Development of a Performance Evaluation System[1] Applied to a Textile Manufacturing Company

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May, 2005

Abstract. Enterprises global competitiveness is, nowadays, directly related to the trinome Productivity, Quality and Innovation. These topics have been extensively developed and studied in several fields from technology, information systems, layouts, distribution channels, logistics, etc. Thus, the constant attempt to optimise the trinome leads to numerous models and management tools development. However, one of the main vectors to create enterprise differentiation is the human resource asset.

This research project intends to contribute to upgrade human resources to the level of the other enterprise systems. Therefore, a performance evaluation system was developed, based solely in objective criteria. These allow the enterprise collaborators to experience a healthy competition between each other, under fair, clear and recognised criteria, by all.

The strategic objectives of the company have to be breakdown into section objectives, and these suffer a further breakdown to suit them to individual objectives, supported by individual productivity, quality and innovation criteria.

This research intends to disseminate the objectives to every collaborator, and allow the enterprise global objectives to be attained by adequate and measurable individual contributions.

Keywords: Performance Management; Performance Evaluation System; Human Resources Management

[1] Based on the first author undergoing M.Sc. thesis research project.

1. Introduction

Nowadays, organizations have some intrinsic factors that condition its subsistence, growth and competitiveness. The technical know-how associated with each activity is no longer a differentiator factor since the perfect knowledge of the "modus operandi" of each function is a minimal condition to guarantee their existence.

The differentiator factors between organizations lie down on other complementary areas, besides the production technique. In our opinion, these competitiveness factors are:

- Quality
- Productivity
- Information and Communication Systems
- Health and Safety
- Environment
- Costing Systems
- Marketing
- Commercial Policies
- Innovation

However, there is a support area which, in the limit, even if all the previous factors coexisted, could cause the organization to run serious survival risks. We refer, of course, to the human resources area. It is of general knowledge that it is not possible to have a healthful organization if we don’t have motivated teams, lined up with the goals of the organization. In many cases, the causes of the organizations being unable to reach the desired level of involvement and motivation of its collaborators are:

1. Communication problems inside departments and between different departments: despite of the normal existent communication between department heads and sub-department responsible, the channels used may not be systematic, what originates inefficiency. Many times, the communication between intermediate chiefs and operators is incomplete because of the lack of knowledge of specific functions and responsibilities. This may generate relational or operational problems.
2. Lack of well defined and fair criteria to classify/distinguish collaborators at all levels of the organization.
3. Centralized Decision Making: the top management tends to centralize in excess the decision process. The culture of responsibility delegation to all hierarchical levels is still not widely spread. This situation leads to an excessive workload of the major responsible, and the lack of involvement of other personnel, with negative consequences in productivity.
4. Lack of Knowledge and Definition of Process Goals: although some companies have outlined and are aware of their strategic goals, these are not unfolded and monitorized by processes/sections. This problem makes it difficult to measure the individual

involvement and contribution. Control and definition of corrective measures is more difficult, and compromises global and strategic goals.

This is the context where this project is being implemented. The organization studied is in the apparel textile sub sector. It has 150 workers. The project is focused in developing a system of performance evaluation, with objective criteria.

2. Objectives

We intend to develop a Performance Evaluation System taking into account our own experience with Portuguese textile companies management systems, with the background of several bibliographic references listed in the Bibliography section (from [1] till [12]).

With this system we intend to reach the following results:

- At the Human Resources Management level:
  - Widening the participation and decision making process, for the fulfilment of goals;
  - Delegation of functions and responsibilities as an element of generalized involvement, promoting the individual and team work;
  - Information share and communication effectiveness improvement;
  - Definition of process goals, for all collaborators, based on the strategic global goals;
  - Systems, elements and data integration for the construction of an evaluation system of individual performance that distinguishes recognizes and involves all the collaborators.
- At the Structural Organizational Level of the Working Procedures:
  - Creating a system of individual performance evaluation;
  - Unfolding of the strategic and global goals into section goals;
  - Creation and dissemination of techniques, technologies and methodologies of communication and information exchange.

With the introduction of the different measures at the human resources level, organizational structure and work processes management, it is desired to increase the involvement of all the collaborators. We expect to involve collaborators of lower hierarchic levels, making them also responsible for the direction the company takes. On the other hand, we expect that the definition and implementation of more efficient ways of communication, allows a wider involvement of everybody, lower inefficiency on the processes, more celerity, a reduction of quality problems and an increase of the productivity. The cost control system per activity will allow controlling wastefulness, and the collaborators involved will be responsible and aware of their direct contribution to the company development and competitiveness. With all these measures implemented it will be possible to distinguish and to award the collaborators with higher contribution to the development of the company. The integration of these additional data with already existing one will allow developing the Individual Performance Evaluation System. This system will be extremely useful, because it will increase motivation,

involvement, responsibility, and it will enable a healthful competition, with objective rules for the human resources management. With the implementation and dinamization of this project we believe that the competitiveness of the company will be strengthened.

