CONNECTED AVIATION SUMMIT® 2023

Digital Transformation, AI & Innovation

September 6-8, 2023 | Hilton City Center | Denver, CO

Opening Keynote
AI Accelerates Transformation in Aviation

Tassio Carvalho

American Airlines

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Today's agenda

Three concepts: Machine Learning, Artificial Intelligence, Generative AI

The Potential of Generative AI

Challenges in Aviation

AI will transform Aviation

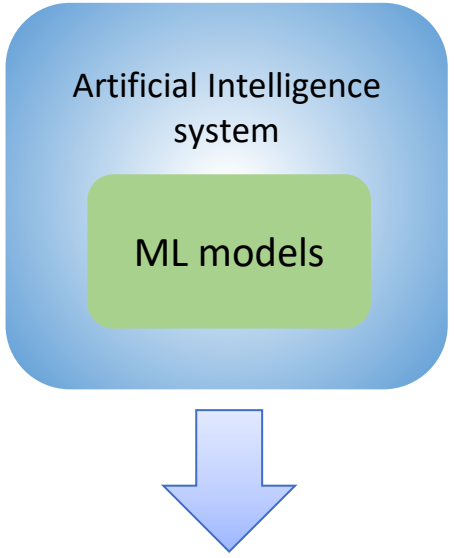
Three Concepts

1. Machine Learning (ML): Computer logic that finds patterns in data and uses them to create a prediction, a set of rules, or a recommendation

Flight Delay Prediction

Three Concepts

2. Artificial Intelligence (AI): Computer systems performing tasks that usually require human intelligence



AI/ML = ML = AI

Three Concepts

3. Generative AI (GenAI): Super-powerful AI models that generate content through prompts

- Text
  - **ChatGPT (OpenAI)**
  - Bard from Google

- Image
  - Dall-E (OpenAI)
  - Midjourney

- Code
  - Codex (OpenAI)
  - GitHub Co-pilot (GPT inside)

- Voice

- Video

- Microsoft 365 Co-pilot

Generative AI revolutionizes Humanity

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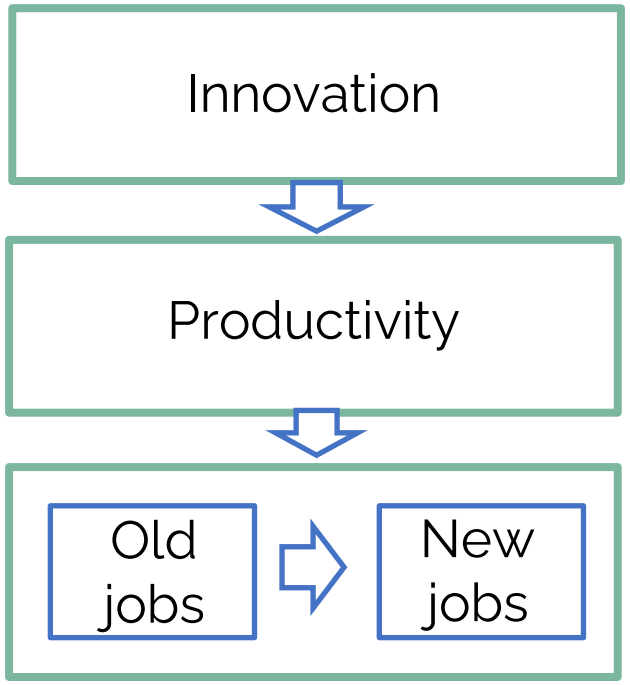
The Potential of Generative AI

7%

Of Global GDP

Goldman Sachs estimated economic gains from GenAI



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The Potential of Generative AI

- Ability to rely on prior research
- History of tracking the economy microscopically
- 850 occupations

Findings

- GenAI will power productivity growth
- $4 trillion plus not quantified benefit
- Significant boost to regular AI
- Impact on educators, professionals and creatives
- Half of today's office work to be automated by 2045
- Large impact in four functions

The Potential of Generative AI

Customer Operations
Issue resolution
Self-service
Increased sales

+38%

Marketing and Sales
Content creation
Personalization
Search optimization
Lead development

