Achieving Excellence Through 5-S - A Case Experience

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ABSTRACT
In order to achieve good results in Quality Management (QM) implementation, a global and integrated QM model need to be designed ad-hoc for each particular organisation, aligned with the organisation's strategy and sustained in its technical, cultural and organisational strengths to give response to its weaknesses and improvement areas. The objectives of this paper are to highlight different critical factors for an effective QM implementation and to present 5-S as an appropriate tool to help organisations to involve and motivate all employees in Continuous Improvement (CI), including shop floor personnel, but also as a tool to separate untidiness and disorder from the inherent chaos of change processes. The paper is supported by a case experience of a company awarded with the European Quality Prize and evidences that QM helps organisations to achieve excellent quantitative and qualitative results.
Keywords: Apoptosis, Cellular Implementation, Complexity, Continuous Improvement, Co-operative Leadership, 5-S, Microsystems. Quality Management, Top Management Commitment.

1.0. Introduction: 5-S practice, a friendly tool for Continuous Improvement

5-S practice is a methodology used to achieve and maintain quality environment in an organisation, practised in Japan for a long time. Its name stands for five Japanese words: *Seiri, Seiton, Seiso, Seiketsu, Shitsuke* [Osada, 1991; Ho, 1997], whose English and Spanish equivalents and their meaning are shown in Table 1.

Japanese	*English*	*Spanish*	*Meaning*
Seiri	Structurise	**Sentido de la Organización**/ Organización	Separate the things that are necessary from those that are not, and keep the number of unnecessary ones as low as possible (Organisation)
Seiton	Systematise	**Sentido del Orden**/ Orden	Efficiency; things must be kept in appropriate places, which make them ready to use when needed (Neatness)
Seiso	Sanitise	**Sentido de la Limpieza**/ Limpieza	Cleanliness; stresses the importance of keeping the workplace clean (Cleaning)
Seiketsu	Standardise	**Sentido del Hábito**/ Estandarización	Visual Management to continually maintain organisation, neatness and cleanliness (Standardisation)
Shitsuke	Self-discipline	**Sentido de la Disciplina**/ Disciplina	Instilling the ability to do things the way they are supposed to be done (Discipline)

Table 1: English equivalent of Japanese 5-S words and their meaning

Most Japanese consider 5-S useful not just for improving physical environment, but for improving thinking process as well [Ho, 1999; Sui-Pheng & Khoo, 2001]. In this context, the stratification management, visual management, habit and discipline management proposed by 5-S methodology can be considered modulators and drivers of the spheres of perceptive processes, feeling processes, cognitive processes, and executive processes [López-Fresno, Fernández-González, 2004]. 5-S drive the necessary cognitive-behavioural process for the continuous adaptive process between change and keep identity. Through 5-S the individuals rebuild their own workplace, which makes them able to see changes occur, observe and reflect, and through their own actions they can adapt new mental models for how things should be done.

So 5-S should not only be focused as a technique to improve quality environment, but also as a philosophy, a set of principles that can help to focus, analyse and manages any aspect, task or problem both in the individual and in the organizational context. From this consideration we can introduce the criteria that 5-S is a tool to separate untidiness and disorder from the inherent chaos of change processes. 5-S constitute a universal and transcultural piece, applicable also to the Occidental society, including the Mediterranean one.

2.0. The Model

A global and integrated QM model needs to be designed ad-hoc for each particular organisation, aligned with the organisation's strategy and sustained in its technical, cultural and organisational strengths, to give response to its weaknesses and improvement areas.
The criteria we propose for its design and implementation [López-Fresno, Fernández-González, 1999, 2004, 2005] are based in the principles of:

- *Complexity:* organisations seen as dynamical adaptive complex systems [Battram, 2001]. As relevant for the behaviour of the system as a whole, we must put emphasis in the analysis of its functional structure, identifying the interconnection and interrelation between its parts or components (cells or microsystems), to detach untidiness and to understand chaos. That is, identifying non linear answers in the continuous process between change and keep identity. Soft aspects have great relevance, in particular those ones related to information, communication and culture.
- *Cellular implementation:* viewing the organisations as a set (system) of units and processes (cells or microsystems), autonomous but interdependent. This criterion allows the gradual implementation of Quality Management (QM) projects, starting with those units/processes that comply with the minimum requirements to generate a cascade effect in other parts of the organisation. A global model need to be designed covering the whole organisation with an integrated point of view, although its implementation should be carried out adopting a Cellular Implementation criteria [López-Fresno, Fdez.-Glez, 1999] in order to guarantee success.
- *Reflexive organizations:* with quite high frequency we find organizations that do not ask themselves "why things happen". They are organizations that seem to live, as defined by Schopenhauer [1788-1860], in a "world of perceptions". By analogy we can denominate these organizations as "perceptive organizations". These organizations think with a short and fragile bridge of anticipation that carries them from one experience to another. They are organizations "quasi-linear" that fit in the model: Demand ⇒ Detection ⇒Decision ⇒ Production ⇒ Offer. They survive because they adapt their behaviors to the environment, but in a hyper-competitive world they show their weaknesses. They try to adopt the quality systems because it is "politically correct", but any new incorporation unleash in them a difficult adaptive process, not always efficient neither effective. We propose a model of Reflexive Organization (RO) based in the concept and category of "Why?", in which the concepts of Complexity and Learning [Senge, 1992; Battram, 2001] are considered.
- *Top Management commitment:* Commitment versus consent. Top Management must provide the appropriate leadership in demonstrating its commitment, must foster a culture commensurate with the organisation's vision and mission and must provide necessary funds to implement the QM program [Laszlo, 1999]. Top management commitment is crucial to guarantee a successful implementation of the QM program.
- *Adhocratic organisation (personnel implication):* using cross-functional teamwork. Employees can be strong allies or formidable opponents for change, depending on whether change is motivated by what they see as beneficial or detrimental to the execution of their responsibilities [Peters, 1997]. As Creech [1995] pointed out, "an organisation not only has a head, it also has a heart" and the size of the heart depends upon the size of employee commitment to its ideals and goals. Lack of employee involvement usually comes from: i) the employees do not understand the project: what is it about, which are the benefits for them and for the organisation; ii) unclear definition of roles and responsibilities: how their work will be affected, how they will contribute to design and implement the project; iii) lack of communication; iv) lack of commitment from top management and lack of resources [López-Fresno, Fernández-González, 2000; Laszlo, 1999].
  The way the project is focused and communicated ("sold") to the employees has great relevance. There is a need for using methodologies easily understandable, that involve all employees in an easy way and allow the recognition of the efforts made. 5-S is as a natural way of starting up and sustaining implementation of a QM program, in order to create an adequate culture and mainly to involve all personnel in Continuous Improvement (CI) [Imai, 1997; Ho, 1999; Sui Pheng & Khoo, 2001; Ljuström, 2005]. According to Ljungström (2005) and the experience of the authors, the main advantages of using 5-S are: i) it's simplicity; ii) It's usable directly in daily work; iii) involves all personnel; iv) creates fast results; v) requires only small structural changes; vi) promotes team work and co-operative leadership.
- *Co-operative leadership:* achievement of an adequate leadership and assertive behaviours at all levels of the organisation, starting from Top Management. Leadership should be deployed top down to all levels of organisation.

- *Apoptosis:* Identification and management of critical indicators and attributes (apoptotic signals) to prevent fatal entropy of units or processes. As a result, some components (processes, units, departments, etc.) could loose relevance and disappear in benefit of the overall project.

3.0. Case study

3.1. Introduction

Microdeco is a medium-sized company, founded in 1963 in the Basc Country – Spain with private capital from three partners. It's work involves bar-turning and cutting of small-diameter precision parts, (maximum 32 mm). It's customers are recognised companies mainly from the automotive industry (80%) and from the household appliances industry, leaders in their speciality and who head the manufacture of technical parts and use cutting-edge technology. Microdeco exports 56% of its production.
In 1986 the increasing requirements from customers, especially from the automotive sector, forced the company to introduce a QM focus, as the way to be able to survive in the market. It was, together with the posterior introduction of the ISO 9002, the root of an interesting journey searching for improvement that was rewarded with the European Quality Prize in 2003. As related below, the selection of the appropriate model and tools helped the company not just to survive in the market, but to highly increase competitiveness in a sustainable way.

3.2. The journey to Excellence

The journey of Microdeco to Excellence was initiated in 1995, just after a visit to Ubisa, one of the Spanish companies awarded by the EFQM with the European Quality Prize, in 1992. At that moment Microdeco had 40 employees. Totally convinced by the benefits to apply a TQM focus, and specially delighted with 5-S methodology, the General Director made the decision to follow what he had saw at Ubisa, and appointed a Total Quality Director to help him to lead and manage the change. Top Management received deep training in TQM and the knowledge acquired was cascaded to the rest of the organisation. Table 2 highlights the main milestones of Microdeco's journey to Excellence.

