LUFTHANSA GROUP
Innovation Runway

Where we come from, where we are & where we go – AI in our production

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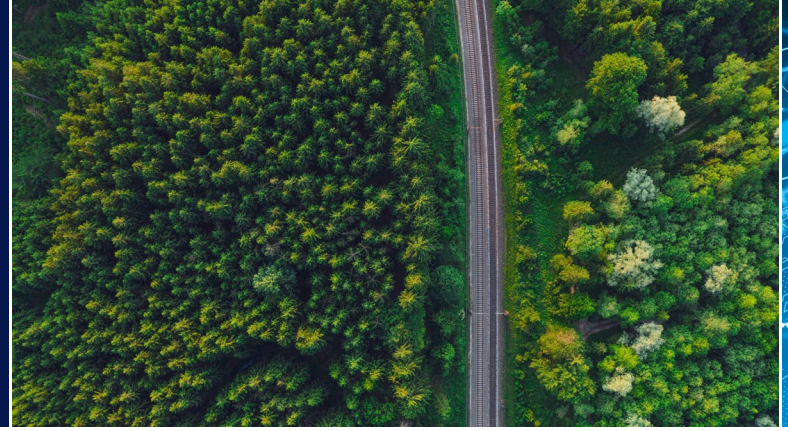
Group Data Strategy, Innovation & Transformation

Internal

123M

passengers in 2023



3.59l

of kerosene per passenger and 100km

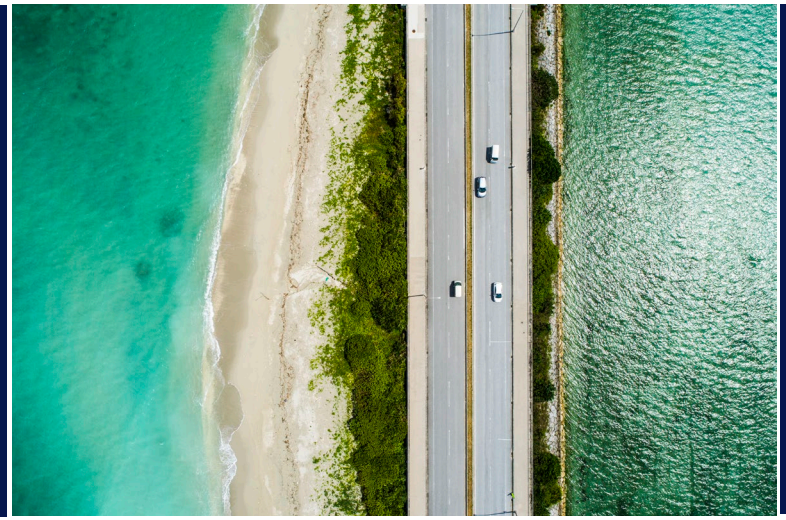
450

daily **intermodal connections** from and to Lufthansa Group hubs

LHG innovates to connect cultures, increase sustainability and improve technical reliability

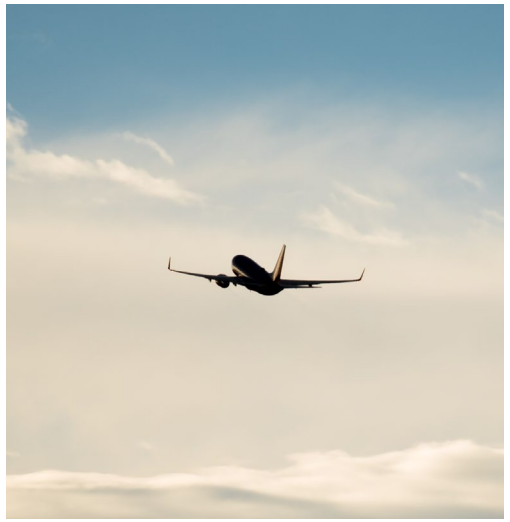
-50%

by 2030 net CO_2 emissions compared to 2019

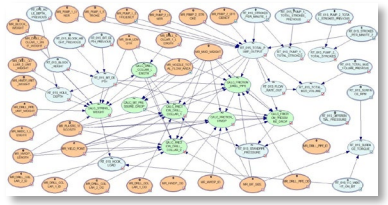


7.400t

CO2 savings at LX within 18 months Google/LHG OPSD Partnership



Where the machine is **coming from**, where it **currently is** and maybe also where **it is going**

