

## THE NECESSARY TRIAD QUALITY, PRODUCTIVITY AND COMPETITIVENESS

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**Abstract:** *The paper deals with methodological aspects to create the competitiveness systems, by using specific elements as a project. The way to create the triad PrQCo and some measures to be taken at national scale are recommended.*

**Key words:** *quality, productivity, competitiveness, management.*

### 1. INTRODUCTION

Competitiveness ( $Co$ ), as a measure of profitable selling capacity in competition, can be defined as  $Co = Q \times Pr$ , the composition of quality ( $Q$ ) and productivity ( $Pr$ ), and the ratios which also characterize it are *Added value/Costs*, reflecting production and *Profit/Costs*, reflecting the sales efficiency. These indicators are referring to a production-sale cycle and are similar in some extent to Profit/Assets and the formula  $P/A = P/To \times To/A$ , where  $P$  represents profit,  $A$  is assets and  $To$  is turnover. Economies of the industrialized countries proved that the booster of the economic success is *motivation* generating also the *innovation perspectives* to face in a better way the competition. As the value of the ratio which defines productivity is not kept when the two factors change the scale, some firms acting on well-chosen or favored niches (e.g. services, IT&C, consulting), can have very high productivity, greater than that of the firms using the scale effect as a favoring factor. Frequently the SME-s have competition advantage of small amounts of great value, differentiating by quality, or by a strategy of generating potential, to be sold to other firms to use it on greater scale [13]. The change of *PROD-OUT* paradigm to *MARKET-IN* one was done to satisfy the customer in a higher measure, due to higher production flexibility and cost decreasing determined by IT&C and new approaches in *concurrent engineering*, as well as a successful *marketing mix*. Quality and productivity are matched taking also into account the environment protection and the quality of life at the individual and social level. Regarding the common goods, there is to be reconsidered the *consumption criteria and values*, as well as the waste reduction, as a source of increasing productivity at the individual and social level. To accomplish it an important role has education at all levels, from the childhood to the postgraduate forms. Promotion of innovation and new technologies became state policy in the advanced industrialized countries as e.g. in Germany, where the mechanical engineering has 226 billion Euro turnover, from robots to industrial firms design and with a special mention for automotive industry. Germany was the 3rd great producer and exporter of automobiles (70% of production) in value of 143 billion Euro in 2004. Siemens registers 36 innovations/day, 60% of R&D ex-

penses being devoted to software development, in complex teams with people from USA, Sweden and India. Advanced technologies are developed also in the field of alternative power sources and environment protection products, having a global share of 19% and a programmed increasing rate of 40% until 2010 [19]. On the other hand, action of the economic laws of the market economy must be understood and used in conditions of the globalization, under the strong economic and political influence of the multinationals with their great financial, production and sale power [1, 2]. The new conditions of the postindustrial economy and society ask and determine new education and managerial methods and practice able to produce mentality and behavior changes. These aspects are retrieved not only in production processes, but also on the *labor market*, where the education system have an essential role concerning professional and managerial training, together with other strategic influence factors from legal, technological, social and political areas. The exponential technical and scientific development during the 20-th century accredited the concept of the *knowledge society*, expressing the importance of knowledge and creativity as a generator and in the same time as a result of this process– the real engine of the development. The knowledge and training process can be considered as a *constructive* one at two levels [3, 4], because as J. Piaget remarked, *the intelligence organizes the world by organizing itself*. This concept assigns to research and education the role of a generator and amplifier of the theoretical and practical knowledge offering answers to the great questions “what, who, how, why, with what social and individual benefit the research, production and sale are carried out?”. *The necessary triad QPrCo is to considered in the context of the sustainable development and environment protection stressing on the quality of life instead only on the profit*. Integration of different approaches is well expressed by TQM & TPM concepts. For managers it is important to understand and practice all 7S factors and to control them as in case of the critical activities of a project[8]. The problem solving in the firm depends also on the organization communication system and the negotiation power in problem solving when appear in relations with the environment or inside firm. The *competitiveness management* is a connective managerial concept of the

strategic and operational management, being also the quality and productivity management on short, medium and long term.

