

# NETWORK OFFERING IN INDUSTRIAL MAINTENANCE SERVICES

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**Abstract:** Industrial maintenance services are outsourced more and more as manufacturers' own maintenance units are nowadays rare. However, instead of outsourcing the maintenance as a whole, many companies are acquiring the needed resources from several actors. Thus, maintenance practices of a plant can be performed by the plant (customer) itself, an equipment provider, or an independent maintenance company. How should this be orchestrated? This paper begins a research project on maintenance service networks. We begin our study with explaining the current state of industrial maintenance business. Next, we offer insights from the services networks literature. Then we move on exploring maintenance offerings from different angles, which brings us to our framework outline for networked maintenance offering. Finally, we will show briefly the research setting.

**Track:** Managing Industrial Networks

**Keywords:** Maintenance networks, service offering, business network, manufacturing industry

**Type:** Work-in-progress paper

## INTRODUCTION

The impact of industrial maintenance is significant but its status and role is not highly recognized among companies (Alsyouf, 2009). Moving from reactive to proactive maintenance strategies with more preventive and predictive practices require more technology and knowledge about maintenance. Strategies such as total productive maintenance (TPM) focusing on long term improving the design of the production equipment and thus lowering the costs of repairs are more often utilized within customer plants (Swanson, 2001; see e.g. Cholasuke, Bhardwa, and Antony, 2004). While the importance of process equipment continuous availability has grown, maintenance services are more often outsourced to special maintenance companies. Furthermore, there are often multiple maintenance companies operating within a single plant, each focusing on different machinery or process levels of operations.

These service providers for maintenance operations can be divided in two broad categories. Equipment manufacturers are driven to provide more comprehensive offerings that go beyond the traditional product by providing various services including maintenance. On the other hand, independent maintenance companies are transforming their offerings from basic operations to cover more complex maintenance tasks. The two types can share together the maintenance of a single customer, thus creating a maintenance *service network offering* from the customer's viewpoint.

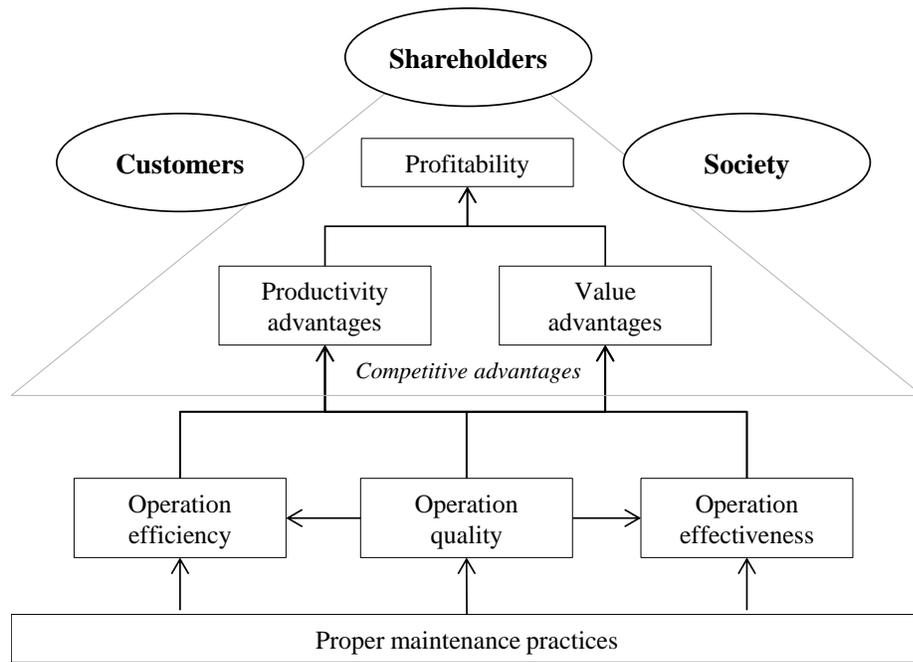
The above described scenario is a type of services network. B2B services have received growing academic attention but the lack of further studies is still acknowledged (Ostrom et al., 2010). On the other hand, services networks (e.g. Henneberg, Gruber, and Naudé, 2013) have been studied mainly in the B2C context (e.g. Morgan, Deeter-Schmelz, and Moberg, 2007) and studies on service innovations in the business networks is claimed by Kindström and Kowalkowski (2009). Also reviewing different offering concept and definitions (Normann and Ramírez, 1993; Grönroos, 2000; Ford et al., 2002; Wikner and Andersson, 2004; Brax and Jonsson, 2009; Nordin and Kowalkowski, 2010; Ulaga and Reinartz, 2011) points out the variety of different elements. Hence, we acknowledge the importance of context when studying the concept of offering. Lastly, maintenance related research has focused mostly on technical issues and studies regarding the business side of managing maintenance service are yet quite scarce.

