the manner in which hospitals manage their resources. As a solution, administration and resource management are handled by a hospital director and insurance companies.
 - *The person receiving health care products and services crosses a time of personal crisis*, being suffering, and his health is more important to himself than anything else. He is concerned, often thrilled and highly uncertain in decision-making, compared to other conventional situations, when a buyer of goods and services makes his purchase decision in a planned manner. Buying a DVD, a book, car or even supplying with food are held in a pleasant, enjoyable environment, and not in "a situation of life and death", as in case of health care service consumption.
 - *Hospital medical services can be located as services provided on a local market*, where candidates (competitors) to such service are non-existent, limited at the most, because they are unable to provide medical services to another market. People want to enjoy medical services close to the place of residence and hence, of their own families. It comes out that patients find it difficult to differentiate general medical offers, following their own doctor's prescription plan and therefore, they can easily ignore the offer of other physicians-hospitals located in the same place. So, health care facilities have not competed between them in terms of service cost or value added to the health care service.
 - *The increasing trend of budget expenses intended for health care*, the main reasons being: cost of medical technology becoming more complex and sophisticated, senescence of population, as well as people's increasing demands for quantity and quality of these services. There may be the risk that the health system exert pressure that cannot be satisfied upon the economy¹⁵. National Health Insurance Fund and the Ministry of Health budget is around 5 billion lei. Most of the money is allocated to hospitals, where about 75% is represented by wages and other staff costs and 10% maintenance costs. Only about 15% of the budget is spent on actual health services. Investments are almost nonexistent¹⁶. Wider use of generic drug that would provide patient access to pharmaceuticals at lower prices is a solution to balance health budget deficit. Both European countries and other third countries facing current situation in Romania, namely health budget deficits, aging of population, increase in health care costs and decrease in the number of those contributing to cover these costs¹⁷. EU health expenses decreased for the first time in the last 27 years; *per capita* expenses and percentage of the GDP allocated to health decreased in the European bloc in 2010. "Health for short: Europe 2012" presents trends over time and variations in the European countries, according to five major themes: health of the population, health risk factors, resources and activities of

¹⁴ Philip Kotler, Nancy Lee - „Marketing în sectorul public” (Marketing in the public sector), Editura Meteor Press, Bucharest, 2008, page 176.

¹⁵ Stephen C. R. Munday - „Idei de avangardă în economie” (Avant-garde ideas in economy), Editura Codecs, Bucharest, 1999, pages 144-168.

¹⁶ <http://cursdeguvernare.ro/guvernul-cauta-solutia-prin-care-sa-gestioneze-cei-16-miliarde-de-euro-cu-care-acopera-deficitul-din-sanatate-serviciile-medicale-15-din-bugetul-sanatatii.html>, 2.12.2010

¹⁷ <http://medicalnet.ro/o-solutie-pentru-echilibrarea-deficitului-din-sanatate/869/>, 14/03/2012

healthcare systems; quality of health care for chronic and acute diseases; expenses and sources of financing for health.¹⁸ The real problems of the health system are underfunding, lack of qualified staff and confusing legislation that lends itself to interpretation and make vulnerable both the medical staff and patients, states the Chairman of the Romanian College of Physicians. Shortage of qualified medical staff reached an alarming rate: in 2012, there was a decrease below the critical level of 40,000 physicians with unrestricted practice licence in Romania¹⁹. New health law should remove the chronic shortage of health care staff, a phenomenon that has worsened since 2008, affecting patients on long-term, consider the representatives of the Health Solidarity Federation in Romania²⁰. Under-secretary of State in the Ministry of Health, Raed Arafat, recently warned that by 2020, at European level, there could be a shortage of health workers of about one million people. Amid European and local regulations, in Romania no physicians from other states may be employed, but the Romanian College of Physicians might come back in the country the Romanian doctors who qualified in Romania²¹.

- Non-profit organizations need a management even more than companies, just because they lack the discipline to achieve profit. Although they are dedicated to "*accomplish good*", but good intentions could not substitute organization and management, accountability, efficiency and outcomes. According to Drucker, the main *economic* priority of developed countries must be increase in knowledge-based labor productivity and that of service sector. This is the most pressing social problem that the the developing countries will face. If this problem is not solved, social pressures will occur, exacerbated polarization, increased radicalization and possibly class struggles²².
- In case of health care services, *suppliers often have a monopoly position*, unlike other services, where the customer chooses a supplier among various suppliers in the field. In the health system, only certain suppliers may offer some type of medical service, only a certain manufacturer can deliver a particular drug, and so on.
- *Entry restrictions for bidders*. The fact that doctors should have a different degree and specialization is a form of authorization, intended for the protection of patients, but simultaneously, it grants a monopoly to those who possess these qualifications, meaning that they do not face a strong competition. If, in a weakly populated area, there is increasing trend of medical staff income, the so-called natural monopoly occurs at a local level, of the hospitals in the area and even of family doctors.

Healthcare marketing is unique in its own way, patients being limited somehow to call on the specialized market offer, knowingly. It is to be nothed that the notion of patient of health care services is particularly complex, because it is not the customer who decides what health care services it will purchase, but it is the doctor who directs him to a certain hospital, when

¹⁸http://www.paginamedicala.ro/stiri-medicale/Raportul_Sanatatea-pe-scurt_Europa-2012_---o-privire-de-ansamblu-asupra-sistemelor-sanitare_18020/, 16th of November 2012

¹⁹<http://www.cluj-am.ro/sanatate/colegiul-medicilor-din-romania-subfinantarea-deficitul-de-personal-calificat-si-o-legislatie-confuza-adevaratele-probleme-ale-sistemului-de-sanatate.html>, 20th of January 2013

²⁰<http://www.manager.ro/articole/sanatate/noua-lege-a-sanatatii-trebuie-sa-elimine-deficitul-cronic-de-personal-din-sistem-16600.html>, 21st of February 2012

²¹<http://www.ghidcabinet.ro/2012/10/raed-arafat-deficitul-de-angajati-din-sanatate-ar-putea-ajunge-la-un-milion-de-persoane-pana-in-2020/>, 19th of October 2012

²² Peter Drucker - „*Despre profesia de manager*” (About the manager profession), Editura Meteor Press, Bucharest, 2007, pages 127, 138.

to be hospitalized and what mixture of tests and services can satisfy his needs. Doctor's recommendation is rarely reasoned by patient and almost never challenged. This lack of rationality has implications for communication on the market of the value of these professional services. In addition, the doctor is often misinterpreted and put in the situation of not appealing directly to *bona fide*, so he often requires more investigation than would be needed, in order not to be accused of lack of professionalism by the College of Physicians. On the other hand, it is not the physician who is put in the position of the patient, resting in a hospital bed, bear injections or additional analyzes, etc.²³

It results that, in fact the patient is not itself a regular customer, being just the beneficiary of medical services, not having the chance to immediately assess their quality. In a critical situation, the patient accepts any recipe and meeting or exceeding its expectations is often irrelevant. On the other hand, patients do not pay directly for health services delivered to them, this transaction being death with by health insurance through Health Insurance Houses. Then, we may think that, in fact, the real customer is the insurance company, paying the bills, but it was often inconsistent with patients, hospital units and competent ministry. Currently, the solution to solve this crisis consists precisely in optimizing relationships between the insurer with the third parties. As we noted, the existence of multiple customers for professional medical services have the effect of complexity of developing a quality health care system, and paradoxically, the voice of the patient itself is the most contested in healthcare field. According to a recent survey, more than half of compatriots disagree with the introduction of copayment system in the health sector. Thus, following the research, it comes out that 68% of respondents considered that the introduction of co-payment system for hospital services will not have a significant effect in terms of improvement of such service quality. In addition, 78% of them disapprove the intention of the Ministry of Health to reduce the number of health services provided free through compulsory health insurance, one of the consequences of introducing basic service package.²⁴

Evaluation of these services is difficult and even impossible, because every patient has a genetic inheritance different from the others and therefore, the success of health care can not be assessed by traditional means of evaluation, the only evaluation criterion practiced since the 1950 being the discovery of negligent person as regards the medical service, or the one who violates the Hippocratic oath and change of their behavior. On the other hand, in the healthcare field, quality of service has broader meanings, also making it possible to apply other criteria: medical badge is a brand that facilitates networking of customers by such "brand", given that a disease may be spread over a considerable period, requiring a prolonged treatment, even "for life", as well as creating a field in which doctors are "heroes".

Another issue is that of hospital management: hospital director, being a physician has a limited mandate and has little authority over medical staff who is temporarily in his subordination, because he does not influence the consumption of financial and human resources or selection of product suppliers. In the first case, he can not limit or influence the number of patients, services provided to them and hospitalization time. In the second case,

²³ "Personal interest, human motivation, key in economics is an inevitable matter of human nature, something that is not necessarily admirable, but always requiring respect and requiring to be engaged in constructive, or at least harmless activities. Once this premise is denied, economic science can be easily dissolved into philosophy, economics, ethics and politics ".(Irving Kristel - „*The Public Interest*”, „*Sinteza*” Magazine of the US Embassy at Bucharest, no. 48, 1981, page 66, quoted by Ion Stoian, Emilia Dragne, Mihai Stoian –„*Comerț Internațional – Tehnici, strategii, elemente de bază ale comerțului electronic*” (International Trade - Techniques, strategies, core elements of e-commerce), First volume, Editura Caraiman, Bucharest, 2001, page 6)

²⁴ <http://www.businesscover.ro/25-02-2013-studiu-copлата-in-sanatate/>, 25th of February 2013

limited allotted budgets may cause serious deviations from the quality of medical services, the cost of a medical reference being the only criterion to trade with suppliers.

College of Physicians is not able to punish only clerical errors and limit resource consumption, consisting of people who are not paid for the extra time allotted, they are not required to be accountable to some shareholders, as in the case of public companies anomine, but mostly to their own conscience (*impaired in Romania by a ridiculous and ironical salary*) who got tired to challenge a system that has been continuously degrading for over two decades.²⁵ Lack of a clear and mandatory sanctions grids give rise to opening of opportunities for influence peddling, punishing frauds being left to the discretion of "hierarchical superiors". Here we find the implementation of basic principle of the new health law: from the desire to maximize profit, health insurance companies will take care that the patients' money should not be wasted by hospitals. But there is also the other side of the matter: insurers will try to reduce costs, which could lead to a decrease in the quality of medical services. Management positions in hospitals which are subordinated to local authorities will remain highly politicized.²⁶ So, the high conjuncture for formation of some leaders in the field, is less favorable as in the case of companies themselves. U.S. nursing shortage made that *Johnson & Johnson* be actively involved in improving the image of nurses and in the collection of scholarships to finance education.²⁷

4. CONCLUSION

While winning companies rely on the synergy of employees, processes and technology to build an exceptional offer, in the medical sector, the technology evolves faster than the financial capacity of hospitals to assimilate progress and, in some cases, medical culture to support the human side of quality - there have been many instances where new medical devices have never been handled. Adoption of new technologies is often suggested by family doctors, who directs their patients to specific public or private healthcare units. In parallel, patients want quick adoption of new technologies in hospitals, associating them with the quality of reliable medical services. Although many hospitals operate with rudimentary information systems, rapid technological development and digitization of medical information will continue to change the optics of supply and demand for these professional services. I stated that marketing task is to "to

²⁵ In 1990, Romania had an exclusively public medical system, funded by the state budget and managed by the Ministry of Health and its county health inspectorates. Services were officially provided free of charge, but underfunding of the system led to a decrease in the quality of services provided and transfer of part of their costs to the population. Many units were operating in damaged buildings and imported drugs were inaccessible to most population. It results an access limitation of some segments of the population to health services. Academic centers had efficient hospitals, in the Romanian context of health services, and on the other hand, primary medical care had not a sufficient coverage in the territory, especially in the rural areas. This contributed to polarization of access to health services. Romania had an Eastern European model of public health services focused on hospital care system that generated a burden for a poor budget, most of the funds (70%) being allocated to hospitals (IMSS, 2002). Outpatient and primary care suffered severely by the lack of funds. Lowering the population standard of living has led to worsening its health condition. Research findings put a warning on the social consequences of the Romanian human capital: impairment of social integration, in getting a job and place of work, through no adequate schooling, or decrease of ability to work through physical damage, as a result of health system disorders. Source: Works entitled „*Accesul populației la serviciile publice de sănătate*” (Access of population to public health services), author Cristina Doboș, published in „*Calitatea vieții*” (Life quality), XIV, no. 3-4, 2003 and „*Programul de cercetare: Polarizarea accesului la serviciile de sănătate și de educație ca sursă a sărăcirii în viitor*” (Research program: Polarization of access to health care and education services, as a source of impoverishment in the future), author Cristina Doboș, published in „*Calitatea vieții*” (Life quality), XVII, no. 1-2, 2006.

²⁶ <http://medlive.hotnews.ro/dezbateri-concurs-coruptia-din-sistemul-medical-%E2%80%93-protejata-sau-exorcizata-de-noua-lege-a-sanatatii.html>, 24.7.2012

²⁷ www.discovernursing.com

change ever-changing necessities of the fellow creatures into profitable *opportunities*, by *delivering value to customers*, by *offering high solutions*, *exempting them to spend time and effort for search and transaction*, *ensuring a higher life standard for the entire society*". *The purpose of health care service marketing is represented by the management of demand for such services, by managing the level, timing and composition of the demand.*²⁸

Health care market demand is a relatively predictable one, easy to set up and inventorized. In parallel, using technology progress requires a significant increase in the cost of health care services. Advanced technology can extend the life of suffering elderly and it may also help survive the children born prematurely. Our social obligation is to prolong life at all costs, but very high technology generates invoices exceeding possibilities and becoming burdens on the shoulders of society, actually of working population. It was estimated that 25% of total expenditure on health care is incurred in the last six months of life.²⁹

Due to a rather limited competition in the Romanian healthcare sector, marketing competitive strategies have not (yet) found their utility. However, under the reform, sanitary facilities (public, private, as well as those undergoing privatization) which relies on marketing competitive strategies will become successful, offering valuable services. It may be said that there is insufficient medical staff, as well as places in hospitals, funds, etc., but, on long term, things tend to improve, surpassing the traditional paradigm of patient care. All changes of this system will require a new kind of health care that be related to customers: patients, doctors, insurance companies and government. Departmental and multi-functional teams will contribute effectively to a correct assessment and to the settlement of problems in a timely manner. Innovation will be a real benchmarking competitive tool. Health activities on which the patient's life depends need structured approaches, based on innovation, even within the health unit: services rendered for the first time, of the highest quality and the best (not the lowest) cost.³⁰

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²⁹ H. James Harrington, James S. Harrington - „*Management total în firma secolului 21*” (Total management in the 21st century company), Editura Teora, Bucharest, 2001, pages 327-334.

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CLOUD-POWERED e-HEALTH

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Abstract: *During the last years, the global economic crisis has affected all domains, including the health sector. Many governments have considered that the solution to this problem is to reduce public expenses on healthcare, to decrease the budgets for health services, to rationalize the medical plans for the population, to increase the share of health expenditure paid by patients and to select the products on the pharmaceutical market.*

In order to improve the medical service whilst maintaining reduced infrastructure costs, the new digital technologies offer the solution of cloud-based services for the e-health systems.

In this paper we present the cloud-hosted healthcare applications concept, the advantages of using e-Health on distributed platforms and some considerations about the security levels. Also, we further present an experiment based on the free OpenEMR solution, which has also a cloud version, ZH-Services OpenEMR.

Keywords: e-health, cloud computing, healthcare services, security

JEL Classification Codes: I10, C88, D83

1. INTRODUCTION

During the last years, the global economic crisis has affected all domains, including the health sector. Many governments have considered that the solution to this problem is to reduce public expenses on healthcare, to decrease the budgets for health services, to rationalize the medical plans for the population, to increase the share of health expenditure paid by patients and to select the products on the pharmaceutical market.

Romania holds one of the smallest GDP shares allocated for public health (3,9% in 2012, 4,4% in 2013), much less than the European average of 9%. This sub-financing has led to a continuous leakage of trained professionals from the medical system.

In 2012, the budget for public health was almost four times smaller than the one in France or Belgium, which had a rate of 11%, as indicated by the British magazine “*The Economist*”.

Also, Switzerland, Canada, Germany and Austria have all similar values, floating around 10-11% per year from their GDP. The biggest rate is present in the USA, which allocates 16% for health problems. In Romania, the total amount raised to 8,67 billion in local currency in 2013 [6]. The Euro Health Consumer Index (EHCI) 2012 Report analyzes the European healthcare systems, offering “reality checks for policy makers, empowerment to patients and consumers and an opportunity for stakeholders to highlight weak and strong aspects of healthcare”.

Figure 1 presents the EHCI scores and it may be noticed that Romania holds the 32-rd place from 34 countries evaluated. The ranking is influenced by the introduction from 2008 of the e-health indicators.

According to Gunter Eysenbach, “*e-health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an*

attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology.”[7]

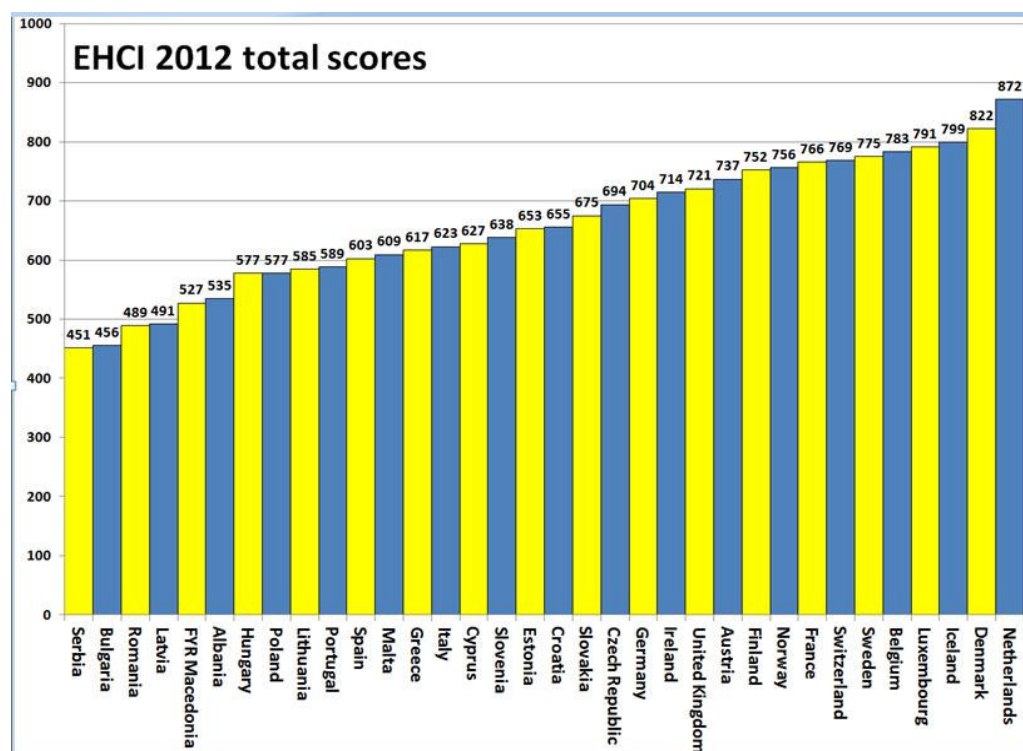


Figure 1 - Results of the Euro Health Consumer Index 2012

Source: <http://www.healthpowerhouse.com/files/Report-EHCI-2012.pdf>

Starting with 1997, in Romania has been introduced the health insurance system, being inspired by the German model.

This represents the main funding source for the health system, through which the insured people pay 5.5% and the employers pay 5.2%, the rates at Jan 1, 2013.

The administration of the system is carried by the National Health Insurance House (rom.: CNAS), a public institution established in 1999 as a juridical person.

To fulfill its mission, the CNAS has introduced a series of advanced IT&C systems that led to a better management of the Social Health Insurance Fund and the control of insured persons, and to the more efficient reporting of the medical services. In order to improve the medical service whilst maintaining reduced infrastructure costs, the new digital technologies offer the solution of cloud-based services for the e-health systems.

The e-Health in the cloud is a relatively new concept that provides the possibility to enhance healthcare management and decrease expenses in an integrated environment.