+6%

Software Engineering
Faster prototyping
Faster debugging
Testing

+31%

R&D
Biotech
Engineering
Prototyping

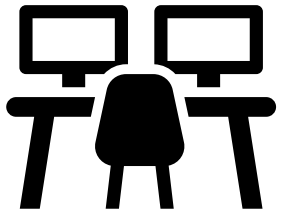
Critical to airlines - Worth 1%-2% of revenue

Productivity growth

The Potential of Generative AI

Highlights

- Not sentient
- Expensive
- Public perception
- Legal risks



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Challenges in Aviation

AI will transform Aviation

Challenges in Aviation

Complexity

- Proliferation of flying machines
- New infrastructure
- Connected aircraft
- Cybersecurity
- Physical security
- Air safety

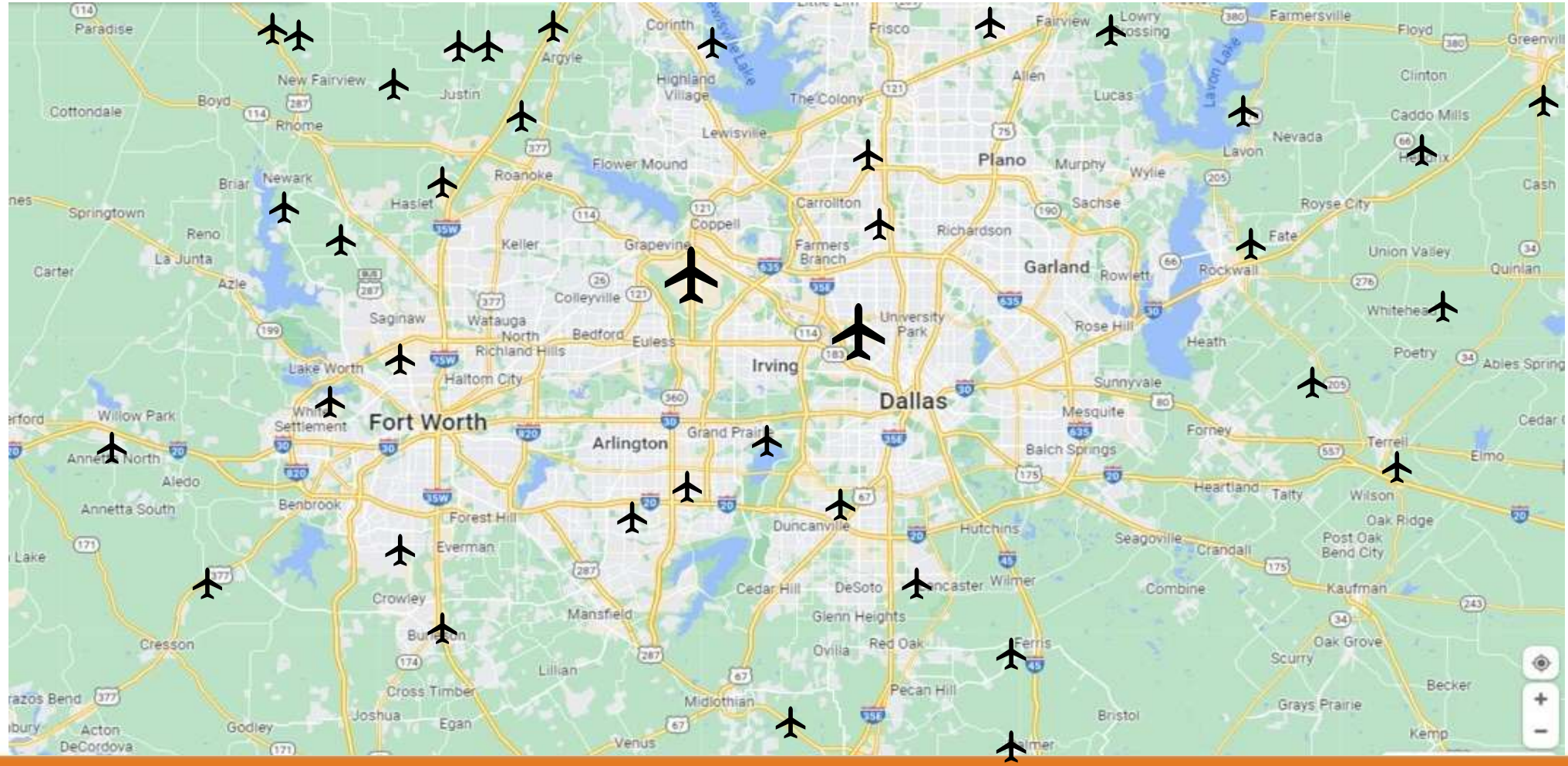
Safety & Security

Sustainability

- Energy Sources
- Environment
- Financial viability

Challenges in Aviation

Dallas &
Ft Worth
Metro
39 airports
+
4 heliports



Challenges in Aviation

Much more complex airspace accommodating more variety of flying

- Supersonic
- Commercial jets
- Electric aircraft
- General aviation
- eVTOLs
- Cargo drones
- Light delivery drones

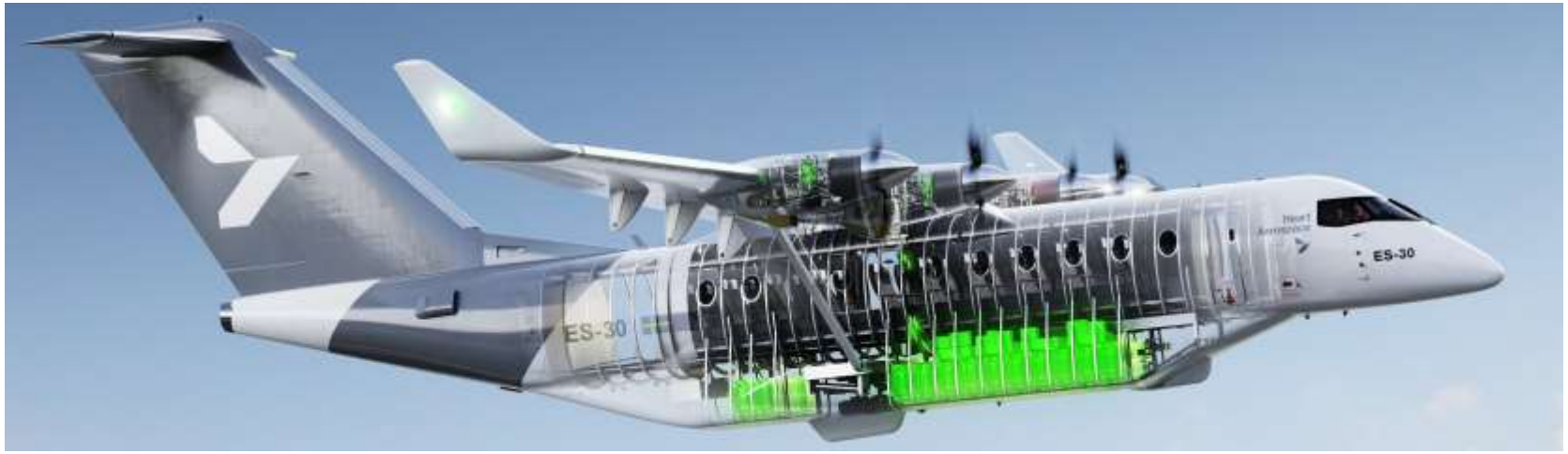
Challenges in Aviation

Connectivity has potential benefits and creates new costs

Boeing 787
- 0.5 TB of data per flight
- Storage ~$25 per year
- Cost of making data useful

