



# SOFTWARE AS A SERVICE: AN INTUITIVE APPROACH TO AVIATION MAINTENANCE PLANNING

## KEY QUESTIONS:

**P3**

What challenges are aviation maintenance planners facing today?

**P5**

What opportunities are driving commercial operators to consider Software-as-a-Service solutions as a means of improving both long-range and line maintenance planning?

**P6**

How is IFS stepping up to the challenge with solutions that support commercial operators of all sizes?

# THE COMMERCIAL AIRLINE PLANNING LANDSCAPE— BALANCING MAINTENANCE COSTS IN A HIGH GROWTH, HIGHLY COMPETITIVE MARKETPLACE

BY MARK MARTIN, DIRECTOR OPERATOR EDITION PRODUCT LINE  
AEROSPACE & DEFENSE

The commercial aviation market continues to grow as airlines carry more passengers to more destinations every year. But competition for those passengers is also fierce. Existing carriers are expanding their networks and their fleets, and new, often low-cost carriers, regularly enter the market causing disruption. In short, it's become a battle to win every customer.

In an attempt to differentiate themselves from the competition and to protect margins, some carriers have turned to value-added services such as exclusive and ultra-luxurious first-class cabin fit-ups and premium entertainment services. But as important as new revenue is, reducing cost is equally critical to the financial health of the business.

Maintenance remains a major cost area for all airlines—therefore, a prime area for reduction. Airlines now spend more on maintenance than they do on fuel or crew. Yet many operators are still using manual planning processes, and for them, building an executable long-range plan depends largely on the tribal knowledge built up in the planning organization over many years.

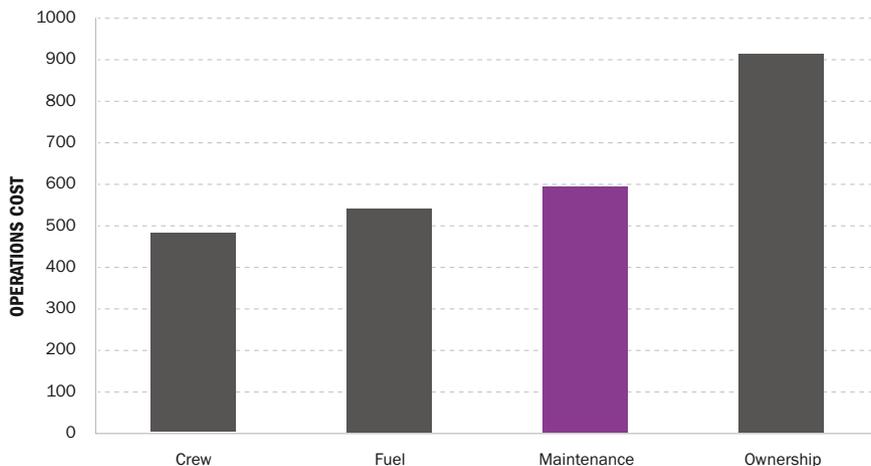
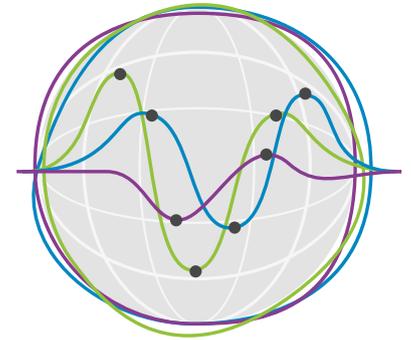


Figure 1. Cost of operations per block hour.  
Source: "Airline Operating Costs & Productivity" – ICAO Feb. 2017



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While these plans may work, they are not necessarily optimized to help the airline meet its goals of compliance and cost effectiveness. Often, when digging into a plan built manually it is easy to pinpoint lost time and money.

There is a simple solution to at least part of this problem. By introducing better planning capabilities, operators can make the most of the resources they have. The end goal is being able to service more aircraft with the same number of maintenance technicians and staff—cost effectively—and generating the most revenue out of each aircraft.