In this paper we present the cloud-hosted healthcare applications concept, the advantages of using e-Health on distributed platforms and some considerations about the security levels. Also, we further present the current level of the Romanian e-Health implementation and our proposal about the migration of e-Health on Cloud Computing. Finally, we present an experiment, based on the free OpenEMR solution, which has also a cloud version, ZH-Services OpenEMR in order to test some of the facilities of this technology.

2. LITERATURE REVIEW

Since the start of the global financial and economic crisis in 2008, all sectors of the national economy were affected, including the health system. The government had to take some unpopular austerity measures in order to reduce the expenses, measures that had an impact on the nation health status. After a short presentation of health policies in various states, we will argue that a major shift in strategy, like the migration to cloud-based e-health, will help keeping the costs down while providing an increased reliability for the end users.

The European countries decreased their current level of public expenditure on health during the last years. With any of these options they could also reallocate funds within the health system to enhance efficiency [18]. All European governments made efforts to implement e-Health solutions to ensure optimal healthcare services to their citizens (E-Medical records, e-Prescriptions, Health card) with a reasonable financial effort. E-Health solutions became popular at the beginning in the European Union, by offering the medical services to the European citizens wherever they are in the EU.

From the EU members, France and Germany were among the first to use IT&C solutions for the health sector.

According to Liberman [19], in France, the “SESAM-Vitale” program, widely deployed from 1998, currently links more than 300,000 healthcare professionals and processes around 1 billion electronic claim forms for reimbursement per year.

The *CPS* (Carte de Professionnel de Santé – Healthcare Professional Card) functionalities include identification, authentication and electronic signature of healthcare professionals.

Patient card (carte Vitale - *CV*) contains health insurance data for the insured person. Also, the e-Prescription service is running, and the pharmaceutical record contains all information related to the consumption of pharmaceuticals to a patient.

The *DMP* (Dossier Medical Personnel – personal medical record) is an electronic secure personal medical record, accessible over the internet. The DMP may contain medical history of a patient, previous medicine prescriptions, hospital care reports and results of medical examinations. Each insured citizen may have a DMP but this is not mandatory, and having a DMP is the patient’s decision, according to the law. The patient keeps control over his DMP: he authorizes access of the healthcare professionals to his DMP.

In the same work, Liberman [19] shows that in Germany, the *KVK* (Krankenversichertenkarte – health insurance card) launched in 1995. Due to the fact the *KVK* did not bear any picture of the cardholder, and its content was just plain memory without security, it had to be replaced by a more secure and efficient system.

The German government is introducing electronic Health Cards (eGK) for all insured citizens. The card contains personal data, insurance details and medical history records and it is used by the cardholders, when they require health care services, which are covered by the insurance.

Bittschi and Markus [20] affirm that since 2005, the electronic health card (EHC) was introduced by the Austrian social health insurance system and the actual goal is to develop the electronic health record (*EHR*) by ELGA project. Within ELGA, the e-card should take on the role of an electronic key providing access to electronically stored patient information.

In other countries, like Canada and Australia, projects are in development for the migration the public health services to the cloud. Thus, Neil McEvoy [21] provides information about the strategy document of Canada Health Infoway, entitled *Cloud Computing in Healthcare*. This provides a reference model for important aspects of a Cloud strategy, especially for Healthcare but also in a broader sense.

Marcoullier [22] says that in 2013, the challenge is run by Health and Human Services (HHS) Office of the National Coordinator for Health Information Technology. Statistic, the

current implementation status and the public opinion of the American public about electronic health records (EHRs) could be summarized as follows:

- 80% of Americans who have access to their health information in EHRs use it;
- Two out of three people would consider switching to a doctor who offers secure access to medical records;
- 65% of Americans who don't have access to EHRs say it's important to have it;
- 17 million consumers used their mobile device to access health information in 2011.

Colley, in its paper *Telstra cloud pilot in e-health system*, refers to a web-application delivery service for medical practitioners [23]. It inked a memorandum of understanding with the Royal Australian College of General Practitioners to build an e-Health Cloud. It will host healthcare applications including clinical software, decision support tools for diagnosis and management, prescriptions, training and other administrative and clinical services.

3. THE CONCEPT OF CLOUD-BASED E-HEALTH

This new concept results by reuniting two technologies: cloud computing and healthcare services supported by electronic processes and communication. Thus, we will briefly discuss the meaning of each component, how did the cooperation between them occur and which are the advantages of accessing healthcare services in the Cloud.

3.1 Defining Cloud Computing

Cloud Computing can be defined as “A computing paradigm which is a pool of abstracted, virtualized, dynamically scalable, managing, computing, power storage platforms and services for on demand delivery over the Internet.” [8]

The National Institute of Standards and Technology (NIST) defines cloud computing as „a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction” [1].

Cloud systems introduce many opportunities for e-health: sharing data with medical organizations, health research institutes, insurance companies, governmental institutions.

On the other side, using Cloud computing is a method to reduce the costs with hardware and software platforms and technical personnel for IT solutions.

Cloud computing is a new computing model that lets different healthcare organizations pay only for the resources they need, when they are needed. With cloud computing, shared resources are allocated dynamically to create a highly flexible environment. This enables organizations to treat the infrastructure as a service, rather than an expensive capital expenditure.

The main features of cloud computing solutions can be summarized as follows [1][2] [10]:

- use of Internet technologies to offer scalable and flexible services; this feature refers to the capacity of dynamically acquiring resources which support variable-size tasks, that can be measured and are cost-effective;
- full maintenance and security are offered by providers; they have more efficiency, extended know-how and the possibilities to periodically update the hardware and software resources.
- data storage strategy takes into account the physical distance to the site where resources are used in a location-independent manner; this leads to increases in reliability, security and lowers communication costs.
- by dynamically provisioning valuable resources, cloud computing platforms can reassign the unused resources and move them to where consumer demand is the highest.

A characteristic of cloud computing is the possibility to be accessed anywhere from an Internet connection and to promote on-demand self-service, by helping the end users to have computing resources at their disposal without the need of permanent interaction with the service provider. Data may be accessed from any network, regardless of the client platform (laptop, tablet, mobile phone) that is used. This leads to the final purpose of location-independent resource pooling.

Cloud computing consists of multiple levels, starting from the physical layer (servers, storage equipment) through the application layer, according to three fundamental models [3][4][5]:

- Infrastructure as a Service (IaaS) – layer capable to provision processing, storage, networks, and other fundamental computing resources (operating systems and applications) for medical data processing and storage resources.
- Platform as a Service (PaaS) – layer offering an integrated environment to design, build, deploy consumer-created or acquired healthcare applications onto the cloud infrastructure.
- Software as a Service (SaaS) – layer providing healthcare service-based applications in the cloud; in this model cloud providers install and operate application software on their platform and users access the services remotely. The cloud users do not manage the cloud infrastructure on which their application is running. The application is not installed and does not run on client computers; in this manner the customer is not responsible for maintenance and support for the software.

An implementation of computing clouds covers infrastructures of different sizes, with different levels of management, and different user numbers. There are four types of cloud strategies:

- Public Cloud - the infrastructure is owned by a third-party organization providing cloud services and is available to the general public or large groups of users; their services are free or offered on a pay-per-use model.
- Private Cloud - the infrastructure is owned, operated and managed by a private organization for its internal use only;
- Community Cloud - the infrastructure is shared by several organizations and supports a specific community that has similar approaches about policy, objectives, and security requirements.
- Hybrid Cloud - the infrastructure is a joint solution of two or more clouds (private, community, or public) that are bound together by standardized rules that enable data and application portability.

3.2 Defining e-Health

The term e-Health refers to “the use of emerging information and communication technology, especially the Internet, to improve or enable health and healthcare thereby enabling stronger and more effective connections among patients, doctors, hospitals, payers, laboratories, pharmacies, and suppliers” [11].

E-Health offers important medical/healthcare services, including [12]:

- Electronic health records: enabling the communication of patient data between different healthcare professionals;
- Telemedicine: physical and psychological treatments at a distance;
- Consumer health informatics: use of electronic resources on medical topics by healthy individuals or patients;
- Health knowledge management: *e.g.* in an overview of latest medical journals, best practice guidelines or epidemiological tracking;

- Virtual healthcare teams: healthcare professionals who collaborate and share information on patients through digital equipment;
- Medical research using Grids: powerful computing and data management capabilities to handle large amounts of heterogeneous data.

E-Health is not a solution for different healthcare organizations due to some limitations and weaknesses, such as: high cost of implementing and maintaining information systems, fragmentation of patient data in many separate healthcare systems, clinics or other areas of the healthcare institutions, lack of a general law to protect the privacy of patients and the interchanges of their medical records between healthcare organizations from many countries, lack of support for collaborative work among different healthcare organizations and the integration of the high volume of medical information.

3.3 Moving e-Health to Cloud Computing

Cloud computing is the technology that many small and medium healthcare organizations have chosen, and it has a powerful financial impact on the health industry also.

Being a newly introduced paradigm, both pro and con discussions about deploying cloud-based e-Health solutions exist, as follows [9][10]:

a). Advantages

- Scalability – the main feature of cloud-based services is that they are incredibly flexible in adapting to the size of the client, and thus even small-scale companies can benefit from them.
- Simplified deployment – the company does not have to support the high expenses for maintaining a complex IT infrastructure anymore, as the solution runs in the datacenter of the cloud hosting company.
- Cost – there is the option to lease the service and use a pay-as-you-grow model, avoiding the elevated costs implied by acquiring a site license from the beginning.

In this context, moving e-Health to the Cloud computing platforms solves these problems and offers important benefits to patients and healthcare institutions [13]:

- Better patient care: an unique patient medical folder, available for all the medical units;
- Reduced cost: a feature for small and medium sized healthcare providers to use advanced IT infrastructures and high performance software services without high operational costs; also, there is another aspect of cost decreases by having medical records available globally for all Cloud participants.
- Improved quality: having the clinical data stored in the Cloud, the healthcare operators will facilitate supplying data to governmental concerned entities such as the Ministry of Health or the World Health Organization with information on patient safety and the quality of care provided.

At national and inter-regional level, there are important positive effects [13]:

- Support research: the huge information repository about millions of patients' cases which can be uniformly and globally accessed can be easily used to develop medical research, to discover new medical facts and to conduct medical research to enhance medications, treatments and healthcare services.
- Support national security: an increased capability to detect and monitor the spread of infectious diseases and/or other disease outbreaks.
- Support strategic planning: decision makers can use data for planning and budgeting for healthcare services, the requirements for doctors, medical labs and equipments, operating

rooms, patient beds, and other medical facilities. It can also be integrated with other Cloud services to help in forecasting future healthcare services needs.

b). Draw-backs of the solution:

- data security risks – accessing patient data by unauthorized users; the systems include credentials to verify identity, but also a recording of every access attempt;
- the risk of loss of data – database management systems such as Oracle, IBM DB2, SQL Server include hot and cold backups, mirroring and database restores as solutions that minimize this risk;
- the risk of systems unavailability – losing an e-Health service is a major issue and must be solved by increasing the reliability of the software applications.

Figure 2 shows a generic architecture of e-Health Cloud, as a layered structure.

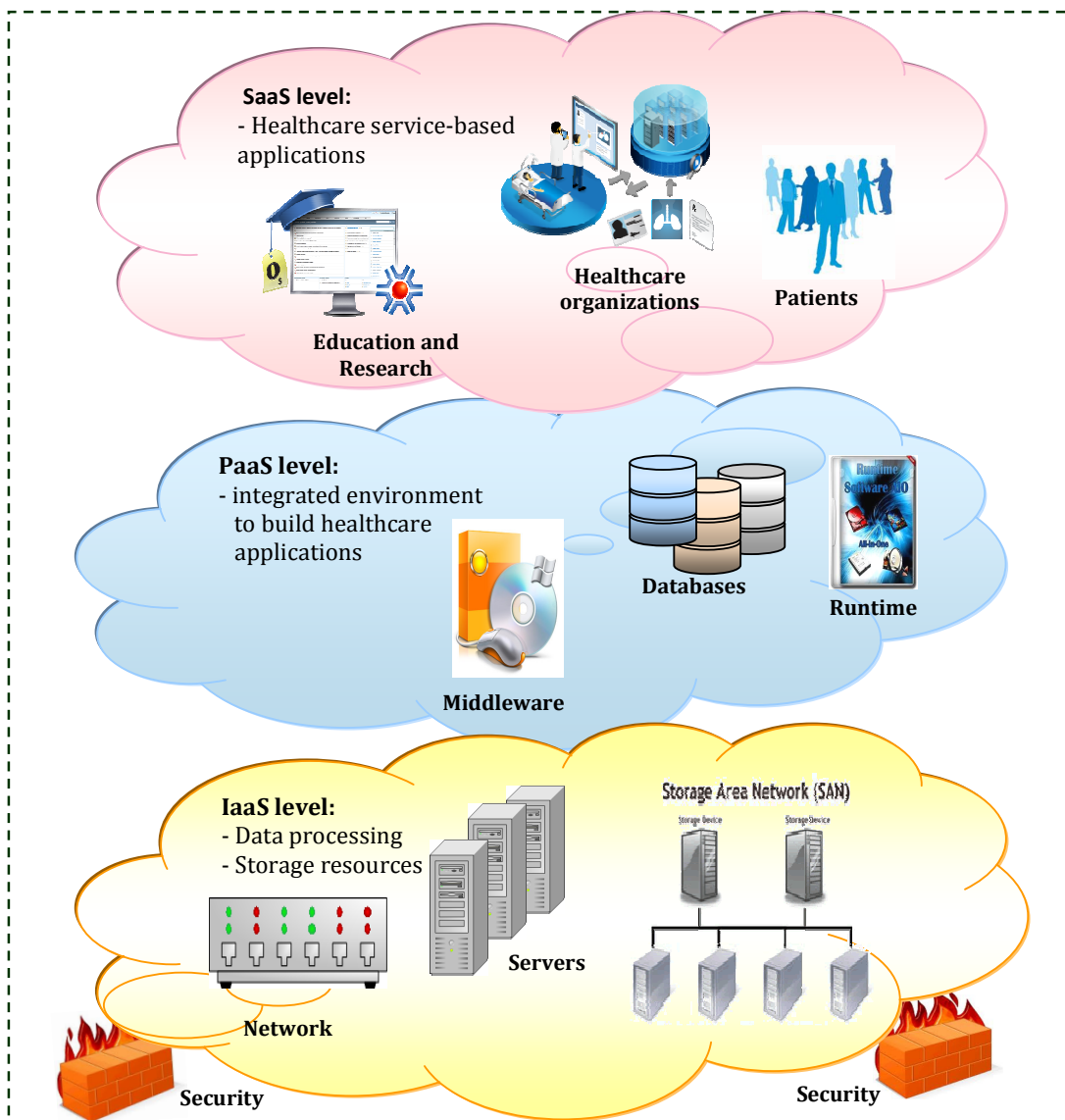


Figure 2. The e-Health Cloud Computing architecture

We choose OpenEMR as e-Health platform for our experiment, taking into account the popularity of this software and its user base spread all over the world.

OpenEMR is free and open source software for Practice management and Electronic Medical Records (EMR) software application. It features fully integrated electronic medical records, practice management, scheduling, electronic billing etc. It can run on Windows servers, UNIX-like and Mac OS X machines, and of course Linux based environments.

OpenEMR was originally developed by Synitech and version 1.0 was released in June 2001 as MP Pro (MedicalPractice Professional). It became an open source project and was registered on SourceForge.net on August 13, 2002. The project evolved through version 2.0 and the Pennington Firm (Pennfirm) took over as its primary maintainer in 2003. Walt Pennington transferred the OpenEMR software repository to SourceForge in March 2005, where it remains today [15].

The following paragraph will synthesize some of the strengths of OpenEMR software, according to the results of research studies in 2012 [16]:

- First of all, it is a free and open source platform;
- Secondly, it was built as a LAMP-type of web based application that uses a web server such as Apache, MySQL as the database and PHP as the programming language;
- Electronic Medical Records;
- A compact and flexible appointment calendar;
- Advanced reporting capabilities;
- Prescription writing capability with ability to email or print prescriptions;
- Patient statements and collection letters;
- Browser-based for flexibility, security, easy maintenance and platform independence for remote access (including tablets);
- Patient Demographics;
- Patient Scheduling;
- Medical Billing;
- Clinical Decision Rules;
- Patient Portal;
- Security.

Various application migrations to cloud computing are the most difficult aspect because there are some rules and principles that should be adopted in this shared environment. For this purpose, more providers such as VMware have teamed up to offer a joint solutions package that delivers e-Health in the cloud, according to Agency for Healthcare Research Quality [14].

So, the Open Healthcare Cloud (OHC) is a VMware implementation that provides a platform on which open source EMR applications can be deployed, run, and administered remotely and for which hardware usage is securely shared to improve affordability.

Another implementation Cloud based solution is ZH OpenEMR. Its popularity is largely due to economic reasons, namely the personnel and resources required to stay on top of the new technologies and ever-changing threat landscape [17]. The ZH OpenEMR cloud-based solution enables companies to focus on their core business of caring for patients by leaving the technical aspects of the EMR application to the experts who really understand the latest technologies and are able to keep the system running efficiently, taking into account the changes in user behavior that introduce security vulnerabilities.

Using a cloud-based application, in our example Hosted OpenEMR, we access the system via Internet to the application hosted in shared resource environment, as opposed to being

deployed on private servers. Cloud services are designed to provide easy, scalable access to the applications resources and services, which are managed by a provider.

A cloud service can dynamically scale to meet the needs of its users, and because the service provider supplies the hardware and software necessary for the service, there's no need for a company to provision or deploy its own resources or allocate IT staff to manage the service. Currently ZH Healthcare utilizes Amazon's AWS Cloud as their data center infrastructure provider [17]. Amazon is the pioneer in the field and has developed a reliable and flexible infrastructure that easily supports healthcare applications.

Why use a Cloud-based OpenEMR solution?

The answer is complex and must take into account the following considerations [17]:

a. Using the system as a better business strategy: the medical personnel will spend time working with patients, not with patient healthcare software. With the software installed in the cloud, the provider upgrades the software, makes the backups and is responsible with security. The cloud infrastructure is built on redundancy, meaning that the system is always available and so are the services.

b. Considering its scalability: in time, EMR system will grow due to the increasing amount of patient data and additional improvements in the application software that may require more computing power. This will require additional computing resources in order to keep performing efficiently. On the cloud platform, the provider can expand as required, and this operation is transparent for users.

c. Considering its security measures: patient information in the cloud became a target for hackers and are harder to secure. By using a cloud-based solution, the advantages are related to an infrastructure that is already in place, providing both security benefits such as private IP network isolation, encryption, server load balancing and automated backups. Server load balancing means that there are two or more servers for every piece of the application software. If one of the servers experiences a malfunction due to hardware or software problems, it is automatically removed from production to prevent it from causing impact to the service. When the issue is resolved, it's automatically placed back into service.

4. ROMANIAN E-HEALTH PROGRESS

In Romania, e-Health implementation has begun by introducing, starting with 2012, of the Integrated Health Information System (*SIUI*), developed by the local software company SIVECO, and it is designed to interface with the components of the Health Insurance Informatics Platform (*PIAS*): *SIVMED* represents a complex software solution, addressed to health units like hospitals, groups of hospitals or large clinics, and it relies on the national health card and the electronic health file (record) for patients.

Today the *SIUI* is implemented at all levels of the health system, from the primary medicine to the ambulatory and specialty medicine and hospitals, with the following functions:

- checking the insurance state of a patient
- checking the prescriptions against the approved drugs list
- warning on double prescriptions
- monthly reporting of medical services

For the primary medicine, all population has been distributed by territorial criteria, by allocating an average of 1800 patients per family doctor.

The electronic prescription module (rom.: *SIFE*) allows for a better management of drug funds and avoiding the most part of the frauds from the system.

The doctor enters the prescription data for each patient and validates it in the health insurance system. Then, the patient receives a printed form that contains a 2D barcode that acts as an access key that any drug store (pharmacy) registered in the system can read and authenticate. The Health Ministry has announced that, in the second half of 2013, the project for the Electronic health Insurance Card (rom. *CEAS*) will be implemented in order to identify the patient and ensure quicker access to medical services. Once this will be available, there will be no need for the printed prescription, as the card will be scanned directly by each entity.

In a future development phase, the Romanian health system will use an electronic patient record, which will store the medical history of each patient and will allow doctors to offer the right treatment for each case.

