ANNALS OF THE ORADEA UNIVERSITY
Fascicle of Management and Technological Engineering
ISSUE #1, MAY 2015, http://www.imtuoradea.ro/auo.fmte/

MANAGERS AND ENGINEER ECONOMISTS USERS OF THE LEAN SYSTEM FOR THE CONTINUOUS IMPROVEMENT OF PERFORMANCES

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Abstract **—** Romania faces just like other countries from Europe and beyond, economic and social challenges combined with a growing number of qualifications (specializations) profitable for the people with higher education, and also with secondary education, which were transferred by other countries because it's well educated and much cheaper. Since the global economic crisis in 2008, the combined rate of unemployment and employment under the professional qualification has continuously grown. Young people have been particularly affected by this crisis. In a sick state, grinded by corruption, with a subsistence economy, like ours, the continuous improvement of the managerial-economic performances is the main scope of managers and engineer economists. This scope has an important reason for managers and engineer economists to use the Lean system in their managerial activities.

Additionally, innovation is a solution which applied in the LEAN system leads to the continuous improvement of performance.

Keywords **—** engineer economists, the Lean system, continuous improvement, transversal competences, the National Register of Qualifications

I. INTRODUCTION

THE current state of knowledge outlines that the current functioning speed of the management systems and mechanisms, regardless of the nature and scope of the involved organization (micro-, mezzo-, macro- and mondo systems) does not continuously accelerate. The management systems and mechanisms can only operate efficiently at certain speeds, hence the need for the continuous improvement or for replacing systems and mechanisms to ensure their increasing operating speed imposed by the socio-economic and human mutations.

The management systems and mechanisms that ensure the survival and efficiency of the involved organizations (companies) are not anticipated and prepared for in advance and more thoroughly to increase their functioning speed. The management systems and mechanisms of different companies are not designed in a different approach based, to a certain extent, on new principles, concepts, rules and procedures capable of ensuring superior and growing functioning speeds corresponding to the current and future contextual development.

The design of management systems and mechanisms does not ensure the basis of the conversion for macro-, mezzo-, micro-companies to elaborate and implement some strategies with a particular radical content that should place informatics and people in the forefront in the economy's vision. This stage induces various blockages in the functioning of the organizational economic management systems and mechanisms by continuously breaking the functioning speed, or innovation of these systems and mechanisms; through their inefficiency some professional performances are not achieved. From here, the necessity for innovation and continuous improvement or replacement, by managers and engineer economists, of the company's management systems to ensure their growing functioning speed imposed by the contextual mutations.

Another induced blockage is the lack of anticipation and training of managers and engineer economists well in advance and more thoroughly in regard to the innovation of management systems and mechanisms and the survival and efficiency of involved companies.

The current strategies concerning the management systems and strategies, using the vital instruments for a successful management of continuous improvement of economic performances don't place informatics and people in the forefront in the economy's vision.

During the preparations, of the specialized subjects, of the curriculum, the courses have the image of main courses based on the theoretical experience of the authors, reflecting the practical sphere less. From here, the necessity to innovate them with a procedural content that can provide managers and engineer economists knowledge according to the practical need in managerial systems and mechanisms.

The lack of the applicable research infrastructure that could ensure the simulation of economic managerial

systems and mechanisms and the software necessary for these simulations are blockages in obtaining managerial-economic professional performance.

Removing these blockages and the continuous improvement of the managerial-economic performances of managers and engineer economists, beside the undeniable and almost universally accepted solution – the innovation of managerial-economic systems – have at their disposal the application, besides the advanced methods of management of some vital management tools, of the Lean system.

II. THE LEAN SYSTEM FOR A SUCCESSFUL MANAGEMENT

Contemporary management faces complex situations, numerous actions are done in order to achieve the set objectives. In order to be successful in these confrontations we have to resort to an assembly of principles (rules), methods, techniques, procedures and tools. Managers and engineer economists try to preserve the dynamic equilibrium necessary for the competitive resistance [1].

The systems of principles, methods, techniques and procedures that are sustaining each other and are interlocked are used in all circumstances for their advantages. Some may be prevailing within the system depending on the concrete conditions and circumstances. For example, we show that the Japanese companies are lead by the management through objectives method (MtO) – because this has the largest share in sizing, allocating and managing resources.

A synthesis of the concepts would ensure a better understanding of the interdependencies of the base elements of the management's actionable universe. They are integrated in the practiced managerial system and can form the "management mix" specific to each manager or managerial team, such as: management principles; management methods; management techniques; management procedures; management tools.

