ADMINISTRATIVE CONTROL - COORDINATE FOR DEVELOPING STRATEGIES AND IMPLEMENTING MANAGERIAL DECISION IN THE PRODUCTION OF ELECTRIC LIGHTING EQUIPMENT

Mihaela(ŞTEFAN) HINT[1]

Abstract: *In view of identifying the trends of increased growth of the market of electric lighting equipment, and of orientation towards the "Eco friendly" behavior of the consumers, we consider this area to be of interest. The external environment is important because of the impact it has on organizations, which is transformed into opportunities and threats for them. The market in which this field of activity activates is dynamic and governed by the competition laws. The analysis of the external environment involves identifying the factors that had and have influences on this field in the past and present, as well as evaluating their influence in the future. The knowledge of the characteristics and mutations involved in the structure of the external environment is a fundamental condition of the quantitative and qualitative satisfaction of a certain category of needs by a production entity active in this field, needs that are constantly growing and diversifying, which must be the foundation of the development of a realistic, scientifically well-grounded strategy. As a dynamic, socio-economic system, this field of production takes from the external environment the resources it needs and introduces them in specific processes, from which result products or services that will be transferred to the same environment.*

Keywords:.administration control, performance, decision, managerial accounting

JEL Classification: M40, M31, G21

Introduction

Considering the progressive way of the Romanian economy, based on numerous transformations caused by globalization, the economic agents must carry out their activity in a competitive environment with their own individuality, especially in the lighting equipment industry, which is asserted by its own initiative, creativity and efficiency.

In this context, the economic entities in this field must closely monitor the results obtained in relation to the resources consumed, in order to create value. Of course, to be able to obtain an analysis as relevant as possible, we must turn our attention to more ways and means of analysis.

The recovery of the production costs and the realization of a corresponding profit are the elements of maintaining and developing the economic entities, of maintaining the competitiveness on the market. The efficient combination of the factors of production, in order to obtain the production are found in the production cost. Therefore, we can consider the cost as a central indicator in the economic indicators within an organization. Within the field of activities analyzed by us in this work, the size of the costs and, in particular, their minimization, are considerations that are taken into account when choosing a certain technological process or production schemes, certain categories of raw materials, materials , based on the introduction of rationalization and inventions in the production process. In this respect, the production costs must be tracked periodically, both on the product and on the whole activity, compared with the cost standards or with the cost forecasts made prior to the production process and, of course, they must also be tracked in their dynamics,

[1] Doctoral School, Faculty of Sciences, 1 Decembrie 1918 University, Alba Iulia, Romania, mihaela.hint@uab.ro

obtained by presenting the information system of costs, the general methodology applied in its analysis.

Research methodology

Scientific research could be defined "as a process of knowledge enlargement carried out in a careful and objective observation, investigation and experimentation, having as a target the discovery or interpretation of new information" (Groşanu A., Cost center calculations, Irecson Publishing House, Bucharest 2010), thus ensuring the progress of an economic entity. Following the analysis of the specialized literature we can see that the research is composed of four parts: consulting the specialized literature; developing new theories; testing theories and reflecting and integrating existing notions. This paper intends to carry out a comprehensive analysis on the production cost-selling price ratio of products through an empirical study within an economic entity producing electrical lighting equipment. In order to obtain an image regarding the production cost, we made an incursion among the theoretical aspects regarding the notion of cost, management control, performance and managerial decision, respectively expenditure, continuing with the methods used to determine the costs in relation to the benefits obtained by presenting the information system of costs, the general methodology applied in its analysis. The practical applicability of our approach has been demonstrated by developing a cost-benefit analysis model using a statistical, mathematical method. Thus, we consider that we will achieve the proposed objectives of increasing the efficiency of the economic activity in the field by following the benefits brought by using the domination strategy through the cost-benefit relationship. The validity of the information used can be said to be proven both by demonstrating the theoretical statements and by the solutions obtained to the concrete applications during this work.

