

Creativity of the Company's Income Multiplier

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Abstract

In this study we highlighted the role of creativity in the innovation process that aims to apply new ideas in practice, whether we are talking about completely new ideas or a new context in which older ideas are exploited, requiring the creativity of all employees. The study of creativity aims to decipher the complexity of the phenomenon of creation, to find methods and techniques for its stimulation and superior capitalization. On the other hand, we concretized this paper which included a series of momentary economic effects, but also the lasting effects that appear at the level of the company as a result of the manifestation of employees' creativity, in different forms. Human resources become a strategic resource with a unique growth potential, and the skills, knowledge, expertise and creativity of employees are crucial in the economic and financial performance of the company.

Key words: *creation, expertise, inventions, opinions, evolutions*

J.E.L. classification: M21, M41

1. Introduction

Creativity is the key factor in progress and the key to problem solving for self-realization and self-promotion. Creativity has long been considered the prerogative of artists, researchers and scientists, so that today we approach creativity as a human sequence existing in each individual, to a different extent, educable and possibly stimulated by specific methods and techniques.

Growing and maintaining competitiveness in a highly competitive and unstable market is not possible without designing new or improved products, diversifying and customizing them, new ways of distribution, marketing and promotion.

Thus, the creation and management of knowledge acquires a central place in the concerns of organizations and their managers, design and innovation becoming essential activities in value creation.

2. Literature review

Roșca (1981) selects, from among many definitions, those considered eloquent for the dimension it highlights.

Hermann (1992) makes the connection between creativity and brain laterality and starting from the fact that the educational system is dominated by the emphasis on verbal and rational, so on the development of the left hemisphere, considers that there is a crisis of arts education by neglecting nonverbal ways intuitive and imaginative.

3. Research methodology

The literature in the field describes multiple opinions, sometimes even divergent, depending on the isolated treatment of creativity; currently there is no comprehensive theory to address this phenomenon in all its complexity.

A first approach to creativity starts from the analysis of special scientific and technical creations, of the great inventions that marked the evolution and development of human society.

His preoccupation with measuring creativity led J. C. Guilford to initiate the psychometric approach, the tests developed by him and later by E.P. Torrance proposing an assessment of creativity through the fluidity of answers, their flexibility and the degree of originality.

The neurobiology psychological theory of creativity reveals new interesting information and tries to find a scientific answer, analyzing in depth the processes that take place in the human brain.

Russu, Mihaescu, Pelinescu, (1989), makes a deeper nuance and identifies five levels of creativity that differ in the depth of the creative act and its magnitude:

- Expressive creativity which is a spontaneous manifestation and without a special originality;
- inventive creativity is specific to inventors who, from the unique combination of known elements, find new uses for them;
- innovative creativity is attributed to the creators of schools, currents that bring profound changes, of essence in art, science, technology, etc. leading to new directions of development in that field;
- emergent creativity is the rarest and highest form, being characteristic of the great creators who revolutionize various fields of human knowledge or experience.

Many foreign and Romanian authors agree on the existence of 4 stages (which in turn can be divided into other sub-stages): preparation, incubation, lighting and creation. This stage of free manifestation of pre-conscious processes is called incubation, it most often occurs in the states of sleep, dream and daydreaming.

■ Lighting is the essential moment of creation, unique and unrepeatable, in which the idea of not the distant elements occurs and the passage of this combination in the field of consciousness.

At this stage there is the sudden appearance of the solution to the problem, of new ideas, without the knowledge I give the intention of the creator, through a synthetic cognitive process, inexplicable and incommunicable, which some authors identify with intuition.

■ Completion or verification concludes the creative process by returning to reality, to logic in order to review, refine the ideas and solutions found, so that they can be materialized in real technical solutions, valid and applicable to the given conditions.

Roger von Oech has a different vision, considering that the creation process involves the terminal phase and the practical phase.

In the germinal phase it delimits: the motivation in which the energy necessary for creation is generated, the search and gathering of information, the manipulation that ensures the transformation of resources and ideas, the rethinking and elimination of inappropriate hypotheses, the incubation that involves forming the idea in the subconscious out.