The aim of our recently started research project is to understand how networked maintenance should be organized in order to maximize the added value to all network members. The need for this kind of business model has emerged from the companies participating to our research project. The present paper forms a ground for our data gathering and case analysis on maintenance service offerings. Accordingly, the **purpose of this work-in-progress paper is to outline a framework for studying service network offering in the context of maintenance services**. The paper is structured as follows. We begin with explaining the current state of industrial maintenance business. Next, we offer insights from the services networks literature.

Then we move on exploring maintenance offerings from different angles, which brings us to our framework outline for networked maintenance offering. Finally, we go through briefly the research setting.

## INDUSTRIAL MAINTENANCE

Traditionally industrial companies have had quite massive maintenance departments. Maintenance has been seen merely as a necessary expense and its status and role is not highly recognized among companies (Alsyouf, 2009). Alsyouf (2009) argues that maintenance strategies, functional organizational structures, top management support, and impact on performance should be highlighted when developing maintenance as a part of overall manufacturing and corporate strategy. However, operation efficiency, quality and effectiveness are all consequences of proper maintenance practices that together contribute to overall business performance, see Figure 1. Regarding to different maintenance strategies, Swanson (2001) suggest three different approaches; reactive, proactive, and aggressive. In the era of harsh competition and tight process schedules, industrial companies cannot count on reactive strategies, which result in massive costs and time losses compared to a more planned maintenance strategy.



**Figure 1.** Impact of proper maintenance practices on companies' competitive advantages (Alsyouf, 2009)

Instead of developing maintenance internally, many industrial companies have outsourced their maintenance function, which has created a new market for maintenance services. To satisfy the

need, often the outsourced maintenance unit has been established as an independent maintenance company (see e.g. Hatinen, Pirttilä, Viskari, and Kärri, 2012). On the other hand, also equipment providers are eagerly developing their offerings to cover more and more services including maintenance. Thus, maintenance practices of a plant can be performed by the plant (customer) itself, an equipment provider, or an independent maintenance company. Nowadays at industrial plants, maintenance is usually done by combining these options. A customer and an equipment provider can agree on sharing the maintenance practices together or a maintenance company can take an integrator role and provide all maintenance services. Thus, the customer believes that there is a chance for added value from a new kind of network model.

## **SERVICES NETWORKS**

Business-to-business services have had significant growth worldwide but the area is still quite underrepresented in service research (Ostrom et al., 2010; e.g. Kunz and Hogreve, 2011). Furthermore, as industrial business actions are often formed by a web of multiple actors influencing each other, it is essential to examine also services from a networked perspective. This perspective has also been the topic of a recent special issue in the *Industrial Marketing Management* (see Henneberg et al., 2013).

In their article, Henneberg et al. (2013) offer a sort of conceptualization for services network. Their view of services networks involve three layers or dimensions of services networks; first, second, and third order, representing “different intensities of possible service network constellations” (Henneberg et al., 2013, p. 5). While the first order of services networks depicts relationships with more traditional services elements, the second order of services networks carries on the relationship to a deeper level by focusing on solutions which combine products and services more seamlessly. The third order of services networks can occur when the emphasis shifts from products to services as the main contributor of value in offerings. Maintenance offerings can vary within this scale. When an equipment provider takes fully care of the plant, meaning a sort of operation or even leasing plan, and utilizes a network of partners, then maintenance can be a part of third order service networks. However, usually maintenance networks are best described as first or second order services networks.

Ahonen et al. (2010) acknowledge the lack of methods, models and practical business scenarios within maintenance service networks. They propose a type of consortium, maintenance community, to orchestrate maintenance operations in a given plant. In this model, deeper relationships are tied in order to orchestrate the maintenance practices as efficiently as possible. The partners share a common development targets and objectives.

## MAINTENANCE OFFERINGS

Offering means the variety of goods and services a company can deliver, it includes both what and how for the customer. The concept of offering has quite a few conceptualizations with many categorizations especially for the services elements, see Table 1.

**Table 1.** Different views on the concept of offering

Offering elements	Context	Authors
Core, facilitating, supporting services surrounded by the service concept, accessibility of the service, interactions, and consumer participations	Service business. Augmented service offering (ASO), the role of technology, service marketing	(Grönroos, 1987, 2000)
Goods, services, risk sharing and risk taking, access to or use of systems or infrastructure, and information	Consumer business. Risk aspects	(Normann and Ramírez, 1993)
Advice, product, service, logistics, adaptation	Business-to-business	(Ford et al., 2002)
Product, services, price vs. benefits and sacrifices	Integrated solutions	(Wikner and Andersson, 2004)
Installed base, solution system platform, information offerings, and service components	Integrated solution, manufacturing industry	(Brax and Jonsson, 2009)
Industrial goods and services combined into innovative bundlings	Hybrid offerings in business markets	(Shankar, Berry, and Dotzel, 2009; Ulaga and Reinartz, 2011)
Customization, integration, range, bundle, proactive/reactive, vertical/horizontal, product/business/partnership	Characteristics of solutions, literature review	(Nordin and Kowalkowski, 2010)

Our aim is to understand the actors and their maintenance offerings that exist in the networked industrial maintenance arena. In the following, we examine the offerings from both the equipment providers' and the maintenance companies' perspectives.

