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The Effect of Tacit Agreements

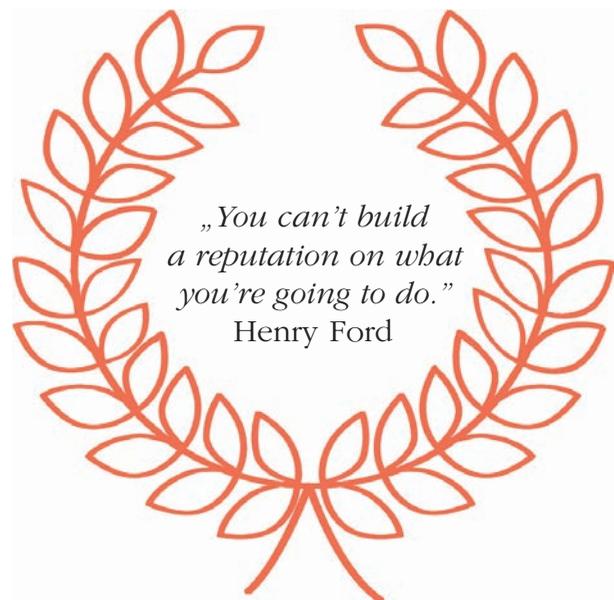
In the pursuit of understanding the employment relationship between the organization and its employees, the **Psychological contract** is one of the most influential concepts in management and human resources research in the last fifty years.

Following the publication of Denise Rousseau's 1989 article on the subject, which became very influential, there has been an exponential growth in publications on the topic in the last fifteen years, giving the impression of a relatively new concept. The introduction of the concept can however be traced to the 1960s, when Chris Argyris (1960) used the term for the first time. He defined it as „an exchange of tangible, specific and primarily economic resources agreed by the two parties that permitted the fulfillment of each party's needs”.

Widely used definitions of the psychological contract are „individual beliefs, shaped by the organization, regarding terms of an exchange agreement between the individuals and their organization's” (Rousseau, 1995), and also „beliefs concerning the mutual obligations that exist between themselves and the employer” (Rousseau, 2001). As demonstrated by further research, these obligations come from the belief that a promise was made, either by the firm or by the employee, explicitly or implicitly, and that its fulfillment by one party depends on the fulfillment by the other. Hence, the psychological contract comprises an individual's perception of the mutual obligations that exist in the exchange with his/her employer.

Factors that shape the formation of the psychological contract are contained in a so-called individual's schema of the employment relationship (Rousseau, 2001). This schema is developed at relatively young ages, when individuals develop and nurture values about employment, reciprocity, hard work, and these values are influenced by family, school, peer group and interactions with working individuals (Morrison & Robinson, 2004). Another influence factor is the national and organizational culture, which shapes the assumptions about what they should give and receive in an employment relationship.

Psychological contracts were proven to be efficient self-regulating mechanisms, which can



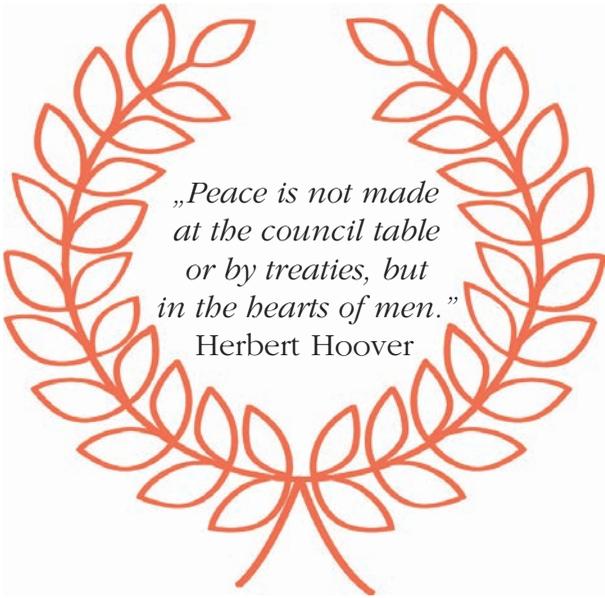


motivate employees to perform according to the conditions of an existing agreement with others. Shanteau and Harrison (1991) found that people are reluctant to break an existing agreement, unless the incentives for doing so are significant (such as a greatly increased salary offered by another employer). Even in this situation, a lot of employees choose to stay with the employer to whom they had committed. Consequently, psychological contracts have been proven to regulate behavior through different mechanisms: as a personal goal the individual assumes, as one's self-image as a promise-keeper, because of the concern for the losses the other party would suffer, through social pressure and concern for reputation, and mainly by reinforcement through incentives.

An important aspect in psychological contracts is trust, as the basis for the social exchange between the employer and employee. If the employees perceive that their company did not keep its promises and obligations initially stated or vice versa, a breach in

the psychological contract occurs. Among the main negative responses that employees or employers are likely to display are mistrust, reduced loyalty, commitment and involvement. These feelings will lead to a negative work environment, with a subsequent negative impact on performance.

However, if the organization knows and respects the contracts of the employees, the risk and imminence of breach will be reduced, organizational commitment will be increased and the company's objectives and results will be achieved accordingly.



*„Peace is not made
at the council table
or by treaties, but
in the hearts of men.”*

Herbert Hoover

Dana Corina Deselnicu
Assistant Editor

Flexibility in Making Decisions for Projects

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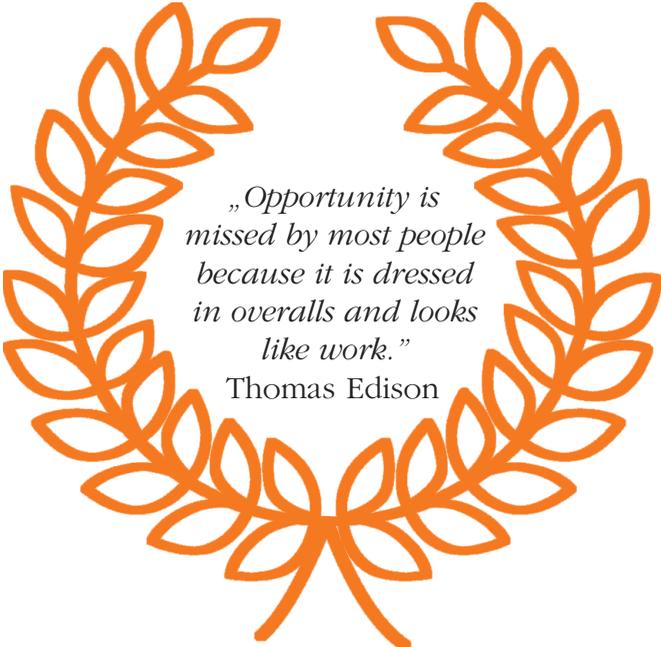
Abstract

One of the main areas of corporate finance, which is a „sub-branch” of modern financial science, is the investment analysis, which consists in assessing the attractiveness of the project for the investor. Over the decades of the existence of this branch of science, many methods and assessment methods have been developed, each of which has certain advantages and disadvantages. The most common is the Net Present Value (NPV) method. A positive NPV indicates that investing in a project makes sense. However, this method has certain drawbacks, the main of which is that it does not take into account the possibility of non-linear development of events during the implementation of the project, as well as the flexibility that managers have in making decisions. This drawback can be eliminated by using the real options method, which allows taking into account the flexibility that managers have in making decisions, which is especially important when there is a high level of uncertainty at a particular stage of the project. Due to the fact that managerial flexibility always has a positive cost, the real options method avoids underestimating projects, which is often allowed when using the NPV approach. This is especially important in cases where the NPV of the project is close to zero.

Keywords: finance, real options, investment decision, capital budgeting, financial modelling

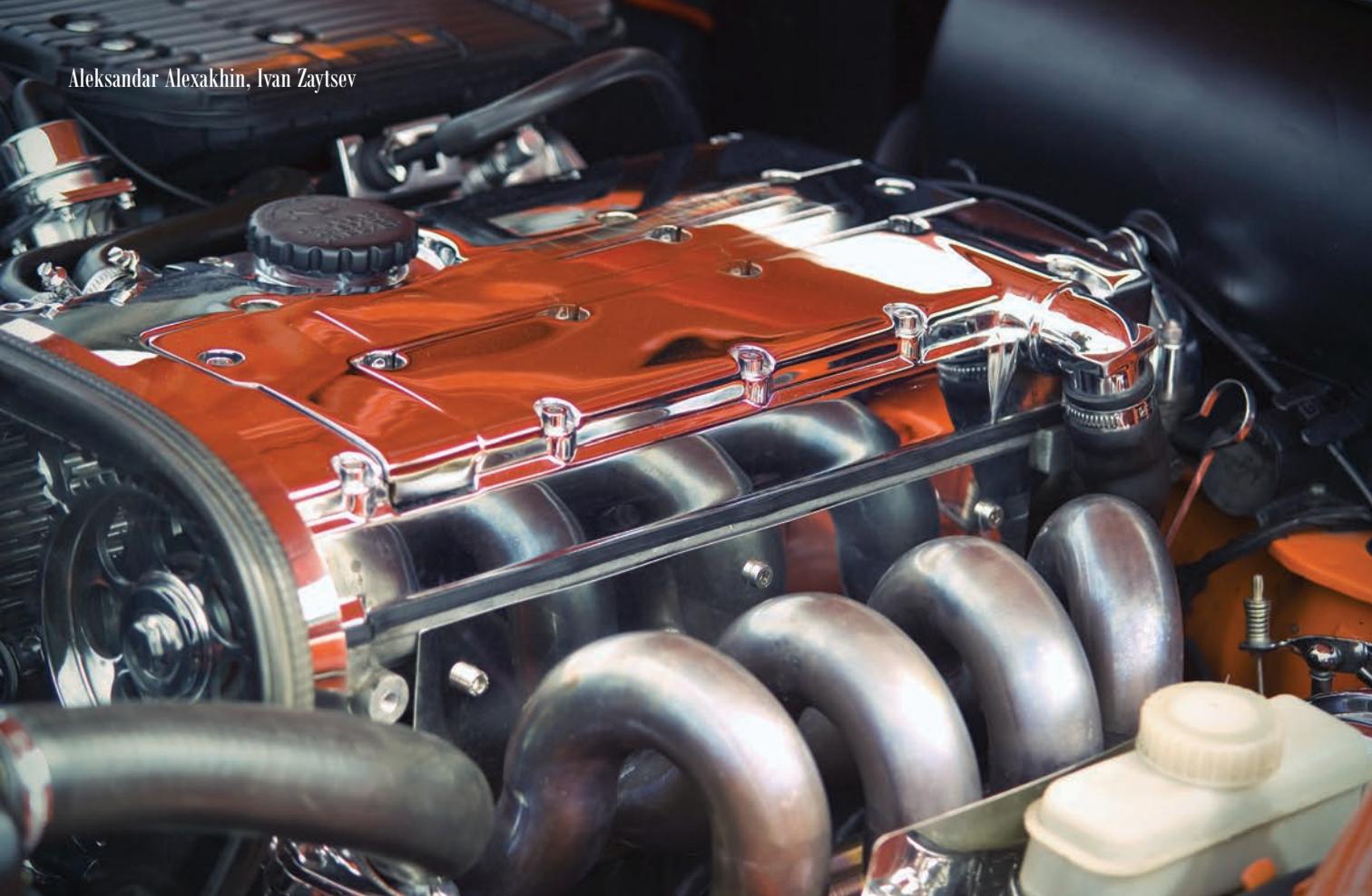
Introduction

The classic valuation model used both for investment projects and for firms as a whole is the net present value estimate, which consists of discounting the expected cash flows from the project. From this



„Opportunity is missed by most people because it is dressed in overalls and looks like work.”

Thomas Edison



amount, the initial investment for the launch of the project is deducted; the result is the NPV of the project, focusing on which management decides to implement the project or to reject it. It is understood that in the future the project is being implemented according to the original scenario, regardless of how events develop.

However, in reality, projects are implemented in conditions of uncertainty, and management has the ability to adjust plans in response to environmental changes. The possibility of making changes to an ongoing project in the literature is indicated by the term „managerial flexibility“. Making flexible changes to the original plan can have a significant impact on cost. The standard method of discounted cash flows does not allow assessing the impact of this flexibility even when using scenario analysis, because it is based on today's ex-

pectations for information that will arise in the future. At the same time, the use of NPV, depending on the circumstances, allows you to take into account the flexibility of making decisions after the emergence of information.

It should be borne in mind that the assessment of this flexibility is only in rare cases relevant for companies as a whole because relatively infrequently, the reaction of management to an emerging event can affect the activities of the entire company. The most relevant is the assessment of the flexibility arising from the implementation of specific projects.

Consider the factors that are the determinants of the cost of managerial flexibility. The key ones are the degree of uncertainty associated with the implementation of the project, and the ability of management to respond to ongoing changes.

Uncertainty, Managerial Flexibility and Value

The ability of management to make changes to an ongoing project as new information becomes available is most valuable when there is a high degree of uncertainty and managers have broad authority to make decisions. Otherwise, the cost of flexibility will be the lowest. In a situation where the ability of management to respond to emerging information is significantly limited, even a high degree of uncertainty will not allow flexibility to have a high cost. Similar properties are preserved for the opposite situation.

In the traditional analysis of investment projects, their attractiveness is assessed based on an analysis of the sum of the expected cash flows generated by the project. However, over time, the expected cash flows and discount rates change, which may lead to the fact that a project that has a negative NPV at the moment, may become attractive to investors in the future. This is especially relevant in the presence of entry barriers, i.e. when a project can only be accepted by one firm. In these conditions, the project can be considered as an American call option.

Consider the input for this type of real options. The underlying asset is a project; as the variance of its value is considered the variance of the present value of cash flows from the project, which can be estimated in one of the following ways:

- Based on the dispersion of cash flows from similar projects in which the company has previously invested;
- By assigning probabilities to various scenarios, estimating cash flows and present value for each of them, this serves as the basis for calculating variance;

- Based on the variance of the value of firms operating in the same industry as the project being implemented.

The input price also includes the strike price – the initial investment, due to which the company has an option. Consider some of the determinants of deferral value. Due to the fact that an investor with the exclusive right to implement a project with a positive NPV, in the face of an increasing dispersion of the project value over time (and, therefore, the price of a deferred option), is inclined to postpone the exercise of the option, there are losses associated with not receiving cash flows.

When evaluating a deferral option, it should be borne in mind that the period during which the company has the exclusive right to implement a project can by no means always be clearly defined and in most cases is an estimated value. The lower the price you have to pay for the deferral and the greater the uncertainty, the higher the cost of the deferral option. An example of this type of option is a license to develop an oil field, the holder of which can postpone production, guided by expectations of higher world oil prices.



The option to expand is a right, but not an obligation to make additional investments in the project with favorable development of events. Obviously, the prototype in the financial market is the American call option. The profit and loss chart is similar to the deferral option. Consider the input for this type of real options. The price of execution is the initial investment in the project, which has the ability to expand in subsequent stages. The underlying asset is the present value of the cash flows created when investing in a project at one of the following stages; the variance of its value is considered the variance of the present value of cash flows from the project, estimated either by modelling or on the basis of the cost of publicly traded firms operating in the same business.

The option life is an estimated value based on the internal constraint imposed by the firm on itself, as there is no externally set expiration date for project expansion. As the waiting costs arising at the time the option becomes viable, the cash flows lost due to non-exercise of the option, or the costs incurred by the firm until the final decision is made, are considered. „The expansion option can be used by the company as a rationale for investing in projects that have a negative net present value, but offer great opportunities in terms of developing new markets or selling new products”.

Like any option, an extension option is most valuable in areas with a high degree of uncertainty. Examples include strategic acquisitions, R&D costs, and multi-stage projects. Let's consider each of them in more detail:

- strategic acquisitions make it possible to create competitive advantages in the future by gaining the ability to more quickly enter a new market, increase



technological competence, or use a well-developed brand;

- R&D by themselves has the characteristics of a call option. As a result, ceteris paribus, the costs of them provide a higher value for firms from the business sector, subject to change;
- presentation of standard projects as a series of extension options, where each option depends on the previous one, makes it attractive for investors to projects that can create value only with phased investment.

A denial option is a right, but not an obligation to dispose of a risky asset at a predetermined fixed price. This feature is most valuable for potentially unprofitable projects, as allows you to get a residual value and thereby completely save yourself from expected losses. As a result, having this option increases the initial cost of the project. The most characteristic areas of application are R&D, mining and exploration of mineral resources, as well as mergers and acquisitions. At the same time, an analysis of the option to refuse allows



nullification of the benefits of the exercise of the option.