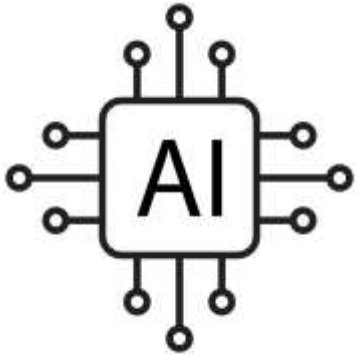
Challenges in Aviation

Rethink energy source → Rethink airplane → Rethink operation → Rethink network

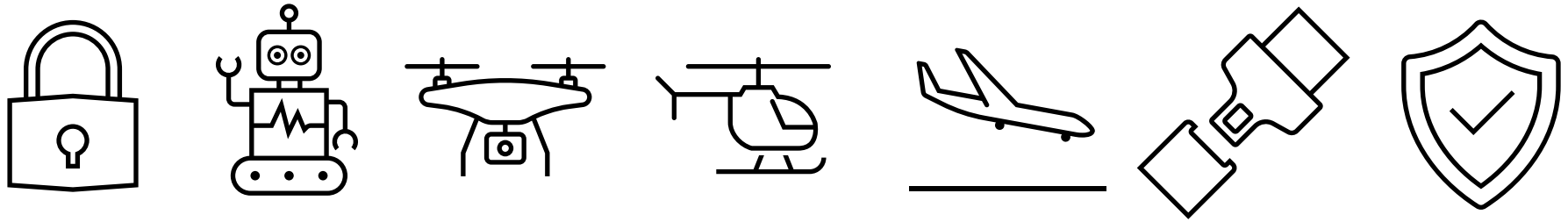


Sweden's Heart Aerospace ES-30

Challenges in Aviation



Technology enables bad actors



Public perception of safety

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Challenges in Aviation

Sustainability

Safety & Security

Complexity

AI will transform Aviation

AI Will Transform Aviation

Impact across the economy <> Impact in Aviation

AI Everywhere

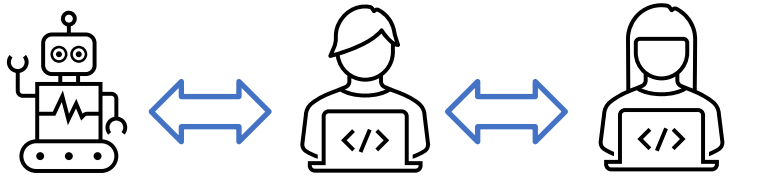
Six areas ->

Digitalization ->
- Automation
- Data Driven Decisions

AI Will Transform Aviation (1/6)

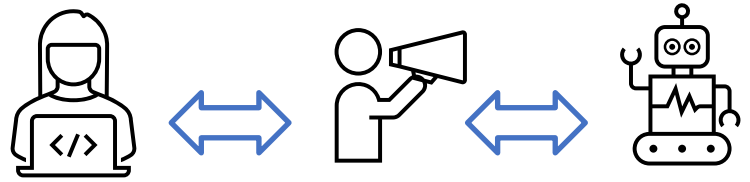
	Translation	Generation	
Summarization	Classification	Comparison	Search
Office Automation with large language models (LLMs)			

AI Will Transform Aviation (2/6)



