# METHODS AND INSTRUMENTS USED TO INCREASE COMPETITIVENESS OF PRODUCTION ORGANIZATIONS

**Valentin Rau Ph. D Student**
**University of Craiova**
**Faculty of Economics and Business Administration**
**Craiova, Romania**

**Abstract:** Competitiveness, often confused with the company's financial position, profitability or productivity, is the ability of an organization, at a given moment in time, to resist competition. Competitiveness is an intrinsic potential embodied in having a competitive advantage on the market. Profitability and productivity are only parts of the overall competitiveness measures outlining competitiveness.
The competitive advantage is determined by several factors of influence: type of organization, type of competition, field of activity, level of knowledge regarding competitors.
In order to gain a competitive advantage, it is necessary to analyze all aspects of the company, by means of using several methods and techniques.

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**Key words: competitiveness, audit, management, "tight spots", cost analysis**

## 1. INTRODUCTION

In order to achieve a competitive advantage in comparison with another organizations the organizations need to developed theirs process for assure the robustness system. In that regarding we will describe several methods which can conduct those organization to become more competitive an to secure their business.

## 2. OBJECTIVES

The objective of this study is to define methods and group them by various activities. Those methods can lead organization top management to keep under control all the process that make up the system. Grouping makes it easier selection decision methods in various situations.

## 3. METHODOLOGY

***Audits:*** systematic, independent and documented process aiming to obtain audit evidences (records, statements of facts and other information that is verifiable) and evaluate them objectively, in order to determine the extent to which audit criteria are fulfilled (overall, policies, procedures or requirements). These may include audits of systems, processes and products. Audits are evaluation methods put in place in order to evaluate the quality assurance system of an organization, and are classified according to their object, as follows:

*System Audit*: assessment of the quality assurance system of an organization.

*Product audit:* evaluation through randomly selecting a product quality… methods have been developed for this - "Demerit" type methods. The method is based on identifying all non-compliances in the final product - ready to be delivered to the client, and categorize the identifyed nonconformities by assigning a score according to the seriousness. Adding the score of each detected noncompliance results in a overall score that actually shows how much a product has been downgraded as compared to a product that fully conforms to specifications. Product audits are conducted continuously throughout the year, in accordance with the inspection process of each product and/or order. The Director for Quality ot the organization is responsible for: ensuring that audits of product, including all receipts of materials, process and final inspections, and testing activities; ensuring products inspections are performed as planned; ensuring that tests results are presented and filed properly. Quality and Production departments are responsible for confirming the product stage after inspection and testing.

*Process auditing*: purpose of such audit is to ensure that all departments work according to instructions and comply with specific process requirements, in a correct and complete manner.

*Special audit:* such audits may be conducted periodically, as required, in order to respond to specific operational situations, as well as in other special events involving inspections from the beneficiary.

Company management is responsible for providing the resources necessary to carry out the audit. It is the responsibility of the organization’s Quality Director to prepare audit plans and to coordinate audit activities. In such capacity, the Director appoints auditors based on their individual skills. Auditors will have minimum qualifications as defined by specific organizational procedures.

The Quality Director is responsible for selecting auditors, deciding on the number of auditors and their qualifications. Before performing audits, auditors will receive adequate training (theory, audit preparation, writing documentation, analysis of knowledge, practical training and shared auditing experience). Auditing activities are included in the employee's job description sheet.

An audit program has been developed and implemented that identifies the importance of areas to be audited, and the results of previous audits. Criteria, scope, frequency, methods, responsibilities and requirements for planning and execution of audits, and for reporting and maintaining results, are defined and documented in internal audit procedures.

Management systems evaluation methods are called audits; this name comes from the Latin verb „to listen” and is used with its relevant sense of checking specific areas, or the field of quality itself, regarding the evaluation and examination of aspects that are relevant for quality and management systems implemented in respective organization.