A real reduction option is the ability to reduce production at some stage. The presence of this option in high-risk projects can reduce potential losses, thereby adding additional value to the investment project. An analogue of this real option in the financial market is the American put option. Consequently, the payment chart is similar to the waiver option. Consider the input for this type of real options. The cost of execution is the estimated future costs of the project. The underlying asset is a project; as the variance of its value, the variance of the present value of cash flows from the project is considered, the methods for assessing which are given above.

Investment Project Overview

We will look at an example. RusTurboMash LLC is a compressor manufacturing company for the oil and gas industries, founded in Perm in 2010. The founders are Siemens AG (51% of the authorized capital) and CJSC Iskra-Avigaz (the remaining 49%). (Rusturbomash.ru) The main type of products is linear compressors for compressor stations on gas pipelines. The design capacity of the enterprise is 60 compressors per year with a technological cycle duration of 12 months. Currently, work is underway to localize the production of centrifugal compressors using technology from the German concern Siemens AG. Available equipment allows you to produce 50% of the design capacity. The bottleneck is a horizontal boring machine designed for metalworking of large-sized parts. In order to reach production capacity at full capacity, the acquisition of the horizontal boring machine Unisign Uniport 7000 is being considered.

us to evaluate not only the cost of exit from the project but also the optimal time to exercise the option. In addition, various provisions of the agreements concluded, allowing under certain conditions to withdraw from them, i.e. being options to exit the contract. The prototype of this type of real options in the financial markets is the American put option.

It is noteworthy that the strike price may be negative (in the case of low resale value). The underlying asset is a project; as the variance of its value, the variance of the present value of cash flows from the project is considered, the methods for assessing which are given above. When evaluating options for rejection, there are several nuances that should be given increased attention. In particular, the strike price of an option is, in most cases, estimated value and can vary over the life of the project, which makes it difficult to use traditional methods for valuing options. In addition, the exercise of an option can create additional costs, which can lead to



The equipment supplier is Globatex AG, which has been supplying milling, EDM and other metalworking equipment to leading European machine tool companies in Russia and the CIS for 14 year. Information was collected for investment design by analyzing the internal documentation of RusTurboMash LLC, as well as interviewing employees.

The industry market is characterized by the presence of a monopolist – OAO Gazprom, which determines the size of the market and the distribution of shares between players, ensuring the loading of their production capacities. Due to the limited size of the consumer's investment program, the market volume is stable at 200 million euros per year. The plans of LLC RusTurboMash occupy 55% of the market. In terms of scale, this market is national. Competitors are the following enterprises: OJSC Kazancompressormash; OAO Compressor Complex; OJSC NPO Iskra; REP Holding CJSC.

Their features are many years of experience and price flexibility. At the moment, market shares are distributed approximately equally between these players. The

sales promotion program is based on the extensive experience of the founders of RusTurboMash LLC in this market. Pricing method – sale with a margin of 15% to the cost. It should be noted that the cost of compressors is higher than that of competitors, due to a more advanced technological level of the product. In the service sector, customers are provided with a full range of support services for the supplied compressor units. To carry out tasks, the company has the necessary permissions and licenses, as well as technical equipment.

Assumptions Underlying Calculations

- the beginning of the project – January 1, 2014 (ordering equipment);
- the forecasting interval is 1 year, the period is 12 years (from the beginning of 2014 to the end of 2025). The forecasting horizon is determined by the life of the equipment;
- cash flows are carried out at the end of each year;
- the period from ordering equipment to its commissioning is 20 months (calculated on the basis of the acquisition of similar equipment by RusTurboMash LLC);
- payment for equipment is as follows: 40% in the first year, 60% in the second;
- contracts are concluded on September 1 of each year in which the purchased equipment is valid;
- contracts are concluded simultaneously for the entire volume produced during the year. The production process is also going on at the same time;
- production costs are distributed evenly across the months;

- the maximum capacity of the production line serviced by the acquired horizontal boring machine is 30 compressors per year (50% of the maximum production volume).

LLC RusTurboMash has a commercial offer for the supply of a horizontal boring machine Unisign Uniport 7000, the cost of which, taking into account delivery and commissioning, is 2.5 million euros. The useful life of the equipment is 10 years because This is a metalworking machine belonging to the 5th depreciation group. The company uses the linear depreciation method.

The cost of production is formed through a 15% premium to the cost of 52.2 million rubles. The share of material costs in the cost is 70%, wages – 21%. Fixed costs are excluded from consideration due to the fact that the company will bear them regardless of whether this investment project is being implemented or not. The planned production volume is 20 compressors per year, which is due to the most probable estimate of the future sales volume of RusTurboMash LLC. The above estimates relate only to the production line, the launch of which is considered as part of the implementation of this investment project. The share of the horizontal boring machine in the production process is 5.7% (determined by the proportion of the machine's working time in the overall production process). This ratio will be used to determine the revenue and expenses attributable to the project in question.

The purchase of equipment is planned by attracting borrowed capital. The source of funding is Siemens Finance, a division of Siemens AG, whose consolidated group includes RusTurboMash LLC. Lending conditions: 7.2% per annum in rubles for a period of one year; Accrual and payment

of interest, as well as body debit occurs at the end of the year. In fact, the parent organization provides a line of credit, as there is an opportunity to take a loan in the required amount at the right time. The loan is repaid due to cash flows generated by the existing production line. The discount rate is 11.5% per annum in rubles, which is due to the internal requirements of Siemens AG for investment design for subsidiaries in the Russian Federation.

Cash flows are presented in real terms. Only the total cash flow used to calculate NPV is subject to adjustment for the inflation rate forecast by the Ministry of Economic Development of the Russian Federation. To improve the visibility of the model, a prerequisite has been introduced that the basis for tax payments is formed exclusively in the period in which the calculation is made with budgets of various levels. The following tax rates are used in the model: VAT – 18%, income tax – 15.5%, corporate property tax – 2.2%.



As a basis for calculations, we used the classic Cox-Ross-Rubinstein model, which is characterized by input parameters such as risk-free rate, standard deviation, and forecasting step. To calculate the risk-free rate, the yield to maturity on government bonds was used. The choice of this issue is due to the duration period (10 years) closest to the investment project under consideration.

Sigma market value of firms included in the engineering industry is 39.8%. However, for the purposes of the study, the following facts must be taken into account:

- the object of the study is a separate project and not the company as a whole;
- the project is implemented by a limited liability company, therefore, cost fluctuations do not directly depend on speculation in the stock markets;
- the project is carried out by a Russian company, while Damodaran data refers to American firms;
- the binomial model uses implied volatility, while Damodaran measures market volatility.

Based on the above, the standard deviation was expertly estimated at 30%. The forecasting step in the model is an interval of 2 years. This value allows to get a fairly detailed idea of the possible scenarios of changes in the predicted value, and at the same time, the resulting decision trees are not overloaded with overly detailed information.



Based on the input data described above, the growth and decrease coefficients were calculated, amounting to 1.35 and 0.74, respectively. As a result, we got the following tree (Table 1), reflecting the change in the volume of production relative to the initial level.

Table 1 – *Change in production*

2014	2016	2018	2020	2022	2024
1,00	1,35	1,82	2,46	3,32	4,48
	0,74	1,00	1,35	1,82	2,46
		0,55	0,74	1,00	1,35
			0,41	0,55	0,74
				0,30	0,41
					0,22



Further, the expression of the volume of production in units of output was calculated. For this, the coefficients obtained above were multiplied by the most expected demand at the moment (20 compressors per year). Scenarios suggesting favourable market conditions are technologically limited to 30 compressors per year. In this paper, it is assumed that free production facilities can be switched to contract work for an affiliate. Thus, we have the following distribution of free production capacities, measured in potentially produced compressors.

Further calculations are based on the following assumptions:

- the company behaves rationally and switches to the maximum available volume of contract work;
- the volume of contract work is capable of fully loading production capacities at any time;
- cash flows generated through contracts are similar to those in the production of compressors, however, they have a discount to the latter, estimated expertly at 25%.

To calculate flows from contract work, a model was used that is largely similar to that used for rigid computing. However, only operating cash flow was calculated, as investments and their financing are carried out for the production of compressors, which is beyond the scope of consideration.

Consider the value of the present value of cash flows generated by switching. It was calculated using the model described above (Table 2). Cash flows were recorded for the period from the beginning of the period to the end of the forecast horizon. The determinant of the value of flows was also the volume of unloaded production capacities. Next, the cost of the switch option was calculated directly. In the last period, it makes up the difference between the present value of cash flows indicated in Table 2 and the strike price of the option, which is the cost of reprogramming the equipment equal to 50,000 rubles. To determine the cost of managerial flexibility in earlier periods, the maximum value was determined from the corresponding present value of the flows generated by the switch, minus the strike price of the option and the weighted value of the option in the subsequent period. As the weighting coefficients for the scenarios, the probabilities of growth and decrease calculated using the Cox-Ross-Rubinstein model were used, which were 0.67 and 0.33, respectively. As a result, the following option value tree was obtained (Table 2).

Table 2 – *Present value of management flexibility*

2014	2016	2018	2020	2022	2024
14,4	8,8	4,1	0,9	0,0	0,0
	25,5	18,1	10,4	2,7	0,0
		40,2	33,4	25,7	8,1
			53,6	48,9	40,5
				63,0	59,4
					70,2

Thus, the cost of managerial flexibility that RusTurboMash LLC has in the framework of the investment project for the acquisition of the Unisign Uniport 7000 horizontal boring machine is 14.4 million rubles. Consequently, the net present value of the project is 5.7 million rubles, the index of profitability of discounted investments is 5.5%, which together suggests the attractiveness of the project from the point of view of a rational investor.

Conclusion

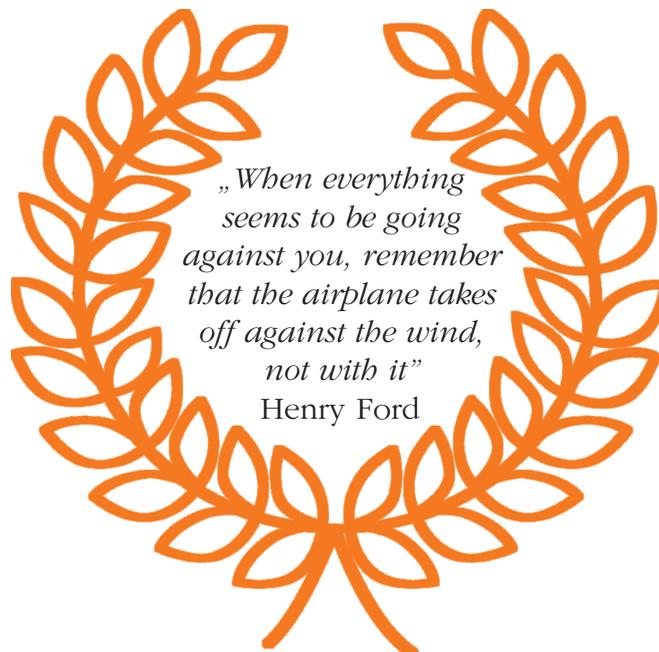
Investment design, which is one of the key areas of corporate finance, allows making decisions on capital investments based on quantitative analysis. Analysis of net present value, the most widely used at present, is an effective tool for assessing the investment attractiveness of projects, however, its inherent rigidity is a serious drawback, leading to an underestimation of projects implemented in the face of uncertainty. At the same time, it is obvious that uncertainty is an integral element of the external environment in the implementation of most projects. Thus, for a comprehensive assessment, it is necessary to take into account the cost created by the availability of managerial flexibility. The binomial approach allows you to evaluate the value of real options based on subjective input data, which significantly expands the list of industries in which an appropriate analysis of investment projects can be carried out.

As part of this study, the cost of the switch option built into the project to expand the production capacity of RusTurboMash LLC was evaluated. As a result, a comprehensive basis was obtained for the management of the enterprise to make a decision on investing funds. Consequently, the work carried out allowed us to achieve the goal.



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Academic Stress Among Teachers

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Abstract

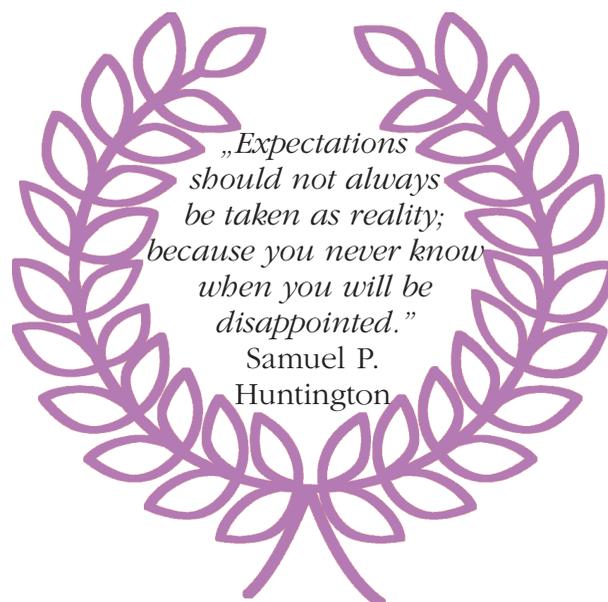
This article incorporates a deep analysis of existing literature on this subject and an ANOVA statistic interpretation of a study based on a survey on stress level and its effects over teachers in university. In simple ANOVA, total dispersion originates in two sources: intra-group (inside the group) and inter-group (between groups). Both sources reflect dispersion caused by the randomized selection of the sample. In addition, intergroup dispersion reflects deviations due to the different steps of the independent variable. This study explored how teachers' working conditions are generating stress. Participants were 15 teachers from a university in Romania. We analysed data by means of three questionnaires. The analyses indicated that, in the teaching profession, the organizational stress level it is low.

Keywords: stress, ANOVA statistic, teacher, academic, questionnaire

Introduction

The purpose of this study is a personal contribution to the drafting of statistics by means of the ANOVA method. The questionnaires have been applied to the academic environment in Romania and aim at identifying the stress level at work. Stress has a different meaning for different people under different conditions. Therefore, over the course of time, stress has been defined in various ways:

Hans Selye, the founding father of research in the field of stress, says that „stress is not necessarily something bad – it all depends on how you take it. The stress of exhilarating creative successful work is beneficial, while that of failure,





humiliation or infection is detrimental” (Selye, 1978). So, the effects of stress depend on one’s positive or negative perception over the situation.

According to the dictionary, stress is: a constraining force or influence; a physical, chemical or emotional factor that causes bodily or mental tension and may be a factor in disease causation (McKenna, 2004).

Research’s indicates that teaching is a particularly stressful occupation and that teacher stress is an international phenomenon (Chan, 2002). In my opinion, teacher stress may have devastating consequences both for the teachers and the quality of education.

The ANOVA Analysis of Variance was introduced by the statistician Irving Fisher, and it has been used in order to test the significant difference between several averages. In the case of the comparison between two averages, the results are the same as the t test for the difference between averages (Ionescu, 2015). In this paper, we have used the ANOVA simple model.

The basic principle: the total variation comprises the sum of the variation between the groups, and the variation inside the groups. The dispersion analysis aims that, for every level of the causal factor(s), there be an analysis of both the distinct associated population, and the possible differences that may appear between populations: to study the effect of the inde-

pendent variable(s) upon the dependent one(s).

The independent t test is a special type of simple ANOVA in which only two groups are involved. The simple ANOVA allows the evaluation of the null hypothesis between two or more series of data, on the condition that these be steps of the same independent variable (Stoica 1983).

The mathematical procedure involved in the simple ANOVA consists of the dispersion analysis of the dependent variable. In this type of analysis, the total dispersion has two components: the dispersion inside of every formed group and the dispersion between the averages of the groups and the total average (without taking into account the formed groups).

In simple ANOVA, the overall dispersion stems from two sources: inside the group (intragroup) and between the groups (intergroup). Both sources reflect the dispersion due to the randomized selection of the subjects. Moreover, the intergroup dispersion reflects the deviations caused by the different steps of the independent variable.

The dispersion due to random sampling is also known as error dispersion, while the dispersion due to the independent variable is also known as true dispersion. The theoretical parts of ANOVA and the model applied to the statistic interpretation have been adapted (Târcolea, 2014).