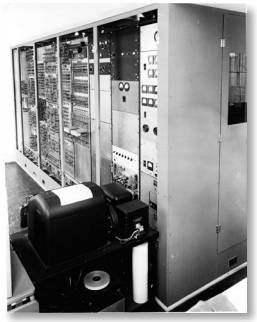


Rise of **statistical approaches** and **Bayesian networks**

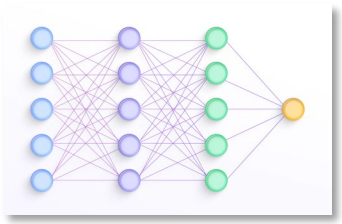
IBM's Deep Blue **defeats world chess champion**

Rise of **Generative AI**, creating new data forms

1950 • • • 1960 • • • 1970 • • • 1980 • • • 1990 • • • 2000 • • • 2010 • • • 2020 • •



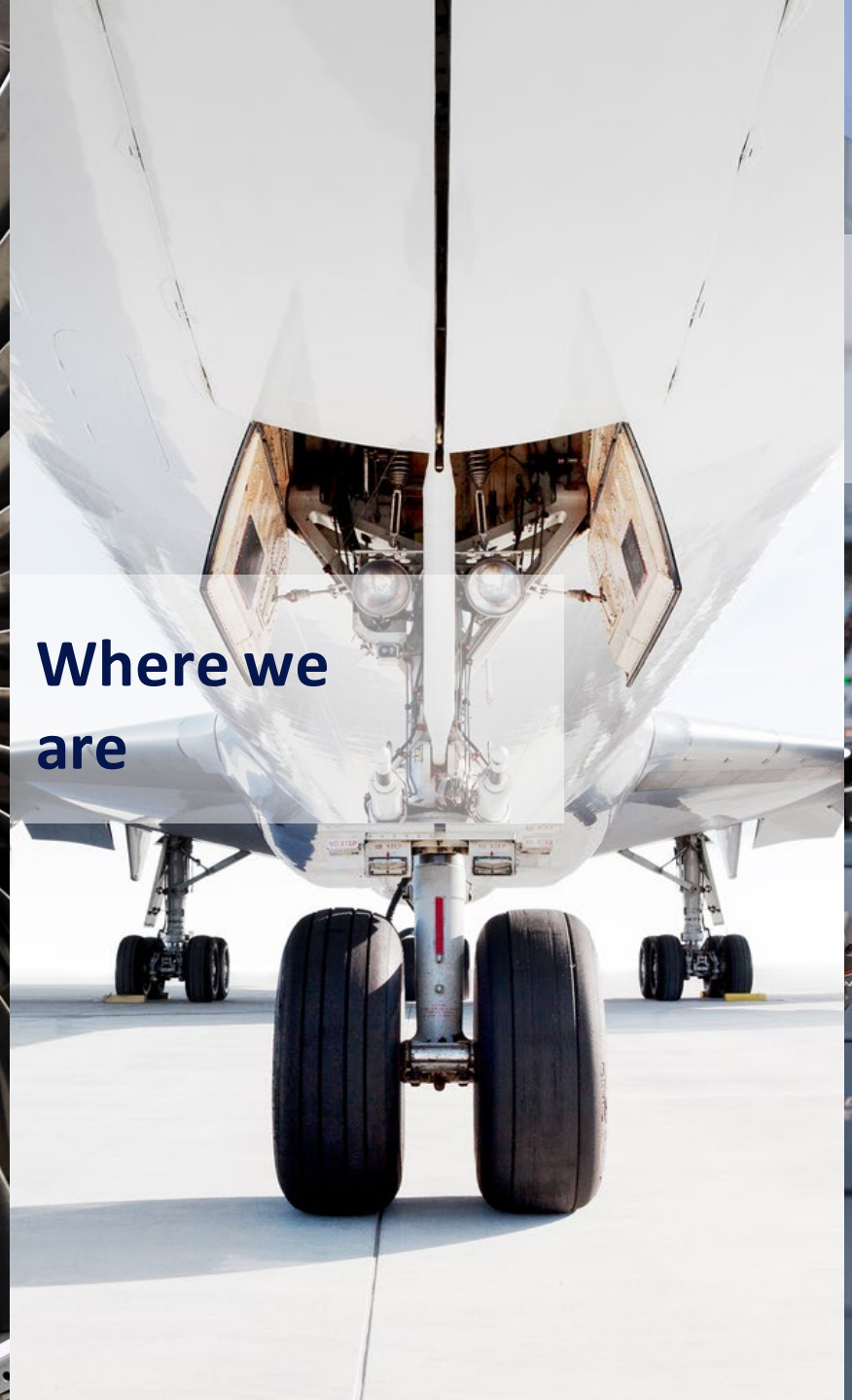
Formal establishment of AI, focussing on symbolic logic