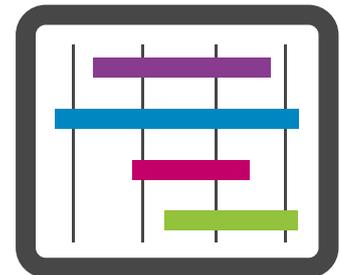
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## CURRENT PLANNING TOOLS OUT OF THEIR DEPTH

Long-range fleet maintenance planners face some fundamental pressures. First, they need to reduce maintenance costs and optimize resource utilization by maximizing yield, lining work on tracks nose-to-tail, planning sequential work by track, and minimizing maintenance visits. Then, they are required to come up with answers to support strategic growth initiatives. How many new aircraft can we support? What does it look like if we add a new fleet type in four years? What happens if we use external MROs for this fleet? All important questions which demand accurate answers.

But many planners are still generating their long-range maintenance plans in spreadsheets. While that might be fine for a plan that is created solely by calculating start and end dates, it does nothing to make the planning process more efficient. Manually collecting and maintaining up-to-date aircraft usage data and performing useful and effective planning work within a spreadsheet becomes a tedious and daunting task. Add in the complexity of aligning plans to accommodate constantly shifting labor and parts availability and other station constraints, and soon it becomes clear that planning by spreadsheets is not an optimized process.



In the manual planning world, just reacting to change in the network becomes a full-time job and one that will not scale in step with growing fleet sizes. As planners become responsible for more aircraft and more maintenance visits, *automation* becomes the only plausible answer.

Consider how a planner streamlines visits. Each visit requires an examination. What work is being done, and is there slack? If so, then determine which additional tasks can fit and assign manually. Simply understanding what is due, what tasks can be merged, and where the work can be done can be incredibly complicated. Now, check for part supply; now labor. If it turns out an overrun is pushing out the schedule, it can take hours to rework the puzzle.

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By introducing automation, much of that manual work disappears. Automated task-merging rules allow the scheduling engine to combine specific proscribed checks into already scheduled visits. Rather than setting up special visits for items such as airworthiness directives or modifications, these tasks are automatically folded into regularly scheduled service visits. This ensures that visits are as full as possible, balancing work and the schedule to ensure

maximum yield from the aircraft, minimized ground time and the most efficient use of technician labor.

## LINE MAINTENANCE PLANNERS FACING SIMILAR CHALLENGES

In line maintenance, there are similar challenges that need to be addressed, but on a shorter planning horizon. Line maintenance is being asked to support a growing number of daily flights and shorter maintenance windows without onboarding additional maintenance staff. But in line maintenance, when committed maintenance activities slip, it introduces the possibility of impact on the day of operations. There is less time to take corrective action. Thus, technicians and planners alike try to maximize utilization and efficiency to make the most of every single maintenance opportunity.

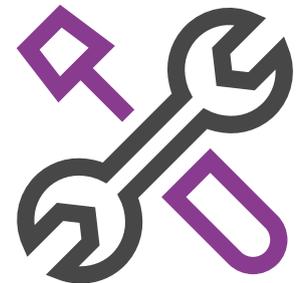
This is easier said than done. On the rapidly changeable day of operations, line maintenance organizations struggle to ensure that maintenance resources are being properly allocated to the most important tasks, in complete alignment with the company's operational objectives. Ensuring aircraft availability in quantities sufficient to support the flight schedule is a given—beyond that, planners are often on their own to figure out which work gets done first. The decisions planners make about which aircraft to prioritize may differ depending on the objective: to maximize revenue, maximize seat availability or maintain schedule.

## A STEP CHANGE IN AVIATION IT MAINTENANCE PLANNING TECHNOLOGY

The planning dilemma is set against an [industry backdrop](#) of increasingly complex aircraft entering service —58 percent of which will be new-generation by 2027—continued growth in air travel demand, and a maintenance, repair and overhaul (MRO) market set to grow over 25 percent in under a decade from \$77.4 billion to just over \$114 billion.

Yet in this rapidly expanding and highly competitive world, many aviation planners are still making do with outdated tools. Spreadsheets are certainly not planning tools, but they still have a heavy presence in aviation maintenance planning departments. To be even remotely functional in the aviation world, users must become expert builders of macros and functions—or wait for IT to do it for them. Designed for single user access, the limitations of spreadsheets make it very difficult to collaborate on plan development, to merge plans, manage plan versions and even share for cross-departmental visibility. How much time is lost because someone was working from an old version of the plan spreadsheet?