Research Methodology

The current case study consists of three questionnaires answered by sample respondent, in order to identify stress in the academic environment:

- The Cohen Williamson Questionnaire, to identify the level of stress (Cohen, 1994);
- The Holmes-Rahe Stress Scale, to identify the factors of stress (Holmes, Rahe, 1967);
- The General Questionnaire about the working environment and health status, to identify the effects of stress (Goldberg, 1978).

Statistic processing of the questionnaires regarding stress detection was as per standard information for each of three questionnaires:

Cohen Scoring: each item is rated on a 5-point scale ranging from never (0) to almost always (4). Positively worded items are reverse scored, and the ratings are summed, with higher scores indicating more perceived stress. Cohen questionnaire scores are obtained by reversing the scores on the four positive items. For example, 0 = 4, 1 = 3, 2 = 2, etc. and then summing across all 10 items. Items 4, 5, 7, and 8 are the positively stated items.

Individual scores on the Cohen questionnaire can range from 0 to 40 with higher scores indicating higher perceived stress.

- Scores ranging from 0-14 would be considered low/ without stress.
- Scores ranging from 14-20 would be considered moderate stress.
- Scores ranging over 20 would be considered high perceived stress.

The questions in this scale ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them, and you should treat each one as a separate question. The best approach is to answer quickly (Selye, 1978).

Holmes & Rahe Scoring: Mark down the point value of each of these life events that has happened to you during the previous year. Total these associated pointed. Add up all the points you must find your score.

- 150 pts or less means a relatively low amount of life change and a low susceptibility to stress- induce health problems.
- 150 to 300 pts implies about a 50% chance of a major stress-induced health problem in the next 2 years.
- 300 pts or more raises the odds to about 80%, according to the Holmes-Rahe prediction model.

General Questionnaire Scoring: Likert scale from 0 to 3. We have 12 questions, between 0 and 3 points each. Score between 0 and 36 points. The score varies depending on the studied population. The average score is 11-12.

- Score over 15 highlights stress.
- Score over 20 points out severe problems and psychological stress.

Taking part in this case study there have been 15 respondents aged 28-60, from the academic environment in Romania. The research took place between December 2019 and February 2020 and the respondents came from University POLITEHNICA of Bucharest.

The statistical and mathematical reading and processing of the data obtained through the applied research tools were achieved by using the following techniques:

- The drawing up of the tables and the logging of the data resulted from the three questionnaires applied to the teachers;
- The calculation of statistical indicators (theoretical average, standard deviation, dispersion/variance) by means of the ANOVA method;
- The statistical interpretation of the questionnaires.



Results of Research

Table 1, Table 2 and Table 3 below sources the Cohen, the Holmes-Rahe and the General Questionnaire surveys that were used with the academic staff in Romania.

Table 1 – Results of the Cohen questionnaires

Respondent/Group	Cohen Questionnaire	
/	X_i	X^2
1	14	196
2	8	64
3	30	900
4	24	576
5	8	64
6	11	121
7	11	121
8	11	121
9	15	225
10	11	121
11	10	100
12	10	100
13	8	64
14	8	64
15	20	400
TOTAL	199	3237

The three questionnaires that were used in this subsection represent the basis of the analyzed data to which statistic calculations were applied using formulas (1) through (12).

Coben Questionnaire:

$$\text{Average} = \frac{\sum_{i=1}^{15} \text{Interview results}_i}{15} = \frac{199}{15} = 13,26 \quad (1)$$

$$\text{Percentage of respondents under heavy stress} = \frac{2}{15} = 13,33\% \quad (2)$$

$$\text{Percentage of respondents who are not under heavy stress} = \frac{10}{15} = 66,66\% \quad (3)$$

$$\text{Percentage of respondents with stress} = \frac{3}{15} = 20\% \quad (4)$$

Medium score: 13,26

Table 2 – Results of the Holmes and Rahe questionnaires

Respondent/Group	Holmes and Rahe Questionnaire		
	Xi	Yi	Y ²
/			
1	101	-49	2401
2	118	-32	1024
3	146	-4	16
4	147	-3	9
5	147	-3	9
6	148	-2	4
7	150	-2	4
8	150	0	0
9	150	0	0
10	158	8	64
11	184	34	1156
12	216	66	4356
13	221	71	5041
14	254	104	10816
15	308	158	24964
TOTAL	2596	346	49864

Holmes & Rahe Questionnaire:

$$\text{Average} = \frac{\sum_{i=1}^{15} \text{Interview results}_i}{15} = \frac{346}{15} = 23,06 \quad (5)$$

$$\text{Percentage of respondents with low risk of illness} = \frac{9}{15} = 60\% \quad (6)$$

$$\text{Percentage of respondents with moderate risk of illness} = \frac{5}{15} = 33,33\% \quad (7)$$

$$\text{Percentage of respondents with high risk of illness} = \frac{1}{15} = 6,66\% \quad (8)$$

Medium score: 173

Table 3 – Results of the General questionnaires

Respondent/Group	General Questionnaire	
/	X _i	X ²
1	7	49
2	9	81
3	3	9
4	9	81
5	13	169
6	19	361
7	11	121
8	8	64
9	15	225
10	12	144
11	9	81
12	17	289
13	13	169
14	21	441
15	14	196
TOTAL	180	2480

General Questionnaire:

$$\text{Average} = \frac{\sum_{i=1}^{15} \text{Interview results}_i}{15} = \frac{180}{15} = 12 \quad (9)$$

$$\text{Percentage of respondents with significant stress/related issues} = \frac{12}{15} = 80\% \quad (10)$$

$$\text{Percentage of respondents with some stress/related issues} = \frac{2}{15} = 13,33\% \quad (11)$$

$$\text{Percentage of respondents with severe stress/related issues} = \frac{1}{15} = 6,66\% \quad (12)$$

Medium score: 12

The results of the statistic indicators for the three questionnaires, as well as their corresponding data can be found in the Table 4:

Table 4 – Statistic indicators

Indicators	Cohen	Holmes and Rahe	General
Average (m)	13,26	23,06	12
Standard deviation (s)	6,32	52,84	4,62
Variance (s²)	39,98	2792,5	38,5

The statistic processing of the questionnaires in this study case was done by means of the ANOVA method. The pro-

cessing of the Cohen Questionnaire and the Holmes and Rahe Questionnaires was presented for illustration (Figure 1).

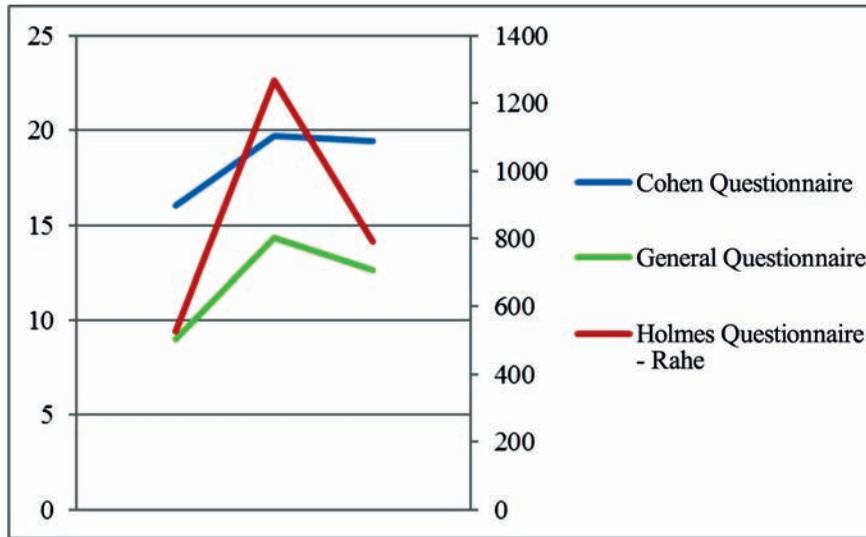


Figure 1 – Analysis of the 3 questionnaires – average

Cohen questionnaire interpretation as follows, using formulas (13) through (35):

$$\text{Average: } m_2 = \sum \frac{x_i^2}{n} = \frac{3237}{15} = 215,8 \quad (13)$$

Dispersion:

$$D = m_2 - M^2 = 215,8 - 13,26^2 = 39,98 \quad (14)$$

$$\text{Standard deviation: } \tau = \sqrt{D} = \sqrt{39,98} = 6,32 \quad (15)$$

$$\text{Variability coefficient: } v = \frac{\tau}{M} \times 100 = \frac{6,32}{13,73} = 46,03\% \quad (16)$$

If $v > 35\%$, means that the population is not homogeneous.

Observation matrix it is represented in the Table 5:

Table 5 – ANOVA groups

Nr Groups/Obs.	1	2	3	4	5	6	7	8
I	14	8	30	24	8	11	11	11
II	15	11	10	10	8	8	20	–

$$n_1 = 8; \Rightarrow x_1 = \frac{117}{8} = 14,62 \quad (17)$$

$$n_2 = 7; \Rightarrow x_2 = \frac{82}{7} = 11,71 \quad (18)$$

$$n = n_1 + n_2 = 15 \quad (19)$$

Average total selection: $M = 13,26$.

The total sum of squares (SST) – the distance between all quotations that occur in the sample around the general average:

$$SST = \sum_{i=1}^{15} (X_i - M)^2 \quad (20)$$

$$D = \frac{1}{15} \sum_{i=1}^{15} (X_i - M)^2 \text{ or } \frac{1}{15} \sum_1^{15} X_i^2 - \left(\frac{1}{15} \sum X_i \right)^2 \Rightarrow 15D = \sum_1^{15} (X_i - M)^2 \quad (21)$$

$$SST = 15 \times 39,98 = 599,7 \quad (22)$$

$$SST = SSB + SSW \text{ parity} \quad (23)$$

where:

- SSB is the sum of squares between the groups, a measurement of variation between groups, which is calculated by adding up the squares of the distances from the average of each group to the general average;
- SSW is the sum of squares inside the groups, a measurement inside all

groups, calculated by adding up the squares of the distances from each observation to the average of the group it belongs to;

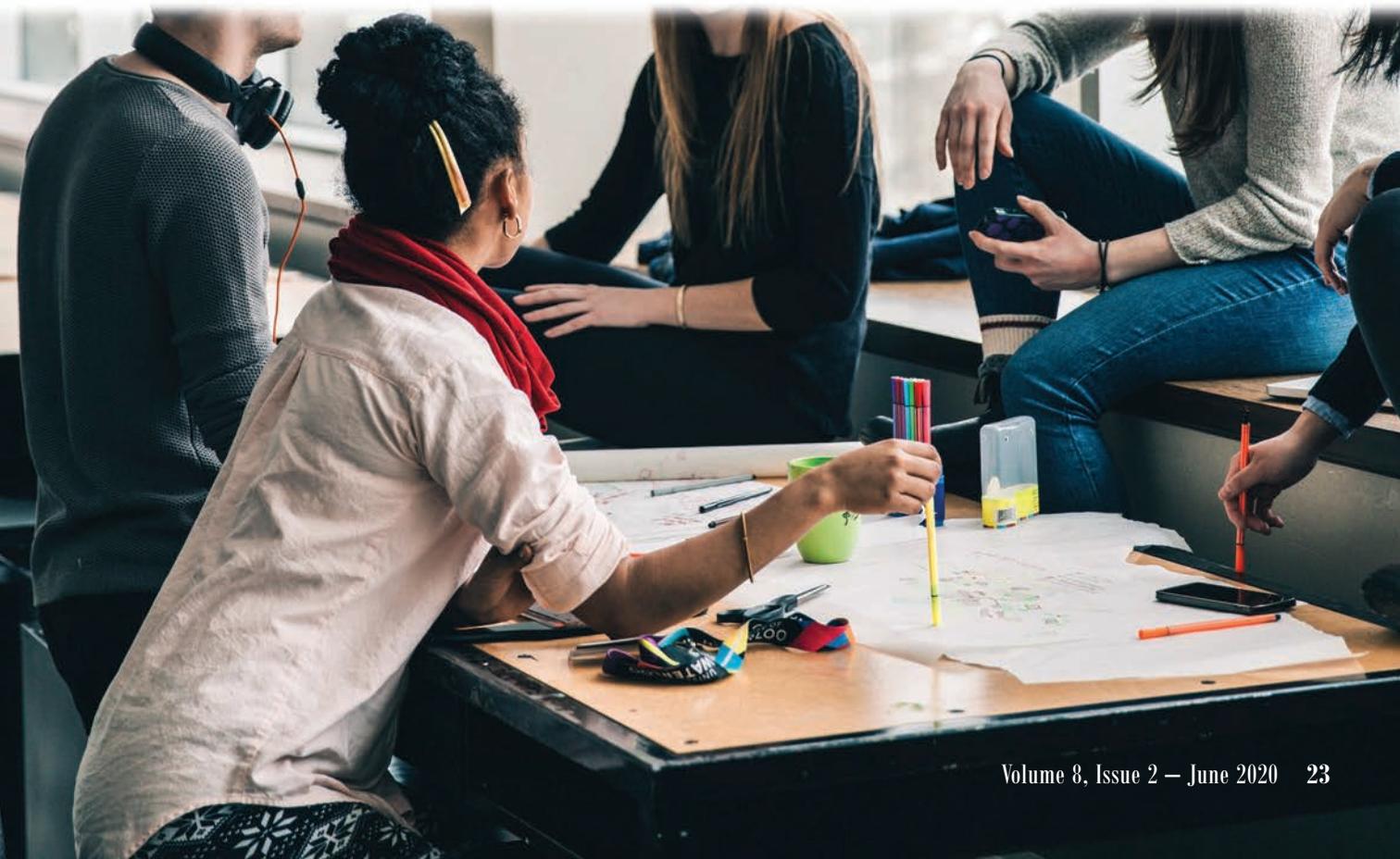
- n – number of groups = 2; \bar{X}_i = average group i; K = degree of freedom number = 2 (number of groups).

$$SSW = \sum_{i=1}^2 \sum_{j=1}^{n_i} (X_{ij} - \bar{X}_i)^2 \quad (24)$$

$$SSB = \sum_{i=1}^2 n_i (\bar{X}_i - M)^2 \quad (25)$$

$$SSB = 8(14,62 - 13,26)^2 + 7(11,71 - 13,26)^2 = 31,6 \quad (26)$$

$$SSW = SST - SSB = 599,7 - 31,6 = 568,1 \quad (27)$$





The two estimates of the variance in quotations over the action can be rewritten in the following manner:

MSB (Average of Squares Between the Groups) – the variance between the groups’ averages, where:

$$MSB = \frac{SSB}{k - 1} = \frac{31,6}{2 - 1} = 31,6 \quad (28)$$

MSW (Average of Squares Within the Groups) – the variance inside the groups, where:

$$MSW = \frac{SSW}{n - k} = \frac{568,1}{15 - 2} = 43,7 \quad (29)$$

$$MST = \frac{SST}{n - 1} = \frac{599,7}{14} = 42,83 \quad (30)$$

F statistics ANOVA (Fisher). The second step to take in order to achieve the variance analysis is calculating the F test statistics, as a ratio between the two estimates of variance:

$$F = \frac{MSB}{MSW} \quad (31)$$

The way in which the F:MSW ratio is interpreted is very important and makes a good estimator of the variance in the σ^2 sample, *regardless* of whether or not the null hypothesis is true. This happens because MSW is based only on the variations inside each group, which, when brought together, offer a fairly good image (a fairly good estimate) for σ^2 . The part which is processed in the test is, however, MSB; if the null hypothesis is true (all averages are equal to one another), then MSB will also make a good estimator for σ^2 . In this situ-

ation, MSB would have a value close to that of MSW, and the F value would be close to 1. In other words, the total amount of variation equals the amount of variation explained through the differences between the groups plus the amount of variation that remains unexplained (random errors around the average); in short, the total variation equals the explained variation plus the unexplained variation. The higher the explained variation would be, the lower the unexplained variation, hence a spectacular increase in the F value; conversely, the lower the explained variation (meaning that the differences between the groups are very small), the higher the unexplained variation (due to random errors), and therefore, the F value would tend to zero (a special case is when the groups are perfectly similar, without absolutely any difference between them, and then the explained variation equals zero). Various statistics analysis software items may differ very little in the way they present the results, but they all refer to exactly the same thing; any table of results will generally contain the following, (Table 6).

