Data-Driven in Aviation



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Data-Driven Oversight in Civil Aviation Regulatory

Data-Driven
Oversight

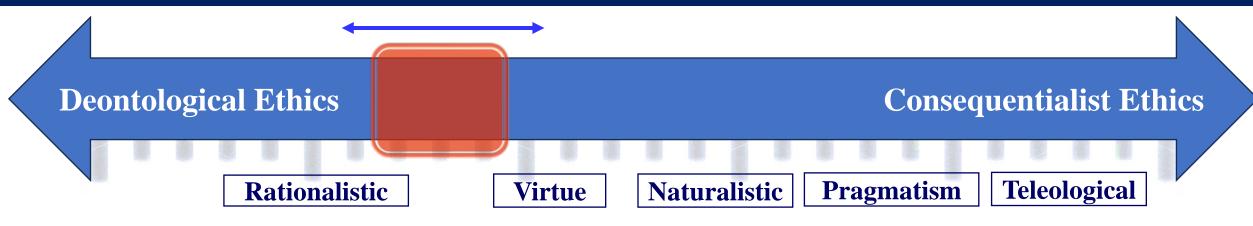
Compliance Based Oversight

Risk Based Oversight

Performance Based Oversight

Data-Driven in Aviation-MEMAR

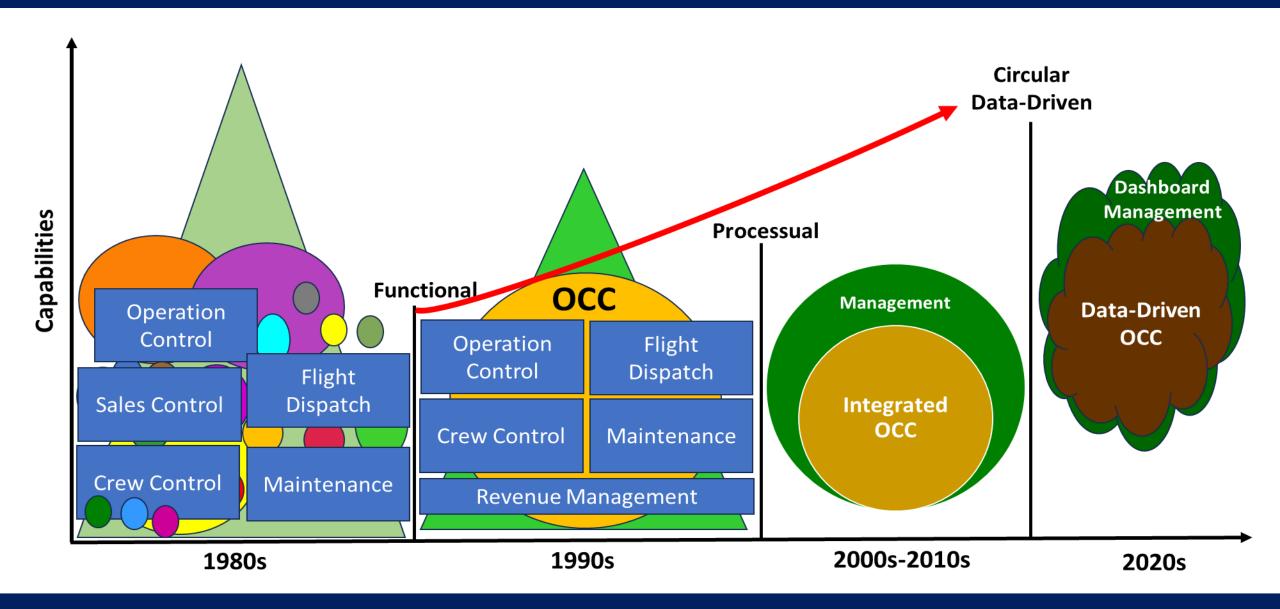
Data-Driven Ethics in Aviation



- Standard Operation Procedures (SOPs)
- Standards And Recommended Practices (SARPs)
- Standards Manuals
- Environmental Regulations
- Commercialization
- Corporatization
- Participation
- Lobbying

- Airline Contingency Plan
- Crew Extend Duty
- Validations Postponing Remarks
- Rule Override by Accountable Manager
- Airline Emergency Response Plan (ERP)
- Liberalization
- Privatization
- Trad off