Implementing the Electronic Patient Record will lead to reduced infrastructure costs, as the new digital technologies offer the solution of cloud-based services for the e-health systems.

4.1 Using OpenEMR as an e-Health Cloud testing tool

For this experiment, we have downloaded the OpenEMR package (available at http://open-emr.org/wiki/index.php/OpenEMR_Downloads) and used the installation guide for the WAMP platform (Windows, Apache, MySQL and PHP) – OpenEMR Setup [16].

After the successful installation, the user may launch the application by pointing the browser to the server (in this case, local machine): <http://localhost/openemr>.

A successful login (figure 3) will bring up the main screen of OpenEMR. The user is presented with two windows, the Calendar and, below that, the Messages page.

OpenEMR can be used with one of the three navigation schemes: Sliding Menu, Tree View, or Radio Buttons. The Sliding Menu option is the default navigation scheme for OpenEMR 4.1. This expanding menu-style navigation scheme presents a hierarchical list of page links on the left side of the screen, which can be directed to load in either in the top or bottom widow of the main screen.



Figure 3. The access to the Cloud OpenEMR

To introduce a new patient, simply click on the name of the clinic, and edit the details.

Now that the clinic and all its practitioners are set up, we can begin scheduling appointments for the patients (figure 4).

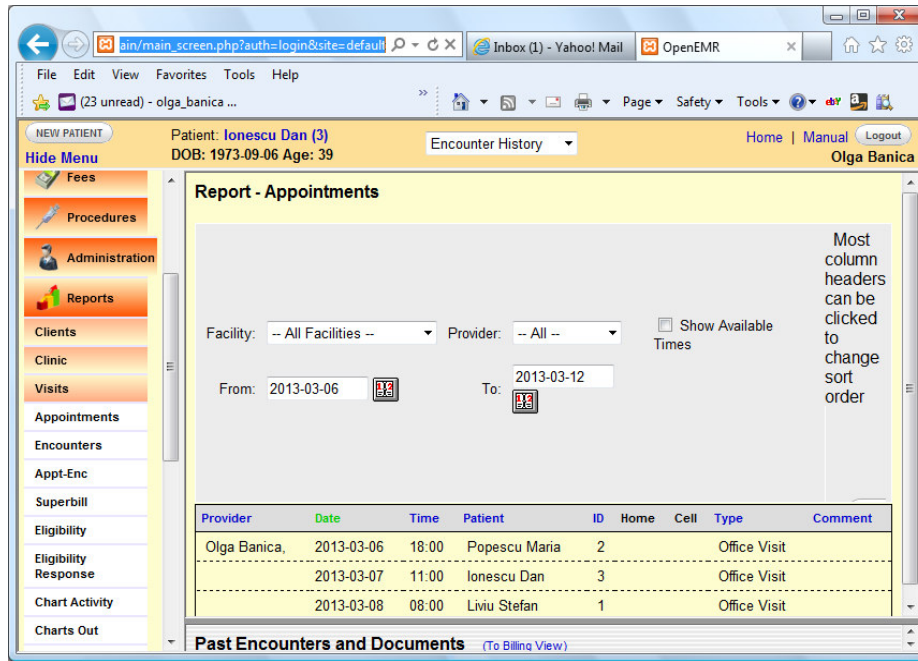


Figure 4. Report of all patient appointments

To locate a patient in the system, we must introduce all or part of their name into the search field and click 'Name' (Figure 5).

OpenEMR Software is relative simple to install on a local station, in a LAMP or WAMP configuration, or accessed in the Cloud, hosted by a dedicated provider, such as ZH Healthcare.

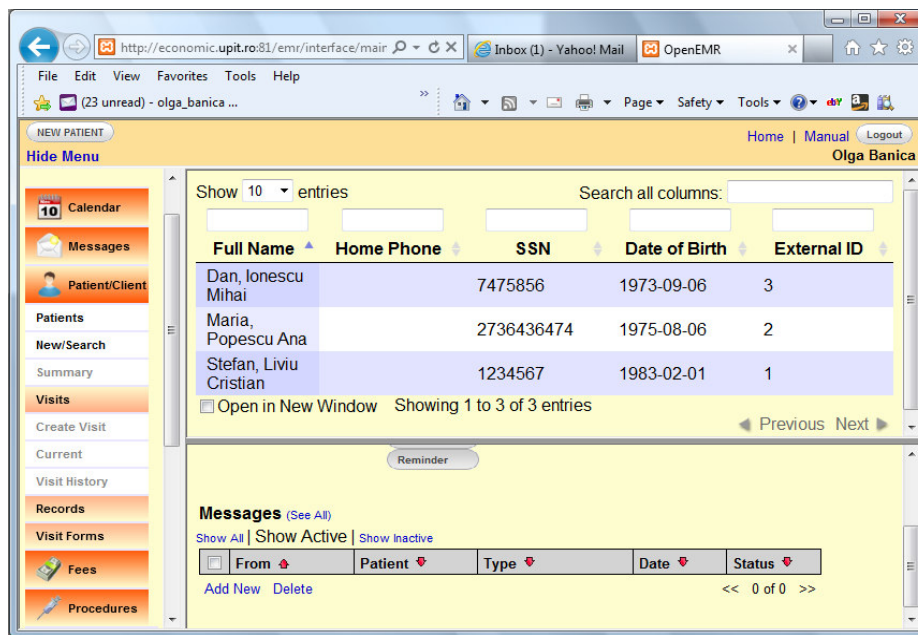


Figure 5. The list of patients

The experiment was dedicated to adding new patients and the appointments for a time period, introduce recommended prescriptions and generate miscellaneous reports.

The software responded to all technical requests of the mono-station experiment, next level being the evaluation of scalable performance on several servers.

5. CONCLUSIONS

The paper emphasizes the four main highlights for the future of the health environment that cloud-powered integration can offer:

- the advantage for the patients, healthcare organizations, pharmaceuticals companies, insurance companies, governmental agencies;
- helping the patients to better care of their health and don't spend their time for medical record redundant operations.
- by migrating to the Cloud computing, healthcare professionals across the globe can collaborate in real time and share information without the need to invest in expensive infrastructure. So, they work with a centralized platform allowing to access reports, scans, electronic medical records (EMRs), prescriptions and patient information and medical history such as insurance claims, prescriptions, and lab reports from anywhere in the world.
- having a central repository for patient information will decrease the risks of misdiagnosis or the prescription of the wrong medication, as well as eliminating chances of conflicting treatments where multiple healthcare professionals are involved.

Today Romania takes important steps in the direction of upgrading the health system, with visible advantages for both the patients and the medical service providers. Though, the financial effort to implement all these technologies from the *CNAS* will be substantial. Therefore, the design, development and implementation of the Integrated Information System for Social Insurance (*SIUI*) required an amount of EUR 119.540.000 (excl. VAT) and a 15 years period to become fully operational.

Thus, our view on moving e-Health on Cloud refers to the implementation of a solution meant to reduce infrastructure costs both in public and private sectors, while keeping the same performance.

Running software such as OpenEMR in Romania involves two main components:

- firstly, a powerful provider for the hardware and software of the cloud system;
- secondly, conformance testing of the available software solutions, in order to assess if they are capable to meet the requirements of healthcare providers, respecting the laws for implementing the framework contract that rules the public health services.

It is not only a *technological challenge*, but also a *strategy decision one*, regarding the following factors: government regulations, budget, available technologies, organizational culture, and these may affect the capacity to reach the desired goal.

Also, we suggest that building an e-Health on Cloud is a process that must evolve through at least four phases: determine the e-Health Cloud model, compare the offers of cloud providers, migrate the information to the data center, run and evaluate a pilot implementation.

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ARE YOU PANICKED? ECONOMIC AND HEALTH CONSEQUENCES OF THE ECONOMIC CRISIS: A PSYCHOLOGICAL APPROACH IN ROMANIAN CONTEXT

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***Abstract:** During the last few years the entire world experienced one of the most turmoil period in its history. Economic crisis is the most traumatic event leading to a substantial deterioration in the quality of life of the household. Unemployment, inflation rate increasing, freezing or decreasing of the wages, the purchasing power decreasing, the decreasing of the investments value represent only of some economic shocks that hit most of the individuals, in the last few years. The individual well-being is determinate by many things like the level and secure income, labor market status, job stability and characteristics, health status, social relationships, family etc. In some ways and to a different extent all these were affected by the economic crisis, for many people, around the world. Empirical evidence presented in different international studies emphasized a causal relation between all these aspects. The propose of the present study was to identify the economic and health consequences of the economic crisis adopting a psychological perspective. The results of the study emphasize that there is a causal relationship between psychological factors and almost all the dimensions of economic behavior and health status measured. Also, the empirical findings uphold that those who are more risk averse and have the highest perception over the risk exposure are taping the highest values regarding the main stressors measured and present more intense symptoms of stress exposure. The limits of the study come from the fact that health consequences were measured in certain period of time (the last six months), thus, this study do not offer a long term evaluation.*

Keywords: economic crisis, psychological approach, economic consequences, heath consequences

JEL Classification Codes: I10, D81, D12

1. INTRODUCTION

During the last few years the global economy has been characterized by turmoil, the world facing one of the worst economic crisis in its history. The transformation of the financial crisis in a severe economic crisis and its rapid expansion worldwide, confirms the acceleration of process globalization of economic activities and the interdependencies existing at present between national economies. The negative economic evolutions in all national markets conducted to important changes in the way the people thing, behave, and in their value system.

The mechanism transformation of the financial crisis in an economic one is based on the fact that a certain type of crisis generated the emergence of another type of crisis. For instance, if at the end of 2008, the majority of economic experts provided pessimistic forecasts regarding the evolution of national economies in 2009, they did not suggest anything about the social crisis generated by the effects of the recession, for example. The core mechanism of this phenomenon is considerate the “economy of fear”. Due to the exposure to the uncertainty and economic

shocks generated by the level of trust in brands, companies, sectors of activity, and in the anti-crisis measures taken by governments, diminished drastically. This is supported by the evolution Consumer Confidence Index (CCI) which, according to Nielsen Global Confidence Index Report 2008, CCI has experienced significant decreases in all national markets in which it was measured, in some national markets taping an absolute record of decrease. In the first half of 2009, CCI continued to decline in 48 of the 50 monitored countries. Regarding the outlook for 2013 and 2014, the forecasts remain reserved. According to *World Economic Situation and Prospects, 2012*, edited by United Nations, New York, global economy is on the brink of another recession. Even if in this report are expected slight increases in 2012, these increases are considerate insufficient to deal with the crisis of jobs in developed economies and will lead to lower incomes in emerging economies. Also in *Global Economic Prospects*, edited by World Bank the evolutions in the first four months of 2012 are presented generally positive. But it should be notice that the World Bank warns about a possible further decrease. Regarding the uncertainty, IMF in *World Economic Outlook (WEO)* sustains that it is not clear if the global economy is hit by another wave of turbulence due to a slow rebuilding of the economic crisis or if the turbulence is a long-term component.

Unemployment, inflation rate increasing, freezing or decreasing of the wages, the purchasing power decreasing, the decreasing of the investments value represent only of some economic shocks that hit most of the individuals, in the last few years. Taking into account that the individual well-being is determinate by many things like the level and secure income, labor market status, job stability and characteristics, health, social relationships, family etc., and in some ways and to a different extent all these were affected by the economic shocks exposure, it is expected that many people around the world to suffer an important deterioration in the quality of life. Thus, taking into account the economic evolutions during the last few years but also the uncertainty regarding the future global economic developments, it is clear that, at present, we are living in a transitional period characterized by high uncertainty to a new era defined by drastic changes which cannot be seen with greater clarity now.

In this uncertain global context there were established the research questions:

There is a direct causal relationship between psychological factors, economic factors and health status of the individual?

How does the panic mechanism function?

What are the main stressors in the context of economic crisis?

What are the consequences of the stressors exposure over health?

The present study is divided in three major parts. The first contains the results of the literature review that was done in order to underline the results of previous researches regarding the effects of the economic crisis and presents the way in which the panic mechanism faction in uncertainty situations and modules individual behavior. The second part of the paper displays the empirical findings of a consumer's survey that was done in Romanian context in order to determine how psychological factors are linked with economic behavior and health statuses. The third part of the paper, traces the conclusions of the study underling the key aspects of the study.

2. STUDY OBJECTIVES AND METHODS

This study is an empirical one and is based on extensive analysis of international studies that was done in context of different economic crisis episodes. Thus, the purpose of the study was to identify the economic and health consequences through economic shocks exposure in the context of economic crisis adopting a psychological perspective. Also, it was considerate important to measure different aspects of economic behaviour change in order to be identify the relation between economic aspects and health status. The starting premise in this study was that

in uncertainty context psychological factors (risk perception and risk aversion) play an important role in individual behaviour alteration. For the purpose of measuring the psychological and behavioral variables a five steps scale was used: 1 - to a low extent, 3 – to an average extent, 5 – to a great extent. For the purpose of analyzing the evolution of the expenses for the main categories of products and services in the last six months, compared to the previous period, a seven steps scale was used where 1 – much less, 4, in-between, 7 – much more. Also, in order to measure stress exposure and health status there was used a seven steps scale. The data were collected during April 2010 at a level of a 527 person's sample. In this research, validity was achieved by reviewing the academic literature in the field about economic crisis, economic psychology, risk theory, consumer behavior etc. In order to check the internal consistency of the measurement scale, there was used Cronbach's alpha for 44 items. The Cronbach's alpha assessed was 0.833, greater than acceptable standard value of 0.70.

3. LITERATURE REVIEW

3.1. INDIVIDUAL BEHAVIOR CHANGE IN TURMOIL PERIOD

Identification of the global consequence of the economic crisis is a very difficult issue taking into account that a precise estimation can't be done because many of these are not visible yet. Still, a complex framework of analysis should contain some certain directions: implications over individual behavior (a less healthy lifestyle, alcohol abuse, marital conflicts, suicides, criminality rate, domestic violence and divorce rate), implications over consumer behavior (changing the consumer behavior with important consequences over market structure), implications over health (mental health and addiction problems, the adoption of a less healthy food because of the consumption of cheap food, alcohol and nicotine due to stress, poor disease management due to overburdened health care services), implications over beliefs and attitudes (the things in which people believe and they treasure).

A great number of the research works were focusing on the identification of the economic shocks exposure in various crisis episodes. One of the first study belong to Kelly and Schewe (1974) in which was analyzed the American consumers reaction at stagflation. Their analysis was focused in the following directions: the consumption vs. savings, the postponing of the major items, the extensive usage of the credit, the lifestyle changes. Analyzing the same crisis episode, Shama (1981), pointed out that according with his study, the crisis conducted to important changes in the consumers motivations, values, attitudes and expectations. At the level of the behavior, he identified some clear changes: the decrease of the consumption enthusiasm, the postponing of durable goods purchasing, an extra time allocated to the purchasing, a focusing on quality and price comparison, elimination of the waste.

Another important crisis episode that was analyzed by many researchers was The American Latina crisis (Robles et. al., 2002; Friszbein and Giovagnoli, 2003; Laurawicki and Braidon, 2004). The researchers adopted different perspectives in indenting the consumers' response to economic shocks. For instance, Friszbein and Giovagnoli (2003) emphasized three categories of strategies adopted by the Argentinean households during 2001-2002 period, considered the most difficult in the history of this country. The first category of strategies corresponding to a reactive response was based essentially on the consumption reduction (quantitatively and qualitatively). The second category of strategies corresponding mainly to a proactive response contained extra activities in which consumers engaged in order to maintain a certain level of income: the production of goods at home for sealing, one of the new member of the household entered on the labor market, one of the member of the household started to work.

The present global economic episode, considered without precedent, put the consumers all over the world in the necessity of reevaluation of the purchasing behavior and spending

allocation. Anyway the change of consumers' behavior has not the same intensity and do not follow the same directions in all national markets. But, as many researchers already pointed out, the response of the consumers in present economic context is on a great extent an emotional one, that is way Quelech and Jocz (2009) considered that market segmentation using socio-demographic criteria is less relevant in present context, but a psychological segmentation is more useful and reflects better the market mood.

On the other hand, international literature suggests unemployment can be considerate the most traumatizing economic shock that an individual can faced in a turmoil period. Thus, many studies analyzed the impact of rising unemployment on individuals' behavior. For instance Rosenfeld (2009) studied the property crime and homicide in USA between 1970 and 2006. He emphasized that unemployment rate, the evolution of GPD and index of consumer sentiment are correlated with each other and with acquisitive crime and homicide. Economic crisis increases acquisitive crime and this in turn increase homicides by exposing more people to risky situations.

Also, the relationship between unemployment and health has been analyzed in several studies. It has been demonstrated empirically that there is a positive correlation between unemployment and mortality rate (Brenner, 1983). Moser (1984) demonstrated that men that are looking for a job had a mortality rate higher than standard level. His study showed also that there is a strong correlation between unemployment and health, but has not revealed which factors actually lead to this effect of unemployment. Another interesting aspect pointed out in the studies, is the connection that exists between loose of job' security and health. Bobak (1998) pointed out that poor health is related to a certain extent with political and economic events, arguing that.

3.2. THE PANIC MECHANISM IN TURMOIL PERIOD – HOW DOES IT WORK?

In order to frame the panic mechanism, and to identify how panic feeling works, it was started from a broader context with the purpose to determine the core factors that generate the change of consumers' behavior in nowadays global context. There was analyzed several studies that was done in the context of various crises: economic crisis (the crisis in Latin America (2001-2002), Asian crisis (1998-2000), the present crisis, 2008-2013); food security crisis (contamination with salmonella, avian flu); terrorism crisis (USA, 2001); public health_security crisis (AH1N1/swine flu, 2009). The purpose of this analysis was to discover to what extent these situations with negative impact on people (risk-generating situations) have some common aspects. The results of the analysis pointed out that obviously no crisis is similar to another as no two similar crisis are alike considering generating factors, evolution, outcomes, etc. But, it was established the fact that in all risk-generating situations the psychological factors play an important role in determining the change of human behavior with consequences over health statues and social capital.

Risk concept is a commune denomination, very often used nowadays in various circumstances: health, investments, terrorism, economic trends, food security, strategy, and long lasting business. In psychology, risk is defined as a subjective construct influenced by how the event is interpreted (Weber, 2004). As Hillson and Murray-Webter (2007) point out, there is a great range of definitions for risk-concept in the academic literature. Nevertheless, there is consensus within various approaches as to the fact that risk is associated with uncertainty and generates consequences. The current crisis is labeled as uncertain and risk generating situation (economic shocks) with significant effects on individuals. Zurawicki and Braidot (2004), defined the economic crisis from consumers' perspective as the most traumatizing event that affects family's life and brings a sudden and substantial deterioration of economic situation.

Akerlof and Shiller (2009) emphasized that a growing number of economists recognized that a psychological perspective is necessary in economic analysis. Unemployment, inflation raise, the freezing or decrease of salaries, the decrease of purchasing power, the decrease of deposits represent economic shocks that individuals have to cope with in the last few years, risks respectively, as long as such evolutions represent “uncertainties that matter” (Hillson and Murray-Webster, 2007) having important effects on individuals’ lives. Each risk is perceived and interpreted (represented) differently by each and every individual, which is the assessment of the degree of situational uncertainty, controllability of the uncertainty, and confidence in these estimates (Sitkin and Weingart, 1995). Risk perception is the interpretation that an individual makes with a view to the chances to be exposed to risk content (Pennings et al., 2002) and to the estimated capacity to control the exposure, for example, the extent to which the individual considers himself liable to unemployment and the control degree of this situation. This personal interpretation generates emotions such as panic, anxiety, stress, fury, etc. On the other hand, each individual likes/ dislikes in a certain measure the risk-generating situation, reflecting each person’s risk-attitude that leads to certain feelings such as panic, confidence/ lack of confidence in brands, companies, government, media, future. Risk-attitude is a hypothetical construction reflecting whether the individual likes or dislikes risk-generating situation and risk aversion. Thus, risk aversion is a mental projection of a certain situation (Hillson, Murray, 2007). Finally, in uncertain situations the change of individual’ behavior is determined by risk perception and risk generating situations aversion. Also, in the uncertainty context the extent to which an individual considers that he/she will manage the risk exposure play an important role in alternating the behavior.