Table 6 – ANOVA results

Results	Sum of squares-Deviation	Degrees of freedom number	Dispersion
Between the groups	$SSB = (k - 1) S_1^2 = 31,6$	$k - 1$	$S_1^2 = MSB = 31,6$
Inside the groups	$SSW = (n - k) S_2^2 = 568,1$	$n - k$	$S_2^2 = MSW = 43,7$
Total	$SST = (n - 1) S^2 = 599,7$	$n - 1$	$S^2 = MST = 42,83$

The splits of $(n - 1)S^2$ as sum of 2 independents terms $(k - 1)S_1^2$ and $(n - k)S_2^2$ is called dispersion analysis. The 2 varia-

bles are assigned λ_{k-1}^2 and λ_{n-k}^2 divided into degrees of freedom, we get the Fisher re-partition:

$$F = S_1^2/S_2^2 \approx F_{n-1; n-k} \Leftrightarrow F = 0,72 \text{ (calculated)} \quad (32)$$

$$F_{(0,05; 91,13)} = 4,67 \text{ (standard), with } a = 0,05 \quad (33)$$

$$\alpha = P (F \geq F_{\alpha; (k-1, n-k)}) \quad (34)$$

$$F_{\text{calculated}} = 0,72 < F_{\text{standard}} = 4,67 \quad (35)$$

in our analysis are accepted the hypothesis of equal averages, so the stress doesn't influence the research population.

Holmes and Rahe questionnaire interpretation as follow, using formulas (36) through (60):

$$n = 15; Y = X - 150 \quad (36)$$

$$M_y = \sum_1^{15} Y_i = \frac{346}{15} = 23,06 \quad (37)$$

$$m_y^2 = \sum_1^{15} \frac{Y_i^2}{n} = \frac{49864}{15} = 3324,26 \quad (38)$$

$$D_y = 3324,26 - 23,06^2 = 2792,5 \text{ (dispersion)} \quad (39)$$

$$\text{If } X = Y + 150, \text{ then } M_x = M_y + 150 \text{ and } D_x = D_y \quad (40)$$

$$\text{Average: } M = 23,06 + 150 = 173,06 \quad (41)$$

$$\text{Standard deviation: } \tau = \sqrt{D} = 52,84 \quad (42)$$

$$\text{Variability coefficient: } v = \frac{\tau}{M} \times 100 = \frac{52,84}{173,06} \times 100 = 30,53\% \quad (43)$$

If $v < 35\%$, means that the population is homogeneous. Observation matrix it is represented in the Table 7:

Table 7 – ANOVA groups for Holmes and Rahe

Nr Groups/Obs.	1	2	3	4	5	6	7	8
I	158	148	148	150	146	150	147	184
II	221	308	216	147	118	101	254	–

$$n_1 = 8; \Rightarrow x_1 = \frac{1231}{8} = 153,87 \quad (44)$$

$$n_2 = 7; \Rightarrow x_2 = \frac{1365}{7} = 195 \quad (45)$$

$$n = n_1 + n_2 = 15 \quad (46)$$

The total sum of squares (SST) – the distance between all quotations that occur in the sample around the general average:

$$SST = \sum_{i=1}^{15} (X_i - M)^2 \quad (47)$$

$$D = \frac{1}{15} \sum_{i=1}^{15} (X_i - M)^2 \text{ or } \frac{1}{15} \sum_{i=1}^{15} X_i^2 - \left(\frac{1}{15} \sum_{i=1}^{15} X_i \right)^2 \Rightarrow 15D = \sum_{i=1}^{15} (X_i - M)^2 \quad (48)$$

$$SST = 15 \times D = 15 \times 2792,5 = 41887,5 \quad (49)$$

$$SST = SSB + SSW \text{ parity} \quad (50)$$

where: n – number of groups = 2; \bar{X}_i = average group i; K = degree of freedom number = 2 (number of groups)

$$SSW = \sum_{i=1}^2 \sum_{j=1}^{n_i} (X_{ij} - \bar{X}_i)^2 \quad (51)$$

$$SSB = \sum_{i=1}^2 n_i (\bar{X}_i - M)^2 \quad (52)$$

$$SSB = 8(153,87 - 173,06)^2 + 7(195 + 173,06)^2 = 6315,52 \quad (53)$$

$$SSW = SST - SSB = 41887,5 - 6315,52 = 35571,98 \quad (54)$$

The two estimates of the variance in quotations over the action can be rewritten in the following manner:

$$MSB = \frac{SSB}{k - 1} = \frac{6315,52}{2 - 1} = 6315,52 \quad (55)$$

$$MSW = \frac{SSW}{n - k} = \frac{35571,98}{15 - 2} = 2736,30 \quad (56)$$

$$MST = \frac{SST}{n - 1} = \frac{41887,5}{14} = 2991,96 \quad (57)$$

$$F = \frac{MSB}{MSW} \quad (58)$$

Various statistics analysis software items may differ very little in the way they present the results, but they all refer to exactly the same thing; any table of results will generally contain the following (Table.8):

Table 8 – ANOVA results for Holmes and Rabe

Results	Sum of squares-Deviation	Degrees of freedom number	Dispersion
Between the groups	6315,52	1	6315,52
Inside the groups	35571,98	13	2736,30
Total	41887,50	14	2991,96

The splits of $(n - 1)S^2$ as sum of 2 independents terms $(k - 1)S_1^2$ and $(n - k)S_2^2$ is called dispersion analysis. The 2 variables are assigned λ_{k-1}^2 and λ_{n-k}^2 divided into degrees of freedom, we get the Fisher repartition:

$$F = \frac{6315,52}{2736,30} = 2,30 \text{ (calculated)} \quad (59)$$

$$F_{\text{calculated}} = 2,30 < F_{\text{standard}} = 4,67 = F_{\text{tabel}} = F_{0,05; (1,13)} \quad (60)$$

⇒ the stress doesn't influence the research population.

Discussion

If the null hypothesis were true, then MSB would also make a good estimator for variance. In this situation, MSB would have a value that would be close to the MPI value, and the F value would be close to 1. The closer the F value is to 1, the more

increases the probability of an error due to the rejection of the null hypothesis.

Future research directions will be achieved by applying other tools (questionnaires) and methods of calculation on a larger sample in order to detect with real approximation the level of stress in the academic environment.



Conclusions

Considering all of the above, regarding the three questionnaires that the sample made out of the two groups answered:

- regarding the Cohen Questionnaire, the average score was less than 14 points and, according to the quota of answers, the group is without stress;
- the average score for the group of respondents to the Holmes-Rahe Stress Scale Questionnaire was less than 150 points, and in this case the respondents are under low susceptibility to stress;
- the average score for the General Questionnaire on Work and Health was less than 15 points, which places the interviewed group outside of major stress risks;
- the 2 groups answered the Cohen Questionnaire similarly (in terms of scores, standard deviation and variance), thus obtaining similar scores and maintaining

a scatter that is similar to the own averages and the general average of the sample.

The general conclusion that rises from the entire study that led to this paper is the fact that, despite there being thousands of treatises about this subject, as well as multiple developments both in theory and in practice, the concept of stress still remains a matter of debate and approaches in this field will continue to be made.

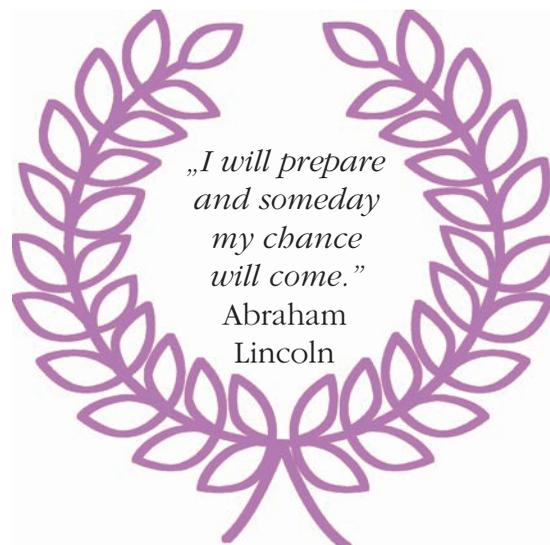
Acknowledgments

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New Technologies for Relationship Management

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Abstract

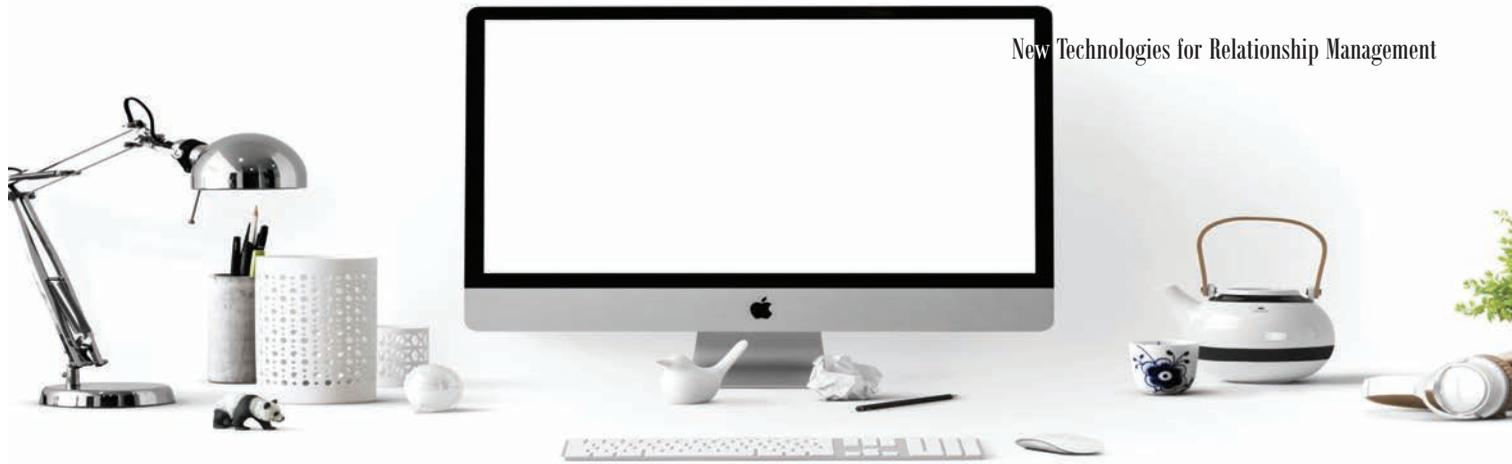
For generations, companies have tried their best in managing and developing customer relationships. Year by year this concept improves and with the help of latest technologies it can become more and more efficient. E-CRM (Electronic Customer Relationship Management) is one of the business concepts that, supported by information systems, lead to integrate all the processes that interact with customers. Therefore, it builds a database that helps businesses to keep all the information about their customers well organized and accessible in matter of seconds. This study aims to talk about the impact that artificial intelligence (AI) and Big Data will have on the CRM activity. Also this paper will analyze these two technologies, mentioning the advantages and disadvantages of them, and, in the end, present the conclusion.

Keywords: E-CRM, customer relationship management, AI CRM, big data CRM, services, quality

Introduction

Information has long been known to empower its holders. Anyanwu (2000) says that data integration is a key advantage of Relationship management software products and enterprise Systems. This combination can bring savings and a more efficient infrastructure system. Moreover, improvements in operational mix empowered by Enterprise Systems can influence the whole association and hence positively impact the firm performance.





CRM is an acronym for Customer Relationship Management and it's basically a combination of strategies, activities and technologies that are used to analyze and manage customer interactions taking in consideration customer life-cycle, in order to improve the relationship and to drive sales growth.

ERP is an acronym for Enterprise Resource Planning, and it defines a process which companies use in order to manage and integrate the important parts of their business. This allows them to integrate all the processes they need in a single system: sales, marketing, planning, finance, human resources all within a single unified platform.

SCM is an acronym for Supply Chain Management and it represents an effort made by the supply chain companies in order to develop and run supply chains in the most effective ways possible. The main role is to link major business functions and business processes within and across companies into a cohesive model.

A new concept encountered is E-CRM. Adirika *et al.* (2010) concluded that E-CRM stands for Electronic Consumer Relationship Management and describes the same Customer Relationship Management operations, but all carried out through an electronic channel, mainly a web platform. It is

a part of the CRM that allows to change data with its customers in order to create a benefic relationship. It creates a unique and central view of customers as it builds a profile for each individual customer. With E-CRM, it is also possible to script and automate marketing campaigns, thus detecting the most profitable customers and focusing the marketing strategy on them in order to generate more revenue.

The purpose of this paper is to further analyze E-CRM and how existing and emerging technologies can add value to these systems.

CRM and Relationship Management

The studied literature offers some examples of the use of E-CRM in relationship management. Some believe that CRM is a strategy, others a business model.

For example, Achumba (2006) describes that CRM stands for Customer Relationship Management and it implies a strategy by which the company is trying to understand, anticipate and manage the needs of its customers.

Basically, CRM is a strategy that allows companies to identify, attract and retain their customers, in addition to helping them increase their satisfaction and thus optimize the profitability of their businesses. We talk about CRM as a strategy, as a



business management model, which implies not only having the right software to manage customer relationships, but also a change in the company's processes, involving all employees for this strategy to succeed.

The CRM is a business management model dealing with an increasingly competitive and demanding market. The objective should focus on providing a series of customer-oriented processes across the different departments and channels, and to attract and retain customers. In this maelstrom for the management of the relationship with the client, a wide range of CRM solutions have been developed that provide companies with the necessary information and the most appropriate ways to optimize their business strategies.

Nowadays the production systems are very developed and therefore the costs are very tight. The battlefield is now on the client. Loyalty and maintenance are essential for the good development of the business, increasing sales to current customers as cross-sales.

The objectives of this concept, in general, are:

- Maximize customer information;
- Identify new business opportunities;
- Customer service improvement.

Anyanwu (2000) defines that CRM answers to three business problems:

- increasing customer loyalty: listening to the customer in order to offer better and more personalized services;
- multi-channel integration: integrate customer data in different ways: commercial, point of sale, catalog, direct mail, telemarketing, Internet, social networks, chat etc.
- increased productivity (cost reduction): automate various services (after sales service, sales force, order taking) and optimize marketing expenses.

The CRM allows an organization to deliver its products and services according to customer preferences. But with the growth of the internet, companies use CRM by providing access to their customers and suppliers through the web. With the E-CRM customers can place orders, check their

status, check the status of their purchases, request additional information about the products. This gives the feeling of freedom in terms of time and place to customers. Data analysis and ERP systems are used in the E-CRM for communication between the

Front End and Back End operations. Data mining allows companies to create Business Intelligence applications that support business activities and decision making. The goals of relationship management are shown in Figure 1.



Figure 1 – *Goals of relationship management*

(Source: Emciuc *et al.* 2019)

In short, the benefits of e-CRM are:

- Customer data collection;
- Customer profiling through quick data mining;
- Offers a contact platform that is available 24/7;
- Enables automation of a large part of the customer related activities;
- Delivers better targeted products and services;
- Acting based on customers' needs it increases customer satisfaction.

Besides clear benefits, the implementation of E-CRM system also comes with security challenges and risks, both hardware and software. Hardware risks are related to

malware attacks that could lead to hardware damage while software risks are a little bit more complex:

- Data security, protect data from internet attacks – worms and malware;
- Data access, who exactly has access to all customer data, and for what purposes are they using it;
- Data accuracy, maintaining accurate data for successful CRM conversion is not an easy task. There is a big risk of having incomplete, duplicate or even „dirty” data that minimizes the potential of E-CRM system.

In another paper (Emciuc *et al.*, 2019) we found that another problem that cus-

customers have, is deals with the connection to the Internet. If a piece of the hosted solution can work without connecting to the Internet, customers would prefer it that way. Any opening to the Internet on either side provides some sort of vulnerability that could be exploited. The host needs to provide solutions to prevent unauthorized access from the outside, either into the host itself or to the customer while connected to the host.