The Evolution of Airline Planning and Management



Data-Driven in Aviation-MEMAR

Historical evolution in the concept of aircraft maintenance system

(Mostly) HISTORY

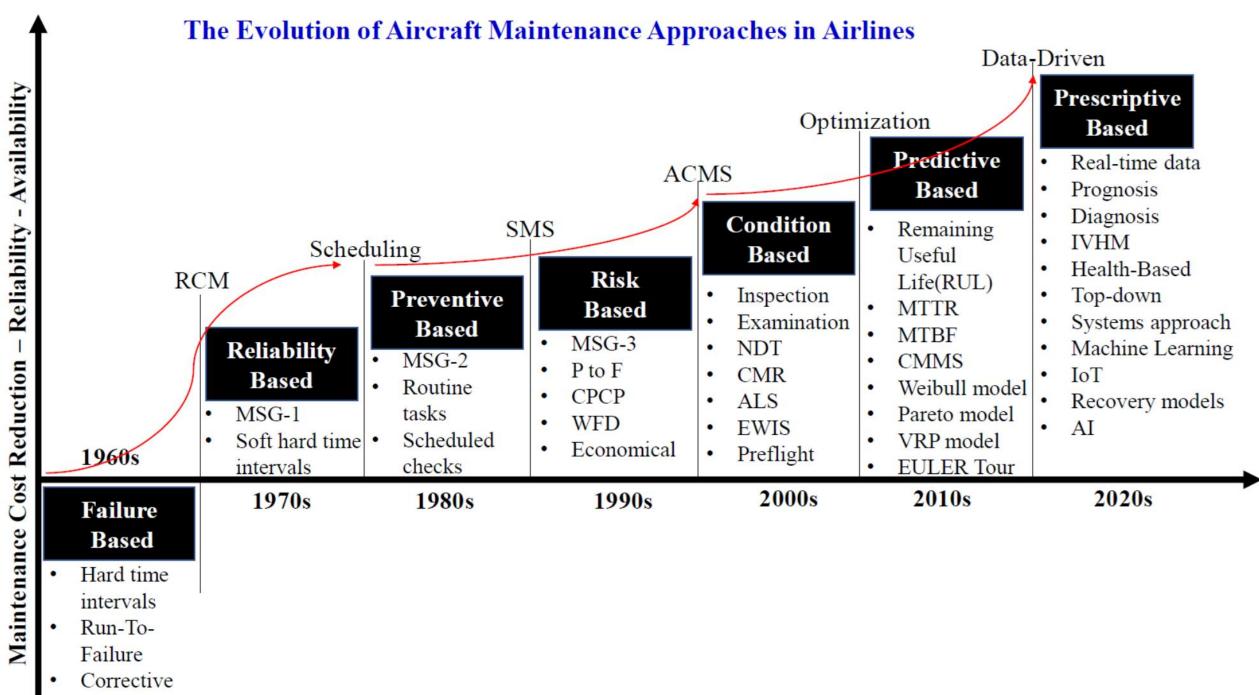
(Majority of) PERESENT

(Desired) FUTURE

- Bottom-Up Approach
- Failure-Based Maintenance
- Consequence-Driven Approach
- Three primary maintenance processes:
 - HD: Hard Time: Calendar Time, Flight Cycles, Flight Time
 - OC: On Condition
 - CM: Condition Monitoring
- Corrective and Fix Oriented
- Servicing maintenance actions (e.g., cleaning and lubrication)
- As if new when the need to recover
- Diagnosis-Oriented

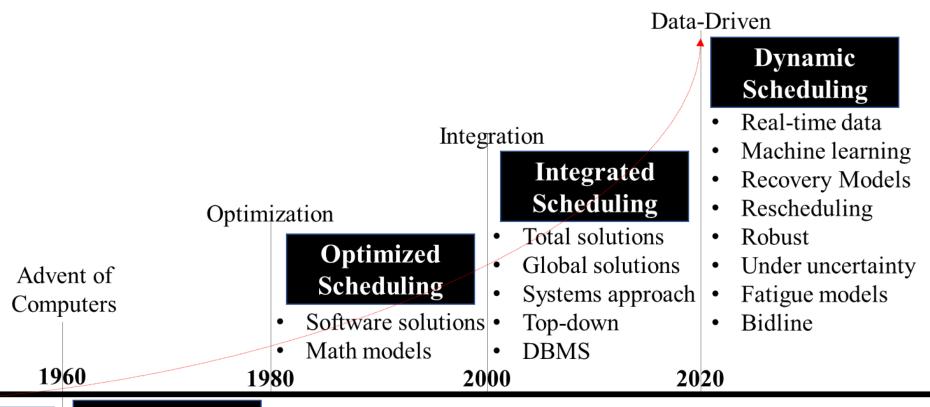
- Top-Down Approach
- Time-Based Maintenance
- Preventive Approach
- More Maintenance, More Reliability
- "Bathtub Model" of failure
- Reliability
- Focusing on the component failure

- Systemic Approach
- Condition-Based Maintenance(CBM)
 - Inspection-Based
 - Examination-Based
- ST: Soft Time intervals
- Holistic Performance instead of Failure Prevention
- Prognosis-Oriented



Introduction to Airline Planning and Management-Fleet Planning and Management-MEMAR

