Opening Keynote
AI Accelerates Transformation in Aviation

Tassio Carvalho
American Airlines
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

Artificial Intelligence system
ML models

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**
  - Microsoft 365 Co-pilot

Generative AI revolutionizes Humanity
Today’s agenda

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AI will transform Aviation
Goldman Sachs estimated economic gains from GenAI

7% Of Global GDP
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

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

Productivity growth

+38%  
+6%  
+31%
The Potential of Generative AI

Highlights

- Not sentient
- Expensive
- Public perception
- Legal risks
Today’s agenda

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The Potential of Generative AI

Challenges in Aviation

AI will transform Aviation

11%
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
Today’s agenda

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The Potential of Generative AI

Challenges in Aviation
- Sustainability
- Safety & Security
- Complexity

AI will transform Aviation
AI Will Transform Aviation

Impact across the economy <-> Impact in Aviation

AI Everywhere

Digitalization -> Automation, Data Driven Decisions

Six areas ->
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

bot as a rep
customer

personalization

customer
marketing
bot

customer
marketing
bot
AI Will Transform Aviation (3/6)

Software conversion
AI Will Transform Aviation (4/6)

- 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
AI Will Transform Aviation (6/6)

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

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

The Potential of Generative AI

Challenges in Aviation
- Sustainability
- Complexity
- Safety & Security

AI will transform Aviation
- AI everywhere

AI is here and will transform our work and our lives
THANK YOU!