

# **Extension of Key Procurement Indicators for the Aviation Sector: A Case Study**

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# 1 Introduction

The current developments of the aviation industry are creating significant challenges for airline operators. Despite the increase of global air traffic, airlines in Europe and the United States are unable to translate this passenger growth into stable results as Middle Eastern airlines are the major winners of this trend. The circumstances for maintenance, repair and overhaul (MRO) providers in the aviation industry are likewise determined by continuous market growth but decline in revenues due to increasing competition by original equipment manufacturers (OEM) which are pushing onto the MRO market.<sup>1</sup> OEMs are increasingly joined by smaller, independent companies which concentrate on the provision of components and engines, and purchase repair services on demand.<sup>2</sup> This business model facilitates rapid market entry, expands capacities and improved quality of competitor services. The consequences for traditional Airline MRO Provider are increased price pressure and the competition for new contracts which have lead to a high outsourcing rate. In order to stay competitive, traditional Airline MRO providers have to strengthen their differentiation features, such as quality, turnaround time and adherence to schedule.<sup>3</sup> However, due to the high subcontracting rate, the execution of these features is directly linked to the performance of their suppliers, which in turn include OEMs. An effective management of the supply base is therefore crucial to the long-term survival of the firm.<sup>4</sup>

## 1.1 Motivation and research problem

The International Air Transport Association (IATA), which represents, lead and serve the airline industry, has identified common inefficiencies in the current MRO supply chains. They refer to supplier management (number of suppliers; selection, evaluation and recognition processes), establishment and monitoring of supplier performance metrics, make or buy decision process, and contract terms (guaranties, caps, timelines, expiration, etc.).<sup>5</sup> Research literature pertaining to these topics provide hardly any evidence how to overcome these inefficiencies, as supplier management literature doesn't embrace the context of the aviation industry which is intrinsically already very complex. In order to provide insights into the

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<sup>1</sup> Lufthansa Technik Annual Report 2011, p 3

<sup>2</sup> Lufthansa Technik Annual Report 2011, p 9

<sup>3</sup> Lufthansa Technik Annual Report 2011, p 9

<sup>4</sup> c.f. Simpson, et al. 2002, p. 39

<sup>5</sup> missing; Internal Document at LHT

supplier management and monitoring processes in the MRO business, a case study at the world's greatest airline MRO provider has been conducted. The inefficiencies named by IATA are also affecting the case company which led to the question, how an effective supplier performance measurement system should be set up at an airline MRO provider. The investigation of this research question has been decomposed into four subjects which are (1) importance of supplier performance measurement, (2) evaluation of Key Performance Indicators (KPIs), (3) issues in supplier performance measurement and (4) proposition of a system based solution. The major goal of the case study is the optimization of the current performance measurement system at an airline MRO provider in order to address the inefficiencies stated above. Moreover the thesis pursues the following objectives:

- Highlight the distinctiveness of aviation industry and the role of supplier performance measurement (chapter 2)
- Discuss current literature as to what insight it offers for the analysis and design of supplier performance measures and measurement systems (chapter 3)
- Present empirical insights into the use of supplier performance measurement in the case of an airline MRO provider (chapter 4)
- Propose a concept of how to implement a consistent and intra-organizational supplier performance measurement system for the case company (chapter 5)

## **1.2 Thesis Framework**

The objectives motioned above already provide a good insight into the structure of this study. The second chapter discloses the influences, which have shaped the industry in the past as well as presence and may shape in future. The many actors within the industry are thereby affected by these influences unequally, which will be highlighted by the value chain of passenger transport by aircraft. In order to capture the organizational context of the case company, characteristics and developments of the airline MRO industry will be explained in detail. The second part of the theoretical background refers to procurement in the airline MRO industry, in order to demonstrate to which extent supplier influence the success of airline MRO provider and which parameter can be leveraged to control supplier performance along the procurement process.

The control of supplier performance is mainly leveraged with the evaluation of performance measures. Which measures thereby are critical for supplier management will be discussed with a literature review in chapter three. Performance dashboards are a relatively new tool to set up an effective performance measurement system. The promising indications from literature have been a major driver, to propose the deployment of a performance dashboard in the case company, as there is currently no formal supplier performance measurement system available.