3. The Model

3.1. The Company

The Company where this pilot research is being conducted belongs to a very specialised market segment, within a very high competitive environment.

The Company is a technical sports garments manufacturer, with close connections to world known brands (Adidas, Nike, Puma, etc....). On the other hand it possesses its own brand directed to a special market niche which does not compete with the other brands clients (neoprene suits for nautical sports). Both segments have in common the permanent need for materials innovation coupled with the fashion needs. After years of constant processes and methodologies improvement the company still faces constant problems which no longer should co-exist with the tough and rigorous needs for high productivity levels and competitive frontiers. To list only a few of them: collaborators unable to make autonomous decisions; high rework levels; generalised lack of knowledge of the company objectives; manufacturing process too long (time); over production costs; production bottlenecks; deficit in product quality.

This Company is a small or medium enterprise. It employs 130 workers, subdivided into several sections: Administrative and Financial, Commercial, Raw Materials, Informatics, Design, Quality Control Laboratory, CAD, Quality Environment and Health and Safety, Warehouses, Cut, Apparel, Finishing, Packing.

This project is centred in the Apparel Section, which accounts to 35% (45 people) of the company collaborators. It is organised in 2 production cells and 1 production line. Thus, there are 3 group leaders and 1 section leader.

3.2. The Team

For the definition of the model a multidisciplinary team was set up, in order that each level of need and knowledge was brought up to the discussion around the model construction. Thus, besides the analysts, the company personnel involved has been:

- One Member of the Board of Directors
- The Financial and Administrative Director
- The Informatics team
- The Quality, Environment and Health and Safety Director
- The Production Director
- The Quality Controller
- The Technical Leader (or Chief Responsible)
- The Apparel Leader (or Chief Responsible)
- The Production Lines Leaders

This team meets weekly, with the objective of adjusting the model to each one needs. In the implementation phase, all the Apparel section collaborators were involved (grouped in their working teams), in order to obtain their opinions and feedback, contributing to the involvement and responsibility of everybody in the pursuit of the common objective.

3.3. Model Description

3.3.1. Introduction

The proposed model is presently at the validation stage. It operates at three levels in the analysis process. It will collect, treat and analyze data according to the following three vectors:

1. Productivity
2. Quality
3. Innovation

Thus, in the apparel section, mechanisms or devices have to be created for gathering and treating those data for three hierarchical levels:

- Operators (in our case Sewers)
- Group Leaders (Production Line or Group Leaders)
- Section Leader (Apparel Leaders)

3.3.2. Selected indicators

The selected indicators can be seen in table 1, and are explained bellow.

Table 1 - The Model Indicators

	Productivity Indicators				
	Performance	**Activity**	**Absenteeism**	**Punctuality**	**Extra Availability**
Operators	X	X	X	X	X
Group Leaders	X	X	X	X	X
Section Leaders	X	X	X	X	X

	Quality Indicators				**Innovation Indicators**
	Checklist	**Rework**	**Devolutions**	**Complaints**	**Innovation**
Operators	X				X
Group Leaders	X	X	X	X	X
Section Leaders	X	X	X	X	X

Productivity Indicators

- Performance: (standard time x nº of operations) / (total time - interruptions time).
- Activity: (standard time x nº of operations) / (total time - production interruptions time).
- Absenteeism: absence from work.
- Punctuality: late arrivals at work.
- Extra Availability (extra time): extra hours given.

Quality Indicators

- Checklist to be verified randomly in surprise audits: it will verify, in place, the fulfillment of enforced rules which are defined in the Quality and Environment Management System and in the Health and Safety System rules.
- Rework: % of rework in the group due to quality problems internally detected.
- Devolutions: Client devolutions due to quality problems attributed to the group.
- Complaints: Client Complaints due to quality problems attributed to the group.

Innovation Indicators

- Innovative ideas for products or processes: in order to favor new products or processes development, or to solve problems.

3.3.3. Merit and demerit indicators

The above indicators have two types, merit and demerit indicators. The demerit indicators subtract punctuation because they measure the unfulfillment of enforced rules or working procedures; the merit indicators add punctuation to the performance evaluation since they are extra items valued, without relating to enforced rules or procedures.

The proposed merit and demerit indicators are listed below.

Demerit Indicators

- Performance
- Activity
- Absence
- Punctuality
- Rework / Devolutions / Complaints
- Checklist

Merit Indicators

- Extra time
- Innovation

3.3.4. Indicators Selection

The indicators were selected through brainstorming sections where all the groups involved in the evaluation were represented. The selection comprised a detailed analysis of the objectives and the consequences of each tentative indicator, always having in mind fairness and objectivity principles. In fact, the first condition required for an indicator to be selected was that it would be measurable and thus objective. Other aspects taken into consideration were specific characteristics of the collaborators, namely cultural and social issues related to the region and the Country, as well as the industrial sub sector where the company operates. We, thus, believe that the indicators system developed can contribute as a methodology to be discussed, adapted and extended even to another industrial environment.

