Chapter 12


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ABSTRACT

Effective management of physical assets should deliver maximum business value. Therefore, Asset Management standards such as PAS 55 and ISO 55000 ask for a life cycle approach. However, most existing methods focus only on the short term of the asset’s life or the estimation of its remaining life. These methods do not consider alignment to changing corporate objectives in a variable context, nor do they adopt a multidisciplinary perspective. This chapter argues that, to create maximum value, Asset Management should be a multidisciplinary and strategic practice that considers the complete life cycle of the asset: Asset Life Cycle Management. A practical twelve-step approach is presented to develop an Asset Life Cycle Plan (ALCP) in which expert sessions are used to identify the main lifetime impacts that influence the creation of business value from the use of the asset. The steps are illustrated with an example from practice. The chapter concludes that the ALCP supports asset managers in making long-term strategic decisions in a timely and effective manner.

INTRODUCTION

Physical assets are indispensable for society. Oftentimes, the assets are not noticed until a seemingly minor technical failure disrupts daily life. At these moments, it becomes clear that these assets fulfil vital functions in our lives. Examples include bridges and roads for transportation, the electricity grid to keep the lights on, and water treatment plants for drinking water. Next to their societal value, the DOI: 10.4018/978-1-5225-0651-5.ch012
financial (replacement) value of these assets is substantial as well. An estimate of this value in the Netherlands lies around 400 billion (milliard) euros (Veenman & Besselink, 2010), which is around 50% of the Dutch yearly GDP. This clearly shows the large financial value represented by physical assets in a modern Western country. Additionally, the costs of the maintenance needed to keep these assets fit for use are considerable. In the Netherlands, the maintenance costs amount to 30 to 35 billion euros per year (NVDO, 2015). Because such high financial and social values are at stake, the effective management of these assets is important for asset owners and society alike.

The fact that the end of the expected functional lives of many assets is approaching, increases the importance of effective Asset Management. This applies to Dutch infrastructure assets (de Leeuw & Pries, 2014; Jongepier, 2007; Wetzer & Bouwman, 2007). The same applies to Western Europe and the USA (Allan, 2005; Brown & Humphrey, 2005). Assets reaching the end of their useful life tend to need more intensive maintenance, and modernization or life extension may be worthwhile. On the other hand, timely disposal may be necessary to prevent excessive costs, or risks for health, safety, and the environment (Jongen, 2012; Rouse & Chiu, 2009). Additionally, these ageing assets often have to fulfil different functions than those for which they were designed, often decades ago. The assets have to comply with new regulations, satisfy changing market demands, and may be needed to produce higher quantities than anticipated (Al-Turki, 2011).

It is in this complex context that the asset manager operates. The management of ageing assets in a changeable context asks for strategic decisions, next to the daily work of maintenance and tactical planning. Strategic decisions directly impact corporate objectives by asking questions such as: How long can the operation of asset X be continued? What modifications need to be made to asset Y at the next overhaul? How can we convince management that the purchase of asset Z is worthwhile, even though its price is higher than all other alternatives? How can we keep the operation and maintenance of the assets aligned with changing corporate objectives? and What external developments may have an effect on the business value created with the operation of the assets?

Such a strategic focus on the complete life cycle of the asset is also required by recent Asset Management standards such as PAS 55 (IAM & BSI, 2008) and ISO 55000 (ISO, 2014). These require a life cycle approach. However, these standards do not provide much guidance as to how such a life cycle approach should be implemented. The same applies to well-known maintenance concepts, such as Reliability Centred Maintenance (RCM), which focus primarily on the short term (Coetzee, 1999; Murthy, Atrens, & Eccleston, 2002). In other words, there are many strategic Asset Management decisions to be made, but there is very little guidance available for asset managers who need to make these decisions. Therefore, the aim of this chapter is to present a tool to assist strategic decision-making in Asset Management.

The next section will present a theoretical background on Asset Management. It will conclude that Asset Management should be a strategic and multidisciplinary practice, focusing on the complete lifetime of an asset. Such an approach to Asset Management will be termed “Asset Life Cycle Management” (ALCM). Current maintenance approaches often just focus on the short term and do not adopt a multidisciplinary approach. These approaches do not address changes in the environment in which the asset operates, changes in regulation, or new corporate objectives. Hence, the concept of “lifetime impacts” will be introduced in the next section. These lifetime impacts are a key ingredient for an Asset Life Cycle Plan (ALCP), which is a tool developed to support strategic decision-making in Asset Management. An ALCP does this by presenting a holistic view of the current and expected performance, costs of the assets, and the main challenges that may affect performance over an asset’s lifetime. An extensive and practical twelve-step approach will be presented to develop such an ALCP, illustrated with an ALCP
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