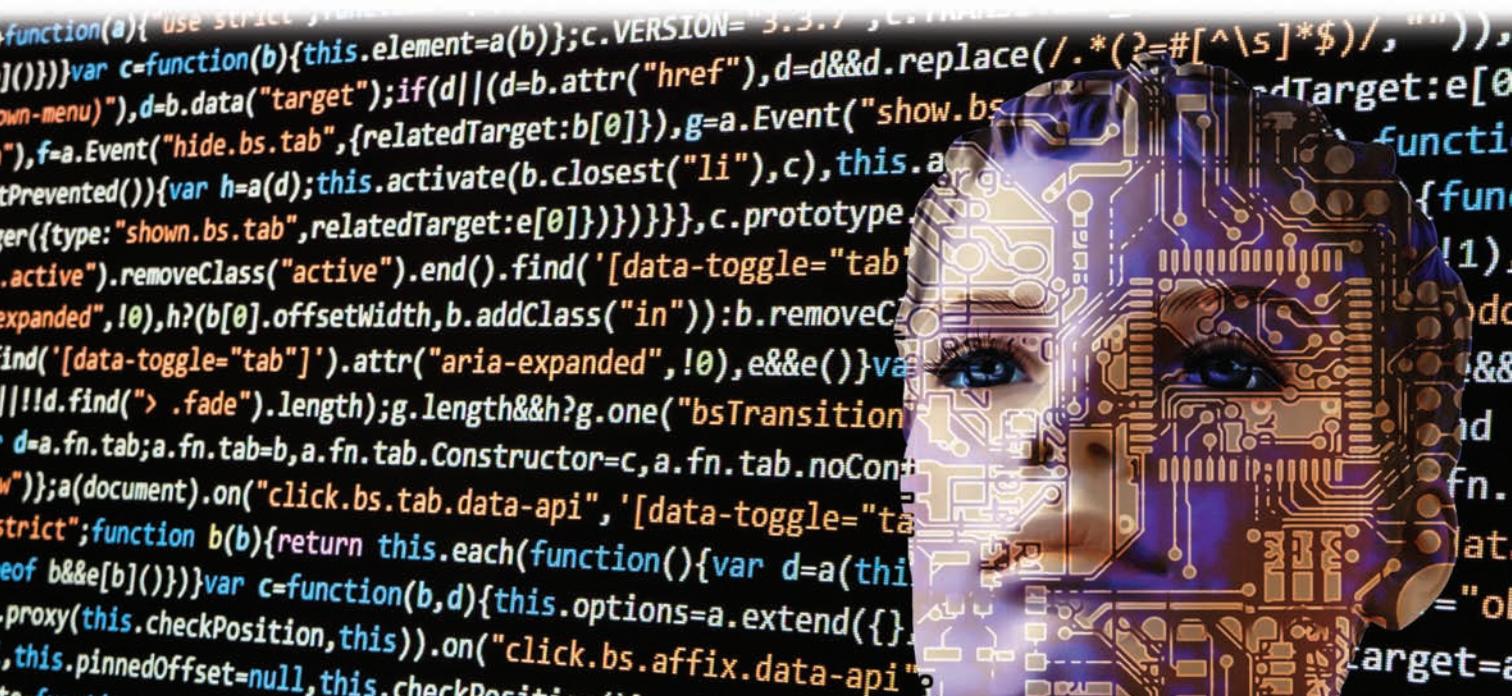
Big Data and Relationship Management

In today's world we see a huge step forward to a more digital and interconnected world. Companies started talking about AI, 5G, Big Data, IoT and how the applications of modern technologies can improve overall business relationships and services. In this article we will analyze how two of these new terms, Big Data and AI, can impact the current way of working of CRM systems. As CRM stands for data collection and data processing, any concept that comes forward to help in these two directions are well received. In this case,

Big Data can bring more details about customers and their preferences while AI can help in processing all this information in a short period of time and more accurate than current data mining techniques.

Big Data brings a new wave of customer relationship management strategies to support the customization of sales and customer services. CRM needs Big Data to improve customer experiences, especially personalization of products or services. Big Data is a term often used to describe data such as volume, velocity, variety, veracity and value of both structured and unstructured data. Big Data brings new tools and techniques to capture, store and analyze information that is used to improve decision making to improve customer management.

Anshari *et al.* (2018) concluded that managing customer relationships in an organization refers to the concepts, tools and strategies for managing customer relationships. CRM, along with web technology, gives organizations the ability to understand customers or potential customers and, as a result, to provide certain activities that might persuade them to make transactions and make decisions.



As Big Data can provide a model for customer information, businesses can predict what their customers' needs are today. Figure 2 shows the basic framework on how this data can contribute to the generation of CRM strategy. Big Data has helped shape many industries and has changed the way they operate today. They also said that CRM together with Big Data has created a new paradigm that allows accessibility and availability of information, which leads to greater acceptance by large or small businesses.

Big Data provides knowledge acquisition in CRM activities. Big Data will support the long-term relationship, by understanding the life cycle and customer behavior, from a more comprehensive perspective. Customers voluntarily generate a huge amount of data daily by detailing their interest and preferences for products

or services through different public channels. These Big Data analysis provide efficient marketing, new revenue streams, customer service, improved value chain efficiency, sustainable competitive advantages over rival organizations and many other benefits.

Big Data in CRM has a great potential to offer, with its ability to collect and produce a large amount of information, but it could really be a waste of time and resources without the proper expertise and tools for analysis. At the moment, there is no general valid solution for integrating Big Data into CRM, which means that each company must develop its own strategy for adapting such a system. Another risk refers to the authenticity of this data, depending on their source: web history, social networks, transaction history, etc.

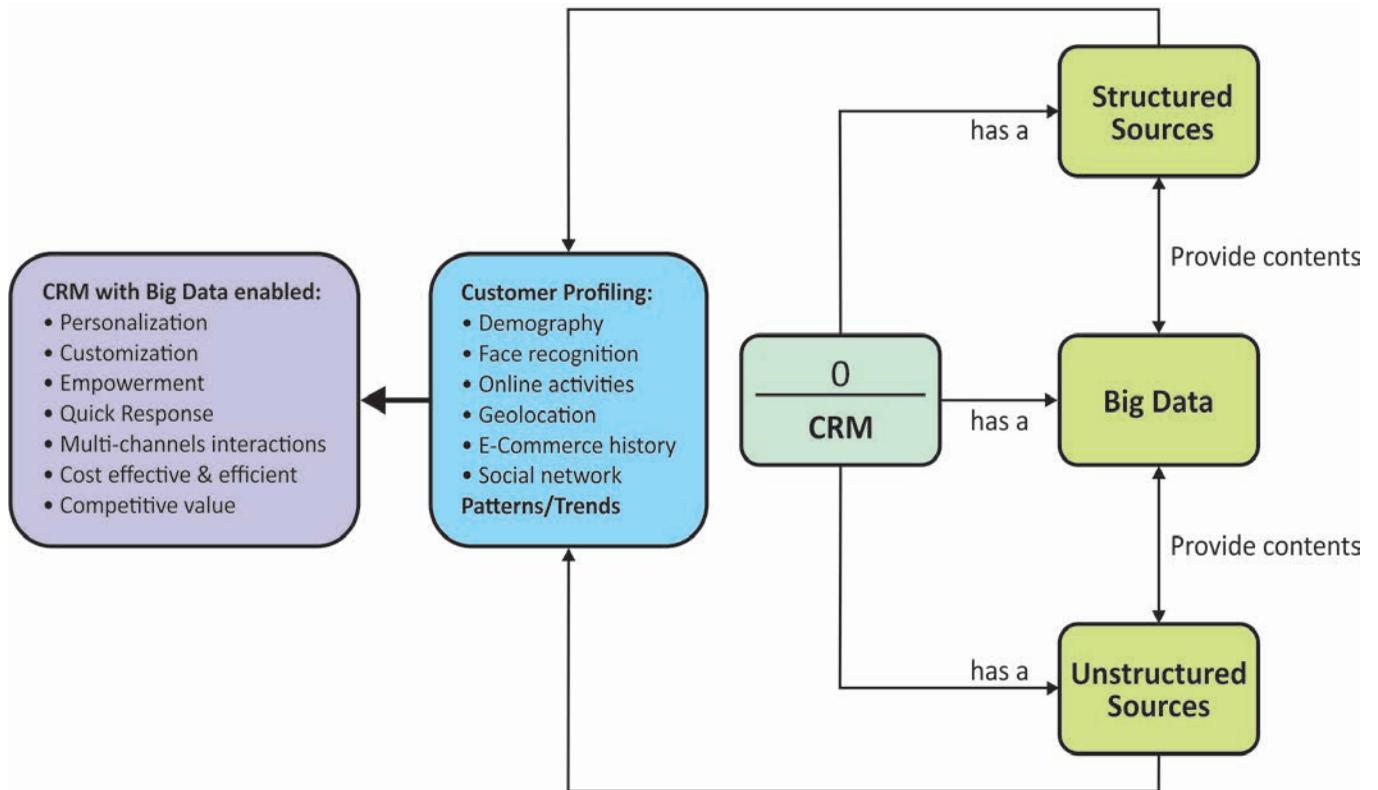


Figure 2 – *The effect of Big Data in CRM*
(Source Anshari 2019)

A.I. and Relationship Management

Artificial Intelligence is currently the hottest buzzword in tech. And with good reason – after decades of research and development, the last few years have seen a number of techniques that have previously been the preserve of science fiction slowly transform into science fact.

Boden (1977) found that AI techniques already are a deep part of our lives: AI determines our search results, translates our voices into meaningful instructions for computers and can even help sort our cucumbers (more on that later). In the next few years we'll be using AI to drive our cars, answer our customer service enquiries and, well, countless other things. But the ultimate goal of artificial intelligence as a science is to enable machines to do things that would require intelligence if done by humans.

Artificial Intelligence began as the result of research in cognitive psychology and mathematical logic. He has focused on the explanation of mental work and construction of algorithms for solving general-purpose problems. Artificial Intelligence is a combination of computer science, physiology and philosophy, so general and broad as that, is bringing together various fields (robotics, expert systems, for example), all of which have in common the creation of machines that can „think”.

The idea of building a machine that can perform tasks perceived as human intelligence requirements is an attraction. The tasks that have been studied from this point of view include games, language translation, language comprehension, fault diagnosis, robotics, prevision of expert advice on various topics.

This is how the increasingly sophisticated database management systems, data



structure and the development of data insertion, deletion and location algorithms, as well as the attempt to create machines capable of performing tasks that are thought of as typical from the field of human intelligence.

It can be said that Artificial Intelligence (AI) is one of the most fascinating and challenging areas of computer science, in its area of cognitive sciences. He was born as a more philosophical and reasonable study of human intelligence, mixed with man's concern to imitate the surrounding nature (such as flying and swimming), even wanting to imitate himself. Quite simply, Artificial Intelligence seeks to imitate human intelligence.

According to Hopkinson *et al.* (2018) the main functions that AI can deliver when talking about CRM are:



- *Attract or Acquire:*

- Programmatic advertising that delivers customized content tailored to customer behavior patterns;
- Automated servicing (Chat-bots) to provide deal with pre-sales and POS queries in real-time;
- Use of AI to provide relevant POS recommendations based on purchase patterns of other customers;
- Automated email – again to deliver relevant messages and content to selected customers;
- AI could also be used to re-target those customers that are most likely convert;
- Use predictive analytics to determine the most appropriate targets (candidates for relationship building), purchase behavior patterns, servicing

needs and relationship duration and to tailor interactions to maximize engagement and optimize channel strategies.

- *Retain and maintain customers:*

- Automated servicing to deal with post-sale needs in real time;
- Intelligent, tailored content marketing based on each customer needs;
- Programmatic advertising to deliver ads tailored to the customers' actual anxieties to reduce post-purchase dissonance and remind the customer of the benefits inherent in the brand/product/service;
- Automated email – deliver relevant, personalized messages and content directly to selected customers to deal with predicted pain points – e.g. the majority of problems or issues arise during the first six months of product usage, and less experienced customers may be more susceptible to switching or exiting the relationship;
- Use of predicted analytics to determine which customers are most likely maintain the relationship and optimize channel strategy to reach them.

- *Enhance and develop:*

- Tailored marketing content – promotion of complementary products or upgrades to extend the relationship;
- Customized content based on customer's predicted journey and past queries. AI would provide insight into the most receptive candidates based on patterns of usage and predicted responses to intended strategies;
- Programmatic advertising tailored to the customers predicted behavior;
- Automated email sending personalized messages to promote new services and to respond to FAQs;

- Automated/intelligent servicing of client's routine needs: e.g. car service appointments automatically booked when service intervals thresholds are reached etc.
- *Ending the relation after a successful cooperation:*
 - Tailored interaction to help the customer on to the next stage in their journey e.g. maturing of a pensions policy;
 - Automated/intelligent servicing – helping clients deal with the formalities of ending a relationship: closing accounts, etc;
 - Automated email and programmatic advertising to remind those in danger of defecting of the product/service benefits.

Conclusions

According to Harris (2000) marketing has become democratized because of the low costs generated by E-CRM (it is now within the reach of the smaller companies

to do CRM and internet marketing). New online communication tools have thus appeared and have come to supplement and bring a real added value to the traditional CRM tools, the client is at this time one of the most valuable of which a company can have, but it is also the most volatile and ephemeral.

Indeed, it has also evolved and became more demanding in the face of multiple solicitations from companies, especially through their offers sent by email. He knows from now on that he can very easily go to the competition with a simple click. It is therefore important today, in an ever more competitive and international environment, that a company has the right tools to effectively manage its customer relationship in order to acquire, understand and satisfy its customers as much as possible in order to gain loyalty, to ensure the sustainability of the business.

In order to fulfill the customers' demands, clearly new technologies come in handy and can help companies to improve their everyday activities. From this research we saw exactly how two of the last technology concepts, simply can improve a company's tasks in order to achieve greater results in their business. In the business world today, companies need to use the latest technologies in order to develop the relationships with its customers. The same way medical devices enable doctors to monitor and keep track of their patients, businesses are in need of similar instruments in order to keep up with their customers more demanding needs.

By all this, from our perspective, any company that is already using a CRM system, should indeed take advantage of these two concepts: Big Data and AI.



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Decision Making Based on Affectations Degree

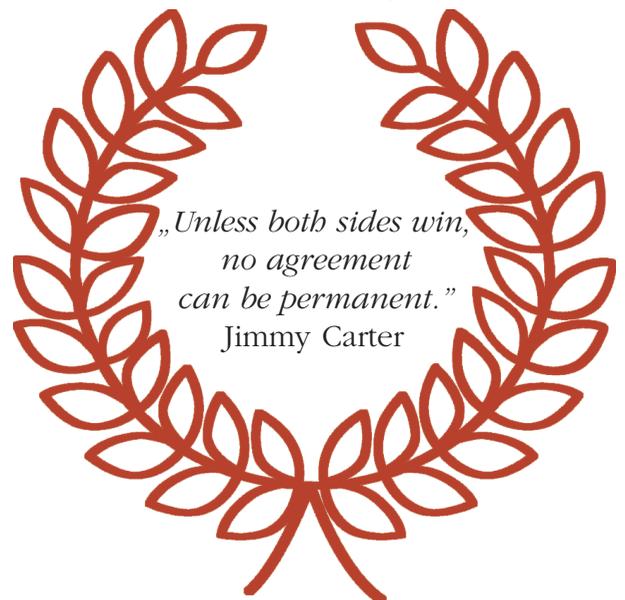
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Abstract

Under congestion and overcrowding of living spaces in the urban area, people seek different methods to harness the useful area of housing. Thus, they began to turn their attention to modular furniture objects, objects that have become increasingly popular. From promotion to purchase, however, it is a long way, which is why modular furniture manufacturers must first understand the needs of their customers. Through this paper, the authors propose to investigate the links between the characteristics of the modular furniture and the degree of affectation to the problem. The main problem found after this study is the lack of space in houses. Ten main requirements were identified, and correlations were made between the problem's degree of affecting and the notes given by each respondent to each requirement. It was also considered the price that a respondent is willing to offer on average for such a product and the frequency of occurrence of the problem. The methodology underlying the research was an empirical one by using the market survey based on the questionnaire. In this regard, a questionnaire with 21 questions was created, among them were questions with multiple answers, free questions and evaluation scales. Following the research it is observed that the degree of affectation of the problem on the respondents is correlated with the constructive requirements, the requirements regarding the protection of life and the aesthetic requirements of the product under investigation, these connections being statistically significant at a 95% confidence level. The contribution of this paper is important in view of the fact that the main requirements of the customers in the field of modular furniture are known so that the manufacturers can focus on them to best meet the needs of the market. It can also be used as the basis for further research.

Keywords: modular furniture, buying behavior, reduced space, degree of affectation, product requirements





Introduction

In recent years, there has been an increase in the purchase of modular furniture products, being presented at numerous fairs and exhibitions in the area of furniture items. Also, the interest for such products is growing, as the data recorded in the search engine Google Trends (2020) shows. The modular furniture appeared with the need to make the space more efficient and to connect it to the modern trends. Modular design involves dividing an assembly into autonomous parts, which can then be combined to obtain an object with another function (Acaju, 2019).

