
An Architecture Modeling Methodology for Aircraft Maintenance Service System

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Résumé

The maintenance of civil aircraft has the characteristics of multi-points, wide range, a miscellaneous set of things, long period. A number of stakeholders including: OEM (Original Equipment Manufacturing), suppliers, airline, MRO (Maintenance, Repair and Overhaul), and airworthiness authority have been involved. Each stakeholder holds his own responsibility for aircraft maintenance. However, the collaboration and information sharing among these stakeholders are insufficient, which will severely effect on the efficiency of maintenance work. The major challenge of the aircraft maintenance we identified is about how to deal with the problem of the segmentation of maintenance businesses. The segmentation of maintenance businesses implies the information flows are always smoothly propagated from top level to low level, however, the information flows propagation of the opposite direction is inefficient, which results in an influence on the efficiency of the maintenance that cannot be ignored. Due to this problem, the businesses are hard to form into a unified data source and the efficiency of information sharing has been decreased, which makes the operator difficult to make a decision from a global point of view. The segmentation of business processes and the largely manual analysis of the maintenance for the civil aircraft have a significantly adverse influence on improving the efficiency of the maintenance. To solve this problem, there has been a high requirement for providing a collaborative work environment for operation support among the stakeholders. Therefore, in this paper, firstly, the major problems in aircraft maintenance are identified via the literature review. Then, we propose a general architecture modeling methodology based on the adaptation of the conceptual model of architecture description. Then, an architecture model for the AMSS (Aircraft Maintenance Service System) is constructed by utilizing the methodology. Finally, a detailed discussion is illustrated to demonstrate the feasibility of this methodology.

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