NEED OF TRAINING THE SAFETY & HEALTH COORDINATOR IN BASE TO THE BEHAVIOURAL COMPETENCIES

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Abstract
The “Project” concept, which presently embraces all professional fields, gets a multi-disciplinar character and a multi-dimensional approach, considering technical, economic, social and environmental aspects, which work in an interrelated form and must be approached simultaneously.

Project Manager is defined as a professional, who assumes the liability to give a final product or service, according to the specifications and done together with professionals of other kinds.

Now, the PM is understood as the knowledge, skills, tools and techniques application to project tasks to satisfy the project requirements (IPMA, 2001).

The Safety & Health Coordinator is linked to the project, in its conception and development, and also its execution. In order to manage the coordination of the preventing activities of any company in a building work, he needs a training that includes technical, behavioural, or skill concepts within an acting context.

There are several analyses and studies that have been realized on the accident rate, but not one has thought about the competences that this coordinator needs to be able to reduce this rate.

To use these bases to evaluate and to develop the necessary competitions that the Safety & Health Coordinator must reunite in the exercise of his activity, is one of the objectives of this line of investigation that is opened with this communication.

Keywords: Safety and health. Preventive activity. Safety and health coordinator. Tools. Techniques. Behaviour competences. IPMA.

1. Introduction
The integration of the prevention and the safety from the conception of the project is synonymous of quality and efficiency.

This first premise opens the possibility to look for the methodology in order to consider the prevention of labour risks and the safety and health of the workers who are going to execute the project since the very beginning of the design for engineering or construction projects.

We know that there is a high rate of accidents in engineering projects during the construction phase. In this line the Regional Institute of Security and Health of the Community of Madrid (Spain), ride realizing an important effort last years in material of training and sensitization.
The “Universidad Politécnica de Madrid” has collaborated with the Institute in this challenge during the last years. Hereby the Final Degree Projects presented during the years 2007 and 2008 at “Escuela Técnica Superior de Ingenieros Industriales” have been analyzed.

The typology and nature of the Final Degree Project for Industrial Engineering is so rich like the industrial sector towards which there intends the pupil who approaches it.

In spite of it, and without limitative character, for the accomplishment of this study there has been considered to be the three following typologies:

Typology 1: Classic Engineering Project. The main feature of this type of project is that its framework must be adapted to the requirements of official projects that need a stamp from the Official Collegiate Bodies (i.e., must include a report, plans, specifications and a budget). Most projects of this type involve industrial facilities or the implementation of a procedure in an industrial sphere. These projects have to include obligatorily study (or basic study) of safety and health.

Typology 2: Theoretical-experimental work that makes a contribution to technology in various fields of engineering, including, financial assessment and discussion and assessment of results. Many FDP that are developed in the university laboratories belong to this category. This typology does not include study of safety and health.

Typology 3: Technical, organizational and economic studies related to equipment, systems, services, etc. that are linked to the scope of the degree and deal with any aspects of design, planning, production, management, operation or any other engineering field-related issue, and list, when appropriate, various technical alternatives with economic assessments and the ensuing discussion and results assessment.

In this modality they would fit, for example, the development of a system of prevention of labour risks into an organization.

In the analysis realized there was detected that, the number of projects in which content they should figure topics of safety and health, only a small percentage of these they present it. For the classic engineering projects presented during this period, only 40 % of them were containing the documents corresponding to the Study of Security and Health.

Regarding those projects containing topics of safety and health, there exists a major trend to realize a Basic Study of Security and Health, document that presents only a descriptive memory, lacking a budget, fold of conditions and corresponding planes, parts included in the Studies of Security and Health.

The principal documents contributed in these studies are the descriptive memory and the fold of conditions.

Likewise, the principal lacks are detected at the general organization of the work and in the objective characteristics of the above mentioned work. In minor measure, lacks appear in the specification of sanitary facilities, as well as in the corresponding economic regulations.

This proven lack generates in the rest of the constructive process lacks of quality and evidences lacking of rigor in the integration of the safety in the execution of the work. Furthermore, this lack of commitment, generates that, among the agents who must develop and take part in the project, there is realized a professional work that brings together the technical training, the knowledge of the context where one executes the project and a few personal skills, which allow them to settle actions or preventive omissions in the conception of the project.
It is enough to mean that, Pierre Lorent (1992), on the basis of a statistical study of variables that were competing in the mortal accidents in construction, tried with enough reliability that, 63% of the reasons that originate those accidents in construction take place before the beginning of the works, in the phases of conception of the project, of organization and of contracting.

