PAMELA, a portable solution for workflow support and human factors feedback in the aircraft maintenance environment

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Abstract

This paper describes the NLR PAMELA (Personal Aid for Maintenance Engineers in Line operAtions) concept and the graphical user interface design of some aspects of it, developed in the EC co-funded projects TATEM and HILAS. The PAMELA concept is based on the use of nomadic computer devices to provide workflow support to aircraft maintenance engineers. It includes a set of functions for potential efficiency improvement, error reduction and the collection of performance data and human factors information. Earlier research in this area yielded a better understanding of the issues related to documentation use and task support requirements. The structure of the concept is modular, thus allowing for supplementary functions to be added.
The TATEM project focuses on the process orientation of the future maintenance system and the HILAS project on the human element in the lifecycle of aviation systems. These distinct project scopes allowed for different yet complementary viewpoints and functionalities to explore and develop under one coordinated concept. Due to the generic character of the EC projects, the project results are not expected to be *the* solution for one specific maintenance organisation, but sets of elements can be taken out for further customisation by individual end-user parties.

Introduction

Previous research has identified a number of human factors issues in the aircraft maintenance environment, of which a large number were related to the use of procedures and task documentation, as described by Van Avermaete and Hakkeling-Mesland (2001). Many of the results pointed out that a better form of task-support was needed in order to improve both safety and efficiency. Two main indicators as derived from these studies, which were based on a number of surveys done in maintenance organisations across the EU, supported this conclusion: the high figures for non-compliance to task procedures (up to 34% of the total number of cases), and the omnipresent use of so-called 'black books', illegal and personal note books, containing notes for later reference. Deficiencies in the content of procedures (e.g. there are easier and quicker ways) and the cumbersome accessibility of the