

Towards a Smart Services Enabling Information Architecture for Installed Base Management in Manufacturing

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Abstract. In the manufacturing industry the provision of smart services is an opportunity to gain a competitive advantage. As there are high demands on machine availability, smart services in the field of installed base management are important. Through integrating condition monitoring data with installed base data a digital twin of the installed base can be created. This enables comprehensive analyses and the provision of individualized smart services. But this requires to structure and standardize the data. Following the action design research (ADR) approach, in this article design principles of an information architecture are developed. The architecture is evaluated and improved in the context of an international engineering and manufacturing company. A test run with real machine data shows the applicability in practice.

Keywords: Digital twin, information architecture, installed base management, smart services, product-service system

1 Introduction

In manufacturing industry, machinery and equipment are subject to high demands on availability and productivity [1], [2]. To meet these requirements, original equipment manufacturers (OEMs) as well as machine component suppliers shift in emphasis from selling only technical products to offering additional individualized smart services [3], comprising e. g. maintenance, repair, spare parts delivery, process consulting. Services are an economic guiding force for OEMs and machine component suppliers [4] because the supply of services in addition to products leads to new sales opportunities and to greater customer loyalty [5-7].

When considering individualized smart services, a major challenge for OEMs and machine component suppliers is that they often lack knowledge about the state of the machinery and equipment during the use phase [1]. Therefore, the collection and processing of condition monitoring data (field data) has been discussed within academic literature as inevitable for offering guaranteed machinery and equipment availability and productivity [8], [9]. However, the integration of condition monitoring

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