Summary of the transfer paper

Overview of the Virtual and Augmented Reality Applications at DIEHL Aircabin with regard to Maintenance/Repair/Overhaul

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Diehl Aircabin acts as supplier for the aircraft manufacturer in the field of cabin lining elements and pipes for cabin ventilation. All activities within the areas engineering, manufacturing as well as verification & documentation have been executed according to the contractually defined requirements of the aircraft manufacturer. These requirements also apply in the field of maintenance, repair and overhaul (MRO). Structure, style and format of the MRO documents must be complied with international standards such as ATA iSpec2200, ATA Spec2000 and S1000D. Investigations in the field of component installation and accessibility are executed with the 3D CAD system CATIA V5. Based on these studies documents are generated and delivered to the aircraft manufacturer.

Today's Aircraft manufacturers' challenge is to simplify complex documentation. The approaches Virtual Reality and Augmented Reality provide great opportunities to fulfill this aim.

Augmented Reality (AR) in MRO
AR is useful for describing the function and structure of the assemblies and is useful for the description of complex work flows. The MRO documents must be delivered by Diehl Aircabin to the aircraft manufacturer. If AR has to be used as documentation media, an exchange format must be agreed together with the aircraft manufacturers. For AR technology the ‘marker-less optical tracking’ approach is applied.

Virtual Reality (VR) in MRO
VR is useful for analysis of the component installation and accessibility of the components. The results of these investigations must be presented to the customer. Diehl Aircabin is spatially separated from the aircraft manufacturers. Therefore either Distributed Virtual Environments or small travel-compatible VR systems could be established.

The wide range of components, configurations, and the frequency of the changes of the components requires a continuous data flow from the PDM database to the VR application.

Diehl Aircabin has planned to carry out a project in 2016 to 2017. This project includes a comparison of the AR and VR use cases within Diehl Aircabin and the AR and VR opportunities. It also includes an investigation of a continuous data flow of design data to the AR and VR applications.