Certainly not all individuals are alike, they do not react identically in a risk-generating situation, such as economic crisis because their perceptions over risk generating situations are varying on a great extent .Thus, the change of individuals’ behavior is not expected to have the same intensity and follow the same patterns, and the consequences of stress exposure to have the same intensity in all cases. In the international literature was empirically shown that people make different appreciations about the chance of being exposed to the content of the same risk, but also regarding the risk management at personal level. In this sense Pennings et al. (2002) and Lusk and Coble (2005) presented some models of individuals behavior change taking into account two psychological dimensions: risk perception and risk aversion. These models underline that the two psychological dimensions varies on a certain scale in case of each individual.

4. STUDY RESULTS

Regarding the economic shocks that the respondents faced: 12,7% experienced a period of unemployment, 53,1% experienced wages decrease, 12,1% experienced the wages freezing, 44,0% declared that they faced with the decrease of the purchasing power, 24,7% with the decrease of the investment/savings value and 15,0% appreciated that they were not affected by the economic crisis.

In order to fulfill the purpose of the study and to find reliable answers to the research questions, it was decided to be used K-means cluster analysis based on two clustering variables: risks perception and risk aversion. The number of initial clusters, settled according to Pennings et al. (2002) and Lusk and Coble (2005) models, was 4. After six reiterations, the final convergent value was reached according to the results below:

Table 1. The centroids of the final clusters generated by SPSS

Psychological factors	Clusters			
	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Perception on the outcomes of the depression generated by the evolution of the national economy	4,38	2,42	3,70	1,67
Aversion to the evolution of the national economy	4,70	4,64	2,43	2,33

Source: Authors' work

The clusters obtained was profiled and measured in total sample, according to the table no.2.

Table 2. Clusters dimensions and profiling

Clusters	Number of cases	Percent	Profile
Cluster 1	282	53,51 %	The Panicked
Cluster 2	145	27,51 %	The Concerned
Cluster 3	67	12,72 %	The Cautious
Cluster 4	33	6,26 %	The Rational
Total	527	100 %	100 %

Source: Authors' work

4.1. CLUSTERS PROFILING

Using the final results of the reiteration process as well as crosstabulation there was established the profile of each cluster:

The Panicked

The Panicked are those consumers thinking that within the next six months they will be highly affected by the consequences of the economic crisis and they dislike the evolution of the national economy on a great extent. This cluster is made up of employees with a low income (53,5%); retired persons and unemployed persons considering that out of 67 of the respondents 49 are Panicked who acknowledged that they were affected by unemployment in the last six months. Thus, 73,1% from those who experienced such period are part of this cluster.

Most of The Panicked are individuals with a low level of education, graduated secondary schools and vocational schools, they come from rural area considering that 67,0% of the respondents coming from rural area on the entire sample are concentrated on this cluster.

The Concerned

The Concerned are those consumers thinking that in the next six months they will be scarcely affected by the consequences of the depression and the evolution of the national economic situation is deeply dissatisfactory. This cluster encompasses firstly, employees with a monthly low and medium income (66,2%), students (17,9%), entrepreneurs/ freelancers (10,3%), retired persons (11%). The majority of the Concerned graduated high-school (41,4%), a higher education institution (41,4%) or postgraduation courses (6,2%). An interesting aspect is the presence of respondents acknowledging that they were not affected by the consequences of the depression. Thus, 36 respondents belong to this cluster out of 79 of the entire sample.

The Cautious

The Cautious are those consumers thinking that within the next six months they will be highly exposed to the consequences of the depression and the evolution of the national economic

situation scarcely displeases them (high risk aversion). This segment encompasses employees (67,3%) with a medium and high monthly income as well as entrepreneurs considering that 18,4% from the total number of entrepreneurs of the sample belong to this cluster. The presence of entrepreneurs shows the impact of the depression on business environment and the difficult problems they have to cope with for surviving in the context of depression. Most of them graduated high-school (55,2%), and higher education institutions (28,4%).

The Rational

The Rational are those consumers thinking that within the next six months they will be scarcely affected by the consequences of the depression and have a low aversion for the evolution of the national economy. The respondents belonging to this cluster are employees with a high monthly income as well as those who professed that they were not affected by the consequences of the depression. Most of the Rational come from urban areas (95,6%). They graduated high school (40,0%) and a higher education institution (48,9%).

4.2. THE ECONOMIC BEHAVIOR CHANGE AT THE CLUSTERS LEVEL

The profile of behavioral change for each cluster was made with the help of cross-tabulation.

Table 3. Descriptive statistics – the mean value of the economic behavior change at the level of clusters

Directions of evaluating behavior change	Mean value at the level of clusters			
	The Panicked	The Concerned	The Cautious	The Rational
Migration on demand curve (MDC)	3,7801	2,4069	3,1045	2,2424
In the process of choosing products the price comes first (PC)	4,2199	3,1724	3,6418	2,7576
In the process of choosing trademarks/ product quality comes first (QC)	3,3723	3,9793	3,9701	4,2121
Aggressive search for options (ASO)	4,0567	3,4000	3,6269	2,8182

Source: Authors' work

As it can be notice, the most intense economic alteration it can be found at the level of the Panicked cluster. Thus, most of the panicked people migrated on the demand curve, switching products. This is sustained by the fact that in choosing the products, price comes first. Also, it can be notice that members of this cluster are engaging in an extra search options in order to find the lowest price. This means that a quality reduction strategy was adopted in order to cope with economic crisis. The effects of this reduction can be found in the health status and quality of life, in general. Thus, it can be expected in this particular group on a long term to be recorded more health problems because of the less healthy food consume. Anyway, as it can be notice in the table above, in case of all clusters there is a certain economic behavior alteration, this alteration varying from one cluster to another. The highest alteration can be found in Panicked cluster, while a slight alteration can be found in Rational cluster.

4.3. HOUSEHOLD BEGET ADJUSTMENT AT THE CLUSTERS LEVEL

As the results of the research emphasized, and as it was expected based on the previous experienced crisis, the main tendency at the sample level was the reduction of consumption, thus, 67,4% of the respondents sustaining this aspect. The consumption reduction was done in order to

increase savings (14,6%) or to survive (52,8%). The fact that most of the respondents, although they consumed less they did not manage to save money almost at all, is due to a higher inflation and prices during the period analyzed as well as to a freezing or decrease of incomes as a consequence of the measures taken by the Romanian employers.

The analysis of the evolution of the expenses in the last six months compared to the previous period was made for the main categories of products and services according to COICOP classification at the level of the clusters.

The cross tabulation process emphasized a general tendency in reduction of the consumption and in rationalization of the consumption by eliminating waste.

Table 4. Descriptive statistics – mean value of the expenses at the level of clusters based on COICOP classification

Categories of products and services	Mean value of the expenses at the level of clusters			
	The Panicked	The Concerned	The Cautious	The Rational
Basic food products (meat, dairy products, bread and pastry products, fruits, vegetables, etc.)	3,8546	4,1724	4, 1045	4,3939
Other food products (sweets, soft drinks, coffee, etc.)	2,8759	3,5793	3,5522	3,6364
Alcoholic drinks and tabacco	2,0248	3,0621	2,9851	3,0606
Personal care products	3,3688	4,1310	3,7313	4,3636
House maintenance and improvement	2,6348	3,4966	3,1493	3,8788
Transport (gas, tickets, seasonal tickets)	3,3582	4,0069	3,4030	4,1515
Water, gas, electricity	3,9433	4,2828	3,9552	4,2121
Magazines, newspapers, books	2,2447	3,1655	2,4925	3,3939
Garments and shoes	2,7128	3,6000	3,3284	3,8788
Appliances and tools (household appliances, electronics, furniture, etc.)	1,8369	2,9517	2,8060	3,0606
Journeys, holidays, leisure	1,7482	2,8897	2,6119	3,2727
Pharmaceutical and medical care products	3, 8723	4,2000	3,8507	4,1515

Source: Authors' work

As it can be notice from the table above, the central tendency regarding spending allocation, is the rationalization of expenses, by keeping the expenses at almost the same level for strictly necessary products (basic food products) and decreasing the expenses for almost all the other categories of products and services. Panicked people reduced spending in almost all categories of products. Based on this results, it can be concluded that in case of this group it was adopted a quality but also a quantity reduction strategy in order to manage the crisis. Anyway the reduction is slightly in basic food products and is more intense in all other categories, the intensity varying from one category of products to another. An interesting aspect is the fact that, the expenses for alcoholic drinks and tabacco were diminished at the level of all clusters; Panicked people were done the highest cut of these expences. It can conclude that, the pattern of individual behavior change in case of Romanians, do not folllow the same direction identifed in the context of pervious crisis, respectively the increase of alchool consumption.

4.4. THE HEALTH STATUS AND THE STRESS GENERATING FACTORS

At the entire sample level 42,1% of the respondents sustained that they confronted with different health problems generated by stress. In case of those who experienced a period of unemployment, 56,7% had different health problems because of the same cause. This emphasizes that unemployment has adverse impact on psychological function, and the unemployed become more anxious and depressed.

Looking at the clusters level, Panicked people present higher value of symptoms associated with mental health problems determined by stress exposure. Taking into account that a long exposure to stressor had consequences over health on a long term, it can be expected that Panicked people to have more health problems in the future than the members of the other clusters.

Table 5. Descriptive statistics – mean value of the consequences of stress exposure

Directions of evaluating the consequences of stress exposure	Mean value at the level of cluster			
	The Panicked	The Concerned	The Cautious	The Rational
The extent to which the respondent felt angry	4,8729	4,3841	4,0909	3,7000
The extent to which the respondent felt anxious	4,6220	4,1333	4,1091	4,0464
The extent to which the respondent had insomnia	3,8213	3,5298	3,7333	3,2364
The extent to which the respondent felt exhausted	4,6564	4,2384	4,2727	4,3333
The extent to which the respondent lost the concentrating capacity	4,1821	3,9205	3,6000	3,5000

Source: Authors' work

Table 6. Descriptive statistics – mean value of the stress generating factors

Stress generating factors	Mean value at the level of cluster			
	The Panicked	The Concerned	The Cautious	The Rational
Family atmosphere	3.6564	3.5563	3.0727	3.3333
The capacity to ensure a decent living for the family	4.8110	4.1060	4.2000	3.5000
The financial status	5.3024	4.5497	4.6182	3.7333
The unemployment fear	5.2845	4.2541	4.5000	3.4231
The general well-being	4.6426	4.4437	4.0727	3.5000
The evolution of national economy	5.2680	4.8146	4.7818	4.0667

Source: Authors' work

According to the results of the research, at the entire sample level, the most stressful factors in the analyzed period were essentially from economic nature. The evolution of national economy, and the uncertainty associated with this evolution, seems to be the most stressful factor at the level of the all clusters. The financial status and the fear of unemployment, as well as the incapacity to ensure a decent life to the family, are important stressors in case of Panicked people. It can be observed that there is a correlation between the profile of the cluster and the main stressors. The membership of this cluster is associated with low income and

unemployment. Because unemployment generates multiple consequences affecting the financial situation of the household/individual, the financial status is the second stressor as value, in case of this group.

5. CONCLUSIONS

The world today is facing the most important changes in its history. The present global economic crisis is only a part of the change. A precise estimation of the economic, health and social consequences of these changes is a difficult issue because some of these will become visible many years from now on.

The point of the present study was to identify the role of the psychological factors in the individual behavior alteration and to make an analysis of the mental health considering the exposure of stress. Thus, the present study focused on identification of the impact of the psychological factors over individual behavior. In this study, the starting premise was that in uncertain conditions, as present economic is, the individual behavior was determined to a great extent by psychological factors as risk perception and risk aversion over the situation and evolution of the national economy. In order to achieve the purpose of the study, K-means analysis was used and four clusters were determined.

The analysis regarding economic behavior and health status was done at the level of the clusters. The results of the study supported the fact that those who are more risk adverse and have a higher risk perception presented the most intense behavior alteration and confronted to a higher extent with different health problems generated by stress, presenting different symptoms of stress exposure.

As the results of the study showed, there is a direct relation of causality between psychological factors and economic behavior change. Those with the highest risk aversion and risk perception presented the highest values of economic behavior alteration.

Regarding the relationship between psychological factors and the signs of mental health problems, the results of the study emphasized that risk perception and risk aversion were in a relation of causality, considering that Panicked people presented higher values of stress exposure symptoms. Also, the results supported the fact that those who were exposed to a period of unemployment presented such signs to a greater extent than those who had not experienced such a period. This supports the empirical findings of previous researches, between unemployment and mental and physical health problems there is a significant association. The important stressors were of economic nature, the results of the study placing the general situation of the national economy as the most important stress generating factor.

The results of the present study bring additional insights into individual behavior in uncertain conditions, underlining that in the context of uncertainty, as economic crisis is, the psychological factors play an important role in individual behavior alteration and over health status.

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NECESSITY TO ESTABLISH LABOR SAFETY AND HEALTH SYSTEMS WITHIN S.C. ARPECHIM

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***Abstract:** The safety and health policy must be officially declared in order to be implemented within the organization. The basic management model adopted is transposed within the strategic action plan in appropriate strategies, on long and medium term, referring to the organization operation, retail market and conduct. Only a conduct aligned to the labour safety and health requirements, acknowledging and accepting the same by volition may lead to an effective implementation of the labour safety and health management system. At S.C. ARPECHIM, labour safety and health management must be prepared as a management system aiming for the ongoing cooperation between all employees in order to improve labour safety and health, to reduce at maximum the illness costs and labour accidents.*

Keywords: health safety, health management system, health strategies and policies

JEL Classification Codes: I10, M12, K32

1. INTRODUCTION

The LSHM system may be defined as an assembly of decisional, organizational, information and motivation, etc. elements within the organization by means of which the assembly of processes and LSHM relationships are coordinated in order to achieve the desired level of labor safety and health.

At S.C. Arpechim the general management system involves three action plans:

- Normative plan, within which the following are set: administrative manner for the organization constitution, its basic principles, policy, objective, organizational culture to be implemented;
- Strategic plan, by means of which the objective set within the normative plan are transposed in long and medium term strategies and action plans;
- Operative plan, within which the strategies and plans are implemented and actual actions are realized, necessary to achieve the objectives proposed.

If we consider the organizational elements providing for the operation of the organization: the structures and basic organization, basic activities, management conduct and the conduct of all remaining employees and if we relate the contents of the three plans to the same, we should obtain nine fields of action afferent to the management system, table 1.

Table 1

	Basic structures and organization	Basic activities	Conduct of all employees
NORMATIVE PLAN	Organization constitution	Basic policy	Organizational culture
STRATEGIC PLAN	- structure and organization	- production and marketing strategies	- public relations and environmental impact

	- necessary resources	for products and services - investment planning	- definition of desired conduct for employees
OPERATIVE PLAN	Process, product or service planning and execution	Control of process execution	Formation of staff conduct in the meaning of professional performance and labor cooperation

The organization constitution aims to select, depending on the field of activity proposed, the most appropriate legal form of constitution for the organization and the actual registration of the same to competent authorities, the establishment of headquarters, the organization statute and operation, as well as to delimitate the employees' rights and obligations by means of the collective labor agreement.

The basic policy is defines as basic principles formulating in details the economic, operational, social and general interests, as well as the values aimed by the organization.

Organizational culture materializes in the top management conduct, the conduct of other management persons, as well as the conduct of all remaining employees.

The top management must aim to protect the manpower, regardless of the legal requirements, so as to be considered as basic principle in the organization's activity and an objective as important as the profit and to monitor the implementation of such value within the strategic and business programs.

Within S.C. Arpechim, such policy is a decisive prior condition for a LSHM system [1] transforming the legal obligation to realize the labor safety and health in a voluntary action, a willing assumption of the responsibility for the employees' labor conditions.

Organizational culture, is rightly focused, forms the attitude of manpower both in terms of the organization interests and macro-social interests.

Figure 1 shows the action fields corresponding to the normative plan.

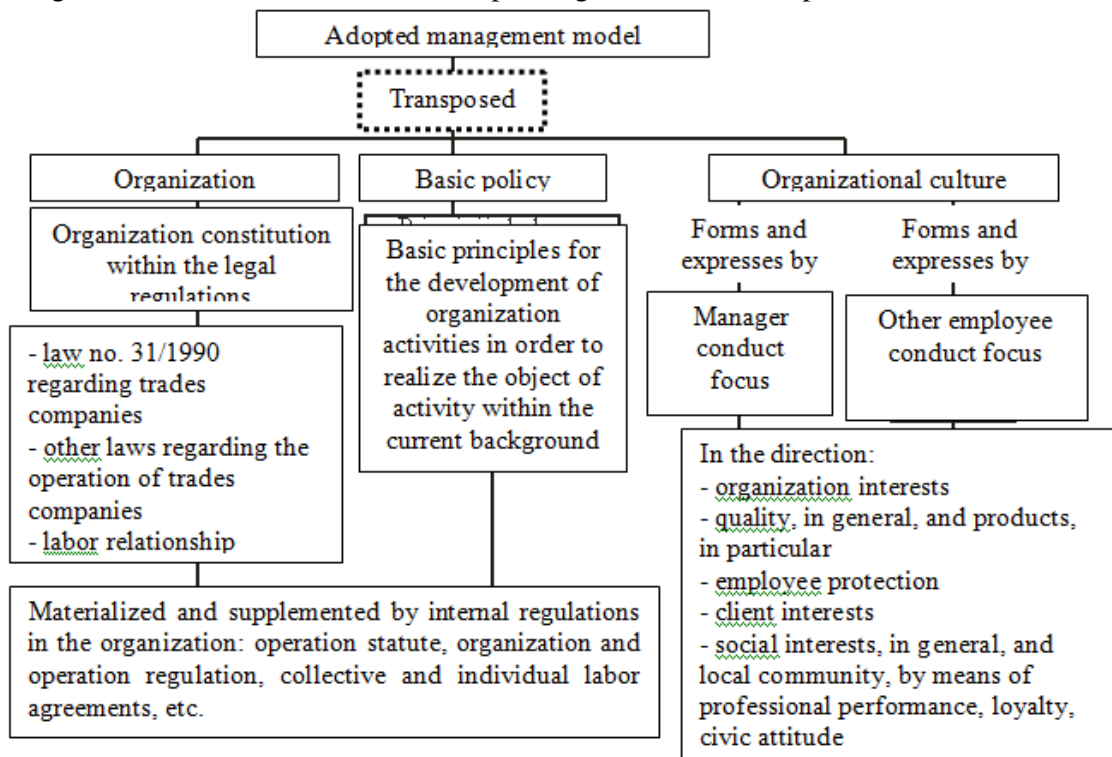


Figure 1. Fields of action according to normative plan

The safety and health policy must be officially declared in order to be implemented within the organization. Although it requires high ethical values, such a policy is not justified only by humanitarian reasons. It is also justified by economic and financial factors, etc., because, by reducing or eliminating professional illnesses and accidents, as well as other expenses involved by inappropriate labor conditions, the profit may be increased and thus exceeding the investment in labor safety. Only on grounds of such a policy may a LSHM system be created, based on the "own care and responsibility: principle.

2. RESEARCH METHODOLOGY

In order to become viable, the actions afferent to each filed of action within the normative plan for a LSHM system must be detailed in elementary actions, according to table 2.

Table 2

<i>Fields of normative action plan for a LSHM system</i>	<i>Elementary normative actions within the LSHM system</i>
Establishment of labor safety and health system	Establishment of organizational structures Resource provisions Legal requirements Other requirements
Labor safety and health policy	Policy and strategy in the matter of labor safety and health
Labor safety and health organizational culture	

The basic management model adopted must be transposed within the strategic action plan in appropriate strategies, on long and medium term, referring to the operation of the organization, retail market and conduct. The strategies must aim towards optimum development, according to the basic policy, organization structure and various management subsystems implemented.

Similarly to the production and marketing strategies, for the LSHM system within S.C. Arpechim strategies providing for the achievement of specific objectives must be implemented:

- Procurement of technical equipments, raw materials and safe personal protection equipments;
- Observance of safety and health requirements in the case of buildings, internal transport and hazardous substances storage;
- Preparation of labor accident and professional illness prevention programs;
- Preparation of medical programs regarding professional illness prevention;
- "Safe" product planning and execution.

The strategic plan must also aim towards human resources, both in terms of quantity and in terms of quality.

Figure 2 presents the fields of the strategic action plan in case of the LSHM system.