One of the actors that take part in the project and that his/her activity bases on coordinating preventive activities of the companies that meet in the centres of work, is the safety and health coordinator in project and of execution phases, agent on whom the present communication is based.

To look for a similarity in the activities, skills and developments, between the project management and the safety and health coordinators in the works of construction, it takes us to the analysis of the elements of competence that both must know and apply.

From the knowledge of the different definitions of competence and competent, the analysis of the current legislation and the activities of the mentioned agents, we will be able to demonstrate and to verify, how the technical personnel who are going to be safety and health coordinators in the works of construction, need something more than his/her own education, they must apply technologies, skills and tools to be competent and competitive professionals.

This paper is based on the experience, on the knowledge of project management and on the legal and normative knowledge on the prevention of labour risks and more concretely, in related to the functions of safety and health coordinators.

2. Objectives

This communication aims to highlight the lack of technical skills and tools that safety and health coordinators have for the development of their job.

These skills and tools have not been included in their initial training program. As a consequence they cannot be implemented in their working activities.

The aim of this paper is to spotlight the need to know and put into practice the techniques associated to the coordination in safety and health matters, from the bases of competence in project management and the required tools to achieve them.

3. State of the Art

To properly understand the relationship and implication between coordination in safety and health matters and the coordinator training skills, we must gather and define the concepts related to the original name that Spanish law enshrined in Article 2 of Royal Decree 1627/97, minimum safety and health rules in construction projects, and about coordinator as technical authority.

Papers published about coordination in safety and health matters cover, in a wide range, functions and tasks in which safety and health coordinator is competent. However, none of them explicitly cover techniques, skills and tools that this agent should know and apply in their professional activity.

We explain briefly a summary of existing legislation at European and Spanish scope, to identify the figure of the coordinator and his competences.
3.1 Competition and Competence

The definitions of "competence" are a veritable legion. The following are some:

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**competition**

(Del lat. *competentia*; cf. *to compete*).

1. f. Dispute or contest between two or more people about something.
2. f. Opposition or rivalry between two or more who want to get the same thing.
3. f. A situation in which two or more companies offers or demands the same product or service in the market.
4. f. Rival person, company or team. *He has gone to “THE Competition”.*

**competence**

(Del lat. *competentia*; cf. *competence*).

1. f. Responsibility
2. f. Ability to perform a specific task, action or function successfully
3. f. Authority of a legal body to deal with and make pronouncements on legal matters

Boyatzis (1982) defines: "A competition is an underlying feature in a person who is causally linked to a good or excellent performance in a particular job and organization.

Spencer and Spencer (1993) considered it "an underlying characteristic of an individual that is causally related to effective or superior performance in a situation or work, defined in terms of a criteria”.

Woodruff (1993) poses as the "A dimension of open and evident behaviour, which allows a person to perform efficiently."

Rodriguez and Feliu (1996) defined as "group of knowledge, skills, aptitudes and behaviours of a person to successfully fulfil an activity."

Ansorena Cao (1996) states: "an ability or personal feature in the behaviour of a person that can be defined as characteristic of his behaviour, and under which the task-oriented performance can be classified in a logical and reliable way."

Guión (cited in Spencer and Spencer) are defined as "underlying features in people indicating ways of behaviour or thinking that could be generalized from one situation to another, and which are maintained for a reasonably long time"

From the analysis of these definitions it can be concluded that competences:

1. Are permanent features of the person
2. Are showed when executing a task or performing a task
3. Are related to successful performance of an activity, whether at work or otherwise.
4. Have a causal relationship with work performance, i.e. they are not only associated with success, but they are assumed to actually cause it.
5. They can be generalized to more than one activity
A Competence is what makes the person be, if you'll excuse the repetition, "competent" to perform a job or an activity and to be successful in it, which could mean a combination of knowledge, skills, and specific behaviours. Failure of any of these aspects, if required to achieve the objective, makes the person not "competent".

The conception itself of competences, having a multidimensional nature, makes them complex, so an analysis on its constitution is required. Spencer and Spencer believe that Competences are composed of features that include: motivations, psychophysical qualities (visual acuity and reaction time, for example) and forms of behaviour, self-knowledge, manual abilities (skills) and cognitive or mental talent. Whereas Boyatzis suggests that a competence may be "a motivation, a feature, a skill, self-image, perception of one's social role, or a collection of knowledge that is used to perform a job.

