Available online at www.sciencedirect.com

ScienceDirect

Procedia Manufacturing 19 (2018) 18–25

Procedia MANUFACTURING

www.elsevier.com/locate/procedia

6th International Conference on Through-life Engineering Services, TESConf 2017, 7-8 November 2017, Bremen, Germany

Efficient development and management of after sale services

Gerardo Pagalday[a]*,Patxi Zubizarreta[b], Jone Uribetxebarria[c], Asier Erguido[d], E. Castellano[e]

Ikerlan S. Coop, Paseo J.M[a] Arizmendiarrieta 2, 20500, Arrasate, Spain

Abstract

In recent years, the concept of Industry 4.0 has been significantly advanced in industrial circles as an aspect that provides a competitive differential. Through the involved technologies, machines can now monitor and relay information on their operating conditions for analysis and decision-making, as well as for prompting action. These new functions generally involve the development of technological projects and significant investments. This render it expedient to explain why certain systems should be monitored, but not others, as well as the use to be given to the data gathered as a way of generating income for a firm. This approach is especially important in certain corporate operations, such as after sale maintenance. This article introduces a reference framework that permits the effective and efficient develop and management of after sale maintenance services. This framework relates after sale service technologies with product technologies (Industry 4.0) and therefore covers the reasons and purposes on Industry 4.0 within the ambit of after sale service.

Peer-review under responsibility of the scientific committee of the 6th International Conference on Through-life Engineering Services.

Keywords: After sale, Maintenance management, Service development

1. Introduction

Until recently, the bulk of the turnover for many capital goods manufacturers was generated by the sale of new machines, with their after sale service being an obligatory extra to be provided with the new sale. For these kinds of firms, therefore, an after sale service has been seen as a necessary evil and, in short, as an added cost.

* Corresponding author. Tel.: 9430712400; fax: +0-000-000-0000 .
E-mail address: gpagalday@ikerlan.es

2351-9789
Peer-review under responsibility of the scientific committee of the 6th International Conference on Through-life Engineering Services.
10.1016/j.promfg.2018.01.004

As a result of the current crisis and the greater difficulties facing the sale of new machinery, together with the tighter margins in new sales, this viewpoint has gradually changed, and many capital goods manufacturers have begun to consider their after sale service as both a business opportunity for generating recurring income from the pool of machines sold and a driver of customer loyalty.

The services that may be provided at this stage of the life cycle for machinery and equipment are linked to the actual servicing of the items sold (e.g., repairs, spare parts, preventive maintenance, and retrofitting), contracts for guaranteeing machine availability, contracts on the use of machinery (e.g., renting and leasing), services related to energy efficiency, process enhancement, and training, amongst others [1].

2. Industrial maintenance reference model

The following figure (1) provides a schematic view of the framework for industrial maintenance management proposed by Crespo (2007)[2]. The aim is to build an equivalent model for after sale scenario, analyzing each phase and defining a new one with the new perspective:

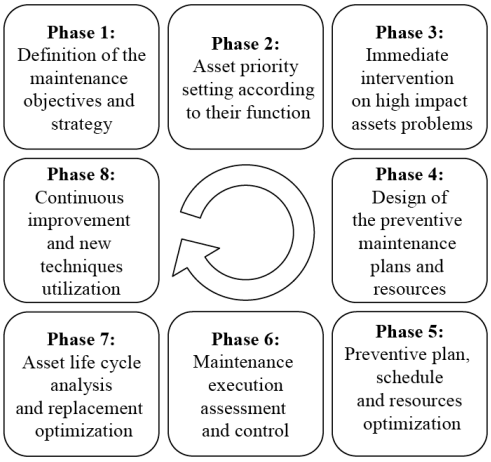

Figure 1. Industrial maintenance management framework (Crespo-2007)

Both scenarios have quite different characteristics and nature. The main characteristic is that industrial maintenance is considered a cost while an after sale scenario tries to maximize the incomes trough the maintenance activities. This means, making a simple very reflexion, that industrial scenario will try to reduce the amount of maintenance while the after sale scenario will try to maximize it, at least until the market says enough. But the question was, could we apply the same basic concepts contained in each phase in after sale scenario?.

In order to identify the equivalence and analyse the applicability between both frameworks, more than 20 companies with after sale services where analysed. The next section describes the types of firms that have taken part in the case studies. The comparison between the reference framework for industrial maintenance [2] and those firms' after sale operations and specific techniques identified in the literature has been used to constitute the reference framework for after sale maintenance services that is described later.

3. Case studies

Based on the industrial maintenance management framework [2], as shown in Figure 1, and the Maintenance Effectiveness Survey [3], a semi-qualitative questionnaire [4] has been compiled for each one of the phases. The questionnaire has been designed for use in industrial firms in the capital goods sector to identify those more salient differences existing between the approach to industrial maintenance and the consideration of the after sale maintenance of the equipment sold, as well as the extent to which after sale maintenance has been developed in those firms.