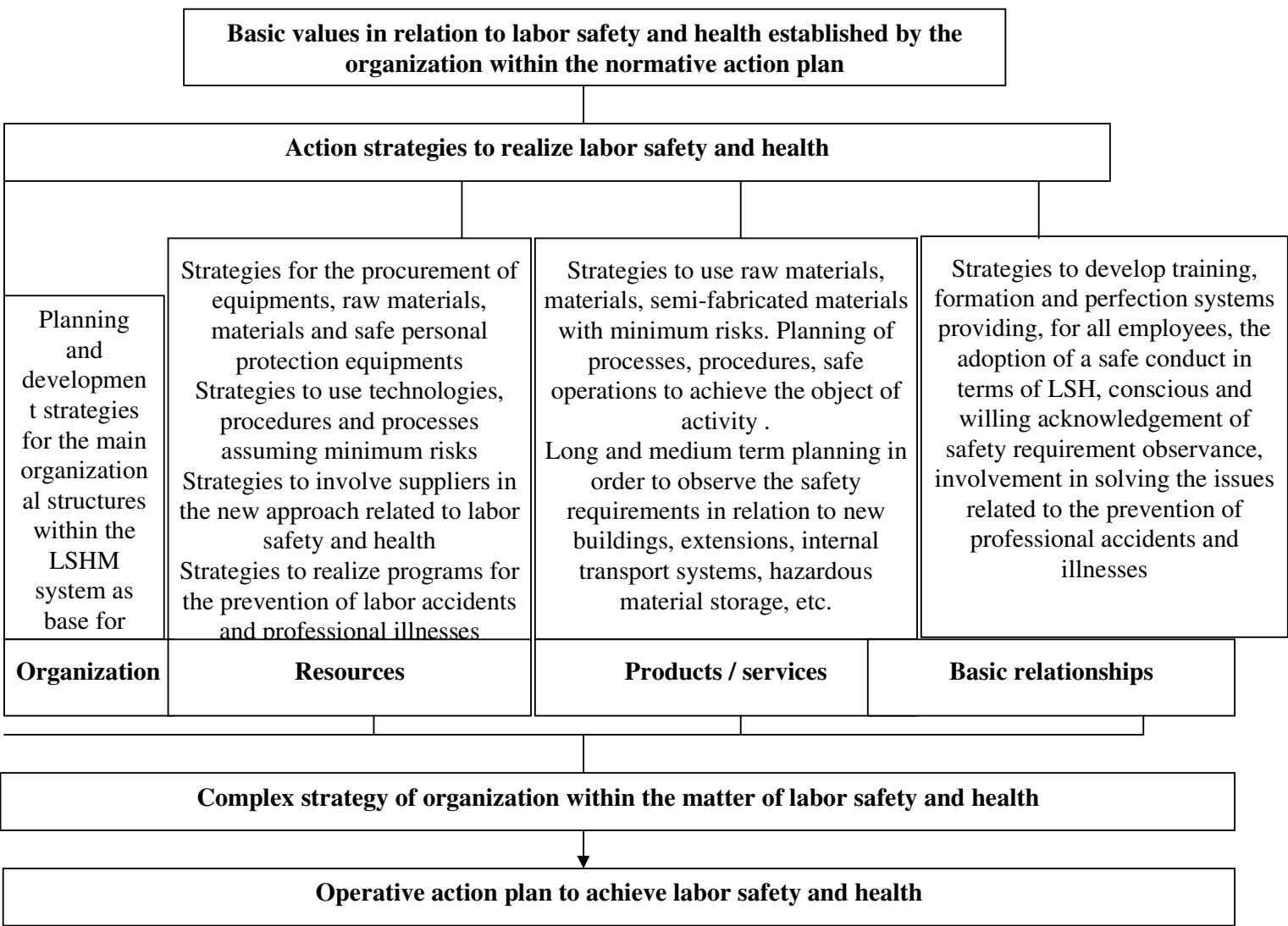


Figure 2. Fields of the strategic action plan in case of the LSHM system
 As in the case of normative plan, the fields of the strategic plan must also be detailed in elementary strategies outlining the directions for punctual sub-fields, as in Table 3.

Table 3

<i>Fields of strategic action plan for a LSHM system</i>	<i>Elementary strategies within the LSHM system</i>
Organizational structure planning and development	S ₁ Structure of LSHM system S ₂ Integration of management system S ₃ Operation of management system
Labor safety and health performance strategy	S ₄ Assessment of management system
Development of appropriate conduct	S ₅ Training programs

The objective of the operative plan consists, in the case of a general management system, of all the activity planning, control and execution – from research and development to the execution of the finite product / service – under economic efficiency conditions.

When defining the actions, procedures, etc., providing for the achievement of such purpose, it must be considered that the short time objectives, respectively the immediate profit, must not impair the organization’s long and medium term operation.

The research resulted in that the operative plan must include:

- Process, product and service planning;
- Investment control;
- Economic efficiency performance and control.

Also, it must be considered that the activities specified within S.C. Arpechim cannot be successfully realized if an appropriate staff conduct is nit provided for, as outlined in the training-perfection strategy for all employees.

For this, the operative plan must also provide for appropriate actions to obtain professional performance and desired collaboration between employees Figure 3.

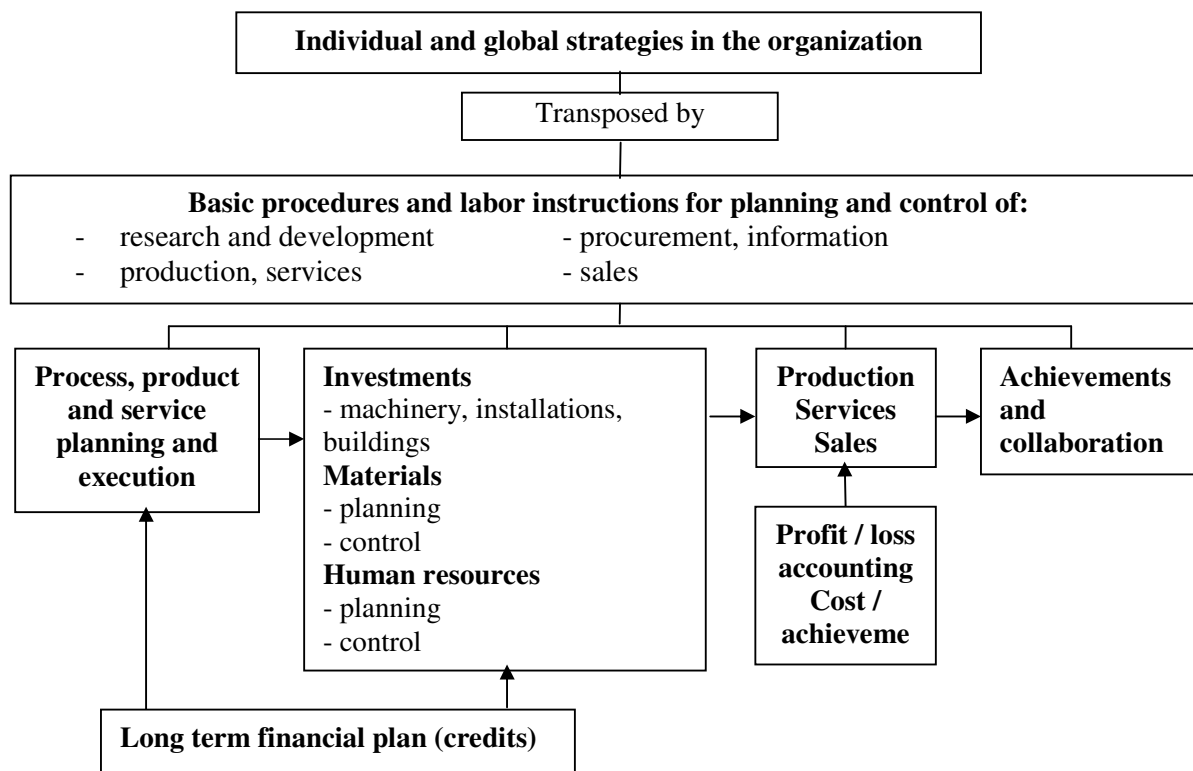


Figure 3. Fields of operative action plan in case of general management system

For the results in the operative action plan to be those aimed, actual actions must be established as well – regular training, detailed content of the same, usable promoting forms – by means of which the appropriate conduct is provided for the management and manpower in general.

Only a conduct aligned to the labor safety and health requirements, acknowledging and accepting the same by volition, may lead to an effective implementation of the labor safety and health management system.

The elementary actions within the operational plan of SLSHM are specified in Table 4.

Table 4

Fields of operative actions within a LSHM system	Elementary operative actions within the LSHM system
Monitoring, control and assessment systems Own labor safety instructions Labor instructions according to the safety requirements	O1 Labor safety and health committees O2 Identification and description of jobs, main stages and processes for safety O3 Identification and assessment of risks O4 Revision and surveillance procedures O5 Evidence control O6 Employees' rights O7 Employees' obligations O8 Employees competence
Planning and action according to the labor safety and health requirements	O9 External and internal communications O10 Formalization and documentation O11 Risk elimination and mitigation O12 Preventive medicine O13 Corrective actions O14 Measures in case of damage and emergencies O15 Procurement O16 LSHM audits
Acknowledgement, by all employees, of the importance of labor safety and health and their implication in execution.	O17 Participation and common interests O18 Action programs O19 Training

The 19 elementary actions detailed for the fields of action within the LSHM system are subsumed in ten system elements, table 5.

Table 5

LSHM system elements	Normative (N), strategic (S) and operative (O) action elements
1. Duties and responsibilities of top management	1.1. LSHM policy and strategy (N5) 1.2. Establishment of organizational structures (N1) 1.3. Assessment of LSHM system (S4) 1.4. External and internal communications (O9) 1.5. Resource provision (N2)
2. Management system	2.1. Structure of management system (S1) 2.2. Labor safety and health committees (O1) 2.3. Participation and common interests(O17) 2.4. Integration of management systems (S2) 2.5. Operation of management system (S3) 2.6. Formalization and documentation(O10)
3. Legal and other requirements	3.1. Legal requirements (N3) 3.2. Other requirements (N4)
4. Prevention	4.1. Identification and description of jobs, main stages and processes for safety(O2) 4.2. Identification of risk factors and assessment of risks(O2)

	4.3. Risk elimination and mitigation (O11) 4.4. Preventive medicine(O12) 4.5. Action programs (O18)
5. Analysis, monitoring and corrective actions	5.1. Analysis and monitoring procedures (O4) 5.2. Corrective actions (O13)
6. Measures in case of damage and emergencies	6.1. Measures in case of damage and emergencies(O14)
7. Procurement	7.1. Procurement (O15)
8. Evidence control	8.1. Evidence control (O5)
9. Personnel	9.1. Employees' rights(O6) 9.2. Employees' obligations(O7) 9.3. Employees' competence (O8) 9.4. Training (O19) 9.5. training, training programs (S5)
10. LSHM system audits	10.1. LSHM system audits (O16)

The functional relationships between the elements of normative (N), strategic (S) and operative (O) actions and the elements in the LSHM system. These elements were defined and structured so as to provide for the synergy compatibility with the elements in other management systems, such as the quality management system (ISO 9000) or environmental management system (ISO 14000). These include, in a first instance, five generic elements, afferent to any management system: top management duties and responsibilities, management system, evidence control, personnel and audit. The other are elements specific to risk control, legal obligations and different in nature, prevention, analysis, monitoring and corrective actions, measures in case of damage and emergencies, procurement.

3. CASE STUDY REGARDING THE ACTIONS REALIZED WITHIN A LABOR SAFETY AND HEALTH MANAGEMENT SYSTEM AT S.C. ARPECHIM.

The legal obligation of S.C. Arpechim is to realize the labour safety and health for all employees, to provide for the development of labour processes so as to avoid the occurrence of professional accidents or illnesses. The preventive experience demonstrated that this is not possible. Even if all possible measures were taken, the installations become old, technologies use hazardous materials in their nature and therefore there shall always exist the possibility of an incident, damage or an action generating accidents or illnesses occurring.

The human factor cannot be definitively excluded from the process even if automation and robots are used. The Master Directive 89/391/CEE outlines the general guidelines for the entire regulating activity in the matter and basic preventive are specified:

- Avoidance of accident risks and illnesses;
- Minimization of risks that cannot be avoided.

Under such conditions, we can rephrase the objective of labour safety and health management as: reaching the maximum possible safety under the actual conditions in the economic agent's activity.

Maximum safety is the targeted result of an assembly of principles and methods gathered in a global strategy enforced within S.C. Arpechim in order to provide for the employees' safety during labour.

The maximum safety strategy considers all activities within the organization and all employees, regardless of the hierarchic position of each employee figure 4 and figure 5.

All employees must possess the same vision and must have the same objective for the ongoing improvement of labour conditions.

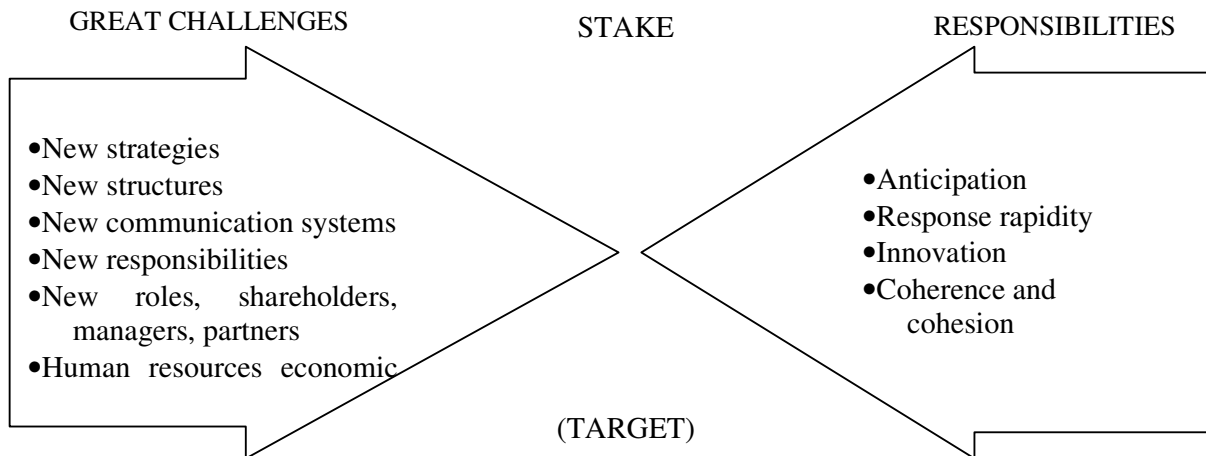


Figure 4. Maximum safety – an objective necessity

The maximum safety requires the active participation of all employees for the prevention and elimination of risks. The labour protection management, within the strategy and relationships to the employees must not forget the note that, within an organization, 8-12% of the staff are the locomotives, 20-30% the tender, 50-70% total mass of cars, 2-10% the brakes and 1% the stars.

The enforcement at the organization level of the maximum safety management principles might have a series of favourable effects Figure 6.

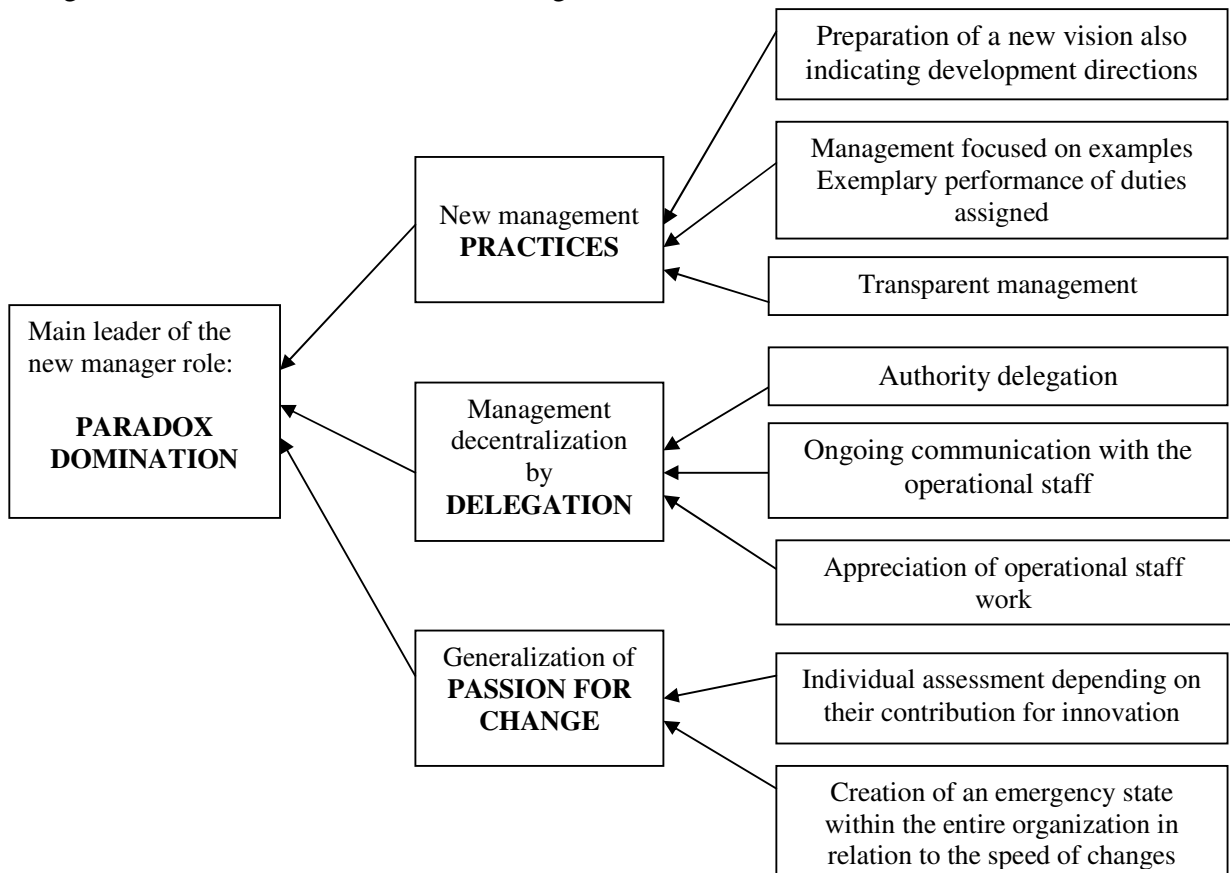


Figure 5. Coordinates defining the manager’s role within the modern organization

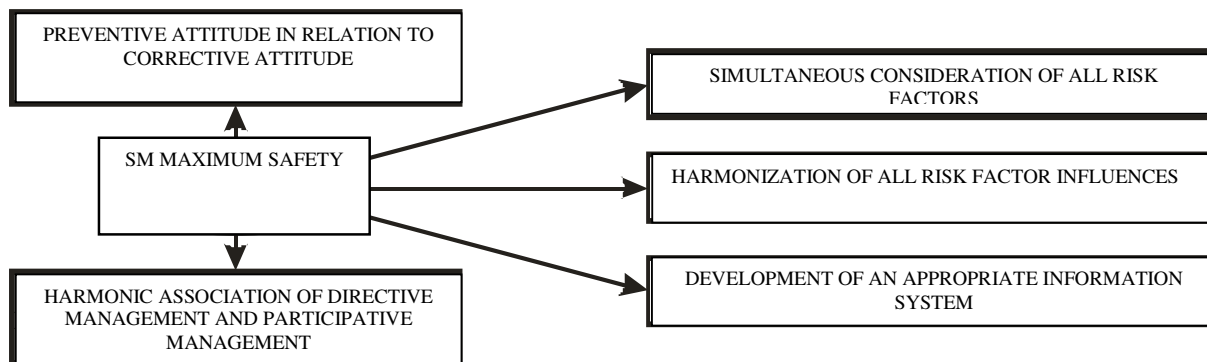


Figure 6. Principles of maximum safety

The purpose of adopting the maximum safety strategy in Figure 7 is to eliminate professional accidents and illnesses and to create comfortable labour conditions Figure 8.

