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Results

- Improved the process of updating high-volume flight manuals by integrating Adobe FrameMaker into the manual management workflow
- Delivered powerful functionality and fast rendering of graphics
- Boosted staff efficiency of editing manuals by about 80%
- Greatly reduced the time associated with manual revisions by using electronic file transfers of Adobe FrameMaker files instead of a previous printing and distribution process that took weeks
- Enabled pilots to easily compare electronic manual updates on-screen and quickly identify changes
- Helped ensure a smooth implementation of the new system and launched on time

ANA (All Nippon Airways Co., Ltd.)

Manual management solution

Adobe solutions support prompt, accurate manual management for the state-of-the-art Boeing 787 airliner

Manuals are required in many different businesses. In some cases, when there is an extremely high volume of paper to be managed, this can represent a significant challenge, and users often experience difficulty finding the specific information they need. For airlines, above all else, precision and care is needed when creating and managing the voluminous flight manuals used by pilots. Based on exceptional efficiency for editing high-volume documents, All Nippon Airways Co., Ltd. (ANA) selected Adobe FrameMaker software to edit and manage its flight manuals.

Managing aircraft flight manuals, a time-consuming and laborious process

Manuals are used in nearly every industry for a variety of purposes, including business office manuals, retail customer service manuals, factory operations manuals, and more. For flight manuals used by pilots, accuracy is essential because the information contained in these manuals directly impacts passenger safety.

Referring to the length and complexity of flight manuals, Tokiomi Fukuda, Head of the Technical Management Team for Flight Operations Quality Assurance at the ANA Operations Support Center, says, "Depending on the aircraft model, each manual is 2,000 to 3,000 pages long, contained in up to four binders which are seven to eight centimeters thick." The management of these manuals is regulated by law and currently for most aircraft models, paper-based manuals must be kept in the cockpit during flight operations.

In addition, the flight manuals for each aircraft model are typically revised about every six months, whereas the flight manuals for newly commissioned aircraft models are revised every few months. As for the aircraft themselves, even if the plane body is the same, the specifications vary for each airline carrier, so the information from the aircraft manufacturer must be checked to determine whether these differences need to be reflected in the manuals.

Hidemasa Miyamoto of the Technical Management Team for Flight Operations Quality Assurance at the ANA Operations Support Center, describes the process: "Once we decide to make a revision, the editing process begins. In order to help ensure that the revision is reflected in the manual accurately and promptly, editing must be performed quickly and without error. Once the revision is complete, the data is then sent to the printing company, and then passed on to the company that stores all the printed manuals. The process takes two to three weeks. Moreover, when revisions are made, since only the revised section is being replaced, the replacement section is distributed to the pilots of the relevant aircraft models, and the pilots replace the necessary section. This work also places a huge burden on the pilots."

Editing system designed for the 787 but frequent updates were a challenge

A state-of-the-art airliner commissioned by ANA in 2011, the Boeing 787 includes a flight support system called the electronic flight bag (EFB). To support paperless operation of the aircraft, it leverages a screen in the cockpit that can display the actual position of the aircraft as well as flight manuals and other flight materials. ANA was the world's first carrier to adopt the Boeing 787, and ANA collaborated with Boeing from planning through the aircraft development stage. As a result, the manual editing system was designed by ANA from the start.



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Challenge

- Managing ongoing revisions to voluminous aircraft flight manuals accurately and promptly
- Handling the frequency of updates to the electronic flight bag (EFB), a program that displays the manual for the Boeing 787 airliner
- Relieving burden on pilots of placing revised, printed sections into manuals

Solution

Working with partner Nihon Unitec Company Limited to implement a new system based on Adobe FrameMaker to edit and manage revisions to flight manuals

Systems at a glance

Adobe FrameMaker
 AXIS manual editing system

A decision was made to use XML for the manuals displayed by the EFB, as it is a very effective tool and supports an efficient editing process. For example, compiling tables of contents and indexes usually requires a great deal of time, but with XML, the tables of contents and indexes can both be automatically generated by the system.

The manual editing system built by ANA could handle XML, but ANA needed to also address challenges associated with EFB system updates. According to Tatsuya Sato, sub-team manager in the IT Solutions Department, ANA Systems Group, "The Boeing EFB had just been developed, and there were frequent program updates. The system developed by ANA was unable to handle the frequency of these updates."

