KOALA

White Paper

Aerospace and Aviation Information Management

KOALA PUBLISHING LTD

http://www.koalapub.co.uk

Management Summary

Synopsis: Using a structured approach to technical information delivery in the aviation industry for both traditional printed (essentially linear) documents and advanced electronic formats which are comprehensively indexed and searchable.

This White Paper discusses a modern approach to producing documentary information in the aviation industry. The problems encountered in this activity, while not unique to the industry, are perhaps even more critical than in other fields and include:

• Duplication of effort on the part of highly skilled and expensive subject matter experts (SMEs)

• Inconsistent quality, which in the safety critical aviation industry can lead to disastrous or fatal consequences

• Inaccessibility: a plethora of information and no easy way to retrieve what's wanted

Today's technology also opens up the possibility of electronic delivery as well as traditional (i.e. linear) documents. However, until now doing this was in the realm of a very technical exercise, which hindered its wide scale adoption. Today, software tools and supporting services are available to enable non-IT users to exploit the power of international standards - such as XML and DITA. These have been around for some years and have finally entered the mainstream to deliver the promised benefits of greatly reduced cost; far higher quality and dependability; and accessibility to those the information is ultimately destined for - users at the sharp end.

Building documentation the "traditional" way

In most organisations - even relatively small ones - there are a lot of people contributing to content. That means commonly, people go their own way in terms of the content and it becomes inconsistent. This is the natural culmination of the use technologies such as WP or DTP, which are now quite old.

This presents many serious difficulties:

• Doing things this way is very time consuming and there is a lot of duplication of effort.

• Many tasks - for example formatting - are manual, leading to further unnecessary costs.

• It's now commonly required that the same content is presented on paper and electronically, and this is often difficult.

• As the company adds more products, this situation gets worse and worse.

These are tough times, so companies are looking for ways to move to common structures, common styles, and a consistent way to present information.

XML and DITA: the structured solution

The idea of reusing content, revolutionary outside the technical community a few years ago, is becoming mainstream as economic realities start to bite.

As a matter of fact, most companies already re-use content - by copying and pasting as described earlier, with all its attendant problems. What's required is to have a formal means of re-using content, where the re-use is controlled and re-used material is kept as a single source. Enter XML.

The eXtensible Markup Language - XML - is well past the leading edge and becoming very much a common technology. The problem until recently has been that XML was shrouded in technical complexity which was daunting for non-technical people to grasp - never mind to understand its benefits. Now, with the emergence of higher levels of standards, such as the Darwin Information Typing Architecture - DITA - built on the foundation of XML, we can start realising the benefits without having to become technical experts.

DITA was originally developed by IBM, and is today an OASIS open standard that allows us to fully exploit the potential benefits of information re-use and information re-purposing offered by XML. It allows non-technical people to capitalise on the benefits of XML without having to go down into the engine room. DITA, like XML is moving away from the leading edge and becoming a mainstream technology to tackle practical business problems.

In DITA terminology, the smallest unit of information is called a topic. Topics may be grouped under a heading, and headings can be grouped much like the chapters of a book. This is done using a dita topic map.

Each topic is an XML file that can be re-used amongst any number of applications, so the same topic could appear in different topic maps - for example a topic map for a User Guide and another topic map for a Maintenance Manual. The key point is that it is the SAME information being re-used in each manual, so consistency is guaranteed. Also, when an update is needed, we only do the update once to bring both the User Guide and the Maintenance Manual up to date.

Also, the same information can be re-purposed - for example in a printed document and a help system; or deployed on an electronic flight bag, or used to compose pages for a web site. Here again, one update will automatically update everything - the printed document, the help system, the electronic flight bag, the web site and anywhere else you have decided the information is required reading.

Operations manuals

Producing and maintaining the Ops. Manual never seems as simple and straightforward as it should be ... Costs rapidly escalate; expensive personnel are tied up wrestling with software; timescales slide away into the future.

- Have you ever had to pay people for duplicated work in several different manuals? Found the results, despite everyone's best efforts are inconsistent and contain errors? And then had to explain why the budget had vanished down a deep black hole?

- Have you ever discovered the "same" information was actually different in various parts of your documentation? At best embarrassing ... at worst, could lead to disaster. And the regulator is watching you ...

- Have you ever been told that a "simple" update would take weeks? When the regulator is breathing down your neck, and you don't even have days, never mind weeks.

- Have you ever been told that putting the manual on an EFB was a major undertaking? When everyone wanted it "yesterday". Did they explain why it would take so long? Did the explanation sound over technical?