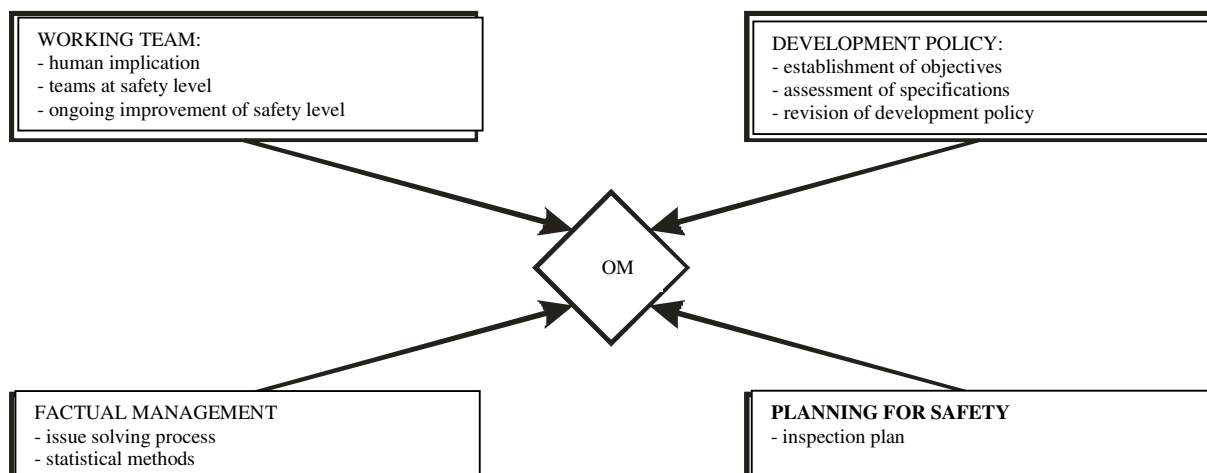


Figure 7. Final purpose of maximum safety

TARGET	The 6 advantages of maximum security	
	DIMINISH	INCREASE
Employees	Risks	Security
Organization	Non-security costs	Profit
Management	Disorganization	Prevention

Figure 8. Favourable effects estimated to reach maximum safety

The mandatory stages to complete until achieving the scope are presented in table 6, establishing the matrix for the actions to achieve the maximum safety objectives.

Table 6

Action matrix to achieve maximum safety objective

Directions Stages	WANTING	THE SYSTEM	ASSOCIATING EMPLOYEES	ASSESSING	RECOMPENSATING PENALIZING	STIMULATING EVOLUTION
KNOWING THE EXISTING SITUATION	Motivation? (external / internal)	Which elements in the service are costly? What are the deviations from the reference norms?	Is there employee sensitivity in terms of safety?	What is non-safety value?	How does safety or non-safety influence remuneration or promotion?	- what actions were realized? - what results were obtained?
ESTABLISHING A POLICY	What policy Is safety aimed to? For what purpose? For what results?	What reference elements were selected? What is the reference norm?	What employees are associated with the action? Their hierarchical role	What is the policy cost? How do we measure results?	What rewards or sanctions are provided?	- action planning? - Responsible person? - piloting?
DEFINING STRATEGY	Display goals Commitment Allocation of means	Outlining the system general principles	Forming a leading committee	Selecting safety indicators	Corroborating the indicators with individual or collective rewards	Setting up responsibilities
ELABORATING	Passion for details Being an example	Elaborating safety system	Teams entrusted with the system document preparation	Creating an assessment system	Appreciating evolution	Using deficiencies to stimulate and print evolution
PROVIDING VIABILITY	Transferring passion for details	Implementing, validating, improving the system	Render entire personnel sensitive Safety seminars, teams	Internal audits	Creating safety managers	- performing diagnoses - bringing new improvements
EXPOSING	Disseminate action components	Checking Authorizing	Informing employees on results	Displaying assessment results	Celebrating results	Exposing processes not applied

4. CONCLUSIONS

The principles of implementation are: will, management example, adhesion of entire staff, improvement of safety by means of prevention, assessment of safety level.

Some necessary conditions for implementation might be:

- Strategic decision;
- Cultivation of safety idea for employees;
- Short term investments;
- Real will promoted and management involvement;
- Will to activate the entire staff;
- Staff training and perfection.

The time allocated for implementation varies depending on the level of human resources referred to Figure 9.

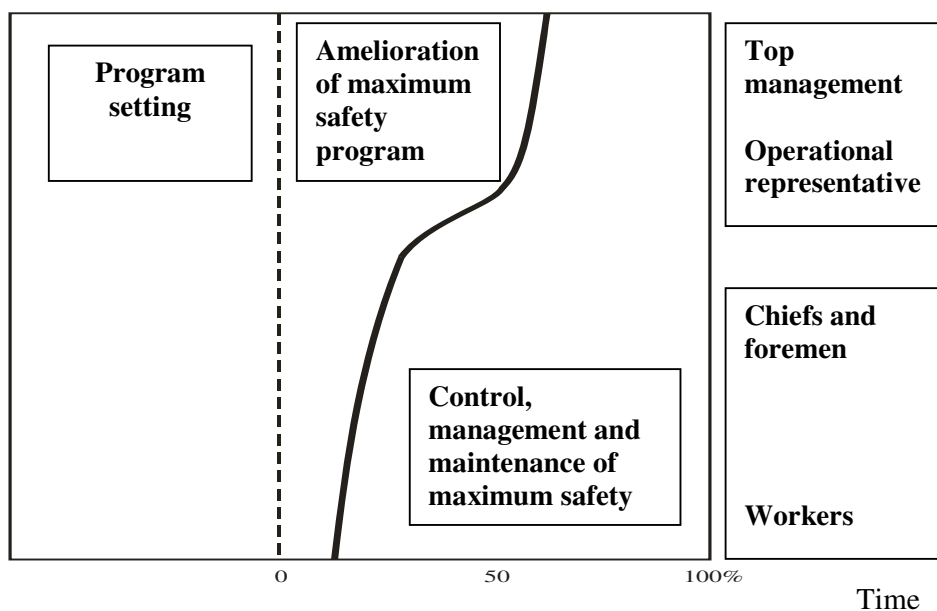


Figure 9. Time allocated to implement maximum safety

The approach of maximum safety within S.C. Arpechim can be seen in Figure 10.

The maximum safety implementation stages are the following:

- a. Conviction of leading team – the performance of a safety level assessment represents a reason for management implication and is intended to learn about the potential losses that may result from non-safety.
- b. Formation of safety structure containing the elements:
 - Safety directive;
 - Safety committees;
 - Working team.
- c. Management adhesion – by defining the necessity, scope and advantages involved by realizing maximum safety and its principle, some sensitivity in this direction may be obtained.

- d. Management formation mainly aims at the issue of maximum safety and requires that the manager assumes both the general aspects and the policy and strategy specific for the organization.
- e. Action launch – starts from the training of the entire staff within the organization, pursuing to achieve a general adhesion.
- f. Formation of personnel, requiring information, training, measurement, etc.
- g. Implementation of safety seminars.
- h. „Simulated" enterprise – simulation of the potential performances within the organization which might be achieved after eliminating the losses generated by the lack of safety.

The policy of S.C. Arpechim in relation to labour safety and health must be a fair policy clarifying the following aspects:

- Safety importance for the organization;
- Persons involved in safety performance;
- Management responsibility for safety;
- The organization's objectives in the matter of safety.

The policy basic rules are;

- You must be understood by everyone;
- Practical enforcement is made gradually;
- Action must exist at all levels;
- The necessary information system must be provided.

The management for the projects regarding the improvement of labour conditions has the following responsibilities:

- Data collection;
- Assessment of safety level;
- Analysis of non-safety causes;
- Discovery and elimination of non-safety causes.

Counting the safety strategy objectives to introduce actual specifications in the projects for the improvement of labour conditions.

LSM methods and means are defined by scope, principle, methods and means.

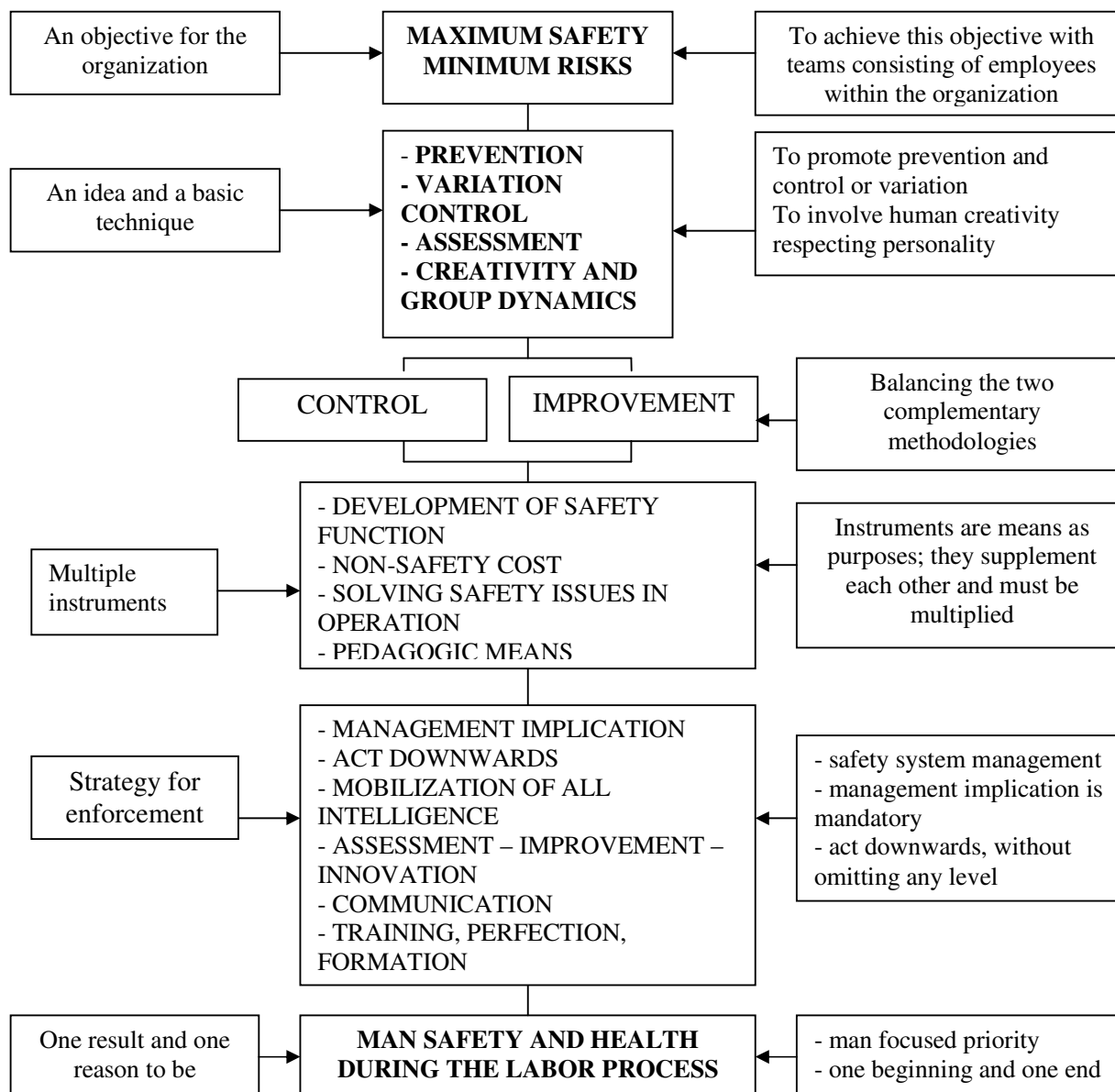


Figure 10. Approach in labour safety and health within S.C. Arpechim

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MOBBING AND BULLYING IN BUSINESS ORGANIZATIONS AND CONSEQUENCES ON HUMAN HEALTH

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***Abstract:** Organizations are often analysed as open systems interdependent, interconnected or interrelated with the referential environment, where the resources, results, processes are evaluated as organizational environment, structure, dynamics and culture. „In a workplace environment that is built on a narrative that values staff needs for identity, belonging, and social interaction, workers are humanized. Cooperation, compassion, empathy, and mutual aid are engendered and employees work together to meet mutual goals, becoming allies rather than threats. Instead of viewing each other as competitors for scarce resources, organizational members are seen as collaborators; and differences in work styles and skills are valued, not feared. Thus, the context, in general and the organizational context, in particular, lays its prints on the development of individuals in a situational frame they perceive differently, choosing the terms of adaptation, costs and benefits, social rituals and beliefs, the set of values, norms and status, the best modality of dealing with the others, with their leaders, the preference for a certain type of management appealing to the personality of the people involved. In such organizational context the existence of conflicts within organizations generates bullying practices that has now become identified as a serious issue in the workplace context.*

Keywords: mobbing, bullying, stressors, consequences

JEL Classification Codes: I10, I81, M20

1. INTRODUCTION

Leadership is known as one of the organizational causes of bullying and some researchers have found a significant relationship between some of the leadership styles and bullying (Stouten et al. 2010).

Shahbazi (et al. 2013:1816) presents three hypotheses concerning the relation between the leadership and workplace bullying.

Hypothesis 1: Benevolent leadership will have a negative relationship with workplace bullying. Benevolent leaders have a serious concern for subordinates' personal and familial well-being (Cheng, Chou, Wu 2004)

Hypothesis 2: Moral leadership will have a negative relationship with workplace bullying. likewise, a moral paternalistic leader possess superior personal virtues (Hayek, et al. 2010); thus, it is clear that these personality features of a leader can guarantee subordinates against bullying behavior.

Hypothesis 3: Authoritarian leadership will have a positive relationship with workplace bullying. There is a positive relationship between authoritarian leadership and workplace bullying. An authoritarian leadership style may also create a climate of fear in the workplace where complaining may be considered futile (Salin, Hoel, 2011).

Sloan (et al.,2010:93) makes reference to two types of leadership and explains the difference between them regarding the openness to the bullying practices."While laissez-faire leadership creates an environment that breeds mobbing, authoritarian leadership breeds bullying behavior. Just knowing the leadership style, however, is inadequate for understanding the dynamics that maintain mobbing and bullying cultures (Einarsen, 2010). In fact, leadership style cannot, by itself, explain the development and response of these behaviors (Einarsen). As Einarsen reports, current models do not supply the theoretical dimensions needed to support the assessment of leaders as both *good* and *bad*. Leadership models with the depth required for exploring this phenomenon include dimensions that evaluate leadership support for both organizational goals and the goals and interests of the individual."

Workplace bullying has been recognized explicitly as a negative, deviant and counterproductive behavior that has destructive effects on both employees and organizations and society as a whole. It has also been realized that bullying is a complex phenomenon and tend to be many causes and antecedents for this behavior. In line with this argument some of leadership styles such as laissez-fair, tyrannical and autocratic styles of leadership are assumed to create conditions that may lead to bullying at workplace. (Shahbazi et al., 2013:1815)

„In many countries, trade unions, professional organizations, and human resources (HR) departments have become more aware over the last decade that behaviors such as intimidation, public humiliation, offensive name-calling, social exclusion, and unwanted physical contact has the potential to undermine the integrity and confidence of employees and reduce efficiency. Bullying may go beyond colleague-on-colleague abuse and become an accepted, or even encouraged, aspect of the culture of an organization. A number of organizations now recognize the need to change the culture of the workplace and have developed clear company policies to offer protection from bullying to their employees." (Cowie et al., 2002:34) Bullying behavior can exist at any level of an organization—bullies can be superiors, subordinates, co-workers and colleagues (Davenport, Schwartz & Elliott, 1999).

2. MOBBING AND BULLYING

Although the terms *mobbing* and *bullying* have been in current usage for work psychologists, managers or law people for many decades, it seems that the issue is still on the agenda of many researchers as well as advocates of employees rights. According to Duffy and Sperry (2007) bullying results in the humiliation, degradation, devaluation, loss of professional reputation and, usually the elimination of the target from the organization with all the concomitant, financial, career, health and psychological implications that one might expect from a protracted traumatizing experience.

There is no agreed definition of the phenomenon described by various terms used in the field such as (Anjun, Yasmeen & Yasmeen, 2011:81): workplace harassment (Broadsky1976), workplace mobbing (Leyman 1990), workplace bullying (Adam & Crawford, 1992), harassment (Bjorkqvist et al, 1994), workplace aggression (Baron and Neuman, 1998), workplace victimization (Zapf, 1999), perceived victimization (Aquino & Bradfield, 2000), aggression (Nansel et al, 2001), etc. „To understand the full nature of phenomenon we must take care to collaborate regarding its terms and definition. This collaboration will support in the development of a standard nomenclature to facilitate employers and legislatures for the development of intervention strategies." (Anjun, Yasmeen & Yasmeen, 2011:81)

Lewis (1999:106) thinks that the early period of interest saw many debates surrounding the key issues concerning the definition and terminology as terms such "bullying", "mobbing" and "abuse" are all widely used depending on the geographical location of the authors and on how bullying differs, if it does, from workplace harassment.

Broadsky offered the definition of *workplace bullying* or *harassment* in 1976 as being repeated and persistent attempts by one person to torment, wear down, frustrate, or get a reaction from another. It is treatment which persistently provokes, pressures, frightens, intimidates or otherwise discomforts another person.

The term *mobbing* was coined by Leymann as “workplace mobbing” (1990) after his previous studies in the 80s about hostile environment in educational system. He transferred his studies to work environment and observed the consequences of campaigns initiated most often by persons in a position of power and carried on by coworkers against a person the same work environment for the purpose of excluding, punishing or humiliating the respective person. Westhues (2002) thinks that as the campaign proceeds, a steadily larger range of hostile ploys and communications comes to be seen as legitimate. At the same time, Leymann suggested that the frequency should be around one incident per week over a period of at least 6 months in order to be considered a criterion for bullying.

Whitney and Smith (1993) emphasize that bullying is a form of aggression which is perpetuated on the victim in a position of less authority and encompasses a problem that is social as well as interpersonal in nature.

Einarsen and Skogstad (1996) consider that aggressive behaviours that have taken place within the last 6 months ‘now and then’ or ‘weekly’ can be defined as bullying.

Bullying is usually defined as a subset of aggressive behavior, in which the aggression is repeated, and in which there is an imbalance of power such that it is difficult for the victim to defend him/herself (Olweus, 1999).

Bullying and mobbing are “vindictive, cruel, malicious or humiliating attempts to undermine an individual or groups of employees” with mobbing additionally defined as a “concerted effort by a group of employees to isolate a co-worker through ostracism and denigration” (Denenberg & Braverman, 2001:7).

Workplace bullying is repeated physical, psychological, or sexual abuse, harassment, or hostility within workplaces and consists of behavior that is known, or ought to be known, to be offensive, unwanted, or unwelcome (Cuyper, Baillien, Witte, 2009).

Shahbazi (et al. 2013) show that common to virtually all definitions of workplace bullying is that they include three key elements:

- Repetitive negative actions,
- That occur on a frequent basis,
- And occur in a place of work, where there is imbalance of power between the Parties.

From another perspective, the elements of these definitions include the following: perpetrator, victim, and workplace.

According to the Queensland Bullying Taskforce (2002) bullying can be approached according to whether they are ‘overt’, ‘covert’ and ‘hostile’ behaviours. Examples of overt workplace harassment include loud and abusive language, yelling and screaming, unexplained rages, unjustified criticisms and insults, constant humiliation, and unjustified threats of dismissal or other disciplinary procedures. Covert workplace harassment includes acts such as sabotaging an employee’s work by withholding information which is required to fulfil tasks, hiding documents or equipment, constantly changing targets or work guidelines, not providing appropriate resources and training, and isolating or ignoring an employee on a consistent basis. Hostile behaviours include deliberately overloading an employee with work and impossible deadlines, exclusion, or harming an employee’s employment or career prospects. (Timo, Fulop & Ruthjersen, 2004).

3. BEHAVIOUR CATEGORIES IN MOBBING AND BULLYING

There are various terms employed for the two main characters involved in the mobbing-bullying process: perpetrator (Shahbazi et al. 2013), offender (Sloan et al.2010), bully or actor (Lutgen-Sandvik, et al.,2009) and victim (Leymann,1996), target (Sloan et.al.2010).

