A MULTIDIMENSIONAL SCALING AND PARTICIPATORY DESIGN APPROACH TO CLASSIFY OPEN ENDED AIRCRAFT MAINTENANCE DATA

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by

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ABSTRACT

The quality assurance data to be analyzed by the web-based surveillance and auditing tool (WebSAT) is both qualitative and quantitative. The forced responses to checklist questions provide a definitive outcome identifying the effectiveness of the four quality assurance work functions. On the other hand, open-ended responses, the second type of response for capturing maintenance errors, are qualitative in nature since they reflect what the auditors and quality assurance representatives observe during their interactions at vendor locations. This research proposes to apply the statistical technique of multidimensional scaling (MDS) and the User centered Design (UCD) method of Participatory Design (PD) to categorize open-ended responses into suitable performance metrics of aircraft safety and organizational cost.

Given the importance of the open-ended comments made in the quality assurance process, it is critical to capture all open-ended response data in addition to the attribute data acquired from the forced responses. While WebSAT proposes to capture both types of information, the open-ended responses require interpretation to ensure their appropriate application in the maintenance/inspection process; that is, this data must be associated with the appropriate measures of the maintenance process. This research will then establish performance measures implying the impact of audit and surveillance findings on aircraft safety and establish another list of performance measures implying the impact of audit and surveillance findings on the organization. These performance measures are referred to as aircraft level impact (ALI) and organizational categories (OC), respectively.