Year	*Milestones – cultural change*
SET UP BASIS	
1995	Visit to UBISA. Training in TQM. First self assessment following EFQM Model criteria.
1996	Mission statement. Training for the deployment of objectives. Training policy. Internal communication model. Starting the implementation of 5-S in two areas of the shop floor.
1997	Second self assessment according to EFQM Model. First deployment of objectives for 1998. 5-S implementation in another two areas of the shop floor.
CONDUCT THE IMPROVEMENT	
1998	Extension of 5-S to Store and Control.
1999	Deployment of objectives to all levels of the company. Third self assessment according to EFQM Model. External assessment - Silver Q award (Basc Country).
PEOPLE DEVELOPMENT	
2000	Polyvalent competencies matrix. Process Management. Minicompanies in two areas – shop floor. Leadership survey.
2001	Extension of Minicompanies to another two areas. 5-S implementation in the offices. Started implementation of Operational Groups.
2002	External assessment - Gold Q award (Basc Country).
SUSTAIN AND CONSOLIDATE THE IMPROVEMENT	
2003	Management plans for Minicompanies and Operational Groups. External assessment by the EFQM. Awarded with the European Quality Prize for their Corporate Social Responsibility).

Table 2: Main milestone of Microdeco during its journey to Excellence

The implementation of a TQM philosophy at Microdeco was sustained in the following pillars:

1. *Top management commitment*: Believe in change and innovation. The success of Microdeco could not be explained without commitment and leadership of its General Director: a work-harder, persistent, manager by walking, who had the vision to lead Microdeco to the first positions implying all personnel; a person who knew how to take advantage of an economical problem as an opportunity to improve. After a visit to Ubisa the General Director was totally convinced by the benefits to apply a TQM focus -and specially delighted by the 5-S methodology as a way to direct imply shop floor employees, working together with top management, in CI-, not only to survive in the market, but mainly to optimise the management of the company at all levels.

2. *To make employees also believe in change and innovation.* 5-S methodology has been chosen as the appropriate methodology to involve all personnel in CI. It's "easy to understand" language and the required implication of all employees characterise 5-S as a very practical methodology, an adequate change agent for promoting quality culture within the organisation through action learning. "There is no learning without action and no action without learning" [Revans, 1983], the basic principle of the cognitive-behavioural practice. At Microdeco 5-S was not focused initially as a technique to increase productivity, but to improve workplace, in order all employees could work more comfortable. However as time savings are important after implementation, productivity increases and employees are more satisfied. 5-S facilitated all the employees understood the benefits they would get from change, individually and for the organisation, and Top Management gained in credibility.
   But effective quality improvement systems require also major changes in an organisation's way of developing, motivating and involving its employees [Kondo, 1993]. So, apart from 5-S Microdeco introduced several improvements for the employees in the area of work development: i) set up of Minicompanies and Operational Groups (Microsystems); ii) cooperative leadership, with recognition to the individuals and teams; iii) answer to demands received through the employees satisfaction survey and leadership survey; iv) people management following the policy to "create persons"; v) several improvement actions and projects to guarantee the impartiality and justice regarding employment; v) employees reward system sustained in quality, costs and production; suggestion system with individual and team recognition; special fiesta to commemorate awards and historical dates; vi) social benefits (green parking; flexible time-schedule; etc); vii) continuous training (more than 5 % of the total working time); viii) foster innovation.
3. *To establish partnership with a good supplier in the area of management technologies*. The third pillar for Microdeco was to find and establish a good partnership with a supplier of management technologies, who help them to implement the QM model.
4. *To introduce changes in the organisation (minicompanies).* At Microdeco personnel are not focused as a changeable resource, but as a resource that can be developed. Employees have responsibility and need authority. So, in order to consolidate and sustain all the changes that had been produced since 1995, and following a cellular implementation criteria, in 2000 Microdeco started to work with Minicompanies. That is, the company identified different autonomous areas and processes and gave empowerment to employees to manage them, following the guidelines established by top management. Also the company established the Operational Groups, constituted by a group of persons working with different processes, in order to continuously improve them. At this moment employees follow 135 management indicators by themselves; 22 of them arrive to Top Management.

3.3. Results

Microdeco is a clear example that QM, when well defined and integrated with company's strategy constitutes the framework for a sustained grow, and reports important quantitative and qualitative benefits. Main indicators for the period 1995-2005 at Microdeco are related below.

- *Quantitative:*
  Economic growth and sustainable development: a)Increase of sales: multiplied by 9,5 points; b) reduction of stocks/sales ratio -from 5,6 to 0,95-; c) reduction of non-quality costs -from 4,17% to 1,36%-.
  Work development – social progress: a) increase of staff: multiplied by 2,2 points -from 44 to 99 employees-; b) increase in training (percent. over total working time)-from 2,3% to 4,7%-.
  Environmental management: reduction of oil consumption: from 6810 kg to 2711 Kg.
- *Qualitative: a)* increase of customer's satisfaction: from 3,69 to 4,39 points; b) increase of motivation and implication of employees -from 2,91 to 3,30, in a scale 1 to 5-; c) sustained implementation of CI and TQM; d) improvement of internal communication and knowledge; e) better visual identification and control of materials, documentation, files and other aspects of workplace environment, etc.