Leymann (1996:170) used 45 behaviour items that he distributed in 5 categories:

1. Effects on the victims' possibilities to communicate adequately:
 - the superiors denies the victim the possibility to express him/herself;
 - the victim is constantly interrupted when speaking;
 - the coworkers prevents the victim to express him/herself;
 - the co-workers yell and offend the victim;
 - the victim's work is criticized;
 - the victim's private life is criticized;
 - the victim is terrorized with phone calls;
 - the victim is verbally threatened;
 - the victim is threatened in writing;
 - the refusal of contact with the victim (eye-contact is avoided, rejection gesture, etc.);
 - the victim is ignored (for example, a way of addressing to another person as if the victim were not present or visible).
2. Effects on the victims' possibilities to maintain social contacts:
 - nobody speaks with the victim;
 - the victim is not allowed to address to another person;
 - the victim is assigned with another position that isolates him/her from the others
 - the coworkers are forbidden to talk to the victim;
 - the physical presence of the victim is denied.
3. Effects on the victims' possibilities to maintain their personal reputation:
 - the victim is aspersed or slandered;
 - rumors are spread about the victim;
 - the victim is ridiculed;
 - the victim is said to be mentally ill;
 - the victim is forced to undertake a psychiatric examination;
 - the victim is said to have a handicap;
 - the victim's actions, gestures and voice are imitated in order to be better ridiculed;
 - political opinions or religious beliefs are attacked;
 - the victim's private life is ridiculed;
 - the origin or nationality is joked about;
 - the victim is forced to accept humiliating activities;
 - the victim's work assessment is unjust and unfair;
 - the victim's decisions are questioned or contested;
 - the victim is aggressed in an insulting and obscene manner;
 - the victim's sexual harassment (gestures or proposals);
4. Effects on the victims' occupational situation:
 - the victim is not assigned any tasks;
 - the victim's depriving of occupation and supervising to prevent him/her from finding one;
 - the victim's assignment of useless or absurd task;
 - the victim's assignment with activities below personal competences;
 - the assignment of new tasks permanently;
 - the assignment of humiliating tasks;
 - the assignment of activities above qualification in order to discredit the victim;

5. Effects on the victims' physical health:

- the assignment with dangerous and novice tasks;
- the threat with physical violence;
- physical aggression of the victim as a warning;
- bad physical aggression;
- the victim is submitted to unreasonable expenses in order to be prejudiced;
- creating uncomfortable situations at home or at work;
- sexual aggression on the victim;

The 45 behaviour items of the perpetrator against his/her victim have a double significance: on the one hand, they characterize the mobbing in its true essence, and on the other hand, they may be converted into in an instrument of measuring the mobbing.

Davenport (et al.1999:41) distilled this list into 10 key factors of the mobbing syndrome:

1. Assaults on dignity, integrity, credibility, and competence
2. Negative, humiliating, intimidating, abusive, malevolent, and controlling communication
3. Committed directly or indirectly in subtle or obvious ways
4. Perpetrated by ≥ 1 staff members
5. Occurring in a continual, multiple, and systematic fashion over time
6. Portraying the victim as being at fault
7. Engineered to discredit, confuse, intimidate, isolate, and force the person into submission
8. Committed with the intent to force the person out
9. Representing the removal as the victim's choice
10. Unrecognized, misinterpreted, ignored, tolerated, encouraged, or even instigated by management

Namie & Namie (2000) have identified the following bully profile according to behavioural patterns in organizational context: (1) bullies use surprise and secrecy to gain leverage over those targeted; (2) they are never interested in meeting someone else halfway, so trying to negotiate with a bully is useless; and (3) they routinely practice psychological violence against specific individuals (through putdowns, belittling comments, name-calling, constant criticism, blame, sabotage, stealing credit, cutting the individual out of the communication loop or through angry outbursts intended to intimidate). Making unreasonable job demands, criticizing abilities and excluding targeted employees from meetings and relevant information are all activities found in the bully's repertoire. In almost every instance, the bully's actions will negatively affect the targeted individual on an emotional level.

Sloan (et al, 2010:90) makes the difference between the parts involved and interrelated within the organizational context that is the bullies and the victims. „While those who are cooperative and collaborative are too often framed as weak (Namie & Namie, 2009), the person who leads through temper tantrums, critical aggressive demands, greed, insulting behaviour, and dominance is framed as a skilled leader. One of the consequences is that both the individuals and the organizational structures conspire to protect the bully/mobber. Organizational architectures that facilitate bullying and mobbing perpetuate structural violence. The complexity deepens when the two phenomena are intertwined. Through the process of mobbing, the target becomes vulnerable in the organization. Individual bullies in positions of power then attack, isolate, and eliminate their targets.” Sloan further comments on Namie's identifying features of the targeted persons: refusing to be subservient (58%), superior competence and skill (56%), positive attitude and being liked (49%), and honesty (46%) (Namie & Namie, 2009).

In Dr. Hornstein’s view (1996) bullies fall into 3 types:

	Characteristics
Conquerors	Only interested in power and control and protecting their turf. They try to make others feel less powerful. Can act DIRECTLY (e.g. insulting and/or rude words or gestures, [or tones] or INDIRECTLY (e.g. orchestrating battles and watching others disembowel each other)
Performers	Suffer from low self-esteem so belittle targeted persons (can be obvious or subtle put-downs).
Manipulators	Interested only in themselves. Easily threatened and vindictive. Experts at lying, deceiving and betraying. Take credit for the work of others. Never take responsibility for their own “errors.”

4. HEALTH CONSEQUENCES

Namie & Namie (2009) described bullying as “...repeated, health-harming mistreatment, verbal abuse, or conduct which is threatening, humiliating, intimidating or sabotage that interferes with work or some combination of the three.” But more important than the definition itself is the introduction of the concept of *health-harming* bringing forth the idea that bullying itself is long-term health-damaging action with serious consequences on the person affected.

They agree that bullying behaviour leads to real and serious physical and emotional problems for the individuals they target, including but not limited to damage to their self-esteem and confidence, anxiety, depression, gastrointestinal disorders, headaches, insomnia, exhaustion, poor concentration, and substance abuse (2000:60-61).

Bullying, impacts negatively on targets’ mental and physical health with well documented psychological effects including symptoms consistent with stress, anxiety, post-traumatic stress disorder and depression (Lewis, 2006).

Among the many consequences of bullying behavior are anxiety, withdrawal, low self-esteem, and other physical and mental health difficulties. Rather than recognizing these behaviours as a consequence of the abuse, too often they are turned into causes implying that the target is to blame, at least in part. Too often, the target of bullying (individual or group) is blamed for the violence committed by the bully, implying that the target must have done something to warrant the ire of others. (Sloan et al.2010)

The negative consequences of bullying and mobbing are greater and more common for the target than for the offender (European Foundation, 2002). While “bullies need targets to live; targets find it hard to live when bullies intrude in their lives” Targets experience isolation and shame; may lose their employment or have their employability negatively impacted; experience mental health and/or physical crises; and are at risk of suicide.

Changes Experienced by Targets: Poor concentration, Insomnia, Substance abuse, Headaches, Gastrointestinal disorders, Depression, Anxiety, Exhaustion, Suspicion, Fear, Forgetfulness, Fatigue, Failure to pay bills, Crying, Irritability, Change in appearance (Davenport, et al, 2002; European Foundation, 2002; McCord & Richardson, 2001).

Soares (2004:12) presents the consequences of bullying for mental health. He defines the psychological distress with the following consequences: depression, anxiety, aggressiveness and cognitive problems. “Psychological distress is to mental health what fever is to infectious diseases: a measurable symptom, an obvious sign of a health-related problem, but which by itself cannot explain the etiology nor the severity of the problem.” At the same time, another outcome

is hopelessness. (Soares, 2004:15):"Hopelessness appears when the individual's initiatives to respond and react to an event appear to be blocked".

Numerous studies have illustrated the relationship between bullying and the onset of post-traumatic stress syndrome. Leymann and Gustafsson (1996) highlight a very important aspect: post-traumatic stress syndrome can bring about changes in personality in victims of bullying to the point of triggering depressive or obsessive behaviours.

Soares (2004:17) believes that „most individuals afflicted by post-traumatic stress syndrome try to avoid all recollections or thoughts associated with the traumatic event. But despite the avoidance strategies, the individual will relive the event in repeatedly, through nightmares, intrusive thoughts, etc. The most frequent symptoms are troubled sleep, nightmares, depressive feelings, feelings of guilt, and irritability”.

Among a plethora of potential health problems to produce a diagnosis, Maslach & Leiter (1997:416) proposed the notion of *burnout* as an erosion of one's engagement to one's work, which includes three dimensions: exhaustion, depersonalization, and inefficiency. Thus, “What started out as important, meaningful, and challenging work becomes unpleasant, unfulfilling, and meaningless. Energy turns into exhaustion, involvement turns into cynicism, and efficacy turns into ineffectiveness”.

Lutgen-Sandvik (2009:57-58) displays a series of studies and authors concerned with the consequences of workplace bullying: “Empirical and anecdotal evidence indicate that bullying affects all aspects of targets' lives. Their self-esteem (Price Spratlen, 1995), physical and emotional health (Duffy, Ganster, & Pagon, 2002; Rospenda, 2002), and cognitive functioning (Brodsky, 1976) are at risk or damaged. Targets report higher levels of anxiety, depression (Namie, 2003a), alcohol abuse (Richman, Rospenda, Flaherty, & Freels, 2001), and suicidal ideation (Leymann, 1990) than do non-bullied workers. Longitudinal research suggests that perceptions workplace injustice (no doubt experienced by targets) are associated with chronic stress, high blood pressure, and increased risk of coronary heart disease (De Vogli, Ferrie, Chandola, Kivimäki, & Marmot, 2007). Targets of long-term workplace abuse also experience symptoms of post-traumatic stress disorder (PTSD).”

Hillard (2009:47) provides the following opinion about the consequences of bullying as secondary morbidity: „Victims of workplace mobbing frequently suffer from: adjustment disorders, somatic symptoms (eg, headaches or irritable bowel syndrome), PTSD, major depression. In mobbing targets with PTSD, Leymann notes that the “mental effects were fully comparable with PTSD from war or prison camp experiences.”Some patients may develop alcoholism or other substance abuse disorders. Family relationships routinely suffer. Some targets may even develop brief psychotic episodes, generally with paranoid symptoms.”

At the same time, Davenport (et al.1999) draws attention on the three degrees of mobbing and their consequences on the physical or mental state:

First degree: Victim manages to resist, escapes at an early stage, or is fully rehabilitated in the original workplace or elsewhere

Second degree: Victim cannot resist or escape immediately and suffers temporary or prolonged mental and/or physical disability and has difficulty reentering the workforce

Third degree: Victim is unable to reenter the workforce and suffers serious, long-lasting mental or physical disability.

5. CONCLUSIONS

Difficult relations with co-workers, subordinates or superiors represent one of the factors that induce a counterproductive workplace behaviour (Penney&Spector, 2005) which can be relocated in other similar work environments by the targets of bullying, generating a incivility workplace spiral (Andersson&Pearson, 1999).

Mobbing is a serious stressor that can lead to psychiatric and medical morbidity and even suicide. Major depressive disorder—often with suicidal ideation—is frequently associated with being mobbed.

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CONSIDERATIONS REGARDING THE IMPLEMENTATION OF A PERFORMANCE MANAGEMENT SYSTEM IN PRIVATE HOSPITALS

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***Abstract:** Obtaining performance in private hospitals require a proper management of costs and implementing a situation for performance monitoring. The implementation of a cost calculation method in hospitals is a complex process that must take into account the particularities of the activity in health care system. This paper presents a comparative analysis of four costing methods and a model of performance monitoring situation, adapted to the specific of the hospitals.*

***Keywords:** hospital, performance, calculation, standard cost, UVA, dashboard, balanced scorecard.*

JEL Classification Codes: M41, M10, M20

1. INTRODUCTION

Hospital facilities have a number of features that should be considered when initiating an approach for the design of a performance management system. In recent decades, in Romania, we have witnessed a decline of public hospitals and the emergence of the private sector, particularly in response to patient dissatisfaction with the services received in public hospitals. We will focus on the implementation of a system of management through costs applicable to private hospitals.

Private hospitals, legally organized in the form of trading companies, aim at providing medical services but this does not preclude the objective of making profit, which is essential for any company, regardless of their scope. Facilities in the health system are characterized by diversified activity. Even small hospitals provide a large number of services for patients. Their activity is influenced by innovations as a result of technological and scientific discoveries in the medical field.

According to the dualistic concept, the accounting system has two major components: financial accounting and management accounting. Management accounting can be organized by the hospitals to fulfill the needs of their managers. Being dedicated to the hospital management only, the information offered by management accounting system is not published outside and is confidential.

In the case of private hospitals, given the cost structure, the question arisen is that of setting tariffs allowing for covering such costs and for achieving a financial result that should enable the future operation of the respective facility. However, in a competitive economy the prices and tariffs are set by the market, and in the field of private medical services there is such market and an increasingly stronger competition.

The performance of a hospital is assessed differently by the participants in its life, based on their divers and often divergent interests. As a consequence, the performance can be studied from the perspective of each category: patients, shareholders, managers, employees, creditors, state, business partners, mass media and the general public.

A private hospital can not give up the traditional measurement of performance through profit: the financial performance. But, the hospitals should also take into account social performance, wich means to act in a socially responsible manner, and environmental performance wich involves minimizing the impact on the environment. These three sides of the performance are perfectly integrated in the “triple bottom line” concept, which was first coined in 1994 by John Elkington.

2. COST MANAGEMENT IN HOSPITALS

Choosing the cost calculation method and its implementation in the healthcare facilities are essential for obtaining accurate information on costs, at the appropriate time. The implementation and/or refinement of management accounting and cost calculation methods in hospitals imply adopting and adapting systems, methods and techniques of budgeting, tracking and calculating costs. This systems, methods and techniques should allow for simplicity, economy, efficiency and for making forecasts with the purpose of improving the quality of the information provided. The method of cost calculation should allow for performing forecasting analyses representing the basis for making soundly substantiated decisions. Traditional full costs have the disadvantage of being targeted to the past and are obtained through an inaccurate calculation. The decisions made based on the costs determined by these methods may be erroneous.

We will present below a comparative analysis of four cost calculation methods: the standard cost method and three methods of calculation based on the constant ratio principle (the equivalence coefficients method, the GP method and the UVA method).

The standard cost method is successfully used in many fields, being an important cost control system for several reasons:

- no activity, including that in the medical field, can be conceived without knowing the cost that will be used and the difference between the actual cost and the pre-established cost;
- waste is eliminated and the production capacity is used more efficiently by developing cost and production performance standards;
- eliminate the influences related to the fluctuation of the various expense structures and that involve correlated absorption rates, because the standard calculation is defined as a normal cost for a normal production.

In the case of standard cost method, decision-makers are provided with surplus information compared to the traditional methods. This is the reason why the method is widely used by the companies whose core business is production, as presented by Ch.Horngren et al (Table no. 1).

Table 1. The use of the standard cost method worldwide

Country	Companies using standard costs in their accounting system (%)
USA	86
Ireland	85
Great Britain	76
Sweden	73
Japan	65

Source: Horngren, Ch., Datar, S., Foster G. - *Contabilitatea costurilor, o abordare managerială*, 11th Edition (romanian edition), ARC Publishing House, Chişinău, 2006, p. 250

C. Horngren et al also presented a study on the usefulness of this method in the opinion of the responsible employees in the companies. Following the questionnaires, companies in four countries identified the following purposes for using standard costs, in order of their importance (1 being the most important, 4 the least important of the presented purposes). The answers to these questionnaires are summarized in table no. 2.

Table 2. The use of the standard cost method

Purpose/country	USA	Canada	Japan	Great Britain
Cost Management	1	1	1	2
Decisions on pricing	2	3	2	1
Budget planning and control	3	2	3	3
Preparation of financial statements	4	4	4	4

Source: Horngren, Ch., Datar, S., Foster G. - *Contabilitatea costurilor, o abordare managerială*, 11th Edition, (romanian edition), ARC Publishing House, Chișinău, 2006, p. 250

The use of the standard cost calculation methods has both advantages and disadvantages. Basically, the use of this method is positive because it has the role of stimulating and enhancing accountability. Nevertheless, it must be noted that the use of standards can be a negative element if the objective is to punish employees who are “guilty” for the recorded deviations.

The method offers simplicity - standards are not influenced by short-term variations and are only reviewed when they are no longer corresponding to reality. Another major advantage is speed – there is no need to wait for the collection of information on the cost per unit. The standard cost method facilitates decision-making because, by calculating deviations, corrective actions can be implemented. Moreover, standards can be the basis for setting prices/tariffs and allow for the assessment of the performance of the composing units. The calculation of the deviations from the standards allows for enhancing staff's accountability concerning the financial incidents occurred due to failure to observe rules. The possibility of using the management by exception is another advantage of the method: managers are contacted only if major deviations occur, such deviations being deemed exceptions.

Besides the clear advantages, the method also has a number of disadvantages. The implementation of the method requires a long time and the process is slow. In certain situations, conflicts may be triggered for determining the person responsible for the deviation. A very important aspect in the application of the method is setting standards that must be accessible yet ambitious at the same time. Standards can be difficult to set and monitor in areas such as research and development, trade, training, etc.. The costs of implementing and adapting the method to changes can be significant.

Standards can be highly rigid. This is caused by the long and tedious way that is necessary for their development. Employees naturally tend to keep these standards for a period of time as long as possible. If the activity of a facility is drastically changed or changes occur in the business environment in which it operates, standards lose their informational valences.

The flexibility of the standards is the opposite of their rigidity and is a disadvantage when, due to the desire to adapt them, they are frequently changed and do not have the necessary stability over time. Standards are designed to be exciting, but can be perceived by employees as a source of oppression leading to the occurrence of negative attitudes of resistance to them.

Costs are also used to establish tariffs for certain services provided to patients. Given that the provision of a service to different patients has different costs, in the case of the standard cost method the tariff at which the provision of a service makes profit instead of loss is not accurately known.

However, the biggest disadvantage of the application of the method in hospitals is the fact that standardization is often difficult: patients are different and have different needs. We consider that standard cost method could be also used in hospitals but only in combination with other method, given the fact that services offered to the patients are different.

The method of coefficients of equivalence can be successfully applied in small facilities that provide a small number of services. In the case of large facilities, the application of this method can be quite difficult given the large workload involved and the quick changes of the range of services provided. The method of coefficients of equivalence is based on a certain stability of the activity and is not viable in the case of the quick developments of the range of services provided. This aspect is its main disadvantage.

In the case of hospitals, we believe that the application of the method of coefficients of equivalence is not appropriate because, currently, it cannot provide the information needed by modern management.

The GP method, by imputing processing costs based on causality criteria, allows for calculating the cost for each service with enhanced accuracy. This method offers the possibility of identifying the internal reserves of the company and mobilizing them with the purpose of achieving performance.

The GP method offers the possibility of a management system suitable to a modern organization, which allows for controlling achievements compared to the set objectives. A shortcoming of the GP method is represented by the difficulties caused by the calculation of the GP that require a large workload. This disadvantage is offset, however, by its use for a longer period of time. At the same time, the method provides certain advantages compared to the standard cost method and the method of coefficients of equivalence. However, taking into account the emergence of the UVA method, whose purpose was to improve it, in my opinion it is useful to focus our attention on it.

The UVA method offers better answers to the aims of a performance management in private hospitals: accurately knowledge of the services, patients and service/patient combinations. Currently data processing systems enable the development of complex cost calculation methods. We should take into account the fact that, depending on the method of calculation adopted by the company, the cost of such a system can be very high.

At the origins of UVA method are both G.P. method (by using a common equivalence units of production/services) and the ABC method (by splitting processes into activities). UVA method was developed by Jean Fievez and LIA¹ consulting.

Using equivalents in the management accounting is an alternative approach in the cost calculation field and represents a real alternative to the methods used so far. By creating UVA we can measure the value added created by all the functions of a hospital. The method is characterized by accuracy and reliability and enables the accurate knowledge of services and patients.

The UVA method requires maintenance and periodic review, but the related costs are lower than with traditional methods. With the exception of depreciation costs that depend on the selection of the depreciation method, this method does not work with arbitrarily determined amount or with approximations. Another major advantage of this method is that it allows for turning the management of a complex organization (several services and several customers) into the management of a simple organization (one service and one customer).

The only costs that are randomly distributed are those related to the management of the company which generally account for 5-7% of the total, in the opinion of V. Buffet et al. (2005)².

