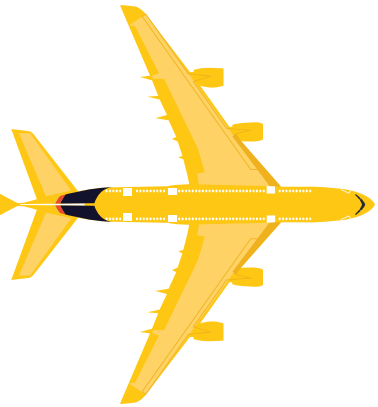
FLYdocs

Executive Briefing

SMART ENGINEERING POWERED BY SMART RECORDS MANAGEMENT



Adrian Ryan
CEO, FLYdocs

Trevor Didcock
Information Strategy Lead, FLYdocs

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SYNOPSIS

A revolution is taking place in aircraft records management, enabling continuous airworthiness management, impact analysis for component issues and automation of aircraft acquisitions, sales and lease returns.

This paper will be of particular interest to Directors of Engineering, IT Directors, CIOs, Engineers and IT specialists in aviation as it highlights the opportunities for smart records, reflects on other industries that have been transformed by the adoption of similar approaches and technologies and presents examples of how some forward-thinking organisations are already leading the way.

FROM 'DUMB' PAPER TO DIGITAL DATA

If ever there was a need for the value tied up in 'dumb' paper aircraft records to be unlocked, that need is at its most acute today. Aircraft are becoming exponentially more complex; the criticality of airworthiness management is at its height and airlines' fleets are being renewed at their fastest ever rate.

According to the CAPA (Centre for Aviation), there are 17,700 commercial aircraft deliveries scheduled up to 2023. The number of outstanding orders is equivalent to almost half of the fleet in service. Many airlines are retiring older aircraft and looking to replace significant elements of their fleets, keen to take advantage of cleaner, quieter, and more fuel efficient models, offering greater passenger comfort and services. And yet the aftermarket for aircraft remains strong. Airlines with business models built around reduced capital employed and increased flexibility thrive when fleet turnover is high, taking advantage of younger aircraft at attractive prices. But both seller and purchaser spend weeks and months building and reviewing the handover documentation and then incorporating the records of new aircraft into their fleet management systems, frequently tying up resource and capital for unnecessary weeks.

Less than 3% of aircraft documentation currently exists as smart records, capable of being queried, checked and analysed. Yet, with the right systems and processes, "big data and analytics" techniques could be applied, enabling rapid analysis in the event of component issues, and easy preparation of the full records history of an aircraft for inspections and sale or purchase in just a few minutes. Imagine true compliance on demand with integrated build and maintenance data and electronic authorisations, all opened up by advanced search and analytics capabilities...is this the future, or does it already exist?

AIRLINES BENEFITING FROM AUTOMATION

Airlines employ on average 3 people per 10 aircraft to manage aircraft records, and creating handover documentation takes an average of 26 man weeks. Most airlines employ project managers and teams of records management staff to deliver the take-on of a new aircraft type or high volumes of existing aircraft types. The same applies on sale and end of lease, only the process is exponentially more complex. How many Heads of Engineering have torn their hair out at their team's "inability" to

complete a full set of documentation? But anyone who has worked in the area knows that it's not a straightforward process. Maintenance records get lost; signatures get missed; component data gets incorrectly transposed; assemblies are poorly prepared – both in terms of back-to-birth traceability, planning for overhaul events and management of structural/ repair related requirements.

But there is an answer. Visionary engineering departments are turning to specialist airline records management organisations to professionalise their processes and, in some cases, to provide a fully outsourced process.

THE VISIONARIES

Airlines such as Cathay Pacific, Qantas, Hawaiian, Jetstar, and Virgin Atlantic have long term contracts with FLYdocs to scan all existing aircraft records, manage new build data, and integrate on an ongoing basis all maintenance records. The scanning and quality assurance is carried out by degree (and often doctorate) qualified aeronautical engineers in India, The Philippines, and Chile, which offer a low cost base. The FLYdocs platform intelligently and automatically builds full aircraft records back-to-birth, allowing the teams in India, The Philippines, Chile, the UK, Spain and the USA to complete a full audit in order to flag any anomalies to the airline. They work collaboratively, not only to create the records but to build an end-to-end process that enables or directly delivers the key business events and activities of an engineering management department. How much of the work is carried out in house and how much by the supplier is agreed up front, perhaps with a planned steady migration of tasks to the supplier over time.

Standard interfaces are built from the airline's engineering systems and from manufacturers and lessors. Intelligent data migration, cleansing, and transformation techniques are applied to generate data structures that can be efficiently queried and analysed; standard airworthiness and exception reporting suites are built, and the handover documentation standards agreed. It's called Current Status – as in 'What is the Current Status of your fleet?'.