International quality standards define auditing as being: a systematic and independent examination aimed at determining whether activities carried out and their results correspond to default, and whether these provisions are implemented effectively and are suitable in order to meet the objective. Audit categories are classified according to purpose and object, as follows:

*According to purpose:* internal quality audits. Are also called first-party audits - assessing the efficiency of corrective actions, or identifying the necessary improvements through internal audits. External quality audits. Are also called secondparty audits. These audits are conducted by the customer. Third part audits. Conducted by certified bodies. Third party audits are conducted by certification bodies, which are organizations, specialized in audits and consulting, which in turn have been accredited by the National Institutes of Standards. In Europe the following national standardization organizations are known:

BMWFI – Austria, BELAC – Belgium; BAS – Bulgaria; CAI – the Czech Republic; DANAK – Denmark; EAK – Estonia; FINAS – Finland; COFRAC – France; DAKLAS – Germany; ESYD – Greece; NAT – Hungary; INAB – Ireland; ACREDIA – Italy; LATAC- Lithuania; RVA – Holland; NA- Norway; PCA – Poland; IPAC – Portugal; HAA – Croatia; RENAR – Romania; SNAS – Slovakia; SA – Slovenia; ENAC – Spain; SWEDAC- Sweden; SAS- Swiss; TUNAC – Tunis; TURKAK – Turkey; UKAS – UK. The European Council Directive for Quality lifted barriers for the Romanian automotive industry, and became a very good market for certification bodies in Europe and Romania.

*Activity-based cost calculation* (ABC): cost accounting system that accumulates cost data regarding the activities carried out, and then uses cost carriers to allocate these costs to products or other bases such as customers, markets and projects.

ABC method emerged in the United States in late '80s, in "The hidden factory", a literature piece developed and published by Jeffrey G. Miller and Thomas E. Vollmann. The two authors subjected to critical study specific areas and places of common costs (indirect costs), concluding that that key to control indirect costs is to develop a model able to detail and structure the causes of such costs. However, they have developed and presented a new costing system[1].

In the same period, a system has emerged in the USA, called "Activity Based Costing", whereas in Germany systematic process cost calculation begun following the publication of "Process Costing" by Horvath and Mayer in 1989[2]. The one to whom other authors credited[3] this method was the American Professor Robert Kaplan and, of course, the emergence of this new approach is primarily due to shortcomings contained in the traditional method of absorption. The main drawbacks are that the modern reference points as the amount of work consumed or machinery work-hours or are not suitable for the allocation of overheads. The rationale of the above is as follows: a company's resources are consumed by certain activities and the production of a particular product requires use of a mix of these activities. The group tries to work so that operations of the same kind to be possible to identify key cost absorption as appropriate. It is obvious that for some activities gross volume or quantity of finished product are not representative of allocating overhead rile. Being a relatively new method we put into practice in our case studies.

Methods and instruments used for economic and financial benefits[4] are:

*Activity based management (ABM):* System management that uses an accounting structure to allocate cost-per-product based on the resources used to manufacture the product. ABM method allows proper allocation of resources on

[1] Klaus Ebbeken, Ladislau Possler, Mihai Ristea, Calculaţia şi managementul costurilor, Editura Teora,

[2] Corina Graziella Dumitru, Corina Ioanăş, *Contabilitatea de gestiune şi evaluarea performanţelor*, EdituraUniversitară, Bucureşti, 2005, pag. 346;

[3] http://www.manager.ro/articole/management/metoda-abc-1313.html - accesat la data : nov 2010

[4] SR ISO 10014 – octombrie 2007 , pagina 25 – 30

activities contributing to the improvement of production processes and reducing their costs, based on the analysis performed by ABC method.

*Upgraded product quality planning (APQP):* a method used to develop a product quality plan which will support the development of a product or service, having as main objective the customer satisfaction. The steps to follow are: program planning and design, design and development checking, and validation of product and process.

*Evaluation :* an activity based on the performance perception analysis, in order to identify improvement opportunities;

*Authority matrix :* a matrix containing one or more of the following items: list of activities, person to whom activities are assigned, assignation parameters, comments/limitations/guidelines, imposed limitations of authority and resources management responsibilities.

*Balanced SCORECARD:* an instrument of measure that uses four present and future performance perspectives (financial, client's, business processes and learning for development), to set the basis for strategic measuring and management. There are other forms (definitions ?) (one of the examples is the use of some types of results, that are specific to business excellence models, instead of the four perspectives mentioned above). They (who?) are used in cascade sequence.