Review of literature

The administration control, as the main characteristic of the management, has as main purpose the real-time identification of the deviations from the proposed objectives, with the purpose of carrying out a profitable activity, materialized in big profits, through the efficient use of resources (I. Ionescu, C. Iacob , 2015). The control strategy represents the different ways in which administration control systems can support valuable strategic roles (C. S. Chapman, 2005). We also find in 2005 by Gervais M. (2005), who defines management control "as the set of processes by which managers ensure that resources are obtained and used efficiently, effectively and appropriately, according to the organization's objectives, and the actions are developing within the meaning of the defined strategy (Tabără, Briciu, 2012, p. 375). Demartini (2014) divided the theories of organizational control into four categories: economic, sociological, psychological and behavioral. The notion of management control was supplemented with the inclusion of performance. A. Braganza, H. Stebbings and Th. Ngosi (2013, p. 443, Wernerfelt, 1984, Peteraf, 1993, Hart, 1994). The control is defined by R.L. Simons (1995) from the perspective of the entities threatened by the fierce competition on the market, the rapid changes in the market, the new forms of organization of the entity, as well as the orientation of the clients. According to some authors (R.N. Anthony, 2007), administration control is the process by which managers ensure that resources are obtained and used efficiently and effectively in meeting the entity's objectives. "In addition to knowing the costs, the administration control helps the managers in directing the actors in order to organize them to the performance" (Alazard C., Separi S., 2001). The performance of an economic entity cannot be analyzed only from the point of view of the "operating result" or by "increasing the net book value", because the profit is the result of all the events that led to its achievement. So, when it comes to performance, we need to consider all the links in this chain of events. (C.Alazard, S.Separi, 1998; A. Burlaud, C. Simon, 1997; M. Niculescu, G.Lavalette, 1999) associate the term performance as "a stable balance between efficiency and effectiveness". The performance is defined by (M. Niculescu, G. Lavalette, 1999) as "a state of competitiveness of the

enterprise, achieved through a level of effectiveness and efficiency that ensures a sustainable presence on the market". Performance is the achievement of organizational goals (Bourguignon, 1997 cited by Marinescu 2002). According to the authors (Albu & Albu, 2005), performance is all that leads to the achievement of strategic goals in an organization and leads to the creation of wealth and value for it. M. Niculescu (2003) defines performance in terms of productivity and states that "an enterprise is theoretically efficient if it is both productive and effective ...". Therefore, we can conclude that performance is a very complex notion, and should not be confused with the indicators that describe it: profitability, efficiency and effectiveness, because financial profitability is only a main indicator of performance analysis, and represents the main objectives set by an economic entity, whose main purpose is to maximize the results obtained through the lowest amount of resources. For the management of the economic entities we consider that it is very important to know both the costs and the prices, for a viable analysis regarding its activity and the decisions to go further knowing the level of competitiveness in relation to its economic environment, having as main support a benchmarking. *The cost is the main one that gives priority to the notion of activity and the relation between the cost and the volume of the activity before the calculation of the production cost according to the consumption of these activities*" (L., Debrulle, 2002). If we analyze the concept of benchmarking we can deduce that an economic entity can be productive and at the same time not be efficient in relation to the market. P. Lorino (1995), appreciates the performance as follows: "Performance for an enterprise represents what contributes to the improvement of the value-cost couple, and not only what contributes to the decrease of the cost or the increase of the value". The management of an economic entity follows the efficiency of managerial decisions in order to reach the highest degree of productivity. In order to be able to appreciate the performance, an appropriate value system is needed, with the help of which its specific objectives can be interpreted. Information consolidation needs monetary translation ”(Albu N., Albu C., 2003).

Materials and methods of analysis

The characteristics of the lighting market

The activity of an economic entity that deals with production in the field of electric lighting appliances develops and produces lighting units in many areas such as: street lighting, industrial lighting, architectural, beacon lighting, airports, heliports, submersibles or even military applications. As the main characteristic of the production of electric lighting equipment, this field is characterized by the diversity of the manufacturing processes of the products on the one hand, and another characteristic worth mentioning is the market to which these highly addressed products are addressed:

Table no. 1 Characterization of the markets to which the lighting field is addressed

Target customers	
Niche markets	**Mass markets**
are characterized by: - specific products; - small quantities of products; - high capital gains on these types of products; - inconsistency in sales; - reduced competition; - requires expensive certifications; - high personnel specializations; - reduced stocks; - costly marketing; - problems in the management of stocks and personnel; - long delivery times; - very expensive manufacturing preparation / per product.	**are characterized by:** - consumer products; - large quantities of products; - small capital gains on products; - constant sales; - high market competition; - does not require special certifications; - low or medium staff specialization; - large stocks of products; - lower marketing costs; - the possibility of sizing the stocks; - deliveries from stocks.