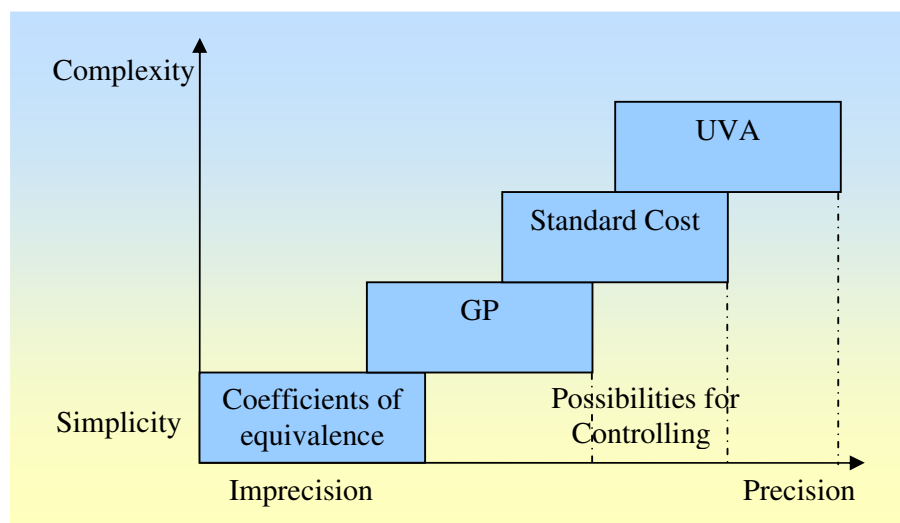
¹ Les Ingenieurs Associés

In our opinion the UVA method is interesting not only from the theoretical point of view; it is also useful in practice due to the many advantages it offers. The application of this method simplifies the cost assessment and analysis of a hospital at an acceptable cost, irrespective of its category.

With the UVA method, the equivalences between products/services are not determined directly, they are determined starting from the equivalences determined among operations, called UVA indices. The principle of occult constants or the assumption of the stability of the UVA indices over time is the foundation of the method. However, this is seen by some researchers as its main weakness, as underlined by P. Mévellec (2002)³ and F. Meyssonier (2003)⁴. For the success of the method it is essential to select a basic item which can be a real or an imaginary one, provided that it best represents the activity of the organization. This aspect can be one of the weaknesses of the method, because the selection of an unrepresentative item can lead to errors that compromise the use of the method.

If the services offered by the organization are standardized, the UVA method allows the adoption of appropriate policies on the tariffs charged. The method offers the possibility of comparing the number of standard with the number of consumed UVA. The method is not only an instrument for the measurement of costs but also a tool for performance management.

De la Villarmois and Levant (2010)⁵ consider that cost calculation methods can be compared taking into account two criteria: simplicity/complexity and imprecision/precision. Figure 1 presents the place of the UVA method among other methods with which it is compared in this paper.



Source: prepared by the author

Figure 1. Place of the methods compared using the criteria “precision” and “complexity”

² Buffet, V., Fiévez, J., Staykov, D. – *Méthode UVA : quelles réalités ?*, Comptabilité, Contrôle, Audit, communication at Congrès de l’Association Francophone de Comptabilité, Lille, 2005;

³ Mévellec, P. – *Libres commentaires : à propos de l’article ‘Origine et développement d’une méthode de calcul des coûts : la méthode des unités de valeur ajoutée (UVA)’*, Comptabilité, Contrôle, Audit, Tome 8, Vol.1, pp.183-185, 2002;

⁴ Meyssonier, F. – *L’approche des coûts complets par les équivalents de production, voie d’avenir ou impasse ? (Une analyse de la méthode GP-UVA)*, Comptabilité, Contrôle, Audit, pp. 111-124, 2003;

⁵ de la Villarmois O., Levant Y. – *Evaluation de coûts complets:des méthodes multiples pour un compromis entre précision et complexité*, Revue Française de Comptabilité, no. 433, pp. 64-68, 2010;

We believe that the UVA method reaches a balance between complexity and simplicity, between precision and imprecision, therefore it could be a real solution for cost calculation in hospitals. Compared with the other methods, the UVA method also offers the biggest possibilities for controlling, as can be seen in figure 1.

There is no perfect calculation method, each one having advantages and disadvantages. Generally each cost calculation method is presented by its promoters as the ideal solution, but, in reality, these methods are evolutions of other older methods whose disadvantages they try to eliminate. By building a method in an attempt to eliminate the drawbacks of other methods certain aspects are not considered, which become the disadvantages of the new method.

We consider that the optimal solution may be a combination of these methods, in order to best meet the needs of information that exists within each facility. The application of a method that does not exclude its combination with the procedures of other methods, insofar as this is deemed viable by the decision-making factors in the company.

Y. Levant and O. de la Villarmois (2001)⁶ found, in the companies that applied the method UVA a number of differences between the recommendations of the promoters of the method and its implementation into practice: standard information was used instead of real ones. The use of standard information may be justified with the purpose to simplify the application of the method in companies. Standard values can be used for the number of work units and for the quantities of materials consumed. This deviation from the concept of the method can be justified by the high cost implied by gathering factual information.

Despite the clear advantages offered by the UVA method, it has a limited use in organizations worldwide.

In our opinion, a combination between UVA method and standard cost method is the way to eliminate the disadvantages of both methods in hospitals. Standard costs should be used in the frame of UVA method.

3. THE NEED TO ADOPT/ADAPT TO A PERFORMANCE MONITORING AND MANAGEMENT SITUATION

Finding the most appropriate situation for monitoring and reporting performance is a continuous challenge given the role and benefits of using such a situation in the organization. In order to achieve performance, managerial decisions should be made based on situations that should provide the necessary information at the appropriate time. The amount of information received by the manager must be dosed so as to facilitate the management process knowing the fact that the information overload is as harmful as the lack of information. The need to use a monitoring situation emerges from the inconsistency between the strategic objectives of the organization and the manner of fulfilling the tasks to be performed. An adequate performance management requires monitoring and reporting situations that should allow for making correct decisions.

Healthcare organizations can use a variety of performance management models, this diversification being based on the values of the organization, the vision of the management, the possibility to adjust a model to its specificity, etc. In order to monitor and report the performance obtained organization a number of models such as the dashboard, balanced scorecard or Skandia Navigator were developed in the economic theory and practice. The purpose of creating these tools is to provide the possibility to act quickly in case of the occurrence of disturbances of the

⁶ Levant, Y., de la Villarmois, O. – *La méthode UVA une étude empirique d'une méthode alternative de comptabilité de gestion*, 4ème congrès international de génie industriel, Communication au 4e Congrès International de Génie Industriel, France, 2001;

managed system. The form of presenting these situations varies from one organization to another.

We will discuss the advantages and disadvantages of each of these situations, trying to find the optimal solution for healthcare organizations. The attention will initially be focused on the dashboard and then we will present a few aspects concerning the balanced scorecard that eliminates big part of the shortcomings of the dashboard.

Sizing an organization's competitive strategy involves focusing on its core business - the provision of medical services, by applying a development program that will lead to cost reductions. The actions that can be taken for this purpose include: performing a tight cost control; reviewing responsibilities and implementing a system of internal reporting; establishing dashboard indicators; implementing a proactive management system that should provide an adequate steering of the organization.

Dashboard is, on the one hand, a way to streamline the information system within the organization and on the other hand, a management method with a direct, favourable impact on the time budget of the managers and on its structure. The purposefulness of the dashboard is not only to convey information concerning the results achieved in the managed environment, but also to adopt corrective decisions, depending on the nature of the causes of deviations.

The use of the dashboard allows for tracking, over time, the achievement of the objectives and the level of the results obtained in order to ensure an improvement in the degree of substantiating decisions. It allows managers to control or monitor areas or the organization as a whole. The use of the dashboard is also recommended when the information system of the organization operates in an inappropriate manner, and there are many cases in which the informational message is changed, and parallelisms in the conveyance and processing of information or the existence of an oversized volume of information to which no adequate answers can be provided any longer. Most of the time, managers' time budget, especially that of those in higher hierarchical levels is crowded, and they are "bombarded" with a multitude of information, some of it at a time of little importance and relevance for the position held.

In response to the French model of the dashboard, the American style of management has developed the balanced scorecard (BSC). By grouping the indicators in multiple perspectives, BSC proposes a multidimensional view on the performance of the organization and tries to strike a balance between financial and non-financial measures of performance assessment, between the interests of the organization and those of the society.

The use of non-financial measures of performance assessment is not new but has been fully developed in the 1990s. The Balanced Scorecard has been in the spotlight the past two decades in both the U.S. and many other countries. However, in France the enthusiasm has been limited, especially in the academic environment. According to A.Bourguignon et al. (2001)⁷, this reluctance is based on the fact that in France the dashboard was used by French companies at least five decades before the advent of the BSC.

Despite the integration of a non-financial perspective, BSC focuses primarily on the financial perspective and on the value created for shareholders. This aspect is also explained by the attention given to the value created for shareholders in the USA, the place where the BSC emerged. If this aspect were neglected, the BSC would not have been successful in American companies.

⁷ Bourguignon, A., Malleret, V., Norreklit, H. – *Balanced Scorecard versus French tableau de bord: beyond dispute, a cultural and ideological perspective*, available on: <http://www.hec.edu/var/fre/storage/original/application/b238ea034d08e3b258e080d334376553.pdf>

The dashboard and the balanced scorecard are two performance management systems with different cultural roots as shown by A. Bourguignon et al. (2001)⁸: the French and the American system, respectively. The dashboard was designed to meet the information needs of managers in order to adopt quick decisions. In France, as in other countries, the top managers of industrial enterprises were engineers by training. Even in the 1990's at least 50% of the chairmen-general managers in the French companies were engineers as shown by M. Lebas (1994)⁹. This is one of the determining factors for the differences between the French and American management practices.

The balanced scorecard provides managers with a range of relevant financial and non-financial information, concerning the activities conducted. The translation of the strategy into action is the principle underlying this company performance monitoring and reporting situation. Management accountants prepare statements supporting managers to monitor the implementation of the strategy.

In the development of the BSC for private hospitals, not only objective indicators, but also subjective indicators should be used (patient satisfaction, employees' satisfaction). The use of the subjective indicators requires attention in order to find a balance between the benefits of their use and their imprecision. Managers tend to focus on aspects that are taken into account in assessing their performance and that is the reason why they pay less attention to non-financial indicators. Even that subjective indicators are not taken into account at the assessment of the manager activity, nevertheless, in the medical field it is a well-known fact that patients' satisfaction has a decisive influence on the future financial performance of the hospital.

The traditional BSC has the disadvantage that it does not show all the forms of performance (economic, social and environmental). The studies in this area have revealed that the BSC can be successfully adapted to meet the need of measuring the overall performance of the company. R. Kaplan and D. Norton (2001)¹⁰ proposed the integration of the social and environmental issues into the traditional model by integrating these issues into the traditional BSC axes. They proposed the existence of societal indicators at the level of internal process axis and expanding the customer axis at all the partners of the company.

Reviewing the specialized literature, M. Dumitrana and C. Caraiani (2010)¹¹ emphasise three ways of developing a viable BSC starting from the traditional model:

- integrating social and environmental performance indicators into the customer axis and the internal process axis, which axes are deemed to be exposed to the sustainable development problems;
- integrating social and environmental performance indicators into all four axes of the BSC (full integration);
- adding another axis, separate from the other four traditional axes and that regroups social and environmental performance indicators (additive integration). This axis changes the traditional architecture of the BSC.

The Balanced Scorecard was implemented in Romania in both the private and public sectors, as shown in Table no. 3.

⁸ Bourguignon, A., Malleret, V., Norreklit, H. – *Balanced Scorecard versus French tableau de bord: beyond dispute, a cultural and ideological perspective*, available on: <http://www.hec.edu/var/fre/storage/original/application/b238ea034d08e3b258e080d334376553.pdf>

⁹ Lebas, M. – *Managerial Accounting in France: Overview of Past Tradition and Current Practice*, European Accounting Review, vol 3, no. 3, 1994, pp. 471-487

¹⁰ Kaplan, R. S., Norton, D. P. - *The Strategy-Focused Organization*. Boston, MA: Harvard Business School Press, 2001

¹¹ Dumitrana, M, Caraiani, C. (coord) – *Control de gestiune*, Universitara Publishing House, Bucharest, 2010, p. 246

Table 3. Implementation of the Balanced Scorecard in Romania

Private sector	Public sector
Petrom	Ministry of Finance
Rompetrol	Ministry of Administration and Interior
ING Romania	Giurgiu Prefecture
Vodafone Romania	Timiș Prefecture
UniCredit Țiriac Bank	Gorj County Council
Kraft Food	Brăila County Council
Brau Union	Botoșani City Hall
Danone	Bucharest Sector 2 City Hall
Lindab Romania	-
Johnson Controls	-
Siemens Romania	-

Source: www.balancedscorecardinromania.ro

The Balanced Scorecard tries to strike a balance in several respects:

- long-term and short-term indicators are equally important and there is a balance between indicators of means and indicators of results;
- monitors both the internal aspects (internal processes, organizational development) and external aspects (customers, shareholders);
- uses both financial indicators and non-financial indicators and pursues the interests of the organization and those of the society.

The promoters of the BSC do not emphasize the importance of clearly delimiting action indicators from result indicators. Action indicators are signals that occur before the results appear. In the BSC implementation there is risk of confusion between the two categories of indicators and for favouring result indicators. The BSC concept deems that the financial results representing the ultimate purpose of the company are primordial. There is sometimes a tendency not to look at the other three dimensions as means. Despite its limitations, the BSC is a formidable alternative to conventional steering tools represented by the dashboard.

Balanced Scorecard has been criticized by some Swedish experts who believe that it is based on a logic of industrial enterprise which produces goods and aims to satisfy the customers and shareholders. Therefore, Skandia Navigator was created. Intellectual capital has gained importance, managers gradually realizing its value. While the BSC concept does not consider human capital as the main profit generator for the organization, Skandia Navigator is a tool that privileges the human capital.

4. PREPARATION OF A PERFORMANCE MONITORING SITUATION ADAPTED TO THE NEEDS OF HEALTHCARE ORGANIZATIONS. THE “SEE” MODEL

As we stated above, for cost calculation, a solution could be the combination of different calculation methods. We consider that the same thing is true concerning the tools for performance monitoring and management. In our opinion, starting from the models discussed above (traditional dashboard, BSC, Skandia Navigator), a model applicable in the healthcare field can be developed, which will be presented below.

The main objective of the model (which is a combination of the three models discussed above) is to be a tool for monitoring and management of an organization overall performance: social, environmental and economic performance (SEE).

In order to outline this model we will start from the internal processes, which are the basis of the activity carried out by the organization. In the medical field, the staff's role is essential. The reputation of the medical staff can attract or drive patients away. Therefore, we consider human resource as having a key role in obtaining performance in all its forms. Managers should monitor indicators that should provide brief information concerning seven axes:

1. Social performance (including performance in the medical field). In the medical service field, obtaining social performance is the purpose for which the organization was created and contributes to its improvement among patients, generating future economic benefits.

2. Environmental performance. Taking into account the European developments in recent years it is expected that the environmental legislation become increasingly restrictive. The organization can gain a competitive advantage by adopting measures to minimize impact on the environment. In the case of hospitals, the waste of used materials is a sensitive problem that should be solved in accordance with law in order to prevent any problems that could be caused to humans or environment.

3. The economic and financial performance. This is the main goal of any business entity and its reason to exist. The affirmation is true for private hospitals also. Here we should take into account both traditional economic performance indicators (operating profit) as well as performance assessment indicators by creating value for shareholders.

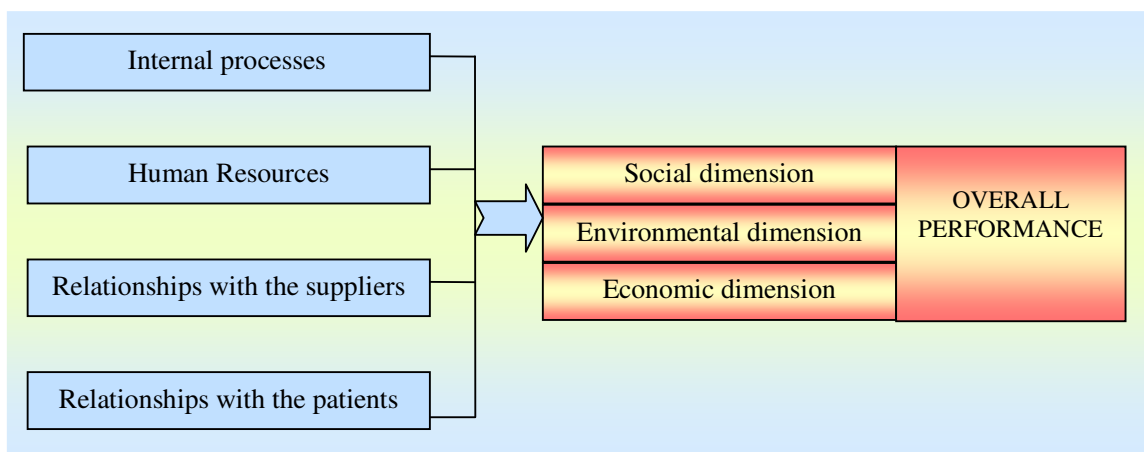
4. Relationship with the suppliers (drug, materials and specific tools) In order to ensure its sustainability, the organization must develop stable relationships with its suppliers. This relationship can be the base for negotiating a better price or better conditions for material purchases.

5. The relationship with the patients is essential because the psychological factor plays a crucial role in determining their behaviour. One of the reasons for choosing a private hospital is, beside the quality of treatments, the special relation with the medical staff.

6. The human resources are essential to the success of an organization in which the labour factor has a critical role in the activity. The appropriate motivation of the employees (both financial and non-financial), given that the mood of the employees and their loyalty to the organization, have a major impact on the image and smooth functioning of a private hospital.

7. The internal processes. We consider that the smooth activity of the organization depends on their efficiency. The achievement of the performance in the above-mentioned fields depends on the performance obtained in the internal processes within the organization.

In our view, taking into consideration the seven axes presented above, the model for obtaining performance in private hospitals can be graphically presented as in figure no. 2.



Source: prepared by the author

Figure 2. The relation between the seven axes of the SEE model

The axes 1-3 (social, environmental and economic sides of performance) are highly influenced by the actions taken in axes 4-7, as shown in figure 2. Based on this affirmation, in order to facilitate the monitoring of the indicators, we consider that they can be presented as a table (Table 4).

In recent decades we have seen a boom in the development of the computing technique that can be used to collect and process data to the performance management. Nowadays there is a multitude of data processing and there is even a risk of informational suffocation.

Table 4. Model for presenting the indicators

Axis	Indicators	Actual value	Target value	Lines of action
Internal processes				
Human Resources				
Relationships with the suppliers				
Relationships with the patients				
Economic performance				
Environmental performance				
Social Performance				

Source: prepared by the author

For the development of such a model, teamwork is required in which responsible employees from several departments of the organization should be involved:

- top managers;
- medical staff of the facility;
- staff in charge with preparing the currently used monitoring situation (if any);
- representatives of subdivisions in which the model is to be implemented.

The implementation of a performance monitoring situation in a healthcare organization can be made at low cost if own staff is used. We believe that for the implementation of SEE model, there is no need to resort to specialists outside the organization, the costs associated to such implementation being thus minimal. The implementation of such a situation should take into account the specificity of the facility and the activity performed.

5. CONCLUSIONS

In our opinion, the action of improving and diversifying cost calculation methods in hospitals should take into account two essential aspects. A first aspect is related to the decrease of the workload for obtaining information on costs and thus for the reduction of the cost required to obtain such information. The second aspect refers to the complex capitalization of the information obtained. The capitalization of the information means providing the management with a supporting tool in making decisions, resulting in the increase of the accountability of all decision-making factors.

We believe that an efficient information system for a private hospital involves the integration into the accountancy of the following modules: financial accounting, management accounting, patient management, supplier management, collection/payment management, stock management, staff wages, tangible assets and calculation of depreciation, management - dashboard/balanced scorecard. Each module will satisfy the needs of certain compartments in the company. The results obtained in each module are transferred and controlled as a whole by the financial accounting, management accounting and dashboard.

We consider that private hospitals can choose and adapt to their own information needs the SEE model that we presented. Using it can provide quick answers to managers' expectations. The successful implementation in the organization of any of the reporting and monitoring tools, depends on the involvement of the managerial team. The SEE model, being a combination of previous tools such as dashboard, Balanced Scorecard and Skandia Navigator, tries to eliminate their disadvantages. In a future paper we will present more details about the SEE model, including some key indicators that could be used to monitor performance for each of the seven axes.

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