*Benchmarking:* such method involves comparison of an organization products and services characteristic against the acknowledged market leader's similar characteristics, in order to identify improvement opportunities.

*Management of tight places:* a method used to identify tight places within an activity, process or system that have the lowest potential as compared to demand, in order to control the speed of the entire organization/system.

*Brainstorming:* an activity stimulating and encouraging open, free and creative thinking within a team/group. Frequently used as an assisting tool in planning and solving of problems.

*Information sheet:* an established internal information system (digital, on paper or any other support) allowing the dissemination of informative messages, files or any other data that are of general interest rather than to a single individual.

*Business excellence models:* For exemplification reasons reference is made to the Calității Malcolm Baldrige National Quality Prize (MBNQA).

Call centers: specialized centers where over-the-phone operators are offering assistance to requesting customers, according to the organization's objectives.

*Capacity study:* a study aiming to evaluate the statistical variability the natural process using a set of characteristics (Cp, Cpk, Ppc).

*Planning of evaluation and competence improvement:* Specific planning activity aiming at evaluating employees knowledge and identifying ways to support them to expand their competence. Frequently associated with the processes of with periodic personell evaluation and delegation of competence.

*Competence matrix:* a matrix containing one or more of the following items: minimum or maximum workload/field competence/acceptable competence/accepted level of competence.

*Preparation for unforeseeable situations:* planning of actions to be taken in order to manage unexpected situations of events.

*Nonconformities control:* a process of management of noncompliance regarding requirements/laws/standards/rules.

*Corrective action:* process aiming at eliminating nonconformities, defects and/or any other undesirable situation, and preventing its recurrence.

*Avoiding of costs:* control activity that evaluates "bad quality costs" in order to prevent errors; such activity represents an investment for the future.

*Cost/benefit analysis:* an instrument used to analyze and compare the monetary costs of implementing an improvement measure against the monetary value of benefit resulting from the respective improvement.

*Critic path method (CPM):* activity-centered project management technique, using the arrow-chart to present the time and costs needed to product completion. Only one time parameter is used: normal time.

*Target-client groups:* a method of selection of groups sampled out of a wide population, together with open discussions on particular topics or fields, especially used in market research.

*Client relationship management (CRM):* control process regarding an organization knowledge regarding its client's requirements and expectations, and the extent to which such knowledge is used to build on client's satisfaction and loyalty.

*Client satisfaction evaluation and feedback analysis:* An analysis and review process aiming at identifying the client's actual degree of satisfaction with the delivered product or service, based on client's requested feedback.

*Color-code visual communication board:* an instrument used to illustrate critical performance measures. Typically, green signifies that all is right and no action is necessary; yellow signals "attention, action may be necessary"; red stands for "action needed". Such instrument is often used in association with certain indicators to improve meetings efficience.

*Taguchi experiment design (DOE):* statistical method aiming at studying, analyzing and understanding processes and data variability, in order to make possible faster improvement and development.

*Economic value added (EVA):* a financial performance measure used to evaluate an organization's actual real profit. Focused mainly on shareholders wealth: (operational profit after tax) minus (total capital used by capital costs) = economic value added (EVA)

*Electronic data exchange (EDI):* a process of standardized documents forms exchange (between the computerized systems of various companies, or between clients and suppliers) to be used for business. EDI is part of the electronic commerce process where clients are able to directly place orders and the suppliers sends an electronic confirmation (including date of dispatch and the price of order).

*Enterprise resources planning:* A software program that integrates all departments and functions within an organization on one computer platform, able to serve all particular departments need.

*Failure mode and effects analysis (FMEA):* risk priority assignment and corrective action implementation method aiming at decreasing risk.

*First item:* Processes regarding the manufacturing of the first item (or first series of items) during the mass production.

*Flux diagram and process chart:* graphic representation of main stages of processes, product manufacturing or service.

*Help desk:* technical support and assistance service provided by the organization.

*Inter and Intra-net communication:* Electronic information handling through e-mai, World Wide Web, etc.

