Simplifying Aircraft Data
EXSYN is a leading industry provider of aviation engineering and data solutions.

Supporting airlines, MRO's and lessors manage their aircraft & airworthiness data to empower digitization.

1600+ tails are handled in our Aircraft Data Operations Platform that focuses on data migration, integration, analytics and automation.

Our platform is compatible with most used systems in the industry and virtually all various aircraft types in the industry.

EXSYN is headquartered in Amsterdam, NL and operating globally.

We are Aviation Engineers with intensive aircraft data and airworthiness expertise and advanced data science skills that create the bridge between Aviation and IT.
Why We Do It

Digitization can enable aircraft maintenance & engineering to operate more efficiently and thereby saving billions in costs to the industry due to unscheduled aircraft ground time, flight delays and costs of aircraft maintenance.

It is possible to eliminate human induced errors and incidents in aircraft maintenance through continuous improvement of digital technologies, systems and software for aircraft maintenance.

In our life-time digital technology will outsmart human capabilities and revolutionize aviation and all supporting industries, companies and processes.
What We Do

Aircraft Data Operations enables airlines, lessors and MRO’s to efficiently manage their aircraft data, gain efficiencies through integration and use advanced analytics to reduce aircraft maintenance costs and increase aircraft availability.

**NEXUS**
The ultimate solution for aircraft data integration and migration. The one place where all aircraft data becomes clear, standardized, insightful and evaluated for continuous improvement.

**AVILYTICS**
Integrated analytics solution for aircraft reliability, predictive maintenance and maintenance efficiency. Increase aircraft availability and reduce maintenance costs.

**Services**
Use our services to support your engineering & maintenance teams in challenges they face around aircraft and airworthiness data.
EXSYN’s Track Record

- Airline Clients: 20+
- MRO Clients: 3
- Different Countries: 20+
- Aircraft Types: 29
- MRO Software Systems: 10+
- TB on Aircraft Data: >150
Scaling Data Management…

…reducing aircraft phase-ins from 3+ weeks to a few days
What Is An Aircraft Phase-in?

Remember that car occasion where you check the maintenance booklet? Same concept in aviation but 100x larger.

Transfer of responsibility of Continuous Airworthiness of aircraft

Proof of airworthiness compliance

Maintenance Data and Aircraft Status
(Entire life of the aircraft! Could be 20+ years)
Normal Process

How do airlines tackle a phase-in?

• Due diligence check of all aircraft data
• Phase into airline’s maintenance & engineering system
• Manual and labour intensive:
  • Multiple engineers for different “sections” of the aircraft
  • Manual data entry and processing (Excel is your best friend)

× Time limitations => History of aircraft often not checked completely

Danger of airworthiness/regulatory compliance issues

× Often not 1 on 1 transferable to own systems and processes
× Repetitive work, engineers are not doing engineering
× Well-paid staff, costly process! ~€30,000,- euro man-days only
× Human error

Minimum Turn Around Time (TAT): ~4 weeks
Consequences If Mistakes Are Made?

Aircraft On Ground (AOG) – The crisis words for an airline

Delay Compensations — (€600 per pax for long-haul flights)

- Replacement Aircraft lease - €€€€
- Unscheduled Maintenance Costs - €€€€
- Schedule disruptions- €€€€
- Reputation damage- €€€€€€

—or—
Application Of ETL By EXSYN

ETL enables more data to be processed and removes some human error

✔ Automatic processing of data => All data can be checked
✔ Engineers can work based on exception reports, reducing workload significantly
✔ Easy conversion to system compatible data
✔ Reduced risk of human error in transfer process

× Dependent on planning resources EXSYN

✔ Source of income

× Custom build for every project
× Repetitive work now shifted to EXSYN
× Risk of “reinventing the wheel”
How it’s done by EXSYN with technology enabled by KNIME
Process Efficiency

What’s the actual repetitive process?

Input
- Limited amount of source systems
- Limited amount of airplane manufacturers
- Reporting in aviation fairly standardised

Cleanse?

Maintenance Data and Aircraft Status
- Validate data definitions in target system
- Validate consistency of aircraft data (e.g. AC utilization vs maintenance report back)
- Map/match/translate aircraft maintenance forecast to new operator maintenance program/requirements
- Set-up missing maintenance requirements

Output
- Transfer files/direct transfer to target system
- Exception Reports needing Engineer validation

Standardize the input

• KNIME has a solution for that!
Before And After Examples

Validation Module (Aircraft Utilization)
Before And After Examples

Output Components
Before And After Examples

Full phase-in (Maintenance Program)
Keeping Things Flexible

Use of configuration nodes and variables
Stop Reinventing The Wheel

Use of KNIME Server

- Created our own KNIME “Node” repository with the components and meta-nodes
- Organised into functions and supported systems
- Linked component and meta-nodes ensure new improvement all rolled out to all workflows
- “Production” control with user rights
  - Only admin user allowed to publish new version of component/metanode
  - All new (versions) will be published first in “In Development” folder for QA approval
Making It Even More Flexible

Database customer parameters

Customer A
- Project 1
  - Parameters
  - Business Rules
  - Settings
  - Locations
  - Databases
  - Target

Customer B
- Project 2
  - Parameters
  - Business Rules
  - Settings
  - Locations
  - Databases
  - Target

- Project 3
  - Parameters
  - Business Rules
  - Settings
  - Locations
  - Databases
  - Target
From Managed Service To Self-service

Why not go a step further and let our customers do it themselves completely?
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From Managed Service To Self-service

**AC Phase-In - Aircraft Utilization Import**

This program will analyze the provided utilization exports and validate these for your aircraft phase-in. After the analysis, the import files for your M&E system will be provided and any items that require attention are highlighted for further scrutiny.

- **Notify me when workflow has run**

  - **Run**

- **Jobs**

  No jobs available
Why not go a step further and let our customers do it themselves completely?

From Managed Service To Self-service
Why not go a step further and let our customers do it themselves completely?

From Managed Service To Self-service
In Summary: EXSYN’s NEXUS Phase-In Solution powered by KNIME

Enabled aviation engineers to use digital technologies without specific programming/data science knowledge

• Sliced the phase-in process to:
  
  Minimum Turn Around Time (TAT):
  
  \(~2\text{ days}\)

• Standardized ETL and data analytics logic into reusable and engineering relatable puzzle pieces
  
  • Put the focus back on \textit{aircraft engineering not programming}

• Customers are empowered with self-service workflows and independent in planning

• Allowed EXSYN to be much more efficient with resources, manning multiple projects due to the reusability of components
  
  • \textbf{Before}: 10-15 days of work per aircraft, now 1-2 days (if self service is not available)
  
  • \textbf{Brain power} goes into further development, not solving the same problem, helping the aviation industry more effectively with further innovation