## 2. COMPETITIVENESS AND HUMAN RESOURCES DEVELOPMENT

Human factor keeps a main role in good running of an organization even if the accelerated development of the automation and IT&C systems seemed to reduce its role. TQM and TPM, competence and motivation of the human resources give a mutual positive influence at the individual level strengthening also the loyalty towards the firm as an organizational result. *Competence, motivation and loyalty generate competitiveness.*

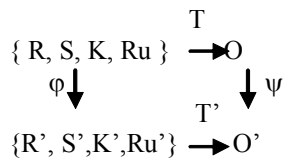
Access to an advanced technology creates also an individual advantage and can be a subject of motivation. But the main motivation remain in Romania the financial one, even in case of great corporations where salaries are higher, in spite of the fact that the declared main point is the labor environment and labor relations. This fact explains also why people leave Romania to work abroad and why young people who studied abroad remain there for long time, if not for ever, if comparable salary conditions are not met in Romania. Implementation of important technological changes, *innovation*, requires investments, but good results can be obtained also by practice *kaizen* (the continuous improvement practiced initially in Japan, now being generalized in the world in connection with quality and productivity improvement goal. This principle and the 5S mentality [7] in all activities (another Japanese approach meaning order, cleanness and discipline) represent the background of the IPQI (Integrated Productivity and Quality Improvement) system created at JPCSED (Japan Productivity Center for Social-Economic Development [6]. But in case of IPQI there is proved also the cybernetic approach of the management systems as systems in class S2. These are systems with two control loops, at the strategic level and at the operational level, acting on different time horizons and with specific objectives, but by the coordinated exercise of the management functions at each level. *This is also a proof of the fractal character of the management at different levels and structural components of the organizations.* The fractal character of the complex systems control was touched *avant la lettre* by M. Mesarovic and his group from Case Reserve University at the end of the '60-ies [9]. Some contributions of the author, and the S2 systems were introduced and studied in the '70-ies by P. Constantinescu and E. Rădăceanu [10]. The capital, goods and labor migration in different forms, promote original organization structures, as the *virtual companies*, illustrating once more the constructive character in the contemporary management theory and practice New paradigms are made possible mainly due the new IT&C systems. Romania benefited the UNDP and Western assistance on management training development since 1968 at CEPECA, but enhanced after 1990 [5]. Referring to university technical level it is obvious that engineers are mainly involved in *three great activities: research and design, production management and sale of tech-*

*nologies and equipment.* From these requirements result the necessary changes in technical high education area. Unfortunately in Romania the necessary changes concerning curricula are not yet accomplished to be competitiveness oriented. The engineers must be promoters of technical progress not only by using CAD, CAM, CAE, CIM or concurrent engineering, but, by technical solutions, they must be factors of education concerning consumption respecting the spirit of quality and productivity, environment protection and quality of life. The Value Analysis and Value Engineering approach, initially used on the product design and redesign, can be also accepted as a suitable approach in HR management development systems at the level of firms and at the national level as well [11].

## 3. CONSTRUCTION OF THE NECESSARY TRIAD IN THE GLOBALIZATION TIME

In Romania the lack of competitiveness can be explained partially by the obsolete character of the equipment and technology, but responsible are great changes on the market and sometimes the HR factors, by an inappropriate maintenance and /or control of the equipment. In some cases implementation of TPM can offer the real solution, skipping costly and unjustified investment. Investment must be always a source of increasing quality and productivity. The static and dynamic analysis (using ROI, NPV, IRR indicators) of investment projects, as well as using the *leverage effect and risk analysis* are usually the background of the investment decisions [8, 12]. Also multi-criteria analysis, simulation and scenarios are used [8, 10], especially in the process of globalization, when different material & labor costs and monetary and fiscal conditions are met in different regions and economic zones. Advantages concerning research & design, production and sale can be met by partnership of firms from different geographical zones [15–18]. The globalization can have contradictory effects all over the world generating anti-globalization movements [1, 2]. But the globalization forces managers and local administrators to understand and use better the key factors of success. The *constructive approach* of the competitiveness system assumes *the integration of the quality & productivity system creation with a special accent on creativity.* The Value analysis/engineering method (VA/VE) [20], can be used as a methodological framework to design or only to improve the production and sale system to increase the competitiveness. By its analytical and creative nature VA/VE is obviously *constructive.* The role of competitiveness is continuously increasing, by creating new forms of organization development and generalization in firm good results concerning quality like QFD (Quality Function Deployment), VA/VE, DEMA (Design for Management and Assembling) [14]. Competitiveness is a result of the efforts of the firm, but it can benefit also by the opportunities created by the political, economic and legal systems, domestic or abroad. In the EU economic competition and competitiveness are protected by laws, like antitrust art. 81, 82 and art. 31 and 86, regarding the state monopoly