*Work specification design:* work design activity aiming at increasing employee's performance (i.e. widening work requirements in order to fully exploit employee's skiils and abilities), by means of expanding work variety and allowing a wider individual work autonomy.

*Knowledge management:* a process of converting data into information by means of expanding, storage, remedy and remedy and dissemination of intellectual capital.

*Minimum costs production:* an instrument focusing on reducing production cycle and costs, in order to improve operations. It is a dynamic process based on knowledge and is client-oriented, by which the entire personnel of an organization continuously eliminates loss in order to create value.

*Life Cycle Cost calculation:* Tracking expenses for a period of time from product creation up to the end of its intended lifespan and disposal (see IEC60300-3-3).

*Management by objectives:* method focusing primarily on opportunities for improvement through employee measurable involvement in order to ensure that business targets are effectively met. Management sets the objectives at the highest level that are Specific, Measurable, Appropriate, Realistic and time-defined (SMART). The objectives are cascade-defined and developed through and over all organization levels. Objectives performance analysis is performed regularly in order to ensure progress, performance, and changes necessary to operate/develop new goals and objectives that are appropriate to the changes. Some organizations link performance objectives to the rewards/appreciation system.

*Management review:* a regular activity performed by the highest level management officers in order to determine appropriate actions by assessing the degree of adequacy, efficiency and effectiveness of the organization and its management system (ISO9001: 2008).

*Market research and analysis:* a method based on receiving feedback from customers regarding their satisfaction with the organization's products.

*Material requirement planning:* a method that helps a company by means of detailed production planning.

*Guidance:* this method is based on trusted counselors or professors, especially in predominantly professional foundation.

*Information updating:* periodic publications containing news and notices on several topics. Such updates may circulate information via e-mail or intranet.

*On-the-job training (OJT):* training conducted usually at the workstation or workplace. Typically, the training is done individually or in small groups.

*Open Book Management (OBM):* management activity aiming at opening and making available the organization's financial information to its employees. Organization can also provide employees with guidance for interpreting such information. The objective is to enable employees to better understand their role and impact in the organization.

*Organizational development:* strategic activity aimed at increase the effectiveness of the organization by developing and strengthening strategies and organizational structures and processes.

*Pareto analysis: s*tatistical process outputting a bar chart reflecting throughout highest to lowest levels of frequency. Pareto chart compares the importance of various factors involved in a problem and help identify action priorities.

*Payback period analysis:* analysis of the time required to recover the initial investment of a project.

*Performance assessments:* instrument used to measure progress against the employee performance standards. Meanwhile, feedback is also provided.

*Pie chart:* a circular shaped chart (pie format) which is divided by rays to separate variable proportion; also called a "pie chart".

*Plan, do, check, act (PDCA):* chapter 4 & 5 ISO 9001:2008.

*Calculating the cost of prevention, assessment and non-quality:* This method broadly identifies three categories costs which helps to focus on and analyze their progress on improvement; particularly important for financial and economic benefits.

*Preventive Action:* process of action-taking to eliminate the cause of noncompliances, defects or other undesirable situation, in order to prevent occurrence. This is a pro-active action.

*Approval process of production parts (PPAP):* a process of parts approval required from suppliers by the manufacturers; valid also for sigle-supliers.

*Professional Development:* an employee tool. A plan is conceived together with the employee and its trainer/supervisor, based on employee's needs and objectives harmonizing them with the organization's needs.

*Service quality deployment (QFD):* a method seeking to link product or service design to customer's needs.

*Response to and handling of complaints:* a process of reacting to customer complaints and problems and, at the same time, protecting the market share (ISO 10002).

*Responsibility matrix:* matrix or chart on which are placed most activities and detailed responsibilities of each party involved. Using this tool, all involved are able to clearly see who to contact for each activity.

*Analysis of profit on investment:* investment potential assessment by means of comparing the size/length of gains expected on investment cost [(earnings-cost)/cost] x 100%.

Risk Analysis: an instrument used to identify and control the risks associated to any item, activity, process or system of an organization. Such analysis should ideally be proactive in nature although, unfortunately, serious events may distort the analysis.

*Self-assessment:* a process of analysis based on performance perception; useful when identifying improvement opportunities and possible strong-points, in order to implement best potential practices throughout the organization.

