Competivity and management activities in die production systems

Mariana Cristina Răşină, University of Braşov, Romania

Abstract

Currently for a production system to act on a global market must have a policy-oriented performance management to increase competitiveness. Performance management should be focused on improved performance by operating rules and principles, techniques, operating methods and tools for improving business performance. To track progress of production, performances should be a system of indicators, well made and systematically followed up.

Keywords

Production system, competitivenees,management activity, measurement indicators, obiectives, waste, aidded value.

JEL Codes: M 11

General management and bussines competitiveness for die making production systems

The mold making production systems competitiveness and competitiveness of any production systems, are measured on the same way, as measuring each departments activities competitivness.
Some activities are more important than others, depending on the activity of the production system and in this way the important departments have a greater role.
Organizing the production systems that made casting and forging molds, organizing the supply, production, delivery, business activities and how it intervenes with the concept of sustainable development in business activities can make the production system competitive, or the contrary.
Competitiveness of a production system is influenced by the applied management policy, the adopted management style and managerial skills of managers at all levels.
The management activity has a center mission, the management of production system. Depending on the type of mission, the objectives, strategies and policies are established according to it. All are made with instructions, rules and programs.

Die production systems charachteristics for an competitivenees production system

It is very important how the management objectives are set, if is it taken into account when is set and where the production system will be by setting those objectives. The objectives of production systems have to be SMART[1]:

- Specific: clear about what, where, when and how the situation will be changed;
- Measurable: the ability to quantify the targets and benefits;

[1] www.scn.org

- Attainable: capacity to achieve the objectives (knowing the resources and capabilities available to the production system);
- Realistic: the ability to get the change reflected in the objective;
- Time bound: determining the time period during which each objective will be achieved.

To be satisfied that objectives need to be:

- communicated to every level of the production system. Management need to ensure that each person understands his the role in achieving the objectives;
- systematically tracked through indicators and then centralized in a database.

After achieving all shown above, an action plan should fix or at least decrease the problems. The measures from the action plan should be pursued until the objectives are achieved, and then the actions should be maintained. There must be guided by the PDCA principles[2] .
A central role in achieving the targets has the time management, usage of the know-how at every level and the amount of money. To overall regularly all activities that may lead to the achievements, relevant indicators need to be established. Depending on objectives, the indicators for a system that produces molds are: turnover, profit, cost, percentage of turnover spent on research - development.
To choose which aims are increasing the competitiveness, must known the current status of the production system. This requires conducting. These tests take as the flow of material and information.

Increase of competitiveness through calue diagram and production management

Material flow analysis is a value analysis which purpose is to achieve value stream map. By this analysis the goal is to obtain an overall picture of all processes from raw material to delivery to customer.
It begins with the realization of current map then is improved the achievement chart and finally determine the action plan. Before starting to analyze and draw the current diagram values, it is necessary to choos the representative family product. This matrix product must be made - a process.
The product family is identified by using ABC analysis (Pareto), but will take into account the value of the total budget. Chart analysis and performance necessary to start with the customer and the customer's perspective and take account of the steps exactly its product through the production process.
For representation are used the standardized symbols. As result of the analyze is the production flow, the added value, waste, time that mold crossing through production, cycle time or better said, the proportion / disproportion between them.
Information flow analysis can be done by the "Swimlane – swimming line. By this analysis it can be seen how are the all functions of a production system, which roles and which documents are needed for each stage. Following this analysis can reduce the documents, you can see and remove activities "backed" by some departments may be achieved at all stages / activities.
Production process directly affects both the competitiveness of production and product competitiveness.
Competitiveness of the production system is influenced by transition during production. For greater competitiveness, it is desirable to pass production for a short time. Short time of passage through the production is achieved by reducing all forms of waste in the process. In