Other definitions:

Vargas, J. (2001) in his article "The changing rules of global competitiveness in the new millennium. The competences in the new paradigm of globalization" makes an interesting analysis about the use of the term competition in the managerial field, expressed in the above definitions and their significance from a psychological perspective.

Mertens, L. (1997, 2000) when referring to the conceptualization of competition from the business perspective, he distinguishes the existence of 2 approaches: structural and dynamic. Both of them are considered complementary, because they deal with the conceptualization of work competence and its training from different views that can be combined in application. He remarks that although the definition of occupational competence in the structural approach is historical, as it does not take into account the performance of the subject, it is interesting as it includes not only the body of knowledge, skills and abilities but also the attitudes required to achieve a certain result of work. This definition can transcend the concept of competition as a cognitive dimension and place it in a broader context person logical.

The NCB, “National Competence Baselines of Project Management”, define competence as the capacity showed to apply knowledge or skills, and when it is needed, demonstrated personal attributes.

We could say the same for definitions of "competent", although they are all linked to the definition of competition itself, or at least to what is understood and has been noted above.

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**Competent**

(Del lat., competitio, -onis)

1. f. Sufficient, proper, proportionate, appropriate, adequate.
2. f. The person responsible of something
3. f. Good knowledge of a technique, a discipline, an art.

**Competent Technician:** person with sufficient qualifications and skills to develop responsibility tasks in project activities, facilities or industrial products as well as their execution management established by this Law.
3.2 Safety and health coordinator in the European and Spanish directive.

As indicated in the beginning of this section, we briefly estate what the European board points out about the figure of safety and health coordinator and the basic regulations in safety and health, applied in temporary and mobile work, and their incorporation into our law.

**Council DIRECTIVE 92/57/EEC** of 24 June 1992 concerning the basic safety and health regulatory requirements at construction sites, temporary or mobile (eighth individual Directive within the meaning of paragraph 1 of Article 16 of the Directive 89/391/EEC)

Initial considerations:

"... Whereas, during project implementation, lack of coordination due, in particular, to the simultaneous or sequential involvement of different companies in a temporary building site or mobile, can lead to a high number of accidents work;

Whereas, therefore, it is necessary to improve coordination between the various parties involved since the design phase but also during the execution of the work; ...
"

Article 2, definitions:

".... e) safety and health coordinator during the development of the construction project, any person or entity designated by the propriety and / or the director of the work to undertake, during the design phase of the work, the tasks set out in Article 5;

f) safety and health coordinator during his work; any person or entity designated by the property owner and / or the director of the work to be performed during the carrying out of the work, the tasks mentioned in Article 6 .... 
"

**ROYAL DECREE 1627/1997**, of October 24, the Ministry of the Presidency, laying down minimum safety and health regulations on construction sites. (BOE 25-10-1997)

Article 2 Definitions

".... e) Safety and health coordinator during the design of the work project: the technician appointed by the developer to coordinate and ensure that the principles mentioned in Article 8 are applied during the work project.

f) Safety and health coordinator during the execution of the work: the technician designated by the developer to carry out assignments set out in Article 9 .... 
"

Subsequently, and according to the fourth additional provision of Law 38/1999 on Management of Building, qualifications required are decoded:

".... Academic and professional qualifications enabling the function of SHC in building works during the design and execution of the work will be ARCHITECT, TECHNICAL ARCHITECT, ENGENEER AND TECHNICAL ENGENEER, according to their skills and expertise. 
"

It is not the object of this communication to deepen in the regulation of each of the countries of the European Union, about the figure of safety and health coordinator but to establish a criterion in training and its competence during development of his activities, based primarily on the definition of a competent technician.
4. Development

As it is indicated in the title of the paper, the safety and health coordinator knowledge, skills, tools and techniques in preventive activities, should be well known and be complemented, so that effectiveness of his work is appreciated and recognized.

This communication aims to disseminate and discuss more specifically the "skills" needed for the role of coordinator and which will be named **behavioural or personal skills**. Techniques and tools will be deferred for a subsequent research project.

4.1 Knowledge

The training of safety and health coordinator is not regulated, and the majority of trainers or entities engaged in this task have not come to an agreement respect to it.