*Servicing Agreement:* an agreement concluded between provider and client, showing what after-sale services will be provided to the customer, at what price and for how long.

*Statistical Process Control (SPC):* using statistical techniques and/or statistical or stochastic control algorithms to meet one or more of the following objectives:

*To increase knowledge about a process:* lead and orient a process to operate in the desired direction. Reduce variance of the final product parameters, or improve a process performance in other ways (ISO / TR 10017 and ISO 11462 -1).

*Strategic planning:* vision, mission, purpose and place in the market. Frequently using SWOT analysis (Strengths, Weaknesses, Opportunities, Threats). Last iteration of strategic planning is expressed as an open community where the organization continuously updating its strategic thinking.

*Strengths, Weaknesses, Opportunities, Threats (SWOT):* the process of identifying an organization's strengths, concomitantly with external opportunities and threats (often illustrated in a chart).

*Career planning:* planning, training and mentoring of potential successors to replace actual position holders within an organization.

*Suggestion Program:* a program of gathering and centralising individual employees suggestions for improving work.

*Supplier Performance assessments:* an instrument used to measure the performance of suppliers (products organization) against expectations.

*Hierarchical list of suppliers:* list which places suppliers of goods and services in order of priority, the character immediately, added value or other criteria.

*Supply Base Management;* the monitoring and evaluation of the quality and performance of materials and the respective suppliers regarding waste disposal, quality problems eradication and manufacturing process continuity.

*Building of teams:* a practice of selecting and motivate a group of individuals to working together to achieve a specific purpose and performance goals.

*Theory of Constraints (TOC):* techniques and tools used to identify and eliminate tight spots in a process. It offers guidance on why system constraints happen and what they should be done about it.

*Trend analysis:* data analysis performed in order to identify a trend or a direction in time.

*Trending graphs:* an illustrative representation of time-related data to identify a trend or direction.

## 4. ANALYSES

All these methods can be grouped according to the line direction. by wich an organizations is able to ensure a robust system. The guide lines are three : inssurance the management system, providing a robust manufacturing and providing a

Insurrance the management system: *System Audit*, *Activity-based cost calculation,Activity based management* , *Evaluation* , *Benchmarking*, *Brainstorming Planning of evaluation and competence improvement*, *Competence matrix*, *Corrective action*, *Cost/benefit analysis*, *Target-client groups*, *Economic value added* , *Management review*, *Market research and analysis*, *Open Book Management* , *Organizational development*, *Plan, do, check, act (PDCA*, *Responsibility matrix*, *Analysis of profit on investment*, Risk Analysis, *Self-assessment*, *Suggestion Program.*

Providing a robust manufacturing process: *Process auditing*, *Benchmarking*, *Management of tight places*, *Brainstorming*, *Information sheet*, *Capacity study*, *Planning of evaluation and competence improvement*, *Preparation for unforeseeable situations*, *Corrective action*, *Critic path method*, *First item*, *Flux diagram and process chart*, *Help desk*, *Inter and Intra-net communication*, *Knowledge management*, *Life, Cycle Cost calculation*, *On-the-job training* , *Pareto analysis*, *Payback period analysis Performance assessments*, *Approval process of production parts (PPAP)*, *Professional Development*, *Service quality deployment* , *Response to and handling of complaints*, Risk Analysis, *Self-assessment*, *Statistical Process Control (SPC*, *Strengths, Weaknesses, Opportunities, Threats (SWOT*, *Supplier Performance assessments Supply Base Management*, *Trend analysis*, *Building of teams.*

Robust product: *Product audit*, *Special audit*, *Information sheet*, *Corrective action*, *Client satisfaction evaluation and feedback analysis*, *Color-code visual communication board*, *Taguchi experiment design (DOE*, *Electronic data exchange*
Failure mode and effects analysis (FMEA, On-the-job training, Approval process of production parts (PPAP, Response to and handling of complaints.

To select a method or combination of method depend on the field the structure of the culture of the organization an resources are used.

## 5. Conclusions

Competitiveness will increase if firms operate in a branch that has a great potential for profit and if resources are used properly to implement the most appropriate strategy.

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