*Equipment providers* have long traditions for offering basic service, such as spare parts and warranties, with their products. However, they have quite recently developed more strategic service elements to differentiate their products. Industrial offerings have shifted away from product-centric with customer ownership and only supporting services to value co-creating and

sharing solutions for customer's specific challenges (see e.g. Kindström and Kowalkowski, 2009). Many equipment providers see services as a tool for ensuring long term customer relationships where different kinds of operating agreements are the key element. Many equipment provider offerings form a continuum (see e.g. Penttinen and Palmer, 2007) of services from less binding training services to heavily co-operational operational relationships, in which the provider might even own the customer's operation facilities. Often, the services are mainly focusing on the specific equipment provided. This is due to the background of the companies, usually their businesses have started with products and the services are heavily bounded to these products.

Equipment providers may have clear strategic choices towards operation agreements, but mainly due to their background on traditional product business, the development of turnkey offerings has shown to be quite an obstacle (Tuli, Kohli, and Bharadwaj, 2007). Often rooting from the discontinued maintenance departments, *maintenance companies* are offering a variety of maintenance services. Among the maintenance companies, there are both highly concentrated companies with deep knowledge only on specific services and companies that offer turnkey maintenance solutions by acting as an integrator towards the customer. These maintenance contracts cover the needed practices in order to avoid production downtimes. However, in some cases the maintenance company handles only customer's auxiliary equipment.

To conclude, it seems that there is overlap between equipment providers' and maintenance companies' offerings – both parties are able to be the maintenance integrator. The reasons behind which kind of arrangement is best in each situation will be one of our main topics in our empirical study.

## **BUILDING A NETWORKED MAINTENANCE OFFERING FRAMEWORK**

The aim in networked maintenance is to develop a setting where the added value is distributed evenly enough for the whole network. The main question is that which maintenance practices would be performed by which actor. This leads to different roles actors can possess, see Table 2. For the customer, there are three available roles. The customer can take the integrator role and orchestrate its maintenance using own and/or networked resources. On the other end, the customer can outsource everything by becoming a bystander. The last role is a participant, where the customer performs some maintenance practices on its own. The equipment provider can either be the integrator or be responsible for specific maintenance practices on core equipment. And finally, the maintenance provider can orchestrate the maintenance or act as an auxiliary equipment caretaker.

**Table 2.** Possible roles within maintenance framework

<b>Customer</b>	<b>Equipment provider</b>	<b>Maintenance provider</b>
Integrator	Integrator	Integrator
Participant	Participant – core equipment	Participant – auxiliary equipment
Bystander		

One of the key issues when developing a maintenance network is forming of mutual trust and commitment across network participants. Companies need to work closely together to find the most profitable setting for every participant. Quite unusual way to accomplish this could be that the participants reveal their cost structures and value creating potential to each other (see Grönroos and Helle, 2010, 2012). By doing this the network can then organize itself so that the value is maximized and shared between participants in acceptable manner. Here, the concept of maintenance communities (Ahonen et al., 2010) can be utilized. However, in order to construct the framework, empirical data must be collected and real life case evidence analyzed.

### **RESEARCH SETTING**

The present paper is a starting point for a networked maintenance services research project, which focuses on identifying, modeling and managing value in industrial maintenance services networks. One objective for the research project is to understand how maintenance *service network offerings* are constructed. The project aims to analyze the current maintenance offerings within the companies participating in the project and then develop a networked offering model. There are two maintenance networks involved in the project, one relating to mining industry while the other one is an energy plant. In both of the case networks the actors are customer (plant), equipment providers, and a maintenance company.

The present paper begins the research project by providing conceptual understanding on a service network offering in the context of maintenance services. However, the subject is quite unexplored and the next step will be using our results from the present study to design and conduct a classic qualitative case study (Dyer Jr. and Wilkins, 1991; Yin, 2009) by focusing on the two maintenance networks, both having four companies. The preliminary setup in both networks involves a customer, two equipment providers and a maintenance operator. However, we will conduct a pilot interview round before locking the research setting and final interview frames. This way we are able to move between data and theory (see e.g. Eisenhardt and Graebner, 2007). The full-scale interviews are scheduled for the second half of 2013, and the first results should be available for the IMP 2013 conference presentation for comments.

At this stage, we would like to receive comments on the proposed conceptual framework. Our aim is to formulate a framework that will unveil how maintenance should be orchestrated by using a service network. This framework is aimed to help to understand the complexity of service networks, which is one of the Henneberg et al.'s (2013) service network research

agendas. Our study contributes on service and network literatures as well as booming service network literature (Henneberg et al., 2013) by advancing understanding of service networks from the offering viewpoint. The study also presents maintenance-specific offering concept. Also, our study suggests fruitful insights for industrial maintenance providers in configuring their service offerings. For the customer side, our study provides topics that need to be acknowledged when assessing different maintenance offerings.

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