It is only in the Technical Guide prepared by the National Institute of Occupational Safety and Health at Work on RD 1627-97 of minimum safety and health regulations at construction sites, that -in his opinion, since it is not a binding text- a training pattern of what the coordinator must know, with an extent of 200 hours, appears reflected in Annex B.

Some university degrees, such as Technical Architect, have introduced subjects in which the figure of the safety and health coordinator is studied in a general way.

The current model of the European Higher Education Area has already included the possibility to carry out the role of coordinator in some graduations such as the Building Engineering.

4.2 Behavioural or personal competences

We have already seen that in the very definition of coordinator, he must be a competent technician. The technician is trained and provided with knowledge to enable him to develop his activity and eventually will be trained with tools and techniques for continuous improvement.

In case of "competition", we have also defined it and we apply to the definition of **competent**.

To provide with behavioural competences or personal competences, called skills in other areas, we use in this communication those identified by the IPMA, International Project Management Association, and also those ones we think are more activity-related with security and health coordinator and which will be more useful to meet the obligations contained in the RD 1627/97.

Required skills, according to the IPMA model, are divided into three categories:

- Behavioural or personal competence range
- Contextual competence range
- Technical competence range

**Behavioural or personal** competence: processes, “soft” skills:

- Communication, presentation
- Teamwork
- Independence, flexibility
- Learning

**Contextual** competence:

The ability - in a given context – to apply:
- Knowledge
- Skills
- Attitudes

Analyze and solve real problems

**Technical** competence:

- Analyze open problems, complex or poorly defined and shorten them to technically solvable problems;
- Considers the result and handle uncertainty;
- Design creative and innovative solutions;
- Evaluate the quality and limitations;
- Meets demands and expectations;
- Respect the ethical and professional standards.

As personal competences, IPMA identifies the following ones: (to this classification, we have added Teamwork. Usually it is regarded as technical competence but we believe it is essential in any professional work).

<table>
<thead>
<tr>
<th>Leadership</th>
<th>Efficiency</th>
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<tbody>
<tr>
<td>Engagement and motivation</td>
<td>Consultation</td>
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<tr>
<td>Self-control</td>
<td>Negotiation</td>
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<tr>
<td>Assertiveness</td>
<td>Conflicts and crisis</td>
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<tr>
<td>Relaxation</td>
<td>Reliability</td>
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<tr>
<td>Openness</td>
<td>Values appreciation</td>
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<tr>
<td>Creativity</td>
<td>Ethics</td>
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<td>Result-orientation</td>
<td>Teamwork</td>
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Therefore, safety and health coordinator shall apply these skills to develop his coordinating functions.

As noted above, this paper opens the door to research and therefore we shall only present an example in which we demonstrate the efficacy of personal competences within the professional coordinator.

We use the case method, simulating real situations to achieve the targets set in the job. This case is on the subject of a meeting of workers, in which the role of the coordinator is essential for the relationship among the people involved in it, to be effective and achieve the goals of prevention and safety at work. Below you can see a brief review of the main data and initial considerations to develop the case.

**Case study**

"**Actions of the safety and health coordinator during his work, when an accident happens**"

On certain occasions, accidents happen in works involving directly or indirectly to the SHC, since as agent involved in it, at least, must have knowledge of the facts and know act professionally.

**Initial considerations:**
The case study is an accident by fall in height of a worker with no major injuries, succeeded after eating and qualified as severe.

When the accident happens the SHC is not in the play, but communicates the event. According to your criteria and process for performance, not immediately goes to the place of the facts, but if do you together with another engineer the next morning, with the aim of collecting data, check what has happened and a report on the possible root causes that accident.

It is desirable that the collected data for the report are ordered unified way so that, once analyzed possible causes, accordingly act proactively to prevent their recurrence.

As practical criteria for data collection, are the following:

- Perform on-site data capture
- Observe the job carefully
- When possible, take pictures or make schemas.
- Interviewing witnesses, individually
- Seek do not alter the conditions of the place of the accident
- Make the report as soon as possible
- To avoid questions indicative or tendentious
- Don't search responsibilities
- Not premature judgments

With the data provided in case workshop "Actions of the safety and health coordinator during his work, when an accident happens", respond with a brief explanation to the questions outlined below:

1. What is the status of key personal competences that are considered in the case?
2. What actions (methods, strategies and processes) have been undertaken within the case for improvement?
3. What were the results achieved after the project?
4. For a real successful implementation of the project and desirable changes take place in time, what other actions need to be developed?