Machine Learning emerges, development of **neural networks**

Advancements in **deep learning** powered by large datasets

Where we come from



Where we are

Where we go

Repair Order Management

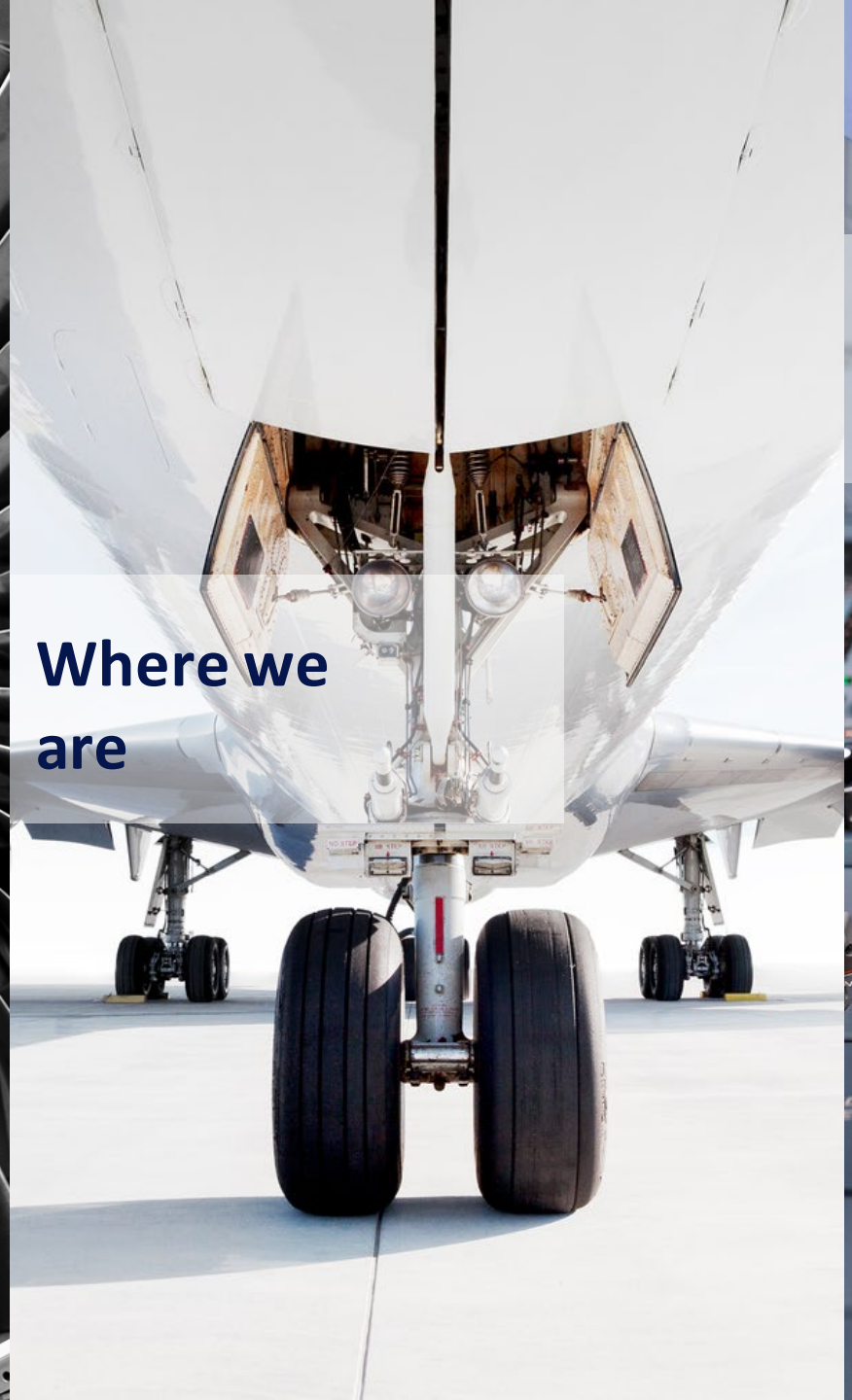
Lufthansa Technik

- Review documentation of engine damage types to derive repairs
- Just ask Claus

- Use Reverse Image Search
- Compare new damages to database of damages and repairs