Other planners use generic planning tools, developed to fit general scheduling needs of multiple sectors. But the lack of industry specificity in these solutions typically leads to failure when they are deployed in a commercial aviation



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setting. Some vendors offer planning tools more suited to purpose but with rigid architecture and on-premise hardware. This makes them unaffordable to small planning departments. And for carriers with larger fleets, it signals the start of a major IT project with all the cost, risk and overhead that entails.

Fortunately, Software-as a-Service (SaaS) solutions, a form of cloud computing, are now coming to the fore in commercial aviation and bringing new efficiencies for both IT and business.

SaaS solutions are helping to address the high capital expenditures airlines and MROs typically faced for hardware, software and ongoing services and support. It is also becoming a vital tool in the new aviation IT landscape as a means to speed delivery of new capabilities and eliminate the cost of purchasing and managing on-premise technology. The SaaS delivery model is also attractive to the business. SaaS applications are intended to be used by a very specific group of users, and therefore, the amount of training required is minimal. With a very targeted user interface, users who are already planners can be up and running with a SaaS solution in just a few days—and live in a few weeks. SaaS can also be thought of as a great equalizer. Affordable enough to be treated as an operational expense, they are in reach of the budgets of small carriers with small fleet sizes.

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## SOLUTIONS FOR ALL PLANNING SCENARIOS

IFS has over 20 years of experience working with a range of airlines, from regional carriers to global leaders. Now, in conjunction with world-leading airlines, IFS is delivering to market two SaaS-based maintenance planning solutions under the IFS Maintenix product family—IFS Maintenix Fleet Planner™ and IFS Maintenix Line Planner™. Both work with information from any Maintenance & Engineering system and make the job of planning across the three horizons of maintenance planning—line, long-range and strategic—faster and more efficient.

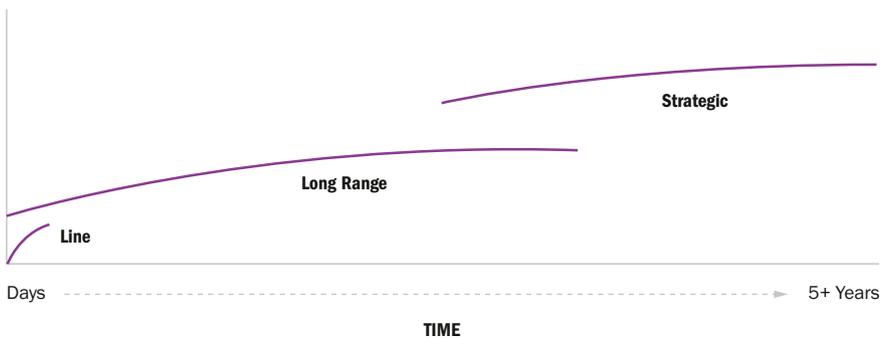


Figure 2. The 3 Horizons of Maintenance Planning address today's execution requirements, long-term compliance and can provide answers to strategic questions.

### IFS Maintenix Fleet Planner: keeping control of fleets of all sizes

IFS Maintenix Fleet Planner helps airlines solve fleet challenges now and in the future. Aircraft usage information is taken from the current M&E system and used to generate the best long-range fleet maintenance plan for the organization, taking into account complex business inputs such as yield, track utilization, merge and hierarchy rules.

With IFS Maintenix Fleet Planner, decision-makers can:

- **Choose the best plan to support their business**—The solution quickly pinpoints the most efficient maintenance plan tailored to an organization’s unique requirements, significantly improving aircraft availability, check yield, and hangar utilization
- **Save time and effort**—Whether for single-base operations or globally distributed maintenance organizations, the automation within the solution enables faster and more efficient planning
- **React and collaborate quickly to manage change**—Because even the best of plans can change in the blink of any eye, the fleet planning solution enables multiple planners to quickly and easily modify, merge, and share plan updates



IFS Maintenix Fleet Planner presents users with a highly graphical user interface designed with aviation planners for aviation planners. The concepts are user-intuitive and complete, covering the entire spectrum of capabilities required in a busy planning department. This includes full control over visit dates, as well as the ability to drag and drop visits to other tracks or locations. Planners can immediately see the effect of changes with side-by-side comparisons of two or more plans, either by Gantt chart or against a set of key performance indicators, such as cost, yield and more.