Answers to questions

1. What is the status of key personal competences that are considered in the case?

From the viewpoint of behavioural competencies, as the SHC is acting in an "individual" way, it is affected by almost all personal competences, but for the settlement of this case, we have taken into account the competences of “Self-control” (2.03), “Relaxation” (2.05), “Efficiency” (2.09) y “Consultation” (2.10).

It is believed to be able to reduce tension in difficult situations and act with self-control, is required in our case for developing effective work.

The SHC needs to be effective in its conclusions and its actions.

“Selected Proceedings from the 13th International Congress on Project Engineering”. (Badajoz, July 2009)
“Consultation" is imperative in this case, since reasoning, listen and find conclusions or solutions, in the difficult moments after an accident, is key to achieving its objectives.

**Status of the behavioural elements of competition**

The **situation** of the competitive behaviour reflects and affects the development of the project, in our case the job itself of work coordinating.

Rather than establishing or identifying errors or failures related to this matter, it would be appropriate to ask:

- Are the level of knowledge for SHC and the rest of people involved alike?
- Has SHC been able to delegate work?
- Has SHC leadership method been authoritarian, permissive, persistent, or how is it?
- Has SHC set up a negotiation strategy?
- SHC communication language is correct?

2. What actions (methods, strategies and processes) have been undertaken for improvement?

**Actions undertaken** to improve the situation of the **behavioural competences** have been based primarily on:

- Control of the situation from the SHC
- Knowledge of duties and obligations of employees and negotiation with all of them
- Effectiveness determinations.

In principle, SHC is committed to safety and health, but the rest involved must become "infected" by this good practice. Through leadership, motivation and negotiation SHC can solve problems and rank first the project liability.

3. What results were achieved after the project?

As **behavioural competences**, the concrete results that were achieved were:

- SHC has consulted effectively.
- SHC has purchased balance and marked priorities, working as a team.
- He has brought tranquillity and been "involved" to those involved.
- He has obtained commitments and continuous improvement.

4. Conclusions and recommendations. 4. For real successful implementation of the project and obtain the desired changes in time, what other actions need to be developed?

**General conclusions regarding the behavioural competences** are:

- When SHC acts in a "personal" way, needs to lead their targets
- The knowledge of the project makes SHC makes more reliable, more committed and more influential to the rest of participants.

“Selected Proceedings from the 13th International Congress on Project Engineering”.  
(Badajoz, July 2009)
– A good negotiator is the key to success in Occupational Risk Prevention, that additionally resolve conflicts

Other possible actions:

For a real successful implementation of the SHC work in coordinating meetings and the desired changes take place in time, it would be desirable:

- Resolve **conflicts and crisis (2.12)** and participatory actions, from the initial point of view that others may also be involved in the same context.
- Have **assertiveness (2.04)** and **openness (2.06)** when you try with other agents.
- Have **ethics (2.15)**, without being outside of legality and morally to be accepted by the others.

**5. Conclusions**

New type of work and the need for professionals such as the safety and health coordinator, to adapt to unexpected situations that require skills other than those provided currently by specific training or academic disciplines.

There is a need to bring in everything we do as professionals, an additional value and differentiation.

Competition is defined as the ability to acquire and apply knowledge and skills in the proper context.

Competition:

- Emphasize effort and find the economic and social development in the assessment of human resources.
- It seems best to respond to the need to find a point of convergence between education and employment.
- It adapts to the need for a pervasive change in international society under multiple forms.
- They allow greater transparency in the professional profiles of the curriculum and emphasize learning accomplishment.
- Closer to the learner's educational process.

Safety and health coordinator, which coordinates preventive activities of companies that exist in a workplace, a building site, needs skills to perform his obligations, which are reflected in current legislation.

In one case, as in the example above mentioned, this need is reflected in the SHC, to resolve difficult situations, when personal attitudes and interests want to hide, when there is little collaboration and stiffness of providing data to clarify the facts.

If to the situation created, we add a working professional and organized to develop an effective report, we have created a necessary conduct so that the SHC develops all performances.

These skills, which we have called behavioural or personal skills, make up the competent technician in accordance with the law.
6. Bibliography


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