Management tools are the technical and conceptual means that determine the functionality of the management methods and techniques. They are material tools (office equipment, telephone, internet, intercom, telex, PC, stopwatch, etc.) and conceptual tools (words, decisions, objectives, plans, IT programs, organization charts, mathematical symbols, etc.). After the role they have in the management process, they are defined as an assembly of technical and conceptual means utilized in the application of scientific knowledge for practical purposes [2]. They constitute informational elements of connection that serve, in equal measure, both the management system and the execution one.

The system of management tools LEAN appeared in the 90s and was developed by the company Toyota under the name of Lean Manufacturing. Today there's a whole "Lean philosophy". In practice this consists in focusing all the organization's resources to eliminate losses and to create value for the customer. In strategies, resources are stipulated under the form of circulating and investment funds [1]. The first provide the resources to undergo the current activity. Their rational sizing by the managers and engineer economists is very important from an economic point of view. The problems that frequently occur are their under-sizing, which generate a lack of liquidities and a high degree of indebtedness to banks and / or oversizing circulating funds, which results in an unnecessary blocking of availabilities that could be efficiently used in another destination. The investment funds through which the financial support is ensured, necessary for the operationalization of strategic options. Managers and engineer economists must resolve the major issue of determining their size, in accordance with the imposed necessities of each strategic option and the allocation possibilities and for the ones attracted or borrowed, for reimbursement. The financial-economic analysis is essential to determine the level of these resources.

Managers and engineer economists, before including a resource in the management strategy, must demonstrate the efficiency of its use and at the same time avoid a high level of indebtedness that can endanger maintaining ownership of the organization. When setting the resources, they also indicate their origin: their own, borrowed (from who), attracted (from who), etc. This is an essential element due to the exhaustive nature of the resources and the decisional share they have upon the interested parties.

All these indicate to managers and engineer economists the necessity of increased rigor in sizing and structuring resources, based on highly complex and thorough financial, market, product and managerial analyses [1].

The Lean Manufacturing system names "losses" all the things that the customer would not be willing to pay, namely that which doesn't bring direct value [3]. The value offered to the customer represents the difference between the total value offered to the customer and the total cost at the customer. The total value offered to the customer by managers and engineer economists is given by all the benefits that these except from a product or service.

In our analysis we started from the premise that customers will purchase petroleum products and LPG loads from the company which, in their opinion, provides the highest value. Basically, a transport company needs diesel fuel to ensure its objectives of transport. It can make the purchase from a certain company that sells diesel fuel or from its competitors. To this end, the sales force of the marketing companies will present their offers. They know that the work without added value is found in almost all the organizational systems, those from Toyota identified 7 new ones.The total cost at the customer represents more than the financial cost. It also includes the time, energy and moral costs anticipated by the customer.

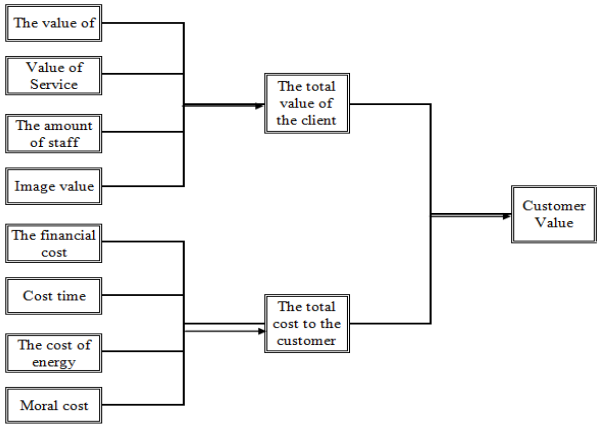

Fig. 1 Elements that determine the size of the added value offered to the customer

In order to form an image about the total cost at the customer, the manager or the engineer economists will evaluate both the costs mentioned beforehand and the financial cost [4]- [7].

Further, the customer will assess if the offer from the company for marketing petroleum products, the total cost at the customer is too high compared to the total offered value. If his assessments are true, it's possible that he will accept the competition's offer. Ultimately, he will make the purchase from the one that offers the highest value. If the company wants to sell its diesel fuel, the managers or the engineer economists from within the company will improve their offer in three ways: firstly, increasing the total value offered to the customer by increasing the advantages offered by the service personnel, self-image or adding additive to the fuel to improve quality, secondly, they can reduce the financial cost at the customer by using applying a price reduction percentage, if the requested quantity is large enough.

Managers and engineer economists determine if a customer forms his own opinion in regard to value and if he acts upon it. They study the customer's satisfaction or dissatisfaction after the purchase, which depends on the report where the offered performances correspond to the expectations.

Satisfaction represents the feeling of a person, resulted from the comparison of the perceived performances (results) of a product and his expectations. The level of satisfaction is a function determined by the difference between the expectations and the perceived performances [2], [6].

The customer experiences three levels of satisfaction: if the performances are far away from the expectations, the customer is dissatisfied; if the performances correspond to the expectations, the customer is satisfied; if the performances exceed the expectations, the customer is very satisfied or delighted.