The Evolution of Crew Scheduling in Airlines



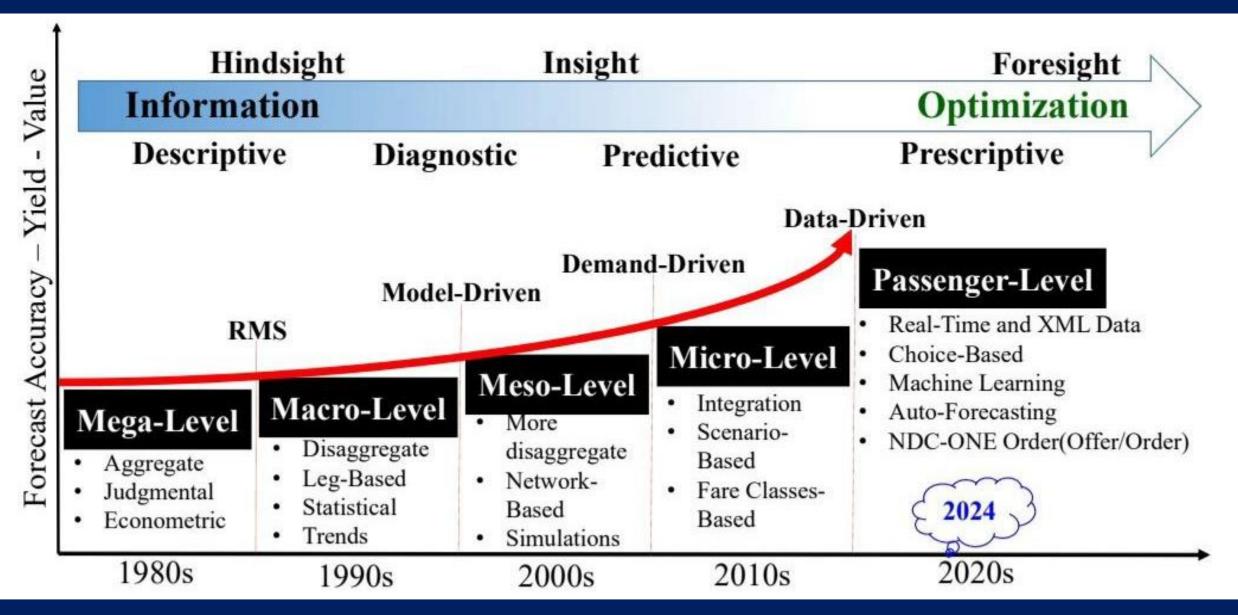
Manual Scheduling

- Time-consuming
- Paper-based
- With errors

Computerized Scheduling

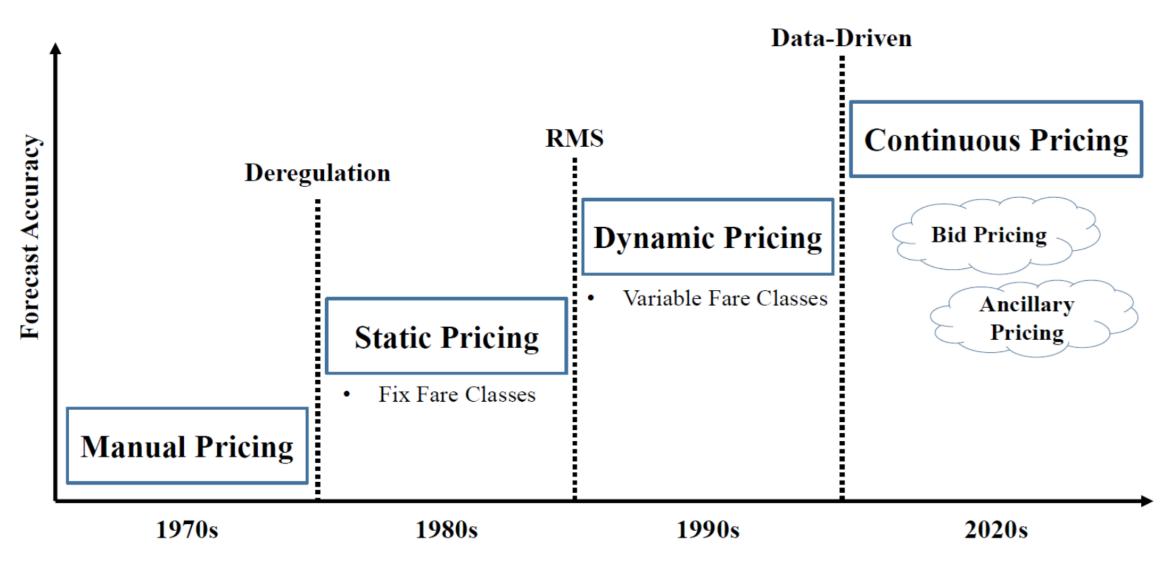
- Paperless
- Manual input from schedulers
- Relied on experienced schedulers

The Evolution of Forecasting in Airline Revenue Management