bot rep customer

personalization

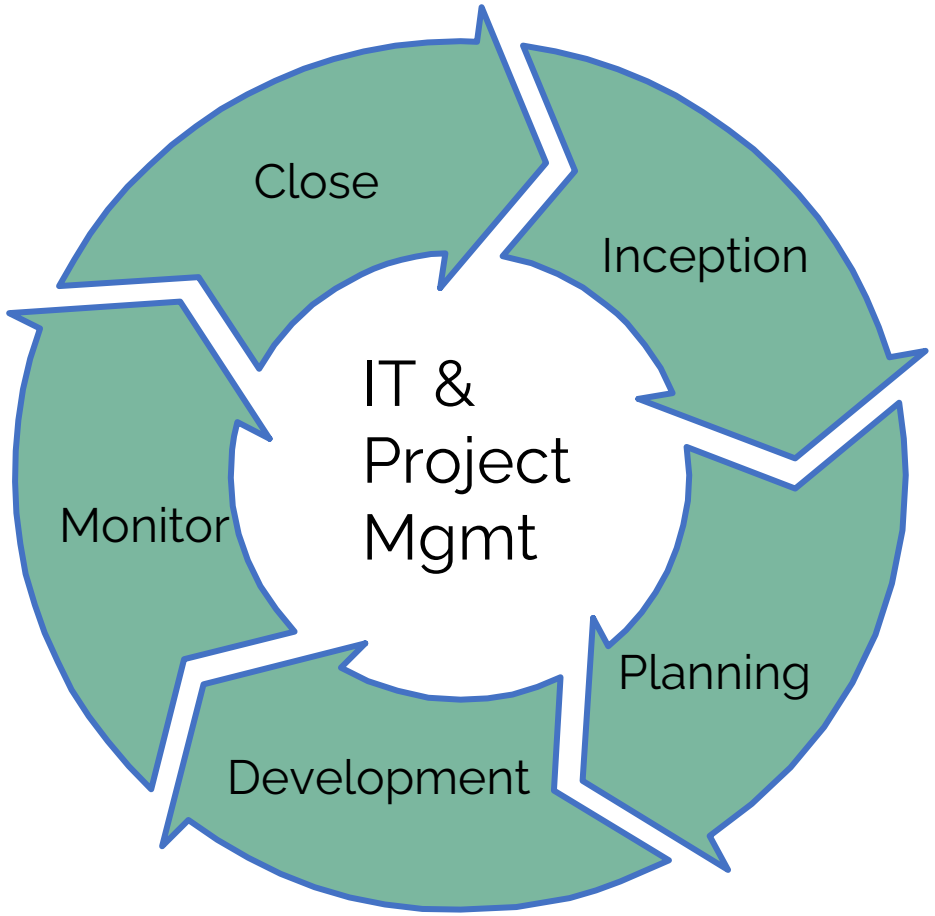


customer marketing bot

bot as a rep customer

customer marketing bot

AI Will Transform Aviation (3/6)




```
000024
000025       PROCEDURE DIVISION.
000026       0001-MAIN.
000027           INSPECT FUNCTION REVERSE(STR-1)
000028                   TALLYING WS-LEN1 FOR LEADING SPACES.
000029           COMPUTE  WS-LEN = LENGTH OF STR-1 - WS-LEN1.
000030           DISPLAY WS-LEN.
000031           MOVE 1 TO I.
000032           MOVE WS-LEN TO J.
000033           PERFORM REV-PARA WS-LEN TIMES.
000034           DISPLAY STR-1.
000035           DISPLAY STR-2.
000036           GOBACK.
000037        REV-PARA.
000038           MOVE STR-1(J:1) TO STR-2(I:1).
000039           SUBTRACT 1 FROM J.
000040           ADD 1 TO I.
000041           EXIT.
****** ********************** Bottom of Data ****************************
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Software conversion

AI Will Transform Aviation (4/6)

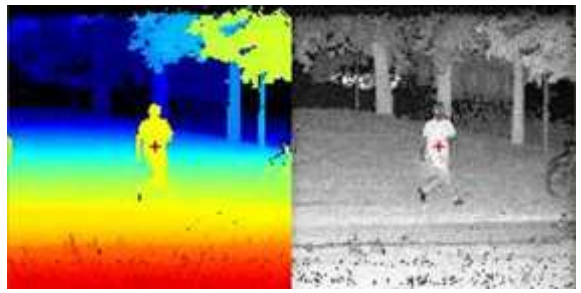
data-rich ⇐ Connected Aircraft ⇒ near real-time

- OEM: Improve design, inform Airworthiness Directives
- Operator: Improve fleet performance
- Operator: Predictive maintenance
- Operator: Efficient turns

AI Will Transform Aviation (5/6)

- Physical monitoring security
- Operational data and decisions
- Inspections

LIDAR Image



Computer vision

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AI Will Transform Aviation (6/6)

- Real time integrated data
- Modeling & monitoring
- Automated and semi-automated decisions

- C
- C
- D
- A

We're not computers, Sebastian. We're physical.

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In conclusion

The Potential of Generative AI

7%

Challenges in Aviation

Sustainability

Complexity

Safety & Security

AI will transform Aviation

AI everywhere

AI is here and will transform our work and our lives

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THANK YOU!