- 2.000hrs / year

Where we come from



Where we are

Where we go

AI driven **maintenance** programs

Lufthansa Technik

- Scheduled maintenance
- On-condition maintenance

- Make findings structured > Greasy
- Look at usage
- Train a model

- Get access to more data
- Include engineering know-how

LHG **airline ops** uses a variety of tools

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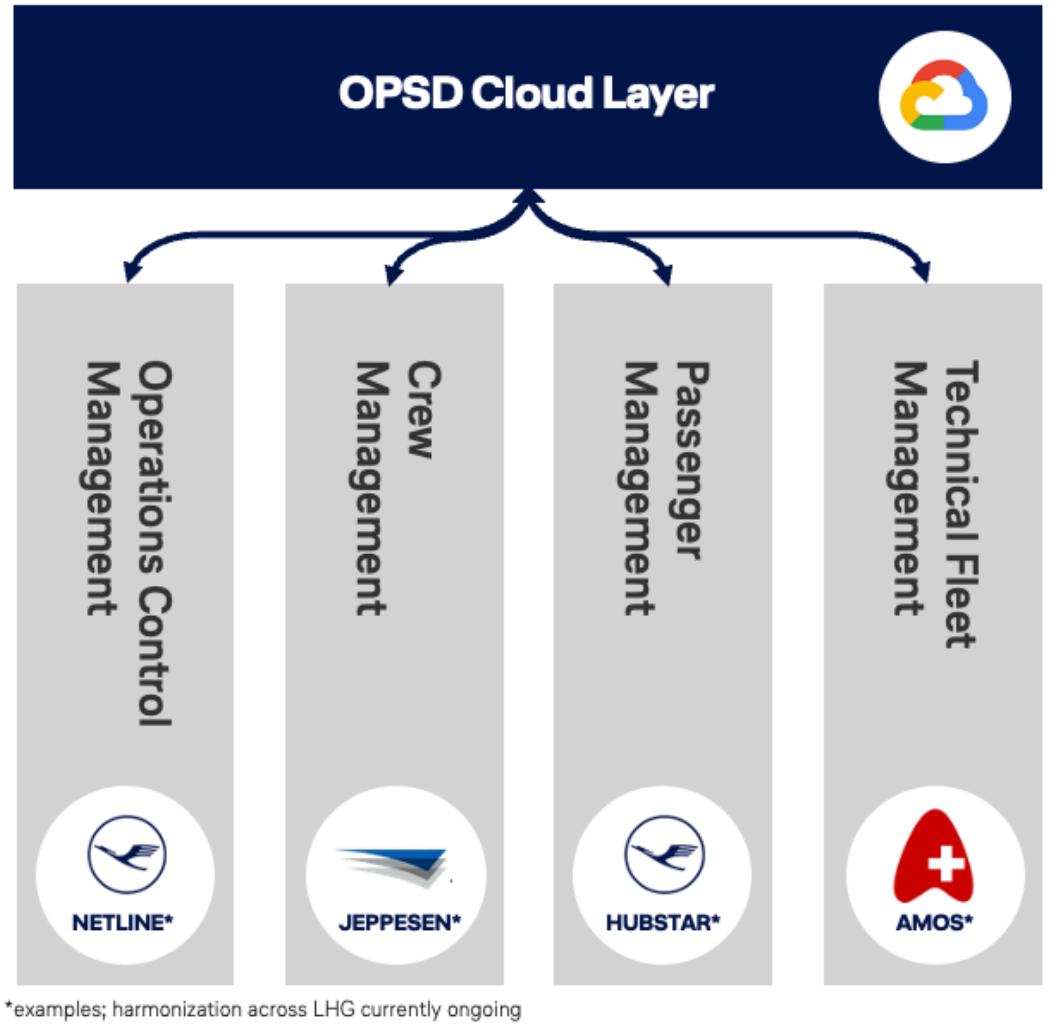

