Aer Lingus cuts CASK with AeroDocs
Aer Lingus Innovation

The EFB programme at Aer Lingus follows in a long tradition of innovative IT applications: Aer Lingus has always been in the vanguard of IT in commercial aviation, having been the first company in Ireland to operate a mainframe computer in the early 1960s.

We quickly realized that even if we had been able to immediately implement EFB in the cockpits it would not have been possible to use it because we were not prepared with the necessary supporting capabilities on the ground, in the back office, in our administration functions. Of course, we knew that there would be major benefits from EFB including the paperless cockpit and improved distribution of content which, in turn, would support better compliance and the streamlining of processes: but, in light of the lack of supporting capability already mentioned, we were finding it difficult to build a business case.

It was decided that the best approach would be to break the program into different phases. This, it was felt, would minimise the risk to each phase, allow us to assess feedback for each individual phase and maximize the cost effectiveness of implementation.

Phase 1
Electronic Document Implementation

The first phase, which commenced in 2007 and ran to 2011, was to implement an electronic document authoring and content management system and to assess the benefits of digital delivery. It was during this phase that we started to work with Viasat, using their applications and expertise as we progressed along the program. At the outset, we already had pilot and cabin crew portals that had been built in-house and were maintained by the airline’s Cabin Crew and Pilot section.

The first decision was to replace those portals with a new content management system (CMS), implementing an XML authoring application so that we could move to electronic manuals and a simplified editing process — a number of past features in Aircraft IT have explained the benefits of XML authoring.

Before embarking on this, we went through a process to define our requirements from which an RFP (Request for Proposal) enabled us to consider a number of vendors. As a result of this process, Viasat was selected to supply two of their web based tools, AeroDocs, which is a guided XML authoring tool and
the Viasat content management system, from which we developed new web-based pilot and cabin crew portals. These first implementations went live in the first quarter of 2009 and any implementation issues that arose were quickly dealt with by the Viasat and Aer Lingus teams overseeing the program.

The extent to which the implementation was a success can be judged from the fact that we soon felt able to develop additional functionality so that Viasat software is now used to support all portals in Aer Lingus and the staff intranet.

By 2011, Aer Lingus had digitised most of the key manuals including FCOM (Flight Crew Operations Manual), MEL (Minimum Equipment List), OMA (Operations Manual Part A) and ACSP (Air Carrier Security Program). A number of content types were also digitised, including flight crew notices, cabin crew notices, airfield briefing sheets, rosters and flight briefing packs. Because it’s a single content management system, we can publish content once and it becomes available everywhere through all relevant portals.

Finally, we assessed the many benefits that had been achieved from this phase of the programme.

Benefits delivered by Viasat:

- Lower documentation editing costs.
- Reduced information distribution timescales.
- Lower Flight Crew information production costs.
- Lower information delivery costs.
- Lower audit costs for compliance on proof of training evidence.
- Reduced Flight Crew community workload with information more easily available through one portal.
- Improved staff awareness.
- Better crew situational awareness pre-flight.
- Lower rostering costs.

These results were very encouraging and added confidence as we moved into the next phase.

**Phase 2**  
**Class 1 Electronic Flight Bag Implementation**

From 2011, the second phase of the programme was to implement the Class 1 EFB solution using Windows. We had first needed to have a documentation system that was available on the ground, which we achieved with the new portals; by the time we set out on this second phase, every part of the airline had a portal that could be accessed through the intranet.

The next step was to bring this all on board the airplane. In 2011, we got management approval but, at the time, class 2 devices to be viewable and available throughout all stages of the flight were very expensive: as a result, we opted to get approval for a class 1 project using a laptop computer. The device that we chose was the Panasonic Toughbook for a number of reasons including that we knew that the case and the shape of it wasn’t going to change.

Based on the successful experience we’d had with the ground portals, we wanted to introduce the Electronic Flight Bag and bring onto it the Viasat AeroDocs manual distributor and viewer system.

One reason for that was that AeroDocs uses XML documents and we also wanted our EFB devices to be able to be updated using 3G.

Viasat has a system whereby we won’t need to run around aircraft with USBs to update the EFBs – that would be tedious and labour intensive – but will be able to update everything over 3G. After discussion with our mobile provider about stability, we have opted to use a more stable 3G M2M (machine to machine) secure private network platform managed service. Viasat system is able to compare new issues of manuals or documents with the previous issue to identify the differences so that it only needs to send the difference, the Delta changes, over 3G which makes for much lower 3G costs.
The software on the device has the capacity to replace the old version of a manual or document with the new amended version to be viewed. We used an in-house performance application called ALPS (Aer Lingus Performance System) which is also on the Toughbook. And we have set up an EFB administration in Aer Lingus’s Flight Operations Engineering Department where the head of performance engineering is also the EFB administrator who set up the EFB manual and accompanying procedures.

