DAC

CLUSTER EUROSME

MAJORBIT PROPOSAL

STRATEGIC THEMES
R00 - 17/05/2020

INTRODUCTION

The reference domain of MAJORBIT PROPOSAL is identified in the general field of aeronautical maintenance and, in particular, of the MRO maintenance bases and the purpose of the research can play a fundamental role for the development and improvement of the digital processes involved

The operator (airline) and the manufacturer (OEM) work to optimize the scheduled maintenance plan of the planes by making sure that the stops are as short as possible. It follows that for a maintenance base the main parameter of measurement of its competitiveness is given by the grounding (duration of the aircraft downtime necessary for maintenance) which is necessary for the execution of the maintenance checks on the aircraft, which is sometimes a parameter still more critical than the cost, with the same quality expressed.

Maintenance of the entire aircraft is a labor intensive process, in the sense that manpower hours affect the maintenance event for about 80% of MRO costs. In particular, maintenance operations are based on the diagnostic analysis of structures, systems and equipment that make up the aircraft, starting from the inspections carried out by specialized technicians who mainly carry out visual investigations to ascertain the status and conditions of airworthiness of the plane. Another important aspect is related to the process of resolving the failures and repairing the defects found in which the well-known specialization of the personnel emerges.

PROJECT PROPOSAL

The expected result of the MROs, for any initiative, is therefore a precise indication on how to obtain the reduction of manpower hours in relation to the process phases involved, considering that the timing associated with the individual maintenance tasks in turn depends on the same variables that influence the process, such as skills and operator qualification, team sizing, special equipment needed, spare parts supply etc. Of course, also the scheduling of the maintenance activities established by the OEM for the maintenance of the airworthiness of an aircraft, entrusted to the expert management of the MRO planners, is interconnected with the relevance of the maintenance events in a technical loop, which can be strengthened with the interventions foreseen by this research.

In this context, it is clear that in order to be competitive, the MRO must focus mainly on enhancing the personal experience of the individual operators, but this can constitute a significant criticality in terms of development. Reducing in some way the dependence of the

results of an MRO on this factor, codifying and generalizing the previous experience to make it accessible at the company level, facilitates the development of new and more efficient processes (in particular on new aircraft), helps in identification of corrective actions to improve the efficiency of existing processes, makes the company resilient towards employee retirement, and more. Ultimately, an important purpose associated with the proposed project initiative is that it must allow to lower the minimum level of experience required of operators in order to enhance the best practices capitalized as company knowledge and not as individual specialist assets. Overall, this determines a greater elasticity and responsiveness of the company to changing market contexts, promoting both further process efficiency and the development of new production activities deriving from the expansion of the aircraft in capability.

The indicated purpose can be pursued through multiple intervention lines based on the use of technology, below are the lines of intervention

- the development of a multimodal platform capable of assisting the process with the use of software based on Artificial Intelligence, characterized on the needs of an MRO, in order to make its operations more efficient, capable of pushing certain automation activities towards automation process such as planning and supporting other more manuals with digital devices that take advantage of new technologies (REFID Technology).
- To create a dedicated BOT module with the aim of making the general experience accumulated in the MRO field (maintence, Repair and Overhoul) available to individual operators in an increasingly complete and extensive manner, thus outlining a new scenario: that of a a real corporate community that interacts with the bot (Virtual Assistant), educates and interrogates it at the same time by feeding the database, and exploits its ability to document and re-propose the same experiences in the future. The same module will be developed also for technical training with VR/AR technology.
- Another guideline refers to the definition of a module that leverages the introduction and innovative use of block-chain technology aimed at efficient management of the production process, limiting the use of paper support to a minimum and favoring the use of digital display and management systems for information and actions. The system must ensure compliance with the certification requirements for data traceability and inviolability, promoting efficient management of the service.
- The project initiative also intends to develop automated diagnostic systems based on data acquisition through high resolution video cameras positioned on rovers and drones that can perform the operations entrusted to technicians with greater speed and precision. The goal is the creation of multimodal platforms programmed to operate in self-control, raising the current human performance also with respect to the difficulties relating to the most remote areas which, by height or conformation, would require specific equipment and scaffolding for the execution of maintenance tasks.

OTHER DIRECTIVES OF INTEREST

In relation to the problem of image post-processing, Major Bit is engaged in self-financed research activities in the field of AI application for the interpretation of multispectral satellite images, radar images and drone images in both visible and infrared fields, etc. . .

The results of this activity are addressed, for example, to the anti-intrusion context inside the airport (apron –fields), as well as to the development of support solutions for operators in interpreting the radar tracks of aircraft in flight and towards other strategic applications. both in the civil and military fields.