The trend of using modular furniture has made its mark especially in large cities, where prices per square meter are very high. According to the National Institute of Statistics (INS, 2019), the average area of completed housing in Romania has decreased, reaching an area of 133 square meters per dwelling, while the average price per useful square meter is 1,310 euros, (Z.F. 2019). Thus, real estate developments have done all kinds of modifications, giving up several annexes, thus creating smaller dwellings, to allow the purchase of more people, especially for young people. At the same time, the overcrowding rate is 65% in Romania among young people between the ages of 15 and 29, compared to the European Union average of 26.7 (Eurostat,

2019). So it appears among young people, the need for a more compact design of furniture objects that will value the useful space of the houses, at the expense of massive objects that occupy this space.

For the furniture companies a new opportunity was created, with the advent of this niche, through the production of modular furniture. Usually, however, young people consider certain things when making a choice when purchasing a certain piece of furniture. The current modular furniture is considered an innovative product on the market in Romania. Nowadays, more and more such furniture items are introduced on the market, which present as varied and new functions. In the specialized literature, regarding the innovation in the furniture area, there are presented ten requirements that a new product must meet: functionality (performance), constructive (conception, weight and material, dimensional-geometrical, technological, handling requirements – transport, assembly, inspection, coverage and protection), use (reliability, maintainability, durability, conservation), possession (cost of acquisition, entry into possession, specific consumption, cost of operation), maintenance (cost of maintenance, cleaning, warranty, service), ergonomic (movement and position, ambiance, psycho-sensory stress), life protection (safety, risk, toxicity), ecological (air, water, soil, biodegradability),



aesthetic (shape, structure, style, color, symmetry), proportion, harmony), organoleptic (taste, smell, aroma, touch) (InovareProdotus.ro).

Through this paper, the authors set out to determine the main factors that influence the choice of a modular furniture object in Romania. In this regard, the analysis of the perceptions of young people and their preferences will be considered, studying the degree of problem affectation (hereinafter referred to as the requirement), regarding their choices for a certain furniture object.

Literature Review

In the field of ergonomics and use engineering, designers need to evaluate approaches in science, technology and product development, not only based on technological trends, but also on customer feedback (Nirmal *et al.* 2018). Therefore, with the help of market and product analysis, the study proposed by Nirmal *et al.*

(2018) aims to identify ergonomic aspects, features and defects in furniture design and to foresee future advances in the technology of furniture.

The main ideas from this study are that the ten most important trends for furniture in the last decade are environmentally friendly furniture, smaller furniture, multi-functional furniture, technology-based furniture design, the popularity of vintage furniture, common furniture, the increasing importance of outdoor furniture and custom products. Considering that this study conducted in Malaysia aims to discover the general aspects of modular furniture, the authors proposed that this study should establish the main problem that leads to the purchase of a modular piece of furniture and according to it establish the most requirements important for respondents.

The study by Wardono and Susanto (2012) analyzes how students live and work, in relation to the need for room furniture and how small local furniture dealers are facing problems in response to this need.

From interviews and questionnaires involving 123 students and the use of descriptive statistics and the Chi-square test, it was found that male and female students prefer furniture that can be accessible, simple, natural, multifunctional and sustainable, in addition to easy, practical and flexible. Their study analyzes several aspects of modular furniture and how it affects the purchasing habit of a specific modular furniture object with certain char-

acteristics, how local furniture dealers react to this custom.

Taking into account their findings, we propose a new perspective, indicating the problem that leads to the purchase of modular furniture and the characteristics that such an object must fulfill that will lead to the purchase of furniture, formulating in this regard a number of ten hypotheses (Table 1).

Table 1 – *The hypotheses of the study*

Hypotheses code	The hypothesis
H1	There is a connection between the problem's degree of affecting and the functionality requirements of the product.
H2	There is a connection between the problem's degree of affecting and the constructive requirements of the product.
H3	There is a connection between the problem's degree of affecting and the use/consumption requirements.
H4	There is a connection between the problem's degree of affecting and the possession requirements.
H5	There is a connection between the problem's degree of affecting and the maintenance requirements.
H6	There is a connection between the problem's degree of affecting and the ergonomic requirements.
H7	There is a connection between the problem's degree of affecting and the protection of life requirements.
H8	There is a connection between the problem's degree of affecting and the environmentally requirements.
H9	There is a connection between the problem's degree of affecting and the esthetic requirements.
H10	There is a connection between the problem's degree of affecting and the organoleptic requirements.

Research Methodology

In order to carry out this study, the authors did a quantitative research on modular furniture objects, in this case a foldable table, using as a data collection tool a questionnaire with 21 questions. This

questionnaire was distributed online between December 10-30, 2019. The research is an exploratory one, the age of the respondents being between 18 and 35 years. For this study, was used the filter question „Do you use modular furniture type products”, in order to include in the research

only the persons who can provide us with representative answers for our study. In the questionnaire, both open-ended and closed-ended questions were used, the most important being the ones in which the main problem was sought and the notes were given to each type of product requirements. The SPSS statistics program was used to interpret the data obtained.

Results And Discussions

The research sample was represented by 30 persons, aged between 18 and 35 years. In Table 2, it is observed that the highest proportion of respondents was between 20 and 35 years old, a single respondent being under 20 years old. Most of the respondents were female 66.67%, the rest 33.33% were male.

Table 2 – *Age of respondents*

		Frecquency	Precent	Valid precent	Cumulative precent
Valid	18-20	1	3,3	3,3	3,3
	20-35	29	96,7	96,7	100,0
	Total	30	100,0	100,0	

For a better visual representation, the product requirements were codified, their values being visible in table 3.

Table 3 – *Requirements codes analyzed for the modular furniture product*

Items analyzed	Codes used
Functionality requirements	A
Constructive requirements	B
Usage/consumption requirements	C
Ownership requirements	D
Maintenance requirements	E
Ergonomic requirements	F
Life protection requirements	G
Ecological requirements	H
Aesthetic requirements	I
Organoleptic requirements	J

Depending on the hypotheses considered, certain correlations were made between the requirements and the degree of affectation and the frequency of occurrence of the problem, as well as the price of the product, the results being presented in Table 4.

First of all, the authors analyzed the links between the degree of affectation of the problem from the respondents and the requirements of a modular furniture product. In Table 4, it is observed that the degree of affectation of the problem on the respondents is correlated with the constructive

requirements (B), the requirements regarding the protection of life (G) and the aesthetic requirements (I) of the product under investigation, these links being statistically significant to a 95% confidence level. Between the problem's degree of affecting and the constructive requirements of the product (B), there is a positive, moderate correlation, suggesting that a greater importance given to the constructive requirements of the product leads to a higher degree of affectation of the problems related to furniture ($R = 0.424$, $p < 0.05$).

There is a negative correlation between the problem's degree of affecting and the requirements of life protection (G), which means that insistence on the life protection requirements of the product leads to a decrease in the problem's degree of affecting ($R = -0.44$, $p < 0.05$). Between the prob-

lem's degree of affecting and the aesthetic requirements (I), there is a moderate negative correlation, suggesting that if the furniture manufacturers pay more attention to the aesthetic requirements of the product, then the customers are less affected by the problems that they may have the product ($R = -0.458$, $p < 0.05$). Between the degree of impairment of the problem and the requirements of functionality (A), the requirements of use/consumption (C), the requirements of possession (D), the requirements of maintenance (E), the ergonomic requirements (F), the environmental requirements (H) and the requirements organoleptic (J) have no statistically significant relationship ($p > 0.05$). As a result of these results, it is found that hypotheses H2, H7 and H10 are confirmed, the rest of the hypotheses being rejected.

Table 4 – Correlations between the analyzed variables

Variables		A	B	C	D	E	F	G	H	I	J
Degree of affectation	Pearson correlation	,246	,424*	,140	-,030	,124	,317	-,440*	-,302	-,458*	-,026
	Sig. (2-tailed)	,190	,019	,461	,874	,512	,088	,015	,105	,011	,892
	N	30	30	30	30	30	30	30	30	30	30
The price of the product	Pearson correlation	-,080	-,147	-,365*	,232	,249	-,029	,303	,298	,093	,379*
	Sig. (2-tailed)	,674	,437	,047	,217	,185	,879	,104	,109	,625	,039
	N	30	30	30	30	30	30	30	30	30	30
Frequency of occurrence of the problem	Pearson correlation	,300	,240	,183	-,111	,231	,490**	-,418*	-,444*	-,383*	,004
	Sig. (2-tailed)	,107	,202	,332	,559	,220	,006	,022	,014	,037	,985
	N	30	30	30	30	30	30	30	30	30	30

* The correlation is significant at the level 0,05.

** The correlation is significant at the level 0,01.

Second, the authors also studied the links between product requirements and the price a respondent is willing to offer on a modular furniture product. In Table 4, it is observed that the price of the product

is correlated with the requirements of use/consumption (C), the organoleptic requirements of the product under investigation (J), these links being statistically significant at a 95% confidence level ($p < 0.05$).

There is a negative correlation between the price of the product and the requirements for use/consumption (C) of the product, which means that users are willing to offer a lower price for furniture, which is very insistent only on the requirements of use/consumption of the product ($R = -0.365$, $p < 0.05$). There is a positive correlation between the price of the product and the organoleptic requirements (J), which means that the insistence on the organoleptic requirements of the product increases the price that users would be willing to pay for a particular piece of furniture ($R = 0.379$, $p < 0.05$).

From the point of view of the average price that the respondents would be willing to pay for a modular furniture product, an average value of 232 lei was registered, which means, however, that the respondents are not aware of the costs that the implementation of such product in-

volves them. At the same time, their responses may also be affected by the low level of incomes they register, the sample of respondents comprising both young people who have a job and young unemployed people.

Table 4 also presents the links between the frequency of occurrence of the problem and the product requirements. According to the data obtained, it is found that the frequency of occurrence of the problem among the respondents is correlated with the requirements regarding the protection of life (G), the ecological requirements (H) and the aesthetic requirements of the product under investigation (I), these connections being statistically significant to a 95% confidence level ($p < 0.05$). Between the frequency of occurrence of the problem and the requirements regarding the protection of life (G), there is a moderate, negative correlation, which means



that the more producers insist on the requirements regarding the protection of life, the more respondents feel that they will have fewer problems with that product ($R = -0.418$, $p < 0.05$).

Between the frequency of occurrence of the problem and the ecological requirements (H), there is a moderate negative correlation, which means that insistence on the ecological requirements of the product leads to a decrease in the frequency of occurrence of the problem among the respondents ($R = -0.444$, $p < 0.05$). It is also interesting to note that for the respondent, the aesthetic requirements matter so much that they no longer have such great problems with the construction of the product, between the frequency of appearance of the problem and the aesthetic requirements (I) with a negative correlation ($R = -0.383$, $p < 0.05$). At the same time, it is observed

that the frequency of occurrence of the problem among the respondents is also correlated with the ergonomic requirements (F) of the product ($p < 0.01$), between them there is a moderate, positive correlation ($R = 0.49$, $p < 0.01$). From the point of view of the respondents, if there are more problems with the use of the product, then the manufacturers should insist more on their ergonomic requirements.

Another element studied by the authors was the connection between the degree of problem affect and the frequency of occurrence of the problem. Following the run of the Anova analysis (Table 5, Table 6, Table 7), it was found that the two variables are positively correlated, suggesting that an increase in the frequency of occurrence of problems directly leads to an increase in the level of problem affect.

Table 5 – Model summary

Model	R	R ²	R ² adjusted	Estimated standard error
1	,588 ^a	,346	,322	,419

Table 6 – Anova Test

Model	Sum of square	df	Square average	F	Sig.
1 Regression	2,592	1	2,592	14,787	,001 ^a
Residual	4,908	28	,175		
Total	7,500	29			

Table 7 – Coefficients

Model	Non- standardized coefficients		Standardized coefficients	t	Sig.	95,0% confidence interval for B	
	B	Standard error	Beta			Inferior limit	Upper limit
1 (Constant)	1,583	,250		6,320	,000	1,070	2,096
Frequency of occurrence of the problem	,399	,104	,588	3,845	,001	,186	,611

Using the results of the Anova test, one can write the regression equation:

$$Y = 1,583 + 0,399 * f \quad (1)$$

where:

Y – degree of affectation of the problem;

f – frequency of occurrence of the problem.

Conclusions

The main applications of this study are given by the application of the data discovered in the needles regarding the development of modular furniture within furniture production. The behavior of young people has been analyzed and their most important requirements can be identified about living in as small and overcrowded spaces. As the overcrowding of urban areas increases, living spaces should be maximized. Modular furniture is an important factor that ensures this.

From the point of view of the young people who made up the sample of our research, the degree of affectation of the problem related to the use of a modular furniture product is correlated with the constructive requirements, the require-

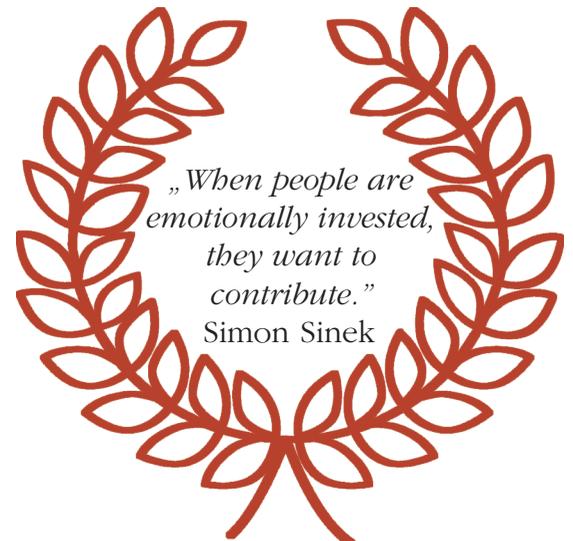
ments regarding the protection of life and the aesthetic requirements of the product under investigation, these connections being significant statistically at a 95% confidence level, the other requirements were not correlated with the analyzed variable. From the point of view of the frequency of occurrence of the problem, the present study has demonstrated that this variable is correlated with the requirements regarding the protection of life, the ecological and aesthetic requirements of the product under investigation, but also with the ergonomic requirements of the product.

The limits of the study are given primarily by the exploratory nature of the research, this research is a pilot one. The research also shows the perceptions of the respondents, the data being influenced by the age category of the respondents. Also, the age category can induce limitations in terms of answers regarding the purchase price of a modular furniture product. For the complex development of the modular type furniture to pass it from the prototype level to the level of commercialized product, it is desired that in the future to carry out more extensive research, on the entire population in the urban environment of Romania.



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The State of Research on Integrated Management Systems

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Abstract

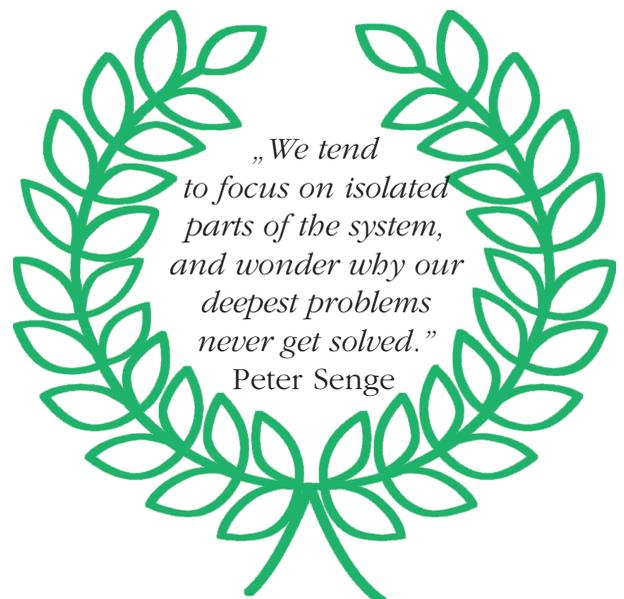
The Integrated Management System (IMS) represents a suitable strategy for managing multiple systems that have to meet the expectations and needs of the different stakeholders. Over the last years, most organizations have been certified under various management systems, such as Quality Management System, Environmental Management System, and more; moreover, many of them have implemented a integrated management system. The purpose of this paper is to see the impact of integrated management systems on organization performance and to determine also what is the role of the strategic management in companies. The results of this research can help business managers better set their goals and manage the integrated management systems correctly, leading to an efficient organization.

Keywords: management system, organization performance, strategic management, efficient organization, integrated management systems

Introduction

The most studied management systems are Quality Management System (certified according ISO 9001) and Environmental Management System (certified according ISO 14001). According to the existing literature, it can be said that the main advantage of an integrated management system is that it improves internal efficiency, considered as a global concept consisting or resource optimization, integrated audits, human resources motivation (Salomone 2008).