Source: own systematization

Analysis of the evolution of production costs and sales prices over a three-year period within a lighting production entity

Material costs and sales prices for the main products made and marketed by SC. Electromax SRL during the years 2016-2018 are presented in the following table:

Table no. 2. Analysis of the products marketed by SC Electromax SRL between 2016-2018

No.	Product	Year	Selling price	Cost of raw materials	Pcs	Benefit per piece	Benefit
1	DISPLAY LINE III	2018	274,75	81,27	3434	193,48	664410,32
		2017	294,44	158,76	1299	135,68	176248,32
		2016	226,48	114,39	1504	112,09	168583,36
2	LEON	2018	185,51	67,41	817	118,1	96487,7
		2017	183,42	88,52	329	94,9	31222,1
		2016			0	0	0
3	QUASAR - Beacon MI	2018	3611,05	459,84	71	3151,21	223735,91
		2017	3414,09	539,71	14	2874,38	40241,32
		2016	3254,87	319,87	11	2935	32285
4	PULSAR - Beacon LI	2018	443,96	69,31	1358	374,65	508774,7
		2017	469,23	135,21	1614	334,02	539108,28
		2016	403,94	54,31	401	349,63	140201,63
5	Alarmare Huawei - Beacon LI	2018	341,19	142,38	298	198,81	59245,38
		2017			0	0	0
		2016			0	0	0
6	Redundancy / Alarming 230V - Beacon LI	2018	84,83	53,88	75	30,95	2321,25
		2017	83,09	48,45	186	34,64	6443,04
		2016	88,57	22,73	322	65,84	21200,48
7	Redundancy / Alarming 48V - Beacon LI	2018	70,58	54,68	459	15,9	7298,1
		2017	70,53	44,05	325	26,48	8606
		2016	74,84	48,56	1333	26,28	35031,24
8	External twilight sensor - Beacon LI	2018	141,57	19,04	51	122,53	6249,03
		2017	144,82	22,12	32	122,7	3926,4
		2016			0	0	0
9	Internal twilight sensor - Beacon LI	2018	347,53	9,12	17	338,41	5752,97
		2017	367,93	15,93	6	352	2112
		2016	181,09	18,65	97	162,44	15756,68
10	Solar power system - Beacon LI	2018	2097,61	838,51	15	1259,1	18886,5
		2017	2036,25	1446,12	7	590,13	4130,91
		2016			0	0	0
11	Galaxy	2018	485,32	207,19	285	278,13	79267,05
		2017	452,59	142,58	930	310,01	288309,3
		2016	471,68	175,69	987	295,99	292142,13
12	Controller HELY Rack	2018	7624,12	1625,89	0	5998,23	0

		2017			0	0	0
		2016			0	0	0
13	Driver HELY 230VAC/12VDC	2018	287,28	62,14	90	225,14	20262,6
		2017			0	0	0
		2016			0	0	0
14	Beacon HELY	2018	5341,17	533,47	5	4807,7	24038,5
		2017	3452,49	1260,11	4	2192,38	8769,52
		2016			0	0	0
15	Elevat HELY	2018	856,34	97,31	80	759,03	60722,4
		2017	682,19	226,94	53	455,25	24128,25
		2016			0	0	0
16	Flat HELY	2018	1395,91	216,68	24	1179,23	28301,52
		2017	1253,42	177,63	15	1075,79	16136,85
		2016			0	0	0
17	Floodlight HELY	2018	1130,84	146,71	75	984,13	73809,75
		2017	593,84	123,13	31	470,71	14592,01
		2016			0	0	0
18	Inset HELY	2018	1325,93	128,97	90	1196,96	107726,4
		2017			0	0	0
		2016			0	0	0
19	Waggy AERO	2018	4525,14	1308,53	91	3216,61	292711,51
		2017	4747,08	1715,44	124	3031,64	375923,36
		2016			0	0	0
20	Sirius AERO	2018	3278,46	1622,92	18	1655,54	29799,72
		2017	1926,66	822,81	2	1103,85	2207,7
		2016			0	0	0
21	DCR 1.4A AERO	2018	15587,55	3538,11	2	12049,44	24098,88
		2017	15295,1	14734,62	1	560,48	560,48
		2016			0	0	0
22	Polaris AERO	2018	1860,05	272,09	7	1587,96	11115,72
		2017	971,34	196,99	12	774,35	9292,2
		2016			0	0	0
23	Pyramid AERO	2018	244,28	25,25	12	219,03	2628,36
		2017	240,66	90,08	58	150,58	8733,64
		2016			0	0	0
24	VISTA AERO	2018	581,93	93,27	162	488,66	79162,92
		2017	533,08	103,61	373	429,47	160192,31
		2016			0	0	0
25	CIGEx LED	2018	793,3	184,28	1	609,02	609,02
		2017	780,55	193,45	25	587,1	14677,5
		2016	753,98	224,36	31	529,62	16418,22
26	APOLO Ex	2018	787,85	318,84	367	469,01	172126,67
		2017	825,11	357,34	615	467,77	287678,55
		2016	601,71	421,56	374	180,15	67376,1

27	FOTON Ex	2018	1112,13	470,76	13	641,37	8337,81
		2017			0	0	0
		2016			0	0	0
28	ELM 01 SD	2018	456,39	125,72	604	330,67	199724,68
		2017	449,96	148,91	645	301,05	194177,25
		2016	498,56	115,75	705	382,81	269881,05
29	Individual charger ELM 01	2018	174,94	85,05	185	89,89	16629,65
		2017	200,44	49,32	156	151,12	23574,72
		2016	161,75	82,68	56	79,07	4427,92
30	Street FOTON LT	2018	234,08	131,85	282	102,23	28828,86
		2017	353,17	138,41	449	214,76	96427,24
		2016	234,08	131,85	0	102,23	0
31	Street FOTON SP II	2018	252,36	183,05	731	69,31	50665,61
		2017	340,28	231,79	1477	108,49	160239,73
		2016	234,56	177,56	5667	57	323019
32	Street FOTON SS	2018	255,48	90,95	91	164,53	14972,23
		2017	274,88	219,92	20	54,96	1099,2
		2016	255,48	90,95	43	164,53	7074,79
33	Street FOTON ST II	2018	699,87	383,39	41	316,48	12975,68
		2017	913,69	336,84	52	576,85	29996,2
		2016	745,41	351,67	404	393,74	159070,96
34	Street PROTON S	2018	633,37	372,37	185	261	48285
		2017	770,16	486,82	312	283,34	88402,08
		2016	601,54	427,12	148	174,42	25814,16
35	Display Line	2018	126,65	103,74	4	22,91	91,64
		2017			0	0	0
		2016			0	0	0
36	Display 1200x300	2018	312,26	152,5	63	159,76	10064,88
		2017	392,68	153,58	0	239,1	0
		2016	294,37	146,74	140	147,63	20668,2
37	Display 600X300	2018	223,07	152,5	68	70,57	4798,76
		2017			0	0	0
		2016	223,07	152,5	12	70,57	846,84
38	Display 600x600	2018	232,48	152,25	164	80,23	13157,72
		2017	228,79	153,58	402	75,21	30234,42
		2016	232,48	152,25	157	80,23	12596,11
39	Cisa LS 05	2018	202,11	74,72	33	127,39	4203,87
		2017	146,57	80,76	35	65,81	2303,35
		2016	202,11	74,72	0	127,39	0
40	Cisa LS 07	2018	265,11	128,93	134	136,18	18248,12
		2017	273,36	138,58	2	134,78	269,56
		2016			0	0	0
41	Cisa LS 11	2018	149,37	91,53	40	57,84	2313,6
		2017	171,54	53,61	56	117,93	6604,08

		2016			0	0	0
42	Cisa LS 12	2018	139,87	54,42	15	85,45	1281,75
		2017			0	0	0
		2016			0	0	0
43	Topaz	2018			0	0	0
		2017	815,48	332,51	20	482,97	9659,4
		2016	246,17	589,68	418	-343,51	-143587,2
44	Titan	2018	246,17	589,68	206	-343,51	-70763,06
		2017	597,74	223,11	144	374,63	53946,72
		2016			0	0	0
45	Apolo II	2018	411,14	696,51	1281	-285,37	-365559
		2017	732,08	452,93	1732	279,15	483487,8
		2016	411,14	696,51	1904	-285,37	-543344,5

Source: systematization according to the data provided by SC Electromax SRL

From the analysis of Table no. 1 it can be observed that both the material costs and the selling price varied from year to year for each product.

Methods. Calculation of the probability of the appearance of an order from a client

Because the company for which the study is conducted does not have firm contracts for long periods of time, the sale of the products is made on request that may occur during a month and which refers to a limited volume of products. Thus, there are months when a customer does not buy any product and there may be months when the same customer asks for products. For example, it can be seen in the following table how the customer *"Tripol Sistem Energy SRL"* made orders during 36 months and what was the number of pieces purchased from the product *"Display Line III"*

Table no. 3 Calculation of the probability of the appearance of an order from a client

Product	Year	Tripol Sistem Energy SRL											
		January	February	March	April	May	June	July	August	September	October	November	December
DISPLAY LINE III	2018												
	2017				34	35						6	
	2016					10				8			10

Source: own systematization

In the long run, it is observed that, the customer has placed orders in 6 of the 36 months. Thus, the probability of an order occurring is:

$$p = \frac{6}{36} = \frac{1}{6}$$

And the probability that there is no order will be:

$$q = \frac{30}{36} = \frac{5}{6}$$

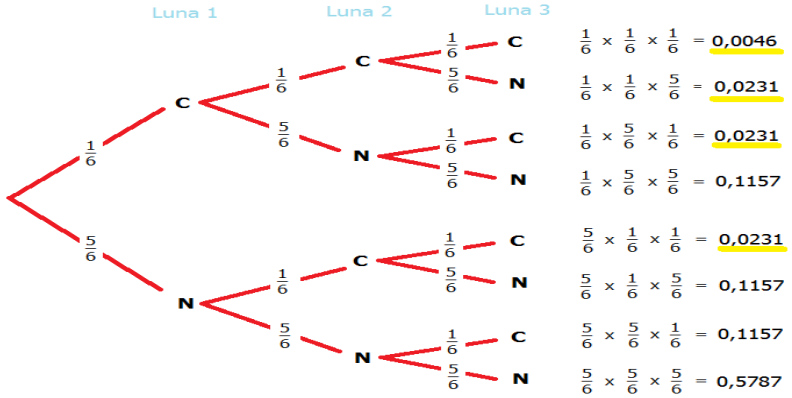
or

$$q = 1 - p = 1 - \frac{1}{6} = \frac{5}{6}$$

The question we have to answer is what happens in the short run or more precisely, which is the probability of an order occurring when a short time interval is taken into account. From the practical experience and from the specialized literature it is known that an activity characterized by experiences with discrete results ("yes" or "no") is well described by the binomial distribution.

Binomial distribution is a discrete probability distribution representing the number of successes in a sequence of n trials (yes / no experiments) with success probability p, respectively the probability of failure q. For the case studied, I continue to illustrate how the probability of Electromax Company receiving at least two orders in the next 3 months from the client "Tripol System Energy SRL" is calculated. The diagram in the following figure shows all possible situations regarding the occurrence of orders (denoted by C) or lack of orders (denoted by N) in the three months. The probabilities for each possible branch are also presented.

Figure no. 1 Probability of occurrence of orders to SC Electromax SRL



Source: own systematization

The probability that at least two orders will appear during the 3 months is :

0,0046+0,0231+0,0231+0,0231=0,0741*

*(*only the first decimals of the calculations were shown in the diagram and in the previous expression).*

This probability can be calculated much more easily, without constructing a scheme, using the rules of calculation of the binomial distribution. The probability that an experience will happen is given by:

$$\Pr(X) = C_n^x p^x q^{n-x}$$

In which:

n is the total number of trials,

x is the number of successful trials,

p is the probability of long-term success

$q = p - 1$ is the probability of failure in the long run

and

$$C_n^x = \frac{n!}{x!(n-x)!}$$

In the case of the studied example in which we ask "What is the probability that *Tripol Sistem Energy SRL* company will place at least 2 orders in the next 3 months?", The variables in the previous formulas have the following meanings:

$n = 3$ is the total number of months (attempts) in which customer orders are expected;

x is the number of successful months (trials), that is, in which the customer places the order. As we want the customer to order in at least 2 of the 3 months, x will take the value 2 (i.e. it is possible to order twice) respectively 3 (i.e. it would be possible for the customer to order even three times)

p is the probability of success in the long run, that is $p = \frac{1}{6}$

$q = p - 1$ is the probability of failure in the long run $q = \frac{5}{6}$

So the probability of this customer ordering at least 2 times in the next 3 months will be:

$$\Pr(\textit{minimum two out of three months}) = P(X = 2) + P(X = 3)$$

where:

$$P(X = 2) = C_n^x p^x q^{n-x} = \frac{n!}{x!(n-x)!} p^x q^{n-x}$$

$$P(X = 2) = \frac{3!}{2!(3-2)!}\left(\frac{1}{6}\right)^2\left(\frac{5}{6}\right)^{3-2} = 0{,}06944$$

and

$$P(X = 3) = C_n^x p^x q^{n-x} = \frac{n!}{x!(n-x)!} p^x q^{n-x}$$

$$P(X = 3) = \frac{3!}{3!(3-3)!}\left(\frac{1}{6}\right)^3\left(\frac{5}{6}\right)^{3-3} = 0{,}00463$$

So

$$\Pr(\textit{minimum two out of three months}) = 0{,}06944 + 0{,}00463 = 0{,}0741$$

Likewise, the occurrence probabilities for other expected variants can be calculated:

For example, the calculation of the probability that the company "*Tripol Sistem Energy SRL*" will order at least once in the next 6 months is done as follows:

$$\Pr(\textit{minimum one order within 6 months}) = P(X = 1) + P(X = 2) + \cdots + P(X = 6)$$

or

$$\Pr(\textit{minimum one order within 6 months}) = \sum_{x=1}^{6} \frac{6!}{x!(6-x)!} p^x q^{6-x}$$

And the terms that will come in this sum are:

$$P(X = 1) = \frac{6!}{1!(6-1)!}\left(\frac{1}{6}\right)^1\left(\frac{5}{6}\right)^{6-1} = 0{,}40188$$

$$P(X = 2) = \frac{6!}{2!(6-2)!}\left(\frac{1}{6}\right)^2\left(\frac{5}{6}\right)^{6-2} = 0{,}20094$$

$$P(X = 3) = \frac{6!}{3!(6-3)!}\left(\frac{1}{6}\right)^3\left(\frac{5}{6}\right)^{6-3} = 0{,}05358$$

$$P(X=4)=\frac{6!}{4!(6-4)!}\left(\frac{1}{6}\right)^4\left(\frac{5}{6}\right)^{6-4}=0{,}00804$$

$$P(X=5)=\frac{6!}{5!(6-5)!}\left(\frac{1}{6}\right)^5\left(\frac{5}{6}\right)^{6-5}=0{,}00064$$

$$P(X=6)=\frac{6!}{6!(6-6)!}\left(\frac{1}{6}\right)^6\left(\frac{5}{6}\right)^{6-6}=0{,}00002$$

Adding the probabilities that the event (command) happens once, 2 times, ..., 6 times, it results that:

$$Pr(minimum\ one\ order\ within\ 6\ months)=0{,}6651$$

The result is very important and it is noteworthy that although in the long term the frequency of orders is on average of an order at 6 months, when we calculate the probability that at least one order will appear in the next 6 months, the probability of this happening is not 100 % but only 66.51%.

The probability that no order will appear in the next 6 months is 1-0.6651 = 0.3349, ie 33.49%. Thus, when we estimate a sales revenue budget, for situations where there are no firm contracts, based only on the experience of the sales in the last years, it is very important that the forecast income / profit is corrected with the probability index that things will happen like this. For example, if Electromax company builds a revenue budget for 2019 considering that the company "*Tripol Sistem Energy SRL*" will place at least one order in the first 6 months, the estimated value per order must be multiplied by 0.6651 (in the case of this company) in this way, the budget will be much more realistic.

Using Excel software to calculate the probability of order occurrence

The calculations presented above, although they seem heavy and cumbersome, can be easily achieved with the Excel application from the Microsoft Office package. This application is very widespread being available to anyone. Excel has a function library from which the BINOMDIST function is used for calculating probabilities in the binomial distribution.

The BINOMDIST function is used in problems with a fixed number of tests or experiments, where the results of any experiment are only success (the presence of the order from the client) or failure (the lack of the order from the client), when the experiments are individual and when the probability of success is constant throughout the experiment.

The syntax of this function is:

=BINOMDIST(no_successes; **nr_experiments**; **probabil_s**; **cumulat**)

Nr_successes is the number of expected successes from the experiments.

Nr_experiments is the number of independent experiments or trials.

Probabil_s is the probability of success in each experiment

Cumulat is a logical value that determines the form of the function. If the cumulative argument is TRUE, then BINOMDIST returns the function of cumulative distribution, which is the probability of being at most no_successes; in the case of FALSE, the function returns the mass probability function, which is the probability that they are exactly no_successes.

For example, in a case similar to the one studied, if the introduced function is

=BINOMDIST(2 ; **6** ; **0,1667** ; **FALSE**)

The result will be the probability that there will be exactly 2 orders in 6 months, knowing that in the long run the probability of an order occurring is 0.1667, ie the exact result of the expression will be obtained

$$P(X=2)=C_6^2 0{,}1667^2(1-0{,}1667)^{6-2}=\frac{6!}{2!(6-2)!}0{,}1667^2(1-0{,}1667)^{6-2}$$

If the function entered will be :

=1 - BINOMDIST(2-1 ; 6 ; 0,1667 ; TRUE)

It will be obtained as a result the probability that there will be at least 2 orders in 6 months, knowing that in the long term the probability of occurrence of an order is 0.1667, that is exactly the result of the expression

$$P(X = 2) + P(X = 3) + P(X = 4) + P(X = 5) + P(X = 6)$$

i.e.:

$$\sum_{x=2}^{6} \frac{6!}{x!(6-x)!} 0{,}1667^{x} (1 - 0{,}1667)^{6-x}$$

In order to evaluate the probabilities of the occurrence of orders from a client, based on the history of the previous orders, an Excel worksheet organized as in figure 3.17 can be used. The D4:O12 cell block contains the distribution and volume of the orders made during the period 2016-2018 by the client of Tripol Sistem Energy SRL. The number of orders made for a particular product can be calculated automatically using a counting function that has been entered in cell P4.

P4 =COUNT(D4:O6)

The formula counts how many values are non-zero in the D4:O6 cell block, ie how many times there were orders durind 2016-2018. The formula can be copied vertically down next to each product.

Figure no. 2. Distribution and volume of orders for several products for the customer Tripol Sistem Energy srl

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1																			
2				Tripol Sistem Energy SRL												Istoric		Prognoza	
3		Produs	An	Ianuarie	Februarie	Martie	Aprilie	Mai	Iunie	Iulie	March	Septembrie	Octombrie	Noiembrie	Decembrie	Numar comenzi realizate	Probabilitate pe termen lung	Numar comenzi prognozate	Probabilitate realizare
4			2018																
5		DISPLAY LINE III	2017				34	35						6		6	0,16667	2	0,61867
6			2016					10				8			10				
7			2018																
8		Stradal PROTON S	2017			9							7			5	0,13889	1	0,83377
9			2016				20	14		8									
10			2018																
11		Topaz	2017													4	0,11111	3	0,14079
12			2016		10			29				3		21					

Source: own calculations

The probability of an order (long run) occurring is calculated in cell Q4 as a ratio between the number of months in which orders were placed and the total number of months (36 over the 3 years).

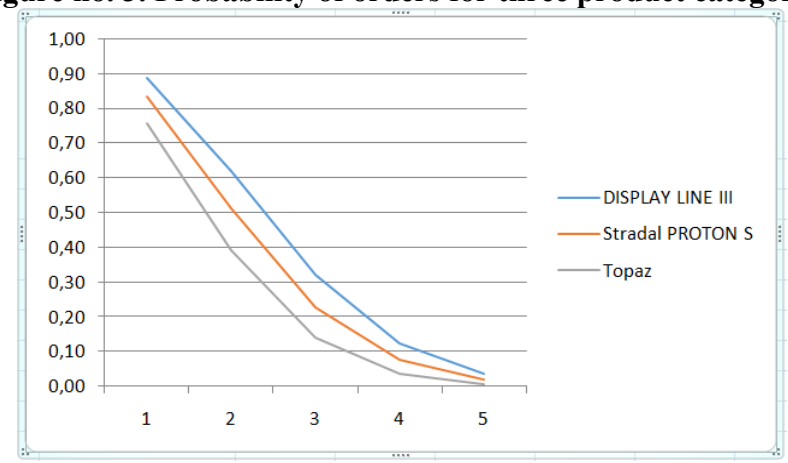
Q4 =P4/36

The number of predicted orders can be chosen by the user, and depending on the number chosen, the program will calculate the probability that the number of selected orders will be realized in the next 12 months (1 year). The formula for which the calculation is made was entered in cell S4 and then copied down on the column.

S4 =1-BINOMDIST(R4-1;12;Q4;TRUE)

For the example in fig.2. probabilities have been calculated for each of the three product categories in the following assumptions: minimum 1 order is expected in 12 months, minimum 2 orders in 12 months, ..., minimum 5 orders in 12 months. Figure 3 shows the probability distribution for each product category is given graphically. It is noticed that the probability of having a minimum order is high (89% for Display line III category, 75% for Topaz category). The probabilities decrease as the expectations increase, thus for the hypothesis that in the next 12 months, at least 5 orders appear, has a probability below 4% for each product category:

Figure no. 3. Probability of orders for three product categories



Source: own projection

Conclusions

The effective approach of a target market and the successful maintenance of the market can be effectively achieved only based on a realistic and well-founded management strategy. For most economic entities, the price objectives based on which they set their strategy is to maximize profit and achieve a higher yield index, which aims to maximize the use of capital and to attract a higher rate of profit. In order to know the cost of a long-term activity, we need, in addition to knowing the costs, a thinking to reach the cost-benefit couple. The methods presented above, like all methods of calculating costs, have also their limitations, because they deal with the nature of the information, and make difficult the connection between information and decision. The paper presents some methods of calculation and analysis of the relevant costs for measuring the performances of economic entities. An optimal forecast of the number of orders expected (how many orders are expected per year) from a customer regarding a product can be made taking into account the maximum reached by the curves "Total price", "Total cost" and "Total profit" for the respective product category. For example (fig, 2), on the studied case of the client Elprest SRL and with reference to the Display Line III product, it can be observed that the optimal number of expectations is on 6-7 orders per year. Even if a larger number of orders per year (for example 11-12 orders) would be expected, the probability of them happening is very small, and this will affect the forecast on such a hypothesis. The calculation was done by constantly considering the number of pieces (34) per order. Once the optimum values for the “Number of expected orders” have been set, (figure 2), we can obtain estimated values of the price, cost and benefit, calculated for the next 12 months for each product category. These summed values give a total value and an overview of the order-sales scenario forecast for Elprest SRL. Both the total value of the price and the cost depend on the number of pieces estimated to be ordered from each product category, so they depend on the variables generated by simulation. There have been several simulations. A simulation in Excel can be done by pressing the F9 key, at which time another set of numbers representing the ordered pieces is generated and all calculations that depend on these values are automatically performed. On the model presented, estimates can be made in relation to each customer of the Electromax entity. In

this way, on a mathematical basis, the forecasts and decisions taken by the management of the company are much closer to reality. As future prospects of the present research topic, we consider the development of an econometric model that quantifies and highlights the cost-benefit relationship on the products, but also the probability of the emergence of orders from customers, with which we can identify the categories of markets and products with the highest profitability.

References:

1. Achim, M. (2010), „*Analiză economico-financiară*‖, Ed. Risoprint, Cluj-Napoca
2. Alazard C., Separi S., 2001, Controle de gestion, Editura Dunod, Paris
3. Albu N., Albu C*., Instrumente de management al performanţei, Vol. II., Control de gestiune*, Editura Economică Bucureşti, 2003, pag. 12
4. Antony R., Govindarajan V., 2007, *Management Control Systems, Chicago*, Mc-Graw-Hill IR WIN
5. Braganza, A., Stebbings, H., Ngosi, Th., *The case of customer recruitment processes:Dynamic evolution of customer relationship management resource networks, Journal of Marketing Management*, 2013, Vol. 29, Nr. 3–4, pp.439–466
6. Briciu S., Contabilitate managerială. Aspecte teoretice şi practice, Editura Economică, Bucureşti 2006, pag. 9.
7. Briciu S., Contabilitate managerială.Aspecte teoretice şi practice, Editura Economică Bucureşti, 2006.
8. Briciu S., Căpuşneanu S.,, ROF L.M.,, Topor D.I., *Contabilitatea şi Controlul de gestiune, instrumente pentru evaluarea performanţei entităţii*, Editura Aertenitas, Alba Iulia, 2010, op. cit., pag 28, 34.
9. Bourgoingon A. (2000), „*Performance et controle de gestion*‖*, Encyclopedie de Comptabilite*.
10. Champan C.S., *Controlling Strategy, Management Accounting and Performance Measurement*, Hardcover – 9 Jun 2005
11. Debiens, J. (1988), „*Comment augmenter la productivité dans le secteur public", Revue de gestion*
12. Demartini, C., *Performance Management Systems, Contributions to ManagementScience*, © Springer-Verlag Berlin Heidelberg, 2014, 215
13. Garriga E, Mele D. (2004), ―*Corporate Social Responsibility Theories: Mapping the Territory*‖*,* Journal of Business Ethics 53, p. 51-71.
14. Gervais, M., *Contrôle de gestion*- 8 éd.. Paris:Ed. ECONOMICA, 2005, 774 p
15. Griffith A., Bhutto K. (2009), „*Better environmental performance: A framework for integrated management systems (IMS)*‖*, Management of Environmental Quality*: An International Journal Vol. 20 No. 5, p. 566-580
16. Groşanu A., *Calculaţia costurilor pe centre de profit*, Editura Irecson, Bucureşti 2010
17. Hoffman D. (2006), ―*Getting to world-class supply chain measurement*‖*, Supply Chain Management Review*, Vol. 10 No. 7, p. 18-24.
18. Jean-Francois H. (2006), ―*Organizational culture and performance measurement systems*, *Accounting*, Organizations and Society, nr. 31.
19. I.Ionescu, C. Iacob (2015), *Control de gestiune-abordare în context European şi international*,Editura Universitaria Craiova, 2015
20. Niculescu M., Op. Cit., pag.38
21. M.,Ştefan *Performance analysis methods within manufacturing companies ans their role in managerial decision*, http://old.upm.ro/cci/CCI-05, pag. 336-338
22. N.,Tabără, S.,Briciu, *Actualităţi şi perspective în contabilitate şi control de gestiune*, Editura TipoMoldova, Işi, 2012

23. I.D. Topor, , *Noi dimensiuni ale informaţiei de tip cost aferente procesului decizional în industria de vinificaţie*, Editura Universitară Bucureşti, 2014, pag.160, 164, 166