The customer's expectations arise from the previous purchasing experience, from the claims made by various acquaintances and from the information and promises made by the company and its competition. Managers and engineer economist have an extremely important objective: "customer orientation". Satisfaction represents an objective and a management tool. The methods through which managers and engineer economists analyze the customer satisfaction level are: utilizing the systems of receiving complaints and suggestions; studying the customer's satisfaction through regular surveys; "the buyer's game"; analyzing the customers' losses.

III. The Continuous Performance Improvement Using the Lean System

The Lean Manufacturing system was designed, in fact, to eliminate three types of losses [3]:

1) Muda, represents the work without value add;
2) Muri, represents the systems' overload;
3) Mura, represents variation.

The use of the management tools from the Lean System, by managers and engineer economists, is quite complex, the links between tools, principles and work methods are not easily understood, however we will analyze the most important ones and their effects in use:

1) 5S

Is a system that eliminates the waste of time, managers and engineer economists must organize the work environment. It's an important component of the visual management, in turn a Kaizen work philosophy. Given the principle "the man sanctifies the place", a difference between an organized and clean organization versus a disorganized and inefficient one can be seen with the naked eye.

Source: R & S, *33 vital tools for Successful Management*, Publisher RENTROP & STRATON, digital, www.rs.ro, 2014, Visited March 2015

Fig.2. Tactical management tools: 5S

This name comes from the Japanese words: Seiri (to sort), Seiton (to arrange, to deposit), Seiso (to clean, to polish), Seiketsu (to standardize) and Shitsuke (to maintain), the five system elements can be arranged in a repetitive cycle like the ones in Fig. 2, which can be started periodically in workspaces where this system is implemented [3].

Managers and engineer economists, once they've decided upon the strategic implementation, form teams in each department / workplace to sort out all the materials found. Sometimes it's the most difficult step because it involves the selection of materials in three groups: those

necessary for the future, in the same work area; those who will be kept in other working areas; waste. Moving further to arranging tools and labeling them in order for each object to have its own place or in order to avoid spending time in finding them. The next step is cleaning the workplace and tools, viewing cleanliness is a powerful impression for each visitor. Standardization is characterized by the system's extension to the whole company and by gaining support. Sustainability is the most important thing to avoid going back to the previous situation. Slippage trends will continue, however periodic audits and inspections will help maintaining this state that will, in time, bring great gains of efficiency and image.

1) Andon:

Is a visual system of emergency assistance that can go until the stopping of a process.

2) Bottleneck analysis:

Managers and engineer economists analyze the process portions that reduce the maximum output.

3) Lean production:

By applying this procedure, managers and engineer economists eliminate the waiting times between work phases, transportation, etc.

4) Gemba:

Is the process through which managers and engineer economists walk among the operators, where the things happen; discussions with the operators.

5) Just in Time:

Is a process of eliminating stocks through the optimization of the relation between demand and production.

6) Kanban:

By applying this process, managers and engineer economists automate the raw material movements as needed, they optimize the flows.

The two tools: Just in Time and Kanban used by managers and engineer economists in the Lean System are distinguished by the fact that, while Kanban is a visual management system, Just in Time (JiT) helps eliminate one of the seven losses from the Lean concept, excess inventory. Managers and engineer economists can interconnect the two processes within the Lean concept, with Kanban adjusting the Just in Time system through visual alerts of the raw material supply, usually with a system of cards, labels or plates.[8].

7) Kaizen:

Is the instrument through which managers and engineer economists obtain the continuous improvement of processes and work procedures. The fundamental idea behind this strategic process is that dramatic and major changes are not necessarily needed to ensure the process, it is sufficient to repeatedly intervene with small steps that can re-launch the process, eliminating waste and improving the company's processes [9].

8) Predictive maintenance:

Managers and engineer economists delegate the preventive maintenance at the operators' level.

9) Poka Yoke:

Managers and engineer economists can eliminate the possibility of error by preventing its appearance.

IV. Conclusion

The current state of knowledge outlines the functioning speed of the management systems and mechanisms, regardless of the nature and the scope of the organization it isn't continuously accelerated. The activities of the human resources are vital to ensuring the success of every company.

The management systems and mechanisms can only operate efficiently at certain speeds.

The combined rate of unemployment and employment under the professional qualification is growing, both in the Romanian labor market and in other European states.

Removing these blockages and the continuous improvement of the managerial-economic performances of managers and engineer economists, beside the undeniable and almost universally accepted solution – the innovation of managerial-economic systems – have at their disposal the application, besides the advanced methods of management of some vital management tools, of the Lean system.

In practice, the Lean System consists of focusing all the organization's resources in order to eliminate waste and to create value for the customer.

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