The practical phase includes the evaluation of the idea and the action that actually ensures the completion of the creative process and which is often the most difficult step.

The term innovation is attributed both to the process that has the practical purpose of applying new ideas, and to the actual result of this process materialized in new products, processes or systems.

The successive development and refinement of an invention to obtain technical services products that will be placed on the market or used within the enterprise is the most widely used definition for innovation.

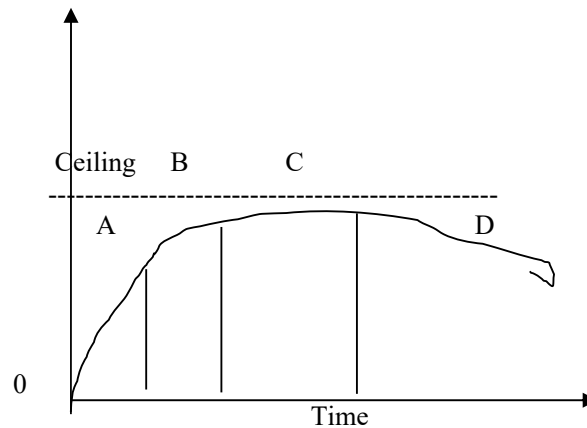
The concept of innovation knows, like creativity, many definitions, so in a broad sense; innovation can refer to a new product or technological process, to the introduction of a new model.

The analysis at the level of an enterprise provides a clearer picture of the role and importance of creativity, the practical way of manifesting its possibilities to stimulate and capitalize on this particularly valuable human capacity.

The approach of novelty therefore requires a broad vision in the process of creating new products or improving existing ones, from which neither the engineering criteria nor the market criteria can be excluded.

Developed by PDMA (Product Development Management Association, Mont Laurel, New Jersey), the system is now widely used in many large companies, namely managerial decisions that allow or not to continue the process.

Figure no. 1. Logistic curve of the evolution of a technology
Performances



Source: Baloiu, L., M., *Innovation management*, Efficient Publishing House, 1995, p.121

There are several areas on the curve:

OA = maintenance period in which the technology is new is not yet well developed and has not been imposed;

AB = the period of development, in which the technology is in full swing and is required;

BC = capping period, in which the technology and reached the limits;

CD = the extinction period, in which the technology is eliminated.

How the differences in the technological stage and their degree of overlapping follow one another over time, as well as the extent of each curve, depends on the evolution of each new technology.

The effects of innovation appear not only in the respective sector, but also in related fields, due to the tendency to induce other innovations (Schumpeter, 1939).

The best known model of economic evolution is that of Nelson and Winter (1982), who, taking Schumpeter's theory and focusing on technological competition as a driving force for the development of capitalism, assumes that firms compete by reinvesting their profits in technology or equipment. new, more productive successful ones get high profits and grow faster than others.

According to the theory of Nelson and Winter (1982), the company has a specific behavior that no longer seeks to maximize profit, including very well-defined technical production procedures, procedures for conducting and conducting research and development, to strategies for product diversification, investment and marketing.

4. Case Study

The entity TIPO SRL with the main object of activity research-development in the field of thermal engines.

The market on which the company sells its products is a very competitive one, internally there are many small and medium producers that supply a range of similar products, and the evolution of prices for raw materials, energy, fuel have seen spectacular growth, with predictable future increases equally important, which exerts increased pressure to reduce the cost of goods.

The use of machine tools with program control was not possible without the design, design, devices, Scholes and verifiers specific to these new products, as well as the design of an applied Software that allows the use of merit commands under changing technology parameters for each work piece (this required due to the specifications of each casting which shows variations in size resulting from casting technologies)

The design and implementation of this software were allowed to significantly reduce the number of processing hours per piece, leading to an increase in production capacity by approx. 15%, under the conditions of the same technical endowment.

As a result of the modernization and implementation of the automatic processing program, there was a considerable reduction of the related labor (as a result of the increase of labor productivity), of the processing costs and implicitly a higher profit in the conditions of maintaining the price level.