Integration of management systems (IMS) can be defined as „putting together various management systems specific to





the function in a single and more efficient IMS” (Beckmerhagen *et al.* 2003). The integration process can be considered according to four main aspects: integration strategy, integration methodology, integration of audit systems and integration level. Many authors have found that organizations are aware of the value of having an integrated management system such as operational benefits, cost savings, and better customer satisfaction (Salomone 2008, Bernardo *et al.* 2015).

Strategic management provides an action directive that has to be in line with the organization’s objectives. Establishing a strategic direction represents a complex task faced by the management team as firms operate in a volatile, dynamic environment. The future is uncertain, with many options from which you have to choose the most appropriate for the company’s resources and goals, and strategic management must involve all employees of the company (Falshaw *et al.* 2006).

The integrated management system requires strategic support from IMS methodologies and models to help companies record the expected results. To represent a basis for the integrated system, the model must have the following characteristics:

a) to provide the foundation for the integration of common elements of the various management systems.

- b)** to be generic and to apply to all types of companies and to accommodate the further integration of other IMS management systems.
- c)** to be flexible in order to meet the different needs of IMS systems.
- d)** to record compatibility with individual management models to facilitate the transition to IMS;
- e)** to be supported by relevant methodologies for managing IMS (Jonker, Karapetrovnic, 2004).

Asif *et al.* (2004) have conducted a study outlining some strategies for implementing integrated management systems and found that these systems are in most cases limited. In their opinion the IMS models studied were supported by incomplete methodologies, being inapplicable in some situations, such as when the organization has not implemented any management system and does not specify where the integration process should start and how it should work.

In the system approach, the organization is regarded as a unique system, in various fields the derivations of this system being adapted to meet the needs and expectations of stakeholders. The systems are analyzed as a whole, so top management is the first to engage in IMS and makes the necessary efforts to ensure that members of the system identify and engage in the project (Jonker, Karapetrovnic, 2004).



Domingues *et al.* (2016) have used three axes of elements aimed at composing the maturity model for the integrated management system. The first axis consists of a set of 21 key process agents identified for the first time in the literature. The second axis analyses so-called externalities, representing external characteristics that take part in the maturity level of IMS. The third axis of the model is based on eight management pillars of excellence: customer focus, leadership, involvement, systems approach, continuous improvement, decisions based on evidence and reciprocal beneficial relationships.

Strategic management involves both thinking and action. Strategic management takes place only when the action follows the idea. The idea alone can be intellectual stimulus but is not strategic management. In this sense, the strategic process includes two major stages: the implementation and the formulation of the strategy. Thus, Pearce and Robinson (2007) consider that strategic management represents a set of actions and decisions that result in the formulation and implementation of plans designed to meet the company's objectives. Dess *et al.* (2004) include in the set of strategic processes, besides decisions and actions, the analysis, underlining the role of strategic management in creating a sustainable competitive advantage.

There are various definitions of the strategic management process (SM), but there is a broad consensus that the main activities are:

- (1) developing a great strategy, a purpose or a sense of direction.
- (2) formulation of strategic objectives and plans to achieve them.
- (3) implementing plans.
- (4) evaluation, monitoring, and corrective actions (Kreitner 2004, Grant, Jordan, 2012).

The relative emphasis on each activity differs in time and among companies. Clearly, endogenous factors, such as corporate culture and the strategic leadership of senior management, influence the process of strategic management in organizations.

Integrated Management System vs. Strategic Management

The Integrated Management System (IMS) can be considered as a set of interconnected processes that use the same resources – human, material, financial, infrastructure, information – to meet a set of objectives related to stakeholder satisfaction. If it is properly built, IMS combines all business components into a coherent framework that allow the organization to fulfill its mission.

C.F. Poltronieri *et al.* (2019) studied and demonstrated that the integration of the management system has an important role in contributing to sustainable performance: it provides statistical evidence that organizations with a greater maturity in integrating the management system have a better and sustainable performance comparative with those with a lower integration maturity.

According to Klute-Wening and Refflinghau (2015) the maturity of the management

system integration affects sustainable performance. A detailed research of each of the three performance areas highlights that environmental, economic, and social performance is strongly influenced by the maturity level of integration. The pay gap, purchasing from local suppliers, energy and water consumption, hours of training, compliance with regulations and laws, impact on society, analysis of products and services that can affect customer health and safety, customer satisfaction, legislation and advertising are among the most mature indicators.

The principles of the integrated system should be streamlined by applying IMS

elements to quality, health and safety management systems, environment, social responsibility, and any other management system the companies want to integrate. They are not sequential, once they are naturally interconnected. Therefore, for both theoretical and practical purposes (e.g. the development of research on the implementation of IMS and SMMEs in companies), users should reflect all six principles in a balanced and integrated way so that development and managing IMS to be harmonious and interdependent (Nunhes *et al.* 2019). The principles of the integrated management system are presented in the Figure 1.

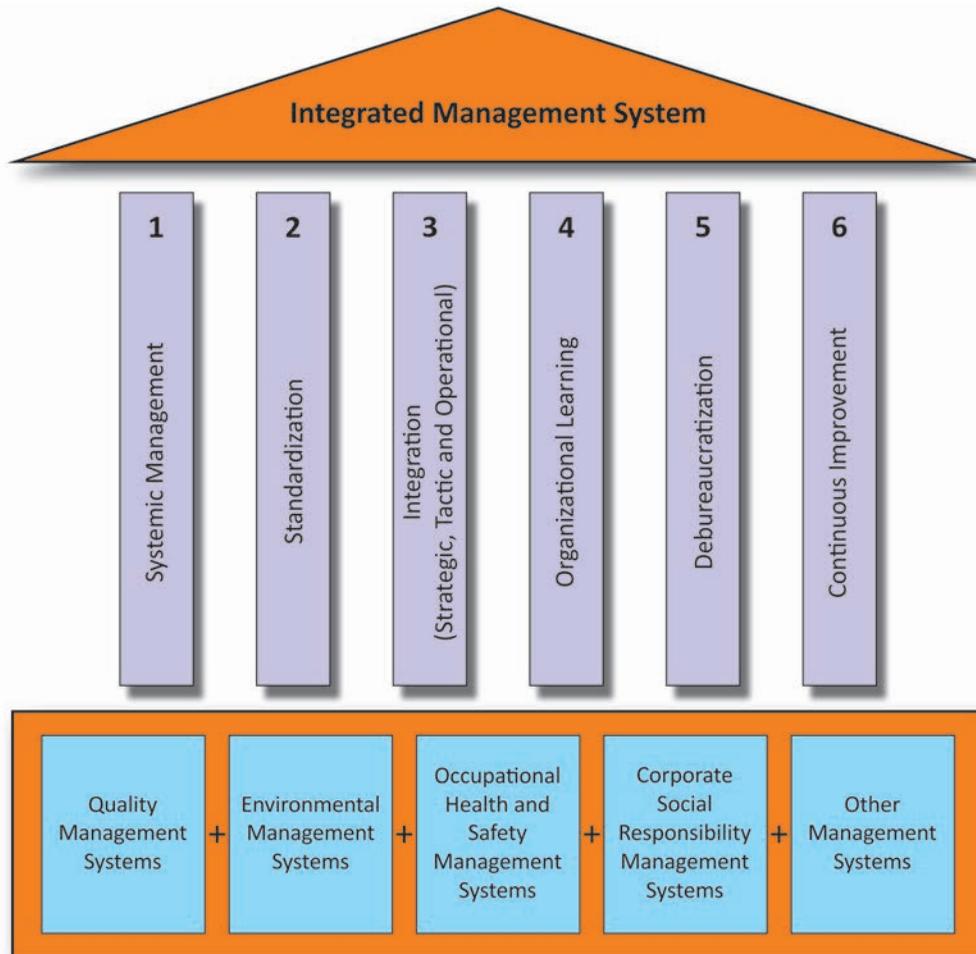
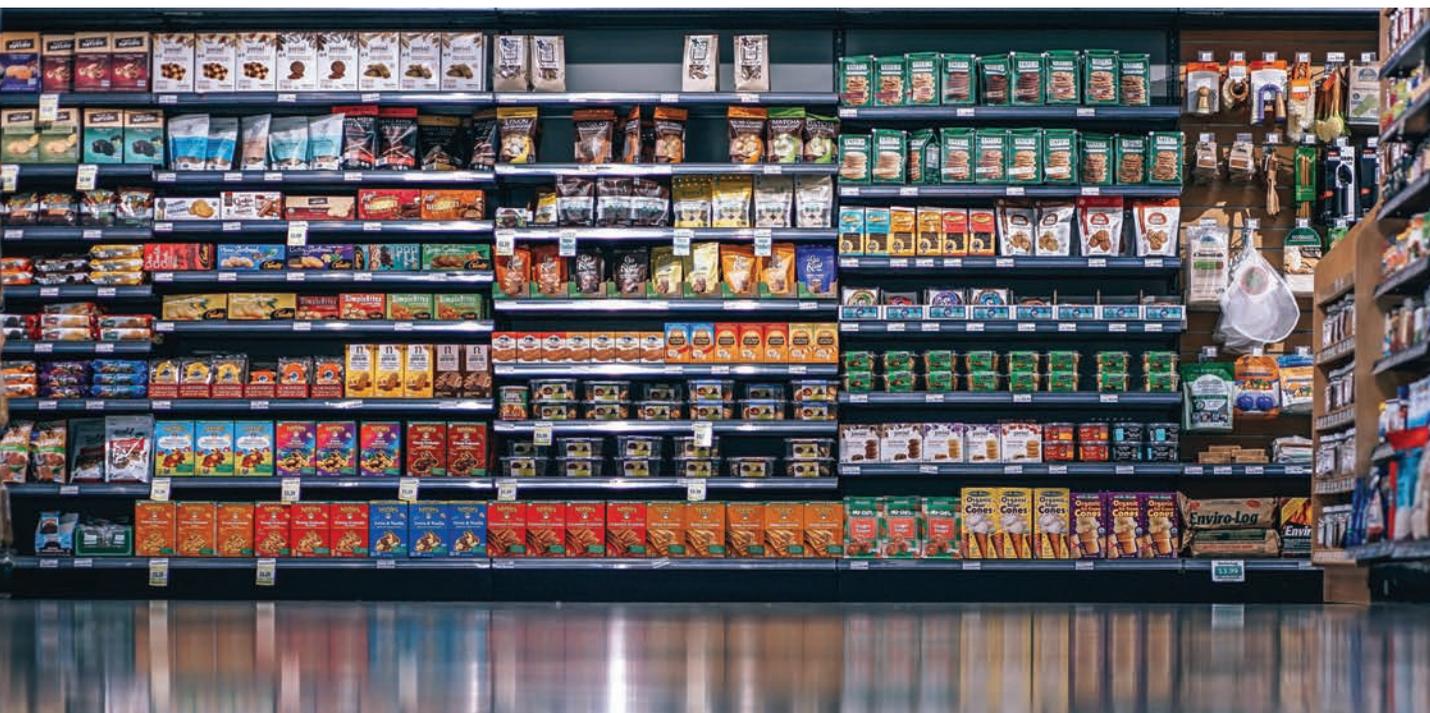


Figure 1 – Principles of integrated management systems

(Source: Nunhes *et al.* 2019)



D. Maier *et al.* (2015) studied the possibility of integrating part of the innovation demand into an existing management system, identifying the demand for innovation performance and proposing some recommendations on innovation management and its adoption as part of an integrated management system. The analysis is based on the development of a model of integration management systems that embrace innovation as an essential part of it.

Strategic management has as a central objective the long-term success of the company. The task of strategic management can be divided into three components: strategic planning, strategy implementation and strategic control (evaluation) (Figure 2).

Strategic planning is fundamental to the other two tasks, and the development of successful strategies is of major importance in strategic management. Strategic planning plays a key role in strategic management, being perceived as a process that runs independently from day to day man-

agement of the business but influences it, while the other two tasks, implementation and strategy evaluation are part of the process everyday managerial. Strategic management is, to a large extent, the product of strategic planning (Mark, 2004).

Strategic management is the process of evaluating the organization and the environment or action in order to achieve its long-term goals. It refers to a series of decisions taken by the organization's management to determine the long-term objectives and the means to achieve these objectives, while ensuring the control of the strategies (Alkhafaji, 2003).

The road to success of companies in the current economic environment is more demanding than ever and the ability to adapt to rapid change is counterproductive to resist the market. Managers are struggling daily with increasingly complex problems caused by fierce competition on the market, but also by increasing customer to be the solution to these problems.

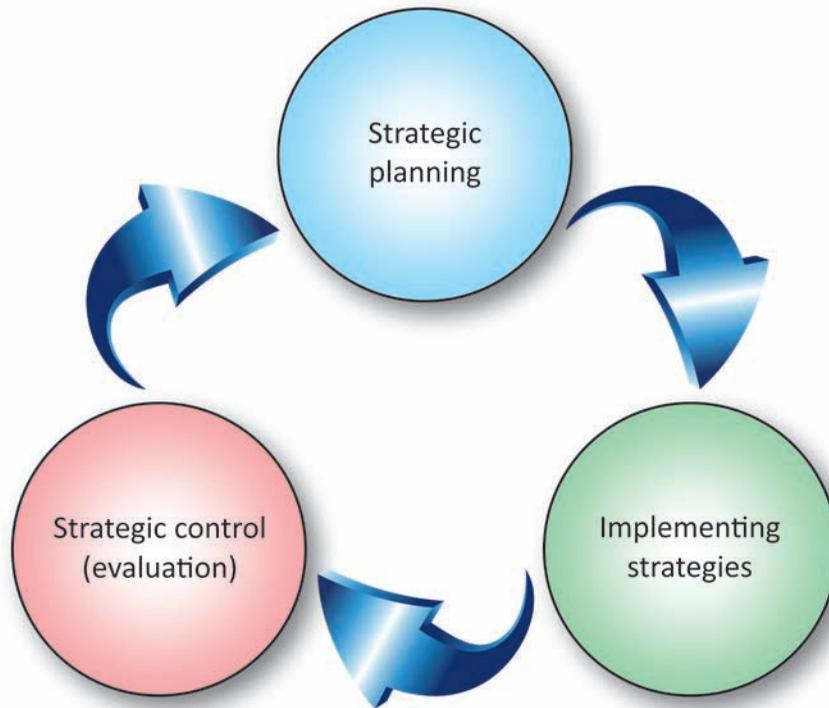


Figure 2 – *The components of the strategic management process*

(Source: Mark, 2004)

The Strategic Role of IMS

Oliveira (2013) demonstrated that integrating management systems that can be certified is an effective alternative and proposes guidelines for integration. According to Bernardo *et al.* (2012) increases the number of organizations that bet on applying and certifying Member States in order to respond to stakeholders' demands and achieve maximum efficiency.

Adopting an integrated management system (IMS) is currently a strategic decision of great importance for the competitiveness and sustainability of organizations. The success of the integration of the Member States is closely linked to the real motivations that lead organizations to integrate (Almeida *et al.* 2012). The research of Khanna *et al.* (2012) concluded that the most convincing reasons for implementing

an integrated management system are to promote synergies between Member States, use common objectives for existing Member States, avoid redundant precedents, improve the image of organizations and lower audits required by each Member State.

A systematic integration leads to a more holistic and results-based approach to identify priority work areas and according to Zeng *et al.* (2007), a big problem for companies is that they reduce the efficiency of management and the implementation if the integrated management system would generate more benefits in terms of environment, health and safety at work, quality and social responsibility. Integration can be seen as a unique process that requires little extra effort at first but offers different types of internal and external benefits as well as a number of benefits for stakeholders.

Examples of benefits would be: eliminating conflicts between independent Member States; promoting synergies and cost savings; optimizing resources; eliminating multiple types of organizational waste; reducing the number of audits; integrated management of sustainability components; reducing the time spent on separate systems management (Tari *et al.* 2010, Majstorovic, 2011).

According to Jorgensen *et al.* (2006), organizations that aim to pursue sustainable development already have collaborators with specific responsibilities for tasks, considering the organizational context, both internally and externally. However, considering a sustained approach to integration, responsibilities and tasks inherent in quality, environment, occupational health and safety, and social aspects must be integrated into the entire organizational culture. These responsibilities and tasks are inherent to every aspect of the company's activities, from acquisitions to product design and from production to sales, marketing and after-sales.

In industry, sustainable management must include quality, environment and health and workplace security in an inte-

grated management system and these areas need to be considered in the lifecycle perspective, respecting the internal and external context of enterprises.

