

Chapter 2

An Analysis of the Relationship Between Maintenance Engineering and Knowledge Management

Francisco Javier Cárcel-Carrasco

Universitat Politècnica de València, Spain

Elisa Peñalvo-López

Universitat Politècnica de València, Spain

Maria Carmen Carnero

University of Castilla-La Mancha, Spain

Vicente López-Mateu

Universitat Politècnica de València, Spain

ABSTRACT

Knowledge is vital in everyday life, but from the viewpoint of the companies, it is a powerful intangible capital that can check the efficiency and existence of the organizations themselves. However, in industrial production environments, maintenance and exploitation activities are little studied in reference to the mechanisms of transmission of knowledge that are generated based on the difficulty of their capture, because it is fundamentally based on tacit knowledge (intrinsic fond professions operating personnel) acquired by operators for years from their work experiences in the industrial plant. These highly qualified professionals, accustomed to solve technical problems and maintain the required state of production with a high load of stress, traditionally function as islands of knowledge, and the company loses an important asset when one of them leaves. This chapter approaches the transcendence of the tacit knowledge among staff and marks the conditions for transmission as a basis for the learning of other partners of the organization.

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1. INTRODUCTION

In the resources of management engineering, it is required a measuring equipment and a human component with high specialization. All this implies a strong knowledge that must be managed in its creation phase, dissemination and use phase. The indicators (normally used) of maintenance performance are based on various pillars such as reliability, availability, maintainability, security, operational costs, and a fundamental one for operability such as the human factor (Cárcel, 2013a), given the high tactical knowledge that is generated in the performance of the assigned functions.

The knowledge is the ability to act, process and interpret the information to generate more knowledge or solve a particular problem. In this new century there has been a fundamental change, in which the growth of many sectors and companies is driven by the knowledge and ideas, more than just taking into account the traditional resources (Del Moral, 2007). This drives us to a strategic management of knowledge-driven companies, where the active assets are losing value in favor of intangibles (Sánchez, 1999; Peña, 2001). This is why the knowledge can be considered as the main intangible ingredient both in companies and in the economy as a whole (OCDE, 2004), and in the evolution of maintenance, where the importance of the human component takes a large incidence, is a value which has taken great importance with the of techniques and the resources destined to the improvement.

When planning a maintenance service, it is vitally important to have a deeper knowledge of the facilities, to transform the tactical strategic knowledge of the operational experiences of the maintenance operators in explicit, which will undoubtedly deepen the study of the measures of energy efficiency and value the reliability of the facilities, with the knowledge failure process, which improves the productivity of the company (Alsyouf, 2007; López, 2006), identifying the relevant data and information to improve the service.

With a shift towards a model based in the knowledge and learning, the organization is focuses on the ability to innovate and learn, to more efficiently solve their daily work, as well as to solve new or non-routine actions, creating a value of the intangible based on knowledge and its quick update in the working environment of the maintenance organization. It must be assumed as a long-term strategy, visualizing knowledge as a strategic factor, as well as a tool for problem solving and decision making (Peluffo, 2002).

There is an abundant literature on knowledge management in various industrial activities and services, and the effects of their application (Bahoque, Gómez & Pietroseoli, 2007; Colino, Martinez & Martinez, 2010; Colino & Riquelme, 2000; Chua & Gu, 2008; Ferrada & Serpal, 2009; Rivas & Flores, 2007; Ventura & Ordoñez, 2007; Yang, 2006;), but normally these studies focus on global management (especially in the more explicit part), with an emphasis on trade, accounting or internal administrative management, or development activities, but dealing sparingly with the tactical actions of industrial trades, normally considered as an “expense for the company”, but having the effect, however, of substantially reducing costs involved (often taken by management itself). Therefore, to manage knowledge in these areas of work means, in itself, not only an improvement in the efficiency of the processes within industrial trades, but also a reduction in the spending caused to the company (by stoppage of production, loss of energy, loss of efficiency or reliability of systems and facilities and longer adaptation time of new technicians).

It is necessary to analyze the personal knowledge to develop organizational knowledge (Martin, 2008; Pauleen, 2009; Volkel & Haller, 2009), that allows to make an analysis of cost-benefit on its application (Volkel & Abeckar, 2008). The internal activities of the industrial enterprise, maintenance needs deep technical knowledge, highly experienced staff and has traditionally been the structure within the company where there is major component of tacit knowledge. Since their duties directly affect the reliability of

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