Furthermore, we’ve designed SOPs (standard operating procedures) for the flight crew to use the devices which are assigned to aircraft rather than to pilots. There are two devices on each airplane, on the left and on the right, and they are registered to that aircraft so that, for sections such as the FCOM, only the information applicable to that specific aircraft will be displayed.

As far as the implementation was concerned, we wanted to achieve some specific cost savings including a reduction of the cost for producing paper manuals right across the organization, a reduction in the cost of distribution of manuals and notices and some cost improvements on the performance side with the ALPS performance calculator allowing us to use, for instance, optimal flap settings and being able to get better flexible take-off thrust figures for reduced power takeoff. On the corporate side we needed to address some extra details. We have an electronic journey log that records all times – ‘off-gate’, ‘take-off’, ‘landing’, etc. – as well as letting the flight crew enter reasons for delays, to support better data gathering and better analysis tools.

**Phase 3**

**Full Mobile Device Implementation**

On completion of Phase 2, the general view was that it had been a success, so much so that we got a lot of feedback from crews including that they wanted some information to be available off the aircraft. This was largely because we had decided to fix our EFBs in the cockpit but the flight crew wanted access to items like the flight briefing packs in advance of arriving in the cockpit or even arriving in the operations area at the airport.
This is particularly useful for overnight crew stays at stations such as New York or Chicago where they can download their flight plan briefing pack onto a mobile device and even be reading it on the bus to the airport to get the information in advance.

This works really well and for that project we decided that the iPad would be the best device and we’re now feeding the information that the crew needs also onto an iPad so that they can have access to everything, on the ground, before they even arrive at the airport. We selected Viasat again for this based on their proven success with the ground operations portal. We also thought it would be best to transfer that onto a mobile platform which Viasat built for us to give mobile devices access to all of the information on the ground portal.

Based on the successful experience we’d had with the ground portals, we wanted to introduce the EFB and bring onto it the Viasat AeroDocs manual distributor and viewer system. One reason for that was that AeroDocs uses XML documents and we also wanted our EFB devices to be able to be updated using 3G: including flight plans, weather information, security information, everything coming from our flight planning system plus some extra information from engineering about defects on the airplane and where the airplane is parked.

During 2014 we issued iPads to all pilots based on a business case that saw further improvements in costs. Aircraft cost savings came from a reduced cockpit workload with improved crew awareness and preparation as a result of having more time to assimilate the information provided, plus there’s a growing body of information available digitally. The mobility aspect of the program, using iPads, was implemented with the third phase, commencing 2012 which, with the second (EFB implementation) phase, is continuing in the current year.

Measuring Success

Overall we’d say yes, the EFB program in Aer Lingus has been a success. It was a pleasant surprise for us when the crews requested the information to be available outside of the cockpit (see phase 3 above). We had decided to make the actual EFB devices ‘aircraft assigned’ to give us better control over the ships’ library and to ensure that the devices were always with the aircraft to avoid any delays in dispatching. However, we’ve revisited this to add in pilot mobility.
We are now proceeding to remove the paper manuals from the aircraft. This will remove up to 35-40 kilos of weight from each aircraft.

iPads, while they met one of the crews’ own requirements, were initially a cause for concern with pilots and their unions worried whether, as trackable devices, they would allow the airline to invade an individual’s privacy. We overcame this with a number of assurances from management.

Lessons Learned

Following the program, we have made a few notes to ourselves for future projects starting with the need to spend time properly capturing the requirements that the project has to meet and to ensure adequate risk reduction on the new technology integration – to avoid exposing the operation to risk. It’s also important to be very careful when selecting suppliers to be sure that they’re adaptable and can work with an airline when its operation might generate particular needs that are not standard to, say, a vendor’s software. Don’t underestimate the effort involved in testing the software, communications and processes, and updates and processes to ensure they work well enough to replace the paper.

And remember that it will be important to work hard to bring the staff along with any changes, even if they are resistant at the outset, and to involve the regulator at every stage because, without regulatory approval, the programme won’t fly.

Finally, the involvement of IT at every stage is critically important given the reliance on servers and communications systems, and for the provision of back-up and fallback capabilities.
Your next steps

1. For more information on the benefits delivered by AeroDocs,
2. Click here to arrange a free consultation call with our airline document experts,
3. To arrange a web demo,
4. To meet us at an event, please contact …

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