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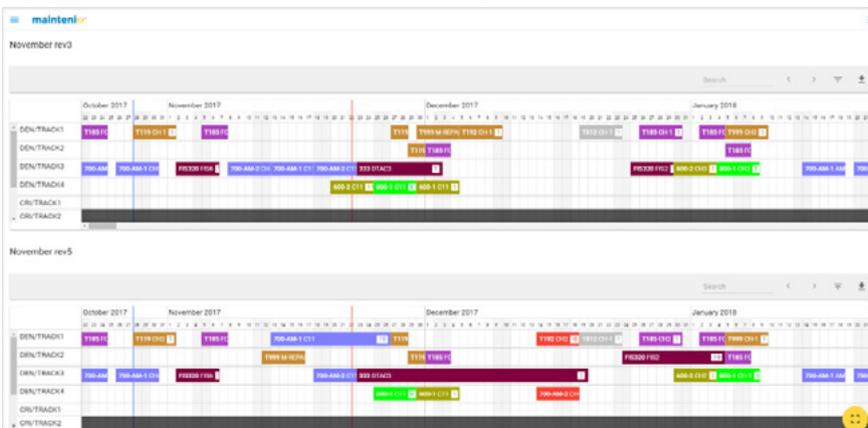


Figure 3. IFS Maintenix Fleet Planner enables side-by-side comparison of potential plans, enabling users to choose the best plan for the organization, taking into account hangar capability, available skills, work days, ferry time and other variables.

And because both market forces and corporate strategy are ever evolving, IFS Maintenix Fleet Planner supports “what if” analysis of various scenarios, enabling planners to easily analyze the impact of changes in fleet size or maintenance capacity before pinpointing the best approach.

### Giving airlines a fleet-wide view of maintenance planning

IFS Maintenix Fleet Planner was designed with the input of experienced long-range planners from a cross-section of large and small aircraft fleet operators. This includes a large North American operator of wide-body, narrow-body and regional jets, who has subjected the solution to real-world use and has witnessed first-hand tangible improvements in aircraft availability, check yield, and hangar utilization.



### IFS Maintenix Line Planner: providing the essential eye for detail

While effective long-range maintenance planning gives operators a view of future heavy maintenance requirements, for shorter term line maintenance planning airlines can turn to IFS Maintenix Line Planner.

IFS Maintenix Line Planner enables line planners to efficiently create, maintain and communicate an executable line maintenance plan. It comes with a single, intuitive user interface designed to work the way planners work, providing all information needed to create and refine plans in a single window—no more switching between screens or information silos to piece together information.

When it comes to getting granular within a plan, maintenance task filters can be saved and shared among users to enable planners to focus on information relevant to their responsibilities. To avoid downstream re-planning, templates capture station limitations and other planning constraints, which are then applied during the planning process.

To further empower decision makers, all maintenance checks can be automated, eliminating much of the manual work involved in planning repetitive checks. With automation in place, planners are relieved of the mundane tasks of rescheduling, and have more time to focus on coordinating execution and solving problems.

IFS Maintenix Line Planner empowers maintenance decision makers to:

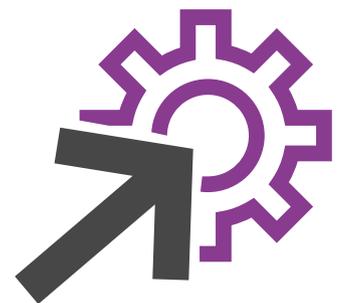
**Dynamically react to schedule changes**—IFS Maintenix Line Planner continuously monitors the plan and identifies changes as they arise

**Drive business value from maintenance processes**—Maintenance priorities can be contextualized against corporate goals

**Improve efficiency**—IFS Maintenix Line Planner simplifies the planning process by quickly creating executable plans and consolidating all information into a single screen