There IS a better way! Koala has produced a standardised DITA Map for operations manuals that gives all the advantages that DITA and XML bring to the technical authoring process.
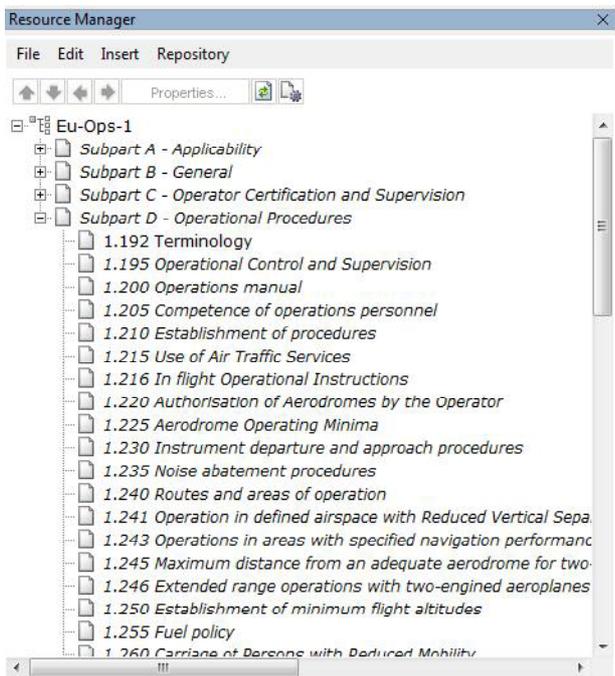
The topics in this DITA Map are reusable XML components and can thus also be used in other DITA Maps - for example for a staff training manual.

Maintenance Manuals

The quality of maintenance documentation is amongst the most critical in aviation. If maintenance is incorrectly carried out, it's usually too late when a consequent problem manifests itself during flight.

Quality issues include:

- Getting the most up to date version of a procedure delivered to all the parties that need it, and ensuring that they all have exactly the same information, no more, no less.

- Ensuring the right version of every diagram appears with the corresponding version of text that refers to it.

- With the advent of inexpensive video technology, integrating this with text and diagrams, and ensuring the video footage corresponds exactly with the text and diagrammatic material.

As well as the quality requirements, we have also to deliver the documentation to the right place and in the most appropriate format. This can include:

- Ruggedised PC compatible devices used in the maintenance area itself.

- Printed documentation maintained for office use and submission to the regulator. The big issue here is that we must ensure that:

1. The information in each case is exactly the same. Furthermore, if the information needs updating, the new information is delivered to both destinations.

2. That the job of maintaining the information is done once only, not once for each destination. Furthermore that the SMEs writing the content don't have to bother about the technicalities of formatting the information for each environment - this must all be handled automatically.

Aircraft Flight Manuals

The Aircraft Flight Manual (AFM) is a highly technical document; and yet it is also regulated and therefore inherently structured. For example, all AFMs must contain an *Emergency Procedures section; a Normal Procedures section; Performance* etc.

The AFM is normally produced as a printed (essentially linear) document, although today it's increasingly required to be available on the EFB as a content addressable randomly searchable electronic information source.

DITA and XML are the modern basis for producing an AFM. The re-purposing capabilities of XML mean that the same source information can be used for printed manuals as well as what is required for the EFB, and for that matter eLearning systems, web sites and more. The fundamental aspects of DITA relevant to AFMs include:

- The AFM is split into sections called topics. A topic is a self contained entity, complete in itself. An example topic is "Double Generator Failure". This topic has to be read in its entirety and can be functionally addressed by its title.

- A facility known as a *DITA Map* which is a sophisticated catalogue of all the topics in the AFM.

- Means of selectively combining topics to make an electronic publication. This could range from the whole AFM, to a QRH, rendered as a printable PDF or to a single topic for display on an EFB. The selectivity can be extended down to an aircraft serial number. This means that AFMs can be economically written on a *per airframe* basis - something that would be prohibitively expensive using traditional DTP or WP techniques.

- Because all of this is encoded in XML, sophisticated searches can be made - for example "retrieve all topics whose title includes "fire" or "takeoff".

Koala can prepare an electronic rendition of the AFM from the original using software that we have developed internally, greatly reducing the workload. The illustration below shows a didtamap for a standardised AFM.
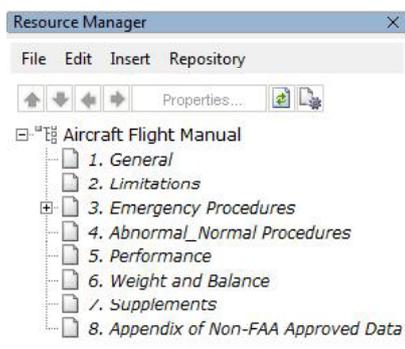
Aerospace and Aviation Information Management

The right digital aeronautical information; at the right place; at the right time.

Koala was founded in 1988. The company has always specialised in technical publishing and develops software solutions mainly based on Microsoft and Adobe platforms, as well as selling third party software products.

Our vision is to be recognised as a leading provider of digital aeronautical information.

Our mission is to provide the right digital aeronautical information to the right place at the right time. We help service providers and manufacturers of sophisticated products who need to create maintain straightforward, easy to use information and deliver it to their customers in the most effective way possible - from electronic flight bags and PDAs to printed manuals.

We offer a unique combination of aeronautical and aerospace industry knowledge and experience combined with knowledge of information architecture and structures and software development capability. Koala has been active in XML from its inception and is a leading practitioner in XML and its related technologies, including DITA, XSL-T, SVG and CSS.

Our partners include Innogistic (UK); IXIAsoft (Canada); JustSystems (Canada); TracWare (IoW); GreenFlight Systems Ltd (IoM).

Koala is a member of the Farnborough Aerospace Consortium (FAC).

KOALA

KOALA PUBLISHING LIMITED

http://www.koalapub.co.uk