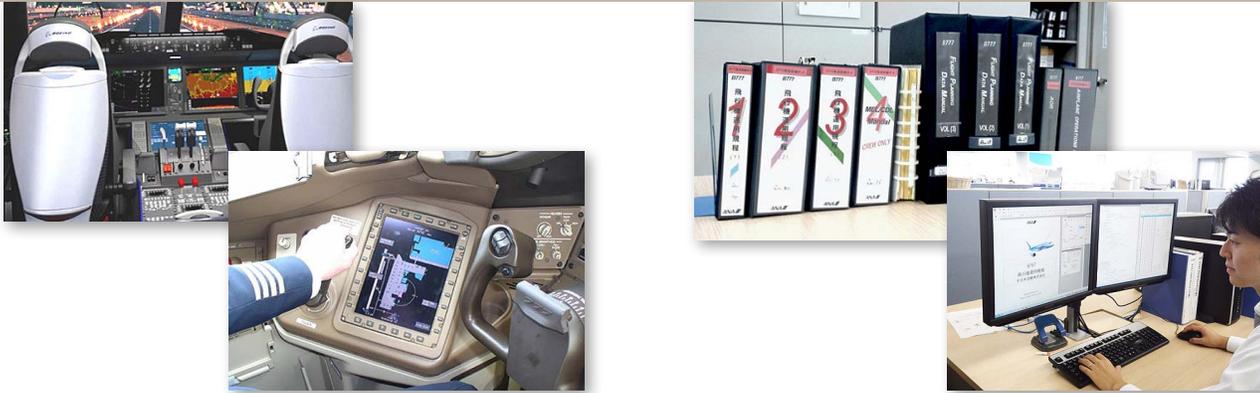
Flexible updates, powerful functions, and high performance

To address this issue, at the end of 2010, ANA started to develop a new system that could handle the EFB updates. After considering the specialized tools and services available for editing aircraft manuals and comparing a range of XML editing software, ANA chose Adobe FrameMaker. In October 2010, ANA began a collaborative development with the Nihon Unitec Company Limited (www.utj.co.jp), a company with extensive experience in developing systems with Adobe FrameMaker. In addition to incorporating an editing management function, in November 2012 ANA began to use AXIS, a new manual editing system.

AXIS was selected for its ability to handle specification changes flexibly, part of the original requirements, as well as allowing ANA to perform the entire editing process internally. Its user-friendly interface means that anyone can edit a manual without requiring knowledge of XML. Mr. Sato also added: "To achieve all of our requirements, we would have had to customize another product. However, with Adobe FrameMaker, the basic functions were powerful and they fulfilled our primary specification. Aircraft manuals also contain many complicated diagrams, and it would be inefficient if the graphics took a long time to display. Adobe FrameMaker was therefore valued for its fast graphic rendering."

To transfer to a new system while keeping the current system operating efficiently, ANA avoided any major changes to the user interface and operation. The built-in flexibility in Adobe FrameMaker helped ensure the smooth implementation of the system, and Junko Hashimoto of the IT Solutions Department, ANA Systems Group, declared: "Just after a new system is introduced, there are usually lots of operational bugs and queries about how to use the system, but there were few problems or queries to address, and we launched the new system on schedule."

Editing a flight manual with Adobe FrameMaker. A typical flight manual used at ANA contains four to five chapters per volume for each aircraft model. The powerful functionality and user-friendly operations FrameMaker provides result in greater efficiency and improves the quality of manuals.



Significant reduction in time required, well-liked by pilots

After introducing Adobe FrameMaker, the time required for editing published manuals has definitely decreased. On this point, Mr. Miyamoto noted: "In the past, two people would be responsible for one manual. In addition, the printing company would appoint several people, so there would be a total of four to five people involved for each manual. Now this has been reduced to just a single person in charge, which is an efficiency boost of around 80%. Also, it used to take at least two to three weeks just for the printing and distribution stages, but this has now been reduced simply by transmitting the files electronically. This means that the time required for implementing the revisions has been greatly reduced."

For manuals created using Adobe FrameMaker, pilots particularly value the function that allows them to compare the old and new manuals. Because the old and new text can be compared on the same screen, it is easy to see which sections have been changed in the manual. The list of revised sections is generated automatically and the ability to jump from the list to each revised section is also highly appreciated.

Currently, ANA is also delivering its manuals in PDF for those aircraft that don't have EFB installed. All pilots carry iPads and ANA is working to make the manuals available on the iPad. Until the law catches up, ANA will continue to carry paper-based manuals during flight operations, but aims to provide electronic manuals on all flights in the future.

Lastly, Mr. Fukuda commented: "Our main task is to help ensure that our manuals have the appropriate content, but we can no longer compile our manuals without using software solutions. We would therefore like to take even greater advantage of Adobe's knowledge and use IT solutions on a wider scale."

For more information

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