The case company is currently struggling with various issues in the evaluation of their suppliers. In order to find a solution how to set up an effective supplier performance measurement system, lead buyers from corporate purchasing have been interviewed. The empirical research process and results of the study are documented thereby thoroughly.

With the results of the case study and arguments in the previous chapters, recommendations how to improve the current situation at the case company with a supplier performance dashboard are presented in chapter five. After a critical analysis of these propositions, this work is finished by a brief reflection of the initially posed objectives of the thesis.

## **2 Theoretical background**

### **2.1 The stratification of the commercial aviation sector**

#### **2.1.2 History and economical development of civil aviation**

The history of the beginnings of aviation can be traced back to the fifteenth century with the first drawings and flying items. Over the centuries, the aviation industry has grown to a remarkable size and has become an important driver of economic growth today.<sup>6</sup> To comprehend this development and the relevant effects we focus on the more recent development of commercial aviation, which developed after World War II, using mostly ex-military aircrafts in the business of transporting people and goods.<sup>7</sup> A comprehensive overview of aviation history with main stages of development can be observed in Wittmer et al. (2011).

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<sup>6</sup> c.f. Wittmer et al. 2011, p. 5

<sup>7</sup> c.f. Wittmer et al. 2011, p. 12

## 6 Conclusion and outlook

The primary aim of this thesis is to provide insights into the use of supplier performance measurement illustrated in the case of an airline MRO provider and how it could be optimized. There are hardly any references for the aviation industry in research literature regarding supplier evaluation, which is distinctive from other industries.

The (commercial) aviation industry is still a rather young industry, which transformed in Europe into a competitive market only two decades ago. Consequently airline managers were forced to fundamentally change strategies and practices by focusing on cost efficiency, operating profitability and competitive behavior.<sup>213</sup> MRO providers are among all actors of the aviation industry those with the lowest margins and the highest operational costs at the same time. Meanwhile most MRO growth comes via partnerships, joint ventures and special agreements with OEMs, other MROs and neighboring countries, which leads to complex supply chains with increasing dependence on suppliers. The effective configuration of the upstream side of the supply chain, namely the procurement, is therefore essential to the long-term survival of MRO provider. This includes the analysis, evaluation, selection and monitoring of suppliers.

There are several parameters which constitute the performance of a supplier of aircraft related material. While the actual performance measurement starts at goods inwards, important performance measures are already determined ex ante within contract negotiations. A well negotiated contract, means from the buyer's perspective enforcement of company interests, also ensures a good supplier performance in the future. It is therefore important to select effective measures and already determine how they could be quantified. In the literature, price, quality, delivery and service are quoted to be the most critical criteria for supplier evaluation. In the case company delivery and quality have been also identified as most critical performance measures as the primary product of airline MRO provider is to offer availability of services and parts 24/7.

In order to measure supplier performance and subsequently optimize their supply base, companies use complex analytical methods like DEA or linear weighting with decision sup-

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<sup>213</sup> c.f. Belobaba et al. 2009, p. 6

port systems. However these methods are only reasonable with a huge supply base which leaves great selection options. This is not the case for LHT, as many of the suppliers act on oligopolistic markets. Supplier evaluation in the MRO business is therefore distinctive to other industries. Nevertheless the optimization of supply base, which requires an efficient and effective supplier performance measurement system, is also a relevant topic for the case company. At LHT, the evaluation of suppliers relies solely upon the measurement of certain KPIs as documented in the internal process tool. This informal structure has led to an inconsistent procedure in the measurement of supplier performance and the disregard of the root problem of poor data quality.

The deployment of dashboards has been identified as an effective solution to set up a formal supplier performance measurement system. Dashboards are also decision support systems, which display only a few central KPIs and are increasingly used in practice to measure business performance. In the literature there is hardly any evidence of dashboard deployment for supplier performance measurement. Since dashboards are still in their infancy, many research streams are not sufficiently covered, e.g. knowledge on how they are built in practice (functional and visual features), whether they are effectively utilized, and what impact they have on decision making and performance management.<sup>214</sup>

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<sup>214</sup> c.f. Yigitbasioglu und Velcu 2012, p. 53