and by the regulations EC nr. 1/2003 applied since 1<sup>st</sup> of May 2004 [21]. But the government can offer financial support on short term to firms in difficulty in their restructuring effort, mainly to SME-s for R&D projects or environment protection training [21]. All these circumstances require adapting large span measures concerning organization, production system, innovation and technology, from restructuring, going sometimes to business reengineering. This complex process is represented in the scheme [8, 11]:



where the firm is represented by  $F = \{O, R, S, K, Ru\}$ ,  $T: \{R, S, K, Ru\}O$ ,  $R$  – resources,  $S$  – structure,  $K$  – know-how,  $T$  – technology (including, Management). In these conditions the complex process of the restructuring  $\varphi$  is determined by the reorientation  $\psi$  and can be lead to the business reengineering  $\rho = \psi \cdot \varphi \cdot \tau$ , where  $\tau: T \rightarrow T'$  represents retechnologization. This process of creation the necessary triad  $QPrCo$  must be run by project management methods and not be stopped after achieving good competitiveness, but must continue and be maintained to face the competition and progress. Globalization asks for reform to face the *challenge of an increased competition where the main actors are the multinationals*.

#### 4. RECOMMENDED ACTIONS TO IMPROVE COMPETITIVENESS

After the 2-nd WW the industrialized countries have created and developed national centers for quality and productivity improvement, similar to JPCSED, created in 1955. In EU was created EANPC-The European Association of National Productivity Centers, with methodological role in coordination of the national programs, where such programs exist. The EANPC most recent memorandum headlined “Competitiveness – The High Road to Wealth” [22] underlines the role of SMS-s and of the new forms of work, like the virtual work (home work), virtual team, shared services and virtual networks.

In Romania it was created in 1994 a Productivity & Quality Center with Japanese assistance of JICA at the former Romanian Institute of Management, abolished in 2004, proving the management and moral crisis at the level of coordination and reform of the Romanian economy after 1990.

*The necessary triad* can be achieved only by coordinated action of the employers, unions and government, supported also by academics and research units, like in all countries where such programs exist and are successful. In the WEF Top of competitiveness Romania is on the 67-th place among the 117 states, the last place among the EU and candidate states, in front of the list being Finland, USA, Denmark and Taiwan. Competitiveness presumes an excellent management TQM&TPM oriented which recommend measures like in the “decalogue”:

1. Create a national wide movement for quality & productivity improvement, promoting special indicators and having governmental and private support and media support to promote best results and benchmarking;
2. Training and education system, performance oriented to R&D, production and sales;
3. Management system supporting the human resources development and motivational mix of employees, able to improve their motivation and loyalty, supporting their career & professional development;
4. Efficient practice of market research and Marketing mix (the 4P) by the firms;
5. Development of an innovative participation system, based on *kaizen*, VA/VE and investment to create competitive products;
6. Design and maintenance of the IPQI like systems of class S2.
7. Higher concern regarding the fund spending and investments in all economic and social areas, to obtain the maximum benefit for the society and the contributors.
8. Greater professional dedication in all actions and projects using EU Structural Funds, PHARE, ISPA, SAPARD, INTERREG to ensure an accelerated economic and social development and to realize a satisfactory standard of life in Romania – the goal and condition for the admission and integration in the EU.
9. Initiate a national movement against wasting resources and towards a sustainable economic and social development.
10. Promoting alternative cheaper and cleaner energy supply for industrial and individual use.

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