Docherty et al. (2002) point out that sustainability encompasses three levels: the individual, the organisational and the societal, closely related to the stakeholders. Sustainability on one level cannot be built on the exploitation of the others. An organisation cannot be sustainable by prioritising the goals and needs of some partners at the expense of others. Microdeco is a good example of balanced management.

4.0. Conclusions

A global and integrated QM model need to be designed *ad-hoc* for each particular organisation, aligned with the organisation's strategy and sustained in its technical, cultural and organisational strengths, to

give response to its weaknesses and improvement areas. Complexity, cellular implementation, reflexive organisation, top management commitment, apoptosis index, cooperative leadership and adhocratic organisation criteria should to be taken into account when designing the model. Moreover we need to bring together the criteria at ease as possible. In our experience in different organisations 5-S evidenced to be an effective and very appropriate tool at both cognitive and affective level to involve all personnel in CI with excellent economical and qualitative results, an adequate change agent, a universal "human glue" for promoting quality culture within organisations through action learning. But if 5-S has great potential to improve tangible and physical aspects of workplace, its intangible aspects cannot set aside. The sustainable results achieved by Microdeco show the potential of 5-S and Microsystems, empowered by a strong Top Management Commitment that knew how to balance the demands and requirements of the different stakeholders.

References

Battram, A. [2001]. *Navegar por la Complejidad*. Ediciones Granica, Spain.

Creech, B. [1995]. *The Five Pillars of TQM: How to Make Total Quality Management Works for You*. Penguin Books.

Docherty, Pl, Forslin J. & Shani A.B. [2002]. *Creating Sustainable Work Systems: Perspectives and Practices*. Routledge. London.

Euskalit [2006]. *Muchachos ¡hay otro mundo!. La travesía de Microdeco*. Euskalit.

Ho, S, [1997]. Workplace Learning: the 5-S Way. *Journal of Workplace Learning.* V. 9, nº 6, pp.85-91.

Ho, S, [1999]. *An Integrated Approach. Implementing Total quality through Japanese 5-S and ISO 9000.* Hong Kong Baptist University.

Imai, M. [1997]. *Gemba Kaizen: A Common Sense, Low Cost Approach to Management.* McGraw-Hill, New York, NY.

Kondo, Y. [1993]. Quality and Human Motivation. *European Quality*, pp. 44-50.

Laszlo, G. [1999]. Implementing a Quality Management Program. Three C's of Success: Commitment, culture, Cost. *The Essence of Quality Management Anthology*. Vol. 3, pp. 10-20. ASQ

López Fresno, P., Fernández –González, F. [1999]. *Medical Adhocracy and Cellular Implementation of Quality Systems.* Proceedings of the 11 th QMD Annual Conference. American Association for Quality.

López-Fresno, P., Fernández-González, F. [2000]. Is Top Management Commitment Enough? A Case Experience in an Airline Company. *Proceedings of the 12 th Quality Management Division Annual Conference.* American Association for Quality.

López Fresno, P., Fernández–González, F. [2002]. The Introduction of JAR OPS 1 Standard in the European Airlines [2002] An Opportunity to Focus on Integrated Management ? *Proceedings of the 7 th International Conference on ISO 9000 and Total Quality Management.* Montreal.

López Fresno, P., Fernández–González, F. [2004]. Environmental Management Through 5-S. *Proceedings of the 7 th International Conference on ISO 9000 and Total Quality Management.* Banghkok.

López Fresno, P., Fernández–González, F. [2005]. Apoptosis Criteria Applied to Management. *Proceedings of the 7 th International Conference on ISO 9000 and TQM.*

Ljungström, M. [2005]. A Model for Starting up and Implementing Continuous Improvements and Work Development in Practice. *The TQM Magazine.* Vo. 17. No 5, pp. 385 – 405.

Osada, T. [1991]. The 5-S: Five Keys to a TQ Environment. Asian Productivity Organisation. Tokyo.

Peters, J. [1997]. Quality Assuring Professional Practices. A Case Example from a Cancer Treatment Center. Proceedings of the 3 rd International Conference on ISO 9000 and Total Quality Management. Pp. 341-345. Hong Kong Baptist University. Hong Kong.

Revans, R. (1983). *ABC of Action Learning.* ChartwellBratt. London.

Senge, P. [1992]. *La Quinta Disciplina*. Ediciones Granica, España, Caps. 9-12.

Schopenhauer, A. (1788-1860). http://www.schopenhauer-web.org ; htpp://www.schopenhauer.org

Sui –Pheng, L.; Khoo, S.D. [2001]. Team Performance Management: Enhancement Through Japanese 5-S Principles. *Team Performance Management.* Vol. 7, Nº 7/8; pp. 105-111.

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