3.3.5. Data collection

At the level of gathering data and attributing criteria, the indicators are:

- Performance (P) and Activity (A) (individual and group) obtained through PMS (Performance Measurement System). For the operators these indicators will be weighted differently, 60% for the Performance and 40% for the Activity. In the case of group leaders and section leaders the activity will be valued at a 100%.
- Absence (AB) obtained from the Time Attendance System (weighted real working time/monthly working time).
- Punctuality (PT) obtained from the Time Attendance System with a 0 min tolerance (weighted by late days/monthly working days). With this indicator each collaborator will get 1% reduction for each delay.
- Extra Time (ET): it will be the overtime (hrs) worked by the collaborator in a period divided by the maximum overtime allowed (40 hours). This indicator will be weighted by 10%.
- Devolutions (D) and Complaints (C) (by client): it will have the total punctuation in case there is no reported defect or complaint in the period. Each devolution will award a penalty of 2% and each complaint 1%.
- Rework(R): it will be obtained from PMS. Until 12%[2] it will have no discount. Above this value it will get a linear penalty, proportional to the rework increase.
- Checklist (CL): it will be divided into two levels (level 2 - maximum importance and level 1 - important). In the summation (trimester) per person the criterion will be to deduct 2% for each no-conformity level 2 and 1% for each no-conformity level 1.
- Innovation (I). It will have 5% in the case any idea occurs that is implemented. If it is not implemented it will have 1% of the *Index*. If no idea occurs it will have 0 *Index*. This is a monthly evaluation, and it does not accumulate ideas all along a month.

[2] This is a value determined by the Quality Department.

After this explanation, we will present the formulas used to get the performance evaluation:

- Operators

$$\boxed{(P \times 0{,}6 + A \times 0{,}4) \times (1 - AB) - \sum PT \times 0{,}05 - \sum \mathrm{CL}_2 \times 0{,}02 + \sum \mathrm{CL}_1 \times 0{,}01 + \mathrm{ET} \times 0{,}1 + \mathrm{I}}$$

- Group Leaders and Section Leader

$$\boxed{\mathrm{A} \times (1 - \mathrm{AB}) - \sum \mathrm{PT} \times 0{,}05 - \mathrm{R} - \sum \mathrm{D} \times 0{,}02 - \sum \mathrm{C} \times 0{,}01 - \sum \mathrm{CL}_2 \times 0{,}02 + \sum \mathrm{CL}_1 \times 0{,}01 + \mathrm{ET} \times 0{,}1 + \mathrm{I}}$$

4. Results or Modifications Expected in the Human Resources Management

After the implementation of this Project, we foresee the following modifications:

- Any collaborator will know which is his responsibility and contribution for the development of the Company.
- Any collaborator will be aware of wastefulness costs.
- All collaborators will feel that each one's work is important for the development of the organization.
- All the collaborators will have their work recognized in the performance evaluation and/or have diagnosed measures to improve it.

The communication system (to be created) will involve and make all responsible. Sentences like *I don't know*, *I didn't say that* or *I didn't hear* will cease. Thus we expect a bigger involvement and responsibility of all, with direct consequences in the quality, productivity, image and therefore competitiveness of the company, with everyone feeling more satisfaction and motivation.

At the present test stage, the use of the reported model is already showing good results: the non-productive interruptions that accounted for 9,33% in 2003 were reduced to 6,73% in 2004. We believe that the workforce is more conscious of the need to avoid time waste. On the other hand the productive interruptions improved from 22,1% in 2003 to 15,46% in 2004, due to the efforts towards higher and better production planning and control. Absenteeism, which accounts to around 10%, nowadays, is expected to drop by 2% in one year. Punctuality, rules fulfilment and innovation monitorisation is being introduced at the moment. The results expected are the collaborators participation and involvement increase. It is also expected that the rework, complaints and devolutions will drop due to the fulfilment of the quality rules and everybody's participation and motivation.

5. Conclusions and Further Work

At the present time this study is not yet conclusive. However, it already presents a tendency for success due to the project team's involvement. After obtaining results from the pilot section under study we expect to analyse them and introduce changes and improvements, if needed. Then, the system will be applied to other productive and non-productive sections of the company, adapting the trinomial *Productivity, Quality and Innovation* to each situation.

Several tools, ranging from statistics to team work, generation of ideas and case studies, will be naturally applied so that each person and each section will be able to improve their performance.

This tool requires computer support either for data collection but also for data treatment and the model implementation. However, it does not mean that it cannot be applied in organizations which do not have a computerised communication system. Some degree of adaptation will be needed.

In the future we intend to apply the final model to other companies in the same sector, but also to different industrial sectors.

This new model intends to gather the collaborators within the reality and aims of each organisation, favouring the team spirit with common objectives and developing a healthy competition between each individual and the others, introducing fair, objective and clear criteria.

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