[2] www.hci.com.au

any production system are forms of waste that can be removed, but there are not forms of waste which can`t be eliminated, can only decrease.
To see what types of waste is essential to have the process diagrams. These diagrams are looking like – one axis passing the time, the time duration equivalent to completion of each activity. Then work directly involved in product realization turns green (Andon principle) and the activity that generates waste turns red (Andon principle). Actions needed to be taken from this analysis are focused on the reduction of the red actions.
Decreased passage time through production has positive effects on customer tact. The customer tact is the customer wishes during matrix. A production system is competitive when the tact is respected.
Product competitiveness, in this case the mold one, is influenced by cost, quality and deadlines. The mold cost must be lower than what the competitors are offering, but to reflect the actual value of the product. From this point, the competitiveness of the production process is reflected by the value added product.
Value added steps in the process are those which raise the value of the product to the customer (see Figure 1.). Forms of waste only raises costs, don`t produce any value. In current market conditions, the customer is willing to pay only what adds value, the system pays the waste. Examples of types of waste and value added production process can be found in Figure 2.

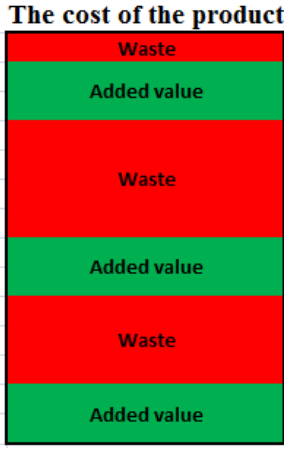

Figure 1. Activities that bring value and of non-value to the mold

Aidded value	Waste
Heat treatment	Change tool
Milling Operation	The introduction of machine work program
Turning Operation	Interoperable movement of half-finish
Grinding Operation	Fixing part on device
Roughing Operation	Equipment "breakdown"
Drilling Operation	Inadequate qualifications of employees

Figure 2. Examples of activities that bring value to the mold and examples of forms of waste in the production process in a production system that produces molds.

All these forms of waste can be more easily observed and waste reductions can be achieved in a shorter time, if the principle which underlies the production process is clean, in good order and discipline. In this case the method is 5S[3].
It is necessary that production activities should be continuously measured and monitory. Measuring manufacturing activity can be done through indicators such as: overall equipment effectiveness (OEE), maintenance response time, the frequency of failure, the cost of production, parts per million (PPM), the quantity produced, the production to customer takt, productivity[4].
All these makes the manufacturing process, whether or not a competitive process.

Management of technic activity

For systems producing molds, the technical work also has an important role in defining the system competitiveness. This work is the first which are offering a feedback to the customer. Designers are those who draw the product required by the customers and can tell if the current production facilities can or cannot perform mold on the takt required by the customer.
A short time in which production system can provides a response to customer demand, has an important role in a competitive system. Providing a response in a short time depends also by which software is used. For example, a fast response is made by the designers using drawing programs and simulation programs. For these programs the production system pays the licenses and this cost is recovered in the final price of the mold. But if the system don`t uses an appropriate software (program), the customer response may come too late, which could lead to customer loss.

Management of logitic activity

The role of logistics extends from suppliers to customers and is a support for production activities. Logistics activities are decisive through production system cost competitiveness.
Results / accreditation of the most suitable suppliers (cost, quality, time) for the production purpose is finally to optimized the network of providers, which can bring significant savings to a competitive system and implies the product through a lower cost. The same is happening with the transport activity of molds to customers.
Logistics activities can influence the product cost and safety stocks dimensioning the ancillary materials. For a production system which has the object of obtaining a molds is indicate that to have no materials in stocks because molds have vary dimensions depending on the product that is desired to obtain. But to have a continuous production flow without interruption, there should be a limited stock of ancillary materials. Raw materials will be ordered only when the production system receives a firm offer from the customer. The role of logistics is to find suppliers that deliver everything necessary, when is necessary, in place and in the required quality. The logistic activities are reflected on the manufacturing activities by providing materials required for production in time and when is required.
The logistics activities can be analyzed in terms of:

- quality: the absence of defects and nonconformities;
- deliveries: time to short deliveries are complete and to decrease delays;

[3] www.graphicproducts.com
[4] www.investopedia.com

- cost: to obtain minimum quantities of stocks at current production and auxiliary materials, zero stocks for raw materials, to have no lack of materials, to work continuue / linear flows, no waiting times and everything is based on a flexible management.

