

**Operations-Based Knowledge Management
(OBKM) in Aircraft Engineering**

By

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Certificate of Authorship/Originality

I certify that the work in this thesis has not previously been submitted for a degree, nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature of Student

Dedication

This dissertation is dedicated for my father, Abdulwahab, and my mother, Noor, who taught me that working hard will get you your dreams. Thank you for believing in me. Your love and prayers is what brought me where I am today. Also, I dedicated this dissertation to my wife, Heba. I would not be able to accomplish this research without her ultimate support, deep understanding and profound encouragement. She was always there cheering me up and stood by me through the good times and bad. Nevertheless, I would like to thank my father and mother in-law Abdulla and Khadija for their prayers, love and support during this journey. Finally, I want to dedicate it to my beloved daughter, Maya, and son, Mohammad, whose unconditional love and sweet spirits lifted and sustained me during the darkest hours.

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Abstract

Raising oil prices, intense rivalry completion, safety concerns and downward pressure on prices are some of the serious challenges facing the civil aviation industry. However, in the past decade the civil aviation industry experienced a new kind of challenge; the escalating shortage of sophisticated technical capabilities especially in the aircraft engineering fields. This was fuelled by the high job rotation, job reduction and the raising rate of retirement of the aging engineering workforce. This exposed the raising knowledge gap between the aircraft engineering experts and new hires. The need for an effective knowledge management (KM) system was evident.

Hence, the main objective of this study is to develop and validate a framework for better management of knowledge in the aircraft engineering field. The Saudi Arabian aviation industry was the domain for this research. A review of KM literature was conducted. Many of the KM initiatives seems to relate to focusing on the information technology (IT) based solutions rather than dealing with the organizations' operational issues that have diverse effect on KM implementation. Thus, Operations-Based Knowledge Management (OBKM) framework guidelines were proposed.

Also, an empirical investigation of the KM practices in the Saudi Arabian aviation industry was performed. Convergent interviews were carried out. It was discovered that level KM awareness among aircraft engineers is low. Moreover,

current KM practices are modest and, where they exist, are merely incidental to everyday operations, and not due to any deliberate focus on KM.

Further development for the OBKM framework guidelines was needed. KM critical success factors (CSF) literature coding and analysis were performed to identify the theoretical OBKM framework.

To incorporate the industry experts' feedback into the framework a KM workshop was performed in the Saudi Arabian aviation industry. It was attended by 63 aircraft engineering experts. It consisted of KM seminar followed by KM focus groups. The workshop helped raising the KM awareness and, at the same time, gathering the CSF for an effective KM system from their point of view. Developing the practice-based OBKM framework was done by integrating the focus groups findings with the proposed theoretical OBKM framework. In the last stage of this study, an industry wide survey was carried out to validate the practice-based framework.

The main outcome of this study was an OBKM framework with a proposed model and implementation guidelines for the Saudi Arabian aviation industry. It will assist the aviation organization to effectively manage aircraft engineering knowledge.

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List of Publications

Conference Proceedings:

- ZAWAWI, R., AKPOLAT, H. & BAGIA, R. Managing Knowledge in Aircraft Engineering. Proceedings of the 2nd International Conference on Logistics and Transport (ICLT 2010), 2010 Queenstown, New Zealand
- ZAWAWI, R., AKPOLAT, H. & BAGIA, R. Operations-Based Knowledge Management. Proceedings of the 2nd International Conference on Industrial Engineering and Operations Management (IEOM 2011), 2011 Kuala Lumpur, Malaysia. IEOM Research Solutions Pty Ltd.
- ZAWAWI, R., AKPOLAT, H. & BAGIA, R. Managing Knowledge in Aircraft Engineering. Proceedings of The 3rd International Conference on Logistics & Transport and The 4th International Conference on Operations and Supply Chain Management on 15-17 December 2011, Kurumba Maldives Resort, Malé, Maldives
- ZAWAWI, R., AKPOLAT, H. & BAGIA, R. Managing Knowledge in Aircraft Engineering – An Operations-Based Approach. Proceedings of the 2012 International Conference on Industrial Engineering and Operations Management (IEOM 2012), 2012 Istanbul, Turkey. IEOM Research Solutions Pty Ltd.

Journals:

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