Conclusions

Day by day, each company is increasingly exposed to various risks and threats. To be able to respond appropriately to these risks, organizations must adopt and develop an effective integrated management system. It is clear from the study that the most studied and implemented management systems are those for quality and environment, but in recent years, following the progress of the organizations, new management systems have been developed that help the companies' performance.

Rapid global development, both in the internal and external organizational context, leads to the continuing need to meet the expectations of relevant stakeholders. Therefore, organizations are constantly confronted with uncertainty and, consequently, with new and diversified challenges, suggesting the need for implementation proactivity in terms of continuous improvements and innovations in organizational and operational processes as well as products with sustainable business performance and excellence expected. Organizations that integrate management systems benefit from improved cost-efficiency, better internal organization and image improvement.

According to this paper, the implementation of integrated management systems is very important for the development of the strategic management process within the organizations. The implementation of the integrated management system enables the company to evolve and record sustainable performance.



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Digital Economy and E-Marketing Advices for Small Businesses

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Abstract

Considered to be an important engine for growth, competitiveness and innovation, with an enormous potential for entrepreneurs and small and medium-sized enterprises (SMEs), digital economy is rapidly expanding globally. The paper presents a picture of the digital ecosystem in Romania. For Romania, it is estimated that the potential economic and developmental benefits of digitization can reach up to 42 billion euros in additional gross domestic product by 2025, (McKensey Report, 2018). The paper presents a picture of the digital ecosystem in Romania. The work also offers a synthetic information about important and valuable tips for small businesses related to the most used E-marketing tools. There were considered website, email marketing, social media marketing, growth hacking, mobile marketing, and video marketing. Thus, the work intends to help entrepreneurs and SMEs to have at hand useful E-marketing tips in order to growth and strengthen their competitiveness.

Keywords: Romanian economy, digital economy, e-marketing, SME

Introduction

As technology gets better and internet runs faster than ever, we spend more and more time online, many of us accessing the web at least once per day. We check emails, we socialize and communicate, we shop, we do business, we search and inform ourselves, we teach and learn, and the list continues.

Therefore, marketers must respond to this daily behavior by increasing their use of E-marketing (EM). EM, which uses besides





internet, the digital media (web, e-mail, wireless media), and focuses as well on relationships with customers (electronic customer relationship management E-CRM systems), along with managing digital customers' data and information, EM becomes one of the companies' most important drivers for business success.

According to Brinker (2019), in 2019, the marketing technology landscape comprises more than seven thousand marketing solutions (software, platforms and vendors) from which to choose, making thus a very tough decision about what is best for your company's marketing. However, choosing to apply some of these solutions is very much depending on the level of development of digital ecosystem available.

Digital Economy in Romania

Defined as an economy that is based on digital technologies, digital economy uses digitized information and knowledge in order businesses to collect, store, analyze and share information digitally. Some facts and figures about how current situation of digital economy in Romania looks like is presented within the following paragraph.

As of 2018, 72.4% of households in Romania had access to internet and the figure increased by approx. 4 percent compared to the same period in 2017, (INS, 2018). The number of mobile broadband internet connections has increased considerably, from 16.6 million in 2017 to 19.3 million in 2018 (ANCOM, 2018). 89.7% of people aged 16-74 used the internet in the last three months of 2018, out of which 75.5% did it daily and 21.1 % weekly, (Dumitrescu, 2019).

In terms of online spending, according to Pavel (2019), Romanians have made online purchases over 3.5 billion euros threshold in 2018, 30 % more compared to 2017. The estimates for 2020 will exceed 5 billion euros as said by Romania (Insider, 2019). Regarding the devices used for online connection, the most used are clearly mobile phones and PCs. According to (2018), in 2018, 86 % of internet users connected online via their mobile phones, and they made purchases of approximate 45 euros (Pavel, 2019). As far as PCs are concerned, as of 2018 (INS, 2018) reported that 50.3% of Romanians connect online using these devices, and they made purchases of about 52 euros (Pavel, 2019).

Thus, the conversion rate on mobile devices is less than the one recorded on PCs, indicating that Romanians prefer to use their mobile phone to search for product

specifications, but choose to complete the transaction on a computer with a larger monitor than the one of their phones.

Regarding social networks, in Romania the figures are compared with the ones recorded in Europe, even slightly higher. Thus, in 2018, Statista (2019) mentioned that 61% of all individuals in Romania used social networks, and as of June 2019, over 45.6% were Facebook subscribers as opposed to 41.1% in entire Europe (Internet World Stats, 2019). Given this context and the fact that small businesses are limited in resources, it is crucial they focus on the areas and marketing channels that will return the most to them, and such some useful tips, which are further offered, could be of great help.

E-Marketing Tips

An e-marketing tool every business should have, and use is website. Being easy and inexpensive to create, website allow to reach millions of people and represents a continuous way to stay in touch with your customers. Moreover, the website could be an important revenue driver by marketing and selling the product and promoting the business online.

Some tips to create and/or improve a website are:

- a clear, user-friendly navigation that guides users through your site;
- provide relevant and consistent information;
- make it easy to subscribe by creating a signup page;
- include trust-building content;
- include attracting and descriptive titles;
- create unique landing pages for specific topics;
- evaluate if are there any links on your website that aren't working and create

a custom 404 page that guides users to a functional page on the site;

- make use of blogging, vlogging and podcasting whenever appropriate;
- get your users accustomed to your line of business by inserting articles, white-papers and/or webinars that show the trends in the industry, explain the business and product, teach something useful for your clients, etc.;
- use quality infographics by:
 - having a good theme;
 - finding the right and verified data;
 - building everything as a story;
 - looking everything attractive and
 - spreading them through social channels, (Smarters, 2019).
- run a competition; for example, share an image relevant to your good or service on Facebook, and request likes or comments in exchange for a prize, (Hall, 2019);
- include a call to action (CTA) on nearly every page;
- always make your content mobile-friendly, since the number of smartphone users worldwide surpasses three billion, (Holst, 2019); ensure that your website provides a user-friendly experience across all devices;





- make use of affiliate marketing by hiring affiliates (publishers) that direct traffic to your website.

As better ways to communicate mean more ways to grow, email marketing communication tool plays an important role in the marketing communication mix. Email marketing has a history of more than two decades and is far from declining since last year 33% of people used it more frequently, (Kilens, 2019). Therefore, email still is a major communication channel for businesses, and this is estimated to not change within the next five years (DAN, 2019).

However, very important in being successful with this tool is to keep up with continuously change of customer's preferences regarding it. Using marketing automation for email and personalization, not only is a must nowadays, but also will help achieving efficacy and efficiency with email marketing. Advanced email automation platforms and data analytics have contributed to progresses in the personalized email area.

According to DAN (2019), personalized emails improve click-through rates by 14% and say it improves customer engagement.

In order to improve the outcomes from email marketing, the followings would be well to consider:

- best day for open rates is Thursday and for click-through rates is Tuesday, while the worst day for both is Sunday, according to Campaign Monitor (2019);
- create a good content and personalize it;
- make sure your emails are attractive to the specific people you're sending to;
- make it easy to subscribe;
- guarantee that you send emails to customers on a permission-based list; „there are studies that revealed that of those who would join email lists, 77% would unsubscribe because they receive information excessively or the information is not interesting or relevant to them at all”;
- avoid big files and attachments;
- stay within the 50-words range; according to Marketingsherpa (2005), subscribers spend approximately less than 20 seconds to scan an email reading on average about 50 words;
- use enticing subject lines;
- use email marketing software and platforms (Get Response, ActiveCampaign, MailChimp, AWeber, and many others);

- use compelling images and visuals since, according to Giglio (2014), „the human brain processes visuals 60,000 times faster than text”;
- make sure your email is optimized for multiple devices;
- personalize your „From” name to your client’s expectations;
- segment email lists whenever possible (Grozăvescu, 2019);
- use the double opt-in method for sign-ups (SendGrid, 2019);
- send your recipients to landing pages;
- periodically clear up the email list (SendGrid, 2019); this will prevent to end up as Spam if the open rate is low, which is a criterion for Yahoo/Gmail in categorizing the email as Spam.

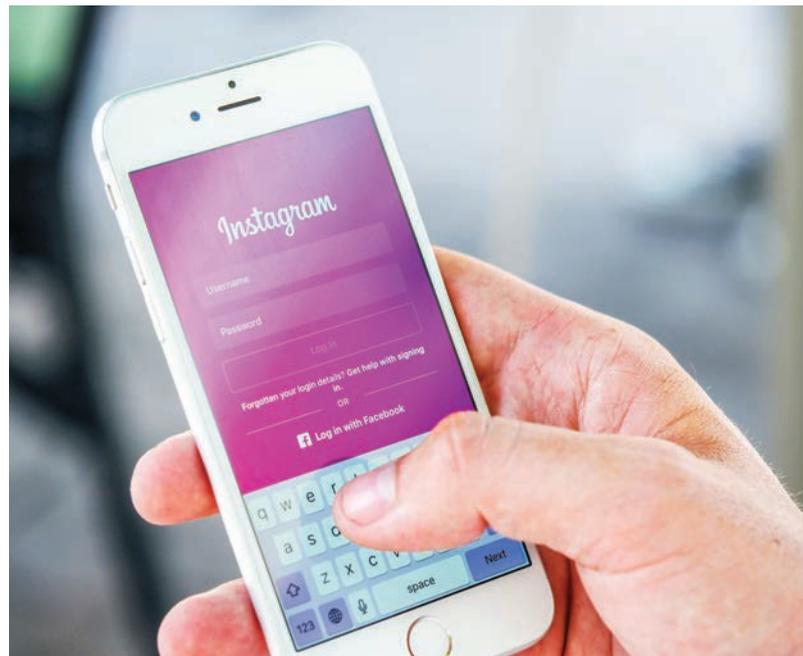
As Sproutsocial (2019) mentioned, social media is valuable in raising brand awareness and finding customers since 57.5% individuals incline to buy from the company that they follow on social media channels. Facebook is great at reaching a diverse audience and rapidly increasing brand awareness, while also providing a unique set of tools – Facebook Messenger, Facebook Groups, Facebook Ads, Facebook Events, Facebook Marketplace, Facebook Insights. Even though it is declining starting from late 2018 and continuing in 2019 (DAN, 2019), it also allows a complete integration from all your other channels – from links to your blog posts or website, to coupon codes, to videos shared on your Youtube page, to Carousels from Instagram.

Instagram allows you to make your brand even more distinguishable, telling its story with engaging visuals; even more, creating a catchy set of hashtags, no more than 3-4, will increase your user generated content (UGC). The marketing tools available on Instagram (Boomerang, Hyper-

lapse, InstaStories&Highlights, Instagram Live & IGTV) provide a wide range of options, from allowing influencers to take over your account to using Geolocation and unique filters for followers that are nearby your location. Moreover, Instagram can be linked with Facebook (something normal since Facebook own Instagram), so you can share your content seamlessly between them (HubSpot, 2019).

Twitter allows you to reach, engage and communicate directly with your audience, especially through TwitterChats, and you can even conduct polls to better understand your audience and create more activity on your page; it is also a great tool to follow current trends and even promote a certain one if your brand identifies with that certain movement (Twitter Analytics Dashboard, TweetReach) as said by Foreman (2018).

Youtube has over 2 billion users (Edmondson, 2019), and is a major trend (Paddon, 2019). Youtube makes your audience easily reachable either by collaborating with vloggers for more exposure



(affiliate marketing) or by publishing your own content, your page allowing unlimited hosting. Youtube videos can also be integrated on all the other platforms, making it easy to promote your content on your website for example, as said by Baird (2018). B2C marketers are getting better results only by using Facebook (CM, 2016). What else you should consider regarding social media marketing:

- create a schedule of social content and post it at optimal time;
- find and use the best hashtags; they increase the visibility of your content even beyond your own followers;
- create good visuals (photos, gifs, videos etc.), as a picture is worth 1000 words; infographics liked and shared on social media three times more than any other type of content (Eurodns, 2019);
- collect user-submitted photos, they are the visual versions of word-of-mouth;
- authenticity is more important than ever; even though influencers are being followed by millions of users, for 90% of Millennials authenticity is the important factor as said by Paddon (2019);
- always respond to messages in a timely manner as said by Baer (2019);
- run a competition; for example, share an image relevant to your product on Facebook, and request likes or comments in exchange for a prize, as said by Hall (2019);
- make use of storytelling; elaborate white papers, guides, blogs, eBooks that usually go beyond 1,500 words as said by Paddon (2019); according to Smarters.ro (2019), long content works better on Facebook than short one, because appear more authentic, while short content is more efficient on Twitter;
- follow back your audience, as their posts reveal so much information about



their interests, needs or preferences, helping you identify opportunities in the market;

- remember that every platform allows you to share information only to those that follow or like your page, thus giving you the opportunity to reward your audience by sharing exclusive access, content or promotion codes with them;
- combine the user-generated content with paid advertising for a better result; according to Sproutsocial.com (2019), the most engaging social ad content by generation is as follow: for baby boomers discount, education, followed by entertainment, while for Xers and Millennials the order is entertainment, discount and education in the third place;
- build a community and grow stronger relationships by directly engaging with your audience, through publishing and sharing relevant content;



- follow your competition, as well as other industry relevant accounts, to research their posts and learn from their best practices.

Getting to know your target audience is even more crucial now. You must know who they are, what is their need and where is their attention, and social networks can even be used as a resource for this (Facebook Insights, Twitter Analytics etc.)

Growth hacking, the process of finding the best channels of growth for your business (Smarters, 2019), is a cheap EM tool that must be in your attention to use. Even you are a startup or a small company in business for a while, growth hacking will help you to expand your customer base more rapidly and efficiently as well. Some of the tips for this tool are follows:

- hack your email list with exit intent; for this, develop a campaign with a lead magnet (an incentive like a free down-

loadable content such as a report, or eBook, etc., in exchange for email address);

- reward social shares with discounts; there are apps like Social Marketing All in One to ask customers to share a product as soon as they add it to the cart, and then reward them with a discount; optimize your social media share buttons to increase engagement of customers, for example by placing them appropriately, optimizing their order of icons, or through message and CTA;
- get bloggers to review your product;
- use contests; they are a great way to increase traffic; the prize must be relevant for the target market; offer additional chances for the ones that invites/brings friends into the contest;
- use email signature; in the end of your emails write a line inviting the recipients to visit your website.

In 2019, people are using their mobile devices more frequently and for longer periods of time than their desktop computers. In addition, there are 68% of email campaigns being opened on a mobile device (Campaign Monitor, 2019). According to Smith (2019), 79% of smartphone users have made a purchase online using their mobile device in the last six months and 80% of shoppers used a mobile phone inside of a physical store to either look up product reviews, compare prices or find alternative store locations. Therefore, according to Blair (2019), „if you aren't using a (and purchases) from your customers, then you're leaving tons of money on the table". To avoid that, you can use the following tips:

- mobile-friendly design is an essential for emails because (Radicati, 2019), „the number of worldwide email users will top 3.9 in 2019, and is expected to grow



to over 4.3 billion by the end of 2023”; the same source affirms that „the total number of business and consumer emails sent and received per day will exceed 293 billion in 2019, and is forecast to grow to over 347 billion by year-end 2023”;

- mobile-friendly is a must for websites as well;
- make subject lines shorter than 25-30 characters (Ribble, 2015); if it needs to be longer, make sure to place the offer or the CTA at the beginning of subject line;
- ensure that email will still make sense if your images don't show (not all mobiles display images by default).

Video marketing is a must nowadays. According to Eurodns (2019), 50% of on-line users search for product videos before they make a purchase. As a small business there is no better way to help your customers to become more familiar with your offerings by exposing them to a video, especially for cases when they are not able to see it in person as they would in a shop.

Putting videos on all media platforms that you work with and inserted it in your emails as well it can only be successful.

The last tip is to pay attention to generation Z which means they are beginning to possess buying power as they enter the workforce. As Patel (2018) affirms, they „seek authenticity, and they prefer socially responsible businesses” and „they're more likely to turn to companies that make the world a better place”.

Conclusions

We consider that digital economy in Romania has a high rate of development. Thus, by further maintaining it, or even better intensifying it, the digital economy in Romania will substantially contribute to growing the gross domestic product. The internet is an inexhaustible mine of information about marketing online and offline tools, best practices, tips, guides, etc.

The information presented in this paper covers the most important tips for small businesses, related to the most used e-marketing tools.

Thus, the work wants to help the management of small businesses interested by saving them a valuable time for searching. The ways in which companies make use of EM tools, and how innovative they might be in using them efficiently, will end up in increasing their market share, revenues and profits.

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