Indicators: On time deliveries, reliability of deliveries, changes in safety stock, safety stock level, was saving in material cost, number of rejects due to defective material, cost of purchased materials, number of suppliers[4].

Process and product quality management

Quality is reflected in the work of any departments / services and is divided in quality and process quality. Quality of processes is the quality of any activity of the production system and includes:

1. Product design and quality compliance. Principles that therefore may reduce the occurrence of errors and can improve the quality of the product:
   - minimizing the number of components used;
   - use of common components;
   - using standard components.
2. Quality compliance and designed processes through methods such as Poka Yoke, Taguchi method, design and ergonomics of work places, organizing the workplace and empower employees[5];
3. Manufacturing operations and compliance of quality: quality of inputs are provided by the system, the level of staff and it`s training, monitoring, testing the response of production system from quality point of view.

Product quality does not necessarily refer to the best mold, ie the mold made from the most expensive materials, the newest machines, the newest methods, etc., but refers to the fact that molds should be able to incorporate all properties to meet the needs of users at the lowest production cost and on the quality required by the customer.

Activities are conducted by the department as PDCA cycle (Plan, Do, Check, Act). The Plan is the quality management function, determining quality objectives, resources needed to achieve them and the conditions referring how to apply the quality system elements.

Quality planning refers to:

- planning the product realization,which presume identification, classification and determination of the importance of quality characteristics and setting goals, conditions and constraints on quality;
- management and operational planning, consisting in which preparations to be made to implement the quality system, including organization and planning;
- establish quality plans and measures for quality improvement;

The Quality Plan is the document that specifies practices, resources and sequence specific to quality activities relevant to a product, project or contract.

The process of Quality planning include the following steps: quality diagnosis, forward planning, establishing basic quality objectives, determining resource requirements, establish actions to be undertaken by the Quality Strategic Plan.

The second phase is “Do", means activities undertaken by the quality department to ensure the quality. In this phase:

- Poka Yoke devices are designed and made (error identification / failure identification) for Poka Yoke production programs for department activities / services;
- to plan and implement Andon signaling problems;

[5] Militaru, G. (2008), *Managementul producţiei şi al operaţiunilor*, Editura All, Bucureşti, pp. 95-113

- is processes standardizing (Standards exist to answer the questions?, Is it the current standard?, Do everybody knew all the standard?; Works are done according to standards?);

At phase "Check" the checks are done. For this stage works are done with tools such as:

- data collection sheets;
- graphs;
- histograms;
- control charts.

All these data are analyzed through the Pareto chart (for mistakes) Ishikava chart, and FMEA 5W. Monitoring work is done through process audits, products are controlled by controllers and raw materials and supplies are made by controlling the Reception / reliable suppliers.
Following the analysis performed and results obtained follows an action plan will be implemented in the fourth phase "Ackt. This plan usually includes cost reduction measures by waste reduction, measures to reduce the number of complaints, training / training of employees.
The most used quality measurement indicators are the cost of scrap, the number of complaints, number of rejects, the cost of rework.

Conclusions

Any of the activities described above if has a inappropriate management may adversely affect the competitiveness of molds production.
For any production system to know where they are going to it should have clearly defined objectives. Each objective must be SMART and communicated to all employees. Is necessary, before the neede action to achieve objectives are determined, the management to ensure that each employee understood correctly what are the objectives.
After the objectives are communicated an action plan should be carried out (which contain completion dates and responsible).
Competitiveness of production system is found in every production activities, on every product made and each process.
To see what the results are, indicators should be measured for each activity, product or process. By these indicators it will be seen the competitiveness development and by variables which are creating the indicators. Those can act to increase competitiveness by improving the business.

Bibliography

1. Militaru, G. (2008), *Managementul producţiei şi al operaţiunilor*, Ed. All, Bucureşti, pp. 95-113
2. www.scn.org
3. www.hci.com.au
4. www.graphicproducts.com
5. www.investopedia.com