Specialist article

Have a good flight: mobile stores management using Android

The Mobile Aviation System (TUP.MAS) from TUP increases the quality of stocks in spare parts stores at airports

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The software producer DR. THOMAS + PARTNER (TUP) has been providing the aviation sector with the TUP.MAS mobile logistics system for several years. As a result, operators can use smartphones and handheld units to access stores processes in the aviation sector. Airlines and MRO service companies (Maintenance, Repair and Overhaul) can optimise their procedures when maintaining and repairing aircraft very simply by using the Mobile Aviation System. The AMOS aircraft maintenance software from Swiss AviationSoftware (Swiss-AS) forms the basis for the mobile mapping of all the processes within the TUP.MAS application and was developed in close cooperation with Swiss-AS. The product is called the Mobile-Device-System (MDS). Both systems enable verifiable increases in efficiency and quality when used in tandem and this in turn spotlights the cost efficiency in a positive way.

Aircraft are still viewed as the safest means of transport. However, they need to be regularly and vigorously maintained to guarantee aviation safety at all times. Maintaining aircraft is a responsible task, for only planes that have been maintained according to the rules are allowed to take off. This creates a logistics challenge, because the maintenance work has to be synchronised with timetables and other outside factors. Operators wish to set aside as little time as possible for cost reasons, as aircraft are only profitable when they are in the air. It is therefore essential to have plenty of spare parts available. This is one of many reasons why maintenance at this level requires a spare parts stores facility with continuous availability and the highest process quality.

AMOS from Swiss-AS has been supporting airlines and MRO service providers around the globe in this field for about 30 years. More than 170 international customers in the aviation sector use the system developed by the subsidiary of Swiss International Air Lines. Thanks to its varied functions, it provides an end-to-end solution for all maintenance processes. Data and information on error-free storage, availability and picking play a central role here in improving the procedures, stock quality and transparency at spare parts stores. Based on these requirements, TUP developed the TUP.MAS Mobile Aviation System in conjunction with Swiss-AS.

“The Mobile Aviation System is a module to support the processes in stores at airports with mobile Android handheld units or mobile data collection devices or Android smart mobiles (traditional smartphones). We’ve established a link to AMOS to map the stores procedures on mobile devices and therefore support the workers in their daily operations. We’re, so to speak, the long, mobile arm for the AMOS stores process,” says Dipl.-Ing. Günther Pfisterer, the TUP.MAS project manager and a member of the management team at TUP, explaining the system.

TUP.MAS: entries in real time

Prior to the integration of the TUP software in AMOS, items were exclusively put into storage at fixed, installed PC terminals. In practice, this involved the following: the worker went to the storage area (fixed space principle) with a spare part and then had to return to the same terminal. He keyed in the stores area where he had put the spare part into storage. Only then was it possible to complete the entry of the item and store it in the system. When developing its module, TUP studied these processes very closely and focused on the workers’ needs. “We always develop our solutions bottom-up and grapple with the problems that customers have in great detail. We also include the workers in this process. As a result, TUP.MAS is now a mobile solution that has proven its worth in practice,” says Pfisterer, explaining the development process. TUP.MAS and mobile devices have eliminated the time-consuming and what are sometimes fault-prone processes. Workers can now key in items online on the spot, directly at the stores area. This provides great benefits in terms of time and the quality of the entries increases.

“All the entries are registered in real time and TUP.MAS transfers them directly to the AMOS system online – even the simplest processes for putting items into stock are handled like this. As a result, there’s always a genuine picture of the physical movement of a spare part in the system,” Pfisterer continues. The advantage compared to handling items without any mobile devices is obvious. “The stores personnel communicate directly with the host system via mobile devices. These units also provide a comprehensible guide for users, industry-scale barcode technology for logging data when items are put into storage or picking and confirming orders, exact instructions for all the working stages and route-optimised, time-saving picking pathways. There are also features like automatically reporting shortfalls, entering new items and inventory functions,” says Pfisterer, explaining the options available.