*examples; harmonization across LHG currently ongoing

Holistic **optimisation** step-by-step

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- Focus on **individual passenger** vs. aircraft rotation
- **Passenger value** vs. Passenger volumes
- **Proactive** vs. reactive **action**
- **Data-driven** & **Cost** function-**based** evaluation
- **Scenario based** decision support

Grand Solver
Customer focused holistic solution creator.

Irreg Solver
Integrated solution creator for major cancellation scenarios

Cancel Candidate
Evaluated list of cancel options

Tail Solver
Allocation of the most efficient a/c type and tail

Passenger Solver
Most suitable alternative for passenger

Crew Solver
Optimization of crew roster

Maintenance Solver
Optimization of maintenance events

LHG Focus till May24

Where we come from

Where we are

Where we go

Facts Options Risks & Benefits

Lufthansa Aviation Training

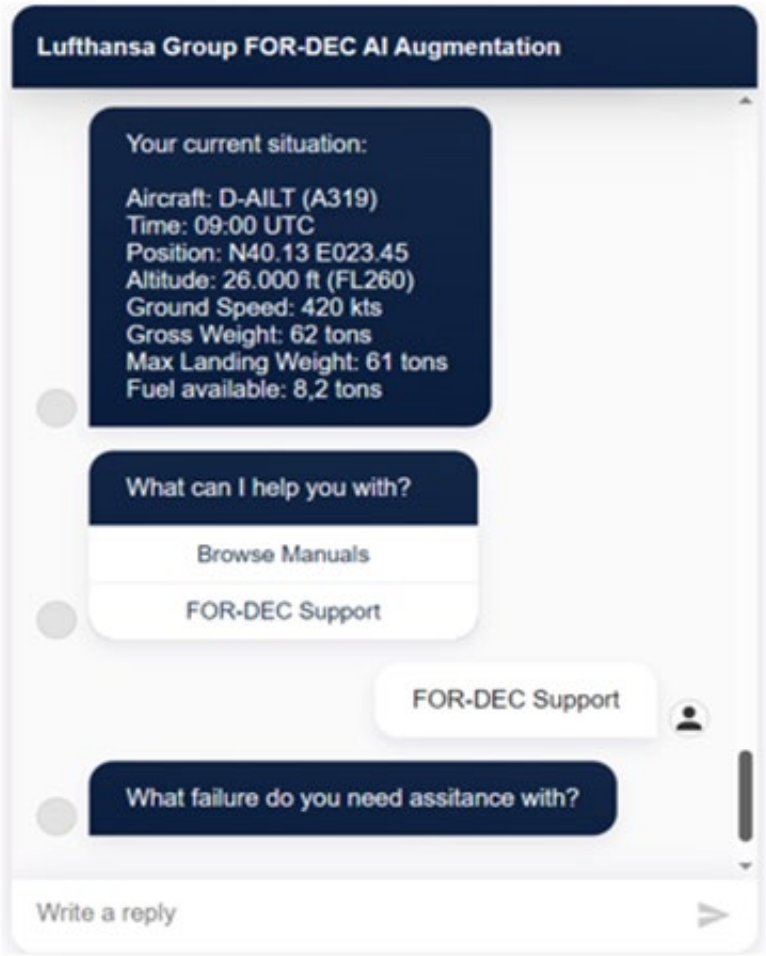
- Formulate a founded opinion on the use of AI on the flight deck
- Learn about possibility & limitations

- Feed handbook into openAI
- Connect sensor data

- Structured process for decision making
- Necessitates access to data and handbooks

… **D**ecision **E**xecution **C**heck

Lufthansa Aviation Training



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Thank you

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