Cathay Pacific was one of the industry's early adopters in moving away from 'dumb' paper when they selected FLYdocs as their aircraft data and records management platform in 2013. This enabled them to cost-effectively scale their business and bring on next generation digitally enabled aircraft.
A specialist FLYdocs team initially migrated all of their records back-to-birth – over 35million pieces of paper. FLYdocs provides Cathay with a digital maintenance history of all of their aircraft which allows them to carry out ongoing day-to-day tasks which require immediate access to all historical records for their entire fleet. FLYdocs provides a window into the aircraft history and is used as the central source for all of the data required for the redelivery of aircraft, available remotely and securely to all parties involved in the process. The platform and the availability of all historical records in one central place enables Cathay to fully manage the sale or redelivery of an aircraft at the end of lease fully electronically.

TAKING THINGS TO THE NEXT LEVEL

But the ultimate opportunity is far bigger. Integrating aircraft records with maintenance and engineering data and including technical manuals will enable comprehensive analytics on maintenance practices, facilitating optimisation of activities and parts usage, predictive maintenance and even comparisons across MRO services. Improved forecasting of maintenance requirements and component usage would reduce costs, reduce downtime, and ultimately provide a better return on capital employed.

LEARNING FROM OTHER INDUSTRIES

The term "smart" is now being applied to many areas of our industrial and domestic lives. Many of us aspire to live in smart cities and smart homes, driving smart cars along smart transport systems. It has not been an overnight transformation, but inexorably over the last five years or so, we have become accustomed to businesses that understand our preferences, navigation systems that understand traffic conditions and re-route us as necessary, and utility meters in our houses that inform us when we are being wasteful. We are much more accepting of our data being used, as we come to understand the value this can bring to us, as well as to the retailer or utility analysing it.

As is generally the case with technological evolution, consumer world applications have preceded effectiveness and efficiency applications in the workplace. The consumer world offers the greatest opportunity for profit improvement...or does it?

Many of the early adopters of digital capabilities were virtual organisations, sometimes creating new business models, but smart "bricks and mortar" enterprises are now really beginning to create and use data and information throughout the product life-cycle, with the goal of creating flexible manufacturing, distribution, and maintenance processes that respond rapidly to changes in demand at low cost and continuously improve efficiency and effectiveness. The concept necessitates a life-cycle view, where products are designed for efficient production and maintenance, and processes are optimised for efficiency.

SMART ENGINEERING

Engineering processes similarly lend themselves to optimisation through information management and analytics. There is a direct parallel with the exploitation of intelligent devices and tags in manufacturing and distribution with the ability to sense and transmit condition monitoring data to predict and forecast maintenance requirements. What hasn't been adequately considered is the opportunity to bring to life previously "dark" records detailing aircraft or component installation and maintenance history to drive smart engineering practices.

There is a perception that engineering departments have been left somewhat behind in this "smart revolution", being perhaps one of the last bastions of industry left to undergo digital transformation. But great innovation is being applied, particularly at the coal face of engineering delivery with the first use of drones for aircraft inspection, 3D printing of components and even experiments with Google Glass for remote maintenance support and manuals [and whilst Google Glass has been a

commercial failure, the technology will be re-imagined in new offerings in the future that will drive commercial change within industry].

It's therefore clear that very little attention has been given to the back-end of 'data and knowledge management'.

PLATFORM THINKING

There is now a very real opportunity to create a knowledge base across the whole of an airline's maintenance and engineering operations, fed by the manufacturers, updated by the chosen maintenance management system, and integrated with the systems of regulators, lessors and other third parties active in the value chain.

On a global scale, through its strategic partnership with Lufthansa Technik AG, FLYdocs is creating the world's first global digital records platform, capable of being utilised on demand by airlines, lessors, MROs, OEMs and even authorities to provide services to individual companies, but also to create an ecosystem which will facilitate efficiencies in relationships with parties in the value chain, so reducing cost and risk.

The vision is for the emphasis to shift from data management and exception handling, to knowledge management and insight in an environment in which partners can share data and collaboratively improve process and efficiency. The clear benefit here is initially seen in cost-saving, but equally important will be the visibility possible in terms of Current Status, Airworthiness, performance and safety in the real world.

CONCLUSION

Aircraft engineering and maintenance is perhaps one of the most advanced and safety critical domains around the world, and yet it has so far been missed in the "smart" revolution. While other industries have embraced the power of "big data and analytics", only pockets of best practice exist in the engineering departments of our airlines. A critical early step is to open up the power of the data held in previously 'dumb' airline records, enabling historical and predictive analysis and easing what is currently a highly labour and real-estate intensive set of processes.

With searchable data and high quality analytical capability, records management ceases to be a risk and the insight otherwise locked into 'dumb' paper is surfaced, enabling better planning, cost savings, and full utilisation of highly valuable aircraft assets and assemblies.
The airline can create a digital MRO platform that acts as the "brain" for maintenance and compliance planning and integrates with partners to manage end-to-end efficiency.

Over time, as more airlines, OEMs, and lessors move their processes to this global ecosystem, new opportunities will develop, shifting the focus of the industry to optimisation and overall value through on-demand access to what really matters...data.

ABOUT FLYdocs

FLYdocs is an independently operated, rapidly expanding international software business, powering innovation and advancing technology in the aviation industry. Over 50 organisations across the globe are now leveraging the FLYdocs aviation data and records management platform to advance their businesses. FLYdocs has achieved over $250m in savings - in lease return penalties avoided and reduced costs of technical records management - for customers and is at the cutting edge of new technology.

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