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Priority	Tail	Fleet	Barcode	Name	Task Type	Deferral Class	Failure Type	Due Date	Driving Task	Due Type	Plan Date	Plan Station	Plan Status	ETA	Comment
				[T00C0906] 20-26-02-18-05A-REFL (BCF EXTINGUISHER (D.G.) REPLACEMENT) REFL			18-OCT-2004 23:59 UTC	0%		COMPLETE					no comments yet. REVIEW
				[T007YHAG] 21-28-01-11-05D-REFL (VALVE-SIGN ASB (FDN - 15M2) REPLACEMENT) REFL			01-MAR-2005 23:59 UTC	20%		COMPLETE					no comments yet. REVIEW
				[T00C0ELX] 26-24-01-32-01D-REFL (PORTABLE FIRE EXTINGUISHER (FDN) REFL			30-JUN-2005 23:59 UTC	12%		COMPLETE					no comments yet. REVIEW
				[T00CPLX1] 26-26-01-01D-REFL (FIRE EXTINGUISHER (BCF), MALON- REFL			30-SEP-2005 23:59 UTC	1%		COMPLETE					no comments yet. REVIEW
				[T00C0FRG] 243300-06-11REQ (PERFORM FUNCTIONAL CHECK OF TIME DELAY FOR REQ - SYST REQ			13-NOV-2005 23:59 UTC 200:73 & HR: 020	4%		UNPLANNED					no comments yet. READY

Figure 4. IFS Maintenix Line Planner features a highly configurable prioritized task list that allows planners to see at-a-glance where they should be spending their time.

### On the job with LATAM line maintenance

LATAM is South America’s largest airline operator, with a fleet of over 300 aircraft and maintenance facilities spread throughout South and Central America. As IFS’ partner in creating and proving the value of this solution, LATAM is live today and seeing the use of IFS Maintenix Line Planner translate into increased time-savings, enhanced collaboration, and ultimately stronger plans that are enabling greater yield and operational flexibility.



### CLOUD-BASED DELIVERY DRIVES NEW EFFICIENCIES

Both IFS Maintenix solutions are delivered through the cloud via a Software as a Service (SaaS) model. Legacy planning applications and clunky spreadsheets can be quickly replaced with the IFS Maintenix solutions with no dependency on internal IT resources nor the need to migrate hardware. As business requirements change, capacity can be increased on demand and with no impact to users. Since the solutions are in the cloud, IFS manages operations with any software updates seamlessly occurring in the background so users always have the latest enhancements and updates.

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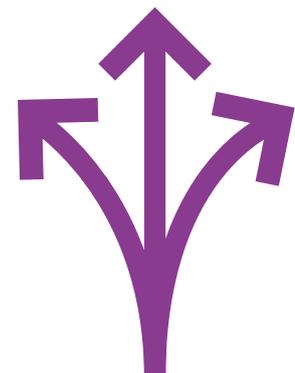


### IFS: ANSWERING THE CALL OF AIRCRAFT OPERATORS

In a recent [IFS Digital Change survey](#), almost 60 percent of commercial aviation respondents cited “operational availability” as a significant industry challenge.

Managing operational availability and avoiding schedule delays begins in the maintenance planning process. The ripple effect of effectively planned maintenance is far reaching—aircraft are turned around quickly, airworthiness is always assured, and maintenance costs can be kept in check.

The IFS Maintenix SaaS solutions have been developed to provide the solid foundation required for long-range and line maintenance planning. Thanks to the elasticity of cloud computing, both solutions can easily and rapidly scale in lockstep as requirements change, new aircraft types are added and fleet size increases.



As the commercial aviation industry continues to accelerate, airlines need to keep their eyes on both the short-term and long-term challenges of managing their fleets. Those who innovate now should be cruising toward their intended goals, while those left behind could be stuck on the tarmac.

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## ABOUT IFS

IFS develops and delivers enterprise software for customers around the world who manufacture and distribute goods, maintain assets, and manage service-focused operations. The industry expertise of our people and solutions, together with commitment to our customers, has made us a recognized leader and the most recommended supplier in our sector. Our team of 3,500 employees supports more than ten thousand customers worldwide from a network of local offices and through our growing ecosystem of partners.

For more information about IFS, visit [IFSworld.com](http://IFSworld.com)



## ABOUT CORNING DATA

Corning Data has provided professional technical services for nearly 40 years. By Partnering with world-class technology providers such as DSI, IBM, IFS, and Oracle, we offer our customers the world class solutions. And by employing only senior-level talent, our customers receive support and services from true experts.

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