Competitive through transparency

Optimising processes when maintaining an aircraft fleet can become a competitive advantage in times when airlines are increasingly facing cost pressure as a result of the competition in the market place; after all, stocks in the aviation sector are extremely valuable. A single spare part can easily cost hundreds of thousands of euros. The rules regarding aviation safety play a role here too. Companies operating in the sector must prove where a particular spare part was installed – firstly, for liability reasons and, secondly, they need to know exactly in which aircraft it was installed if a manufacturer recalls a particular part; it can then be replaced immediately. This is the reason why the traceability of lots, starting from the incoming goods and moving to its passage through the complete hangar, including each storage point, and even its installation in an aircraft is a top priority. “Tracking batches precisely is essential for complying with the high quality standards in the aviation sector with its large range of spare parts. TUP.MAS provides huge support for the AMOS system here, as incorrect manual entries are impossible and the system ensures that the quality of entries is absolutely perfect,” says project manager Günther Pfisterer, by way of summary.

Inventory discrepancies decline if the quality of the entries increases when putting items into storage and when picking. The effort and expenditure on inventory work are cut significantly too, because it is possible to count the items directly at the storage area. The system asks responsible workers to count the items in a storage area; they scan it and each part that it contains and enter the quantity online too. “It’s always absolutely clear where a particular part is located. In many cases, auditors have now agreed that it’s not necessary to count everything all the time, but simply conduct random checks,” says Pfisterer, explaining the verifiable increase in quality.

However, it is not only possible to use the Mobile Aviation System during planned maintenance work or stocktaking. A solution has also been developed for spontaneous aircraft maintenance – something that happens fairly often. “We’ve implemented relevant procedures if we need to perform “Aircraft On Ground” (AOG) maintenance. In this case, TUP.MAS treats the relevant spare parts as a top priority. If an urgent order is placed and a plane lands for AOG maintenance, the system releases the prioritised spare parts first and highlights them accordingly. The employee is automatically directed to these items that are urgently required,” says Pfisterer. The software also takes into consideration the scheduling rules that are relevant for stocks, like “First in first out”, the remaining storage period or the “best before” date. “Storekeepers decided in the old days which part they would pick, install and then enter in the records later. The TUP.MAS system now tells them exactly which component to use. This guarantees that spare parts do not spend more time in the stores than is necessary. This benefits the quality and reduces the number of goods that are defective because of being stored too long,” says Pfisterer, continuing to explain the system.

Industrial-scale mobile data logging devices (or handheld units without a keyboard and touch display) with an in-built scanner and the Android operating system are suitable as equipment in a stores facility. They are often used, as they provide excellent scanning quality. “But theoretically, it’s possible to use traditional Android smartphones too. Both smartphones with an in-built camera and even smartphones with an external scanner, like a ring scanner, can be used for the work in the stores. The customer can use whatever it likes. The device is of secondary importance for the software. The customer receives a complete operating system and hardware adapted to it and then simply has to install the TUP.MAS app,” says Pfisterer.

Keeping an eye on the future

Despite the simple means of implementation and all the other benefits that the Mobile Aviation System offers to its users, TUP and Swiss-AS are working together to continue developing the module. “We want to constantly extend the functions in TUP.MAS. One example of this is the management and return of tools to a store. It’s essential to ensure that all the tools used have been removed from an aircraft after maintenance work in a hangar – rather like after an operation at a hospital. We’re working closely with our customers and Swiss-AS at the moment to provide this function,” Pfisterer explains. And the developers are aiming to improve the traceability of spare parts too. “We’ve received a request from the sector to ensure that the parts taken out of the stores need to be tracked until they reach the hangar – rather like tracking packages with courier services. The customer would like to know where the spare parts are located before they’re installed. That is to say, the logistics chain between the stores and the installation point will be increasingly watertight for traceability reasons. This also has something to do with the fact that MRO service providers are accountable to their customers about where parts are currently located so that they can be reallocated, if necessary.”

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