At the level of 2018, the main indicators registered for the three new products are presented in the following table:

Table no. 1 The main indicators

No. Crt.	Rod sign	Produce A	Produce B	Produce C	Total
1.	Amount q (buck.)	28	24	38	
2.	Unit processing time t_0 (man-hours)	275	194	241	
3.	t_1 (man-hours)	190	134	151	
4.	$\Delta t = t_0 - t_1$	85	60	90	
5.	i_t	1,45	1,45	1,60	
6.	Δ_q^t buck.	8	7	14	
7.	Price lei	11.136,4	6.539,7	100.886,3	
8.	Δ_{CA} lei	8.9091,2	45.777,9	152.408,2	287.277,3
9.	Δ chd	231,4	163,3	245	
10.	Δ chd	6.479,2	3.919,2	9.310	19.708,4
11.	c_v variable expenses	7.359,8	3.990,4	7.047,7	
12.	c_f fixed expenses	1.685,5	1.188,7	482,9	
13.	q_{er}	0,44	0,46	0,12	
14.	$q_v \times P$	311.819,2	156.952,8	413.679,4	882.451,4
15.	$q_v \times c$	253.267,5	124.298,2	286.166,2	663.731,9
16.	Re	58551,7	32654,6	127513,2	218719,5
17.	Rc				24,7

Source: author processing

■ Labor productivity, in this case, was determined in the form of the average time per unit of product [1]:

$$t = T/q \quad (1)$$

where:

q is the volume of production

T consumption of labor expressed in man-hours to unit processing time (man-hours) before machine upgrades t_1 unit processing time (man-hours) after machine upgrades

The labor productivity index for each product was calculated:

$$i_t = t_0 / t_1 \quad (2)$$

Relative change in labor productivity: $Rt = i_t - 1$

Absolute change in labor productivity: $\Delta t = t_0 - t_1$

Production surplus achieved due to the change of time per unit of product:

$$\Delta qt = (t_0 - t_1) q / t_0 \quad (3)$$

Potential increase in turnover: $\Delta CA = \Delta qt \times p$

$$\text{Reduction of unit costs as a result of direct wage expenditure: } \text{cheltuchd} = (t_1 - t_0) \text{sh}_0 \quad (4)$$

where:

sho the average salary per unit of time is 2.72 lei

■ Reduction of product costs:

$$\Delta Chd = q \Delta chd \quad (5)$$

Increasing the profit per unit of product $(t_0 - t_1) sh_0$

Increasing the profit per product $\Delta p = q (t_0 - t_1) sh_0$

■ Profitability threshold (critical physical volume of production) for each product:

$$q_{cr} = \frac{cf}{P - cv} \quad (6)$$

where:

cf = fixed expenses per product

P = unit selling price

cv = cheltuieli variabile pe produs

$$cv = cv_0 - t_1 sh_0 \quad (7)$$

Re profit related to exploitation: $Re = \sum qV \times P - \sum qv \times c$

qv the quantity sold is equal to that produced

■ Efficiency of operating assets

The operating assets are worth 4,145,637 lei

CA turnover was 3,917,451 lei

$$Ef_{AE} = \frac{CA}{Ae} \quad (8)$$

$$Ef_{AE} = 0.94$$

■ Efficiency of fixed assets

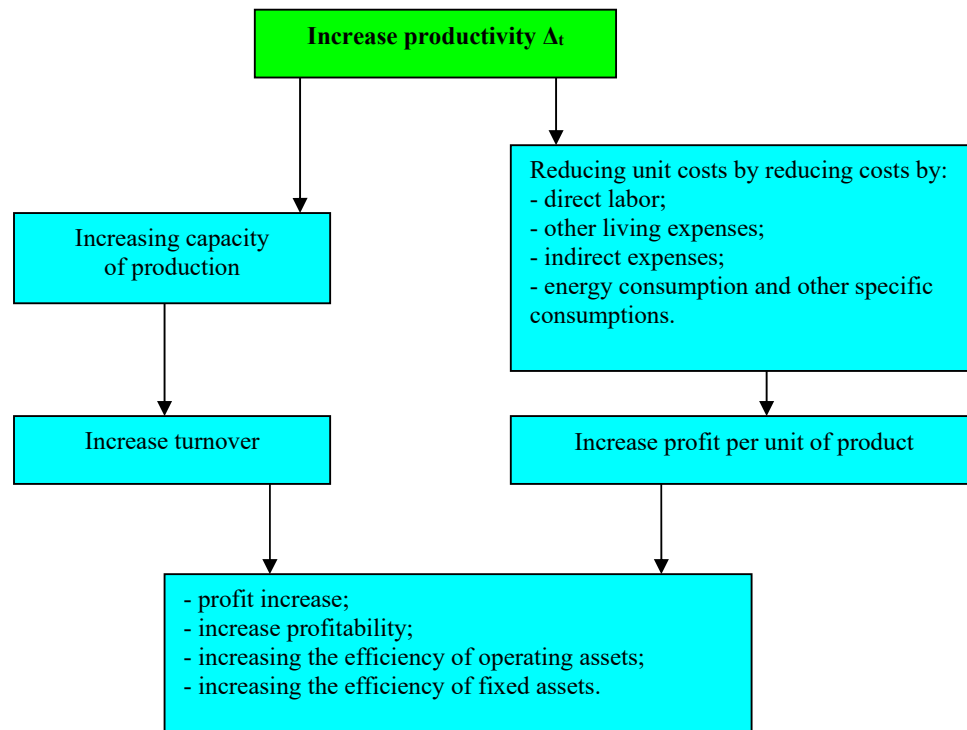
The fixed assets have a value of 695,663 lei

$$Ef_{MF} = \frac{CA}{MF} = 5,6 \quad (9)$$

■ Commercial profitability rate:

$$R_c = \frac{Pr}{\sum qv \times P} \times 100 \quad (10)$$

Outlining the effects induced by creativity manifested in the design and design of the three products, modernization of equipment and development of high-performance programs to automate processing processes and considering increasing machine efficiencies as the main cause of increased labor productivity, we can highlight a chain of effects as presented in the following diagram.



Due to the nature of the main object of activity, creativity was and continues to be a main component of the activity carried out within TIPO SRL, the continuation of its own research being done in order to further capitalize on the results by applying them or selling to other customers.

The research staff has a rich experience and meritorious results in the field of thermal engines, the stock of knowledge, the skills being also appreciable, what is missing is their capitalization, finding market opportunities to relaunch research both fundamentally and on the applied one.

5. Discussion

Given the competitive situation on the market of motor vehicles and their components, the orientation mainly towards research activities and only in the background production (for which it does not have compliant equipment) it is possible that the efforts, in conditions of obvious under funding, will be crowned by success.

An analysis of the creativity procedures and methods used shows a relatively good knowledge, but a lower use of them.

The most common technique is brainstorming, practiced in distinct forms from one research team to another, but considered particularly useful in generating a large number of solutions to a wide range of technical problems.

In the production activity, creativity often takes the form of incremental innovations and aims at the design and execution of auxiliary devices, the replacement of equipment that is lacking in equipment, technologies are constantly subject to changes designed to improve them but often to make up for some equipment shortages, accidental failures and unavailability of machinery or raw materials.

In the production activity, creativity often responds to urgent practical needs and most often springs from the experience of workers.

Access to new knowledge is also relatively low, given that the link with the scientific community is poor, participation in international scientific meetings is extremely rare, and information materials and specialist papers are lacking.

6. Conclusions

Creativity is a fundamental dimension of the human spirit and an essential factor of progress in all areas, and its study aims to decipher the complexity of the phenomenon of creation, to find methods and techniques for stimulating and capitalizing on it.

The study of creativity by various specialists is the beginning of the deepening of this complex phenomenon and the gradual removal of the mystery that has surrounded the act of creation and the great creator for centuries.

The analysis of the determinants of individual and group creativity allows a better understanding of the phenomenon in the direction of its manifestation according to the objective and at the desired time.

The industrial enterprise must be creative, constantly offer products and services that meet the demand manifested in the market, anticipate and even create un manifested needs, in order to be viable and competitive in a market in a process of globalization, in an unstable and unpredictable environment.

Scientific research and development carried out at the level of enterprises represent a favorable framework for the manifestation of creativity, these activities usually generating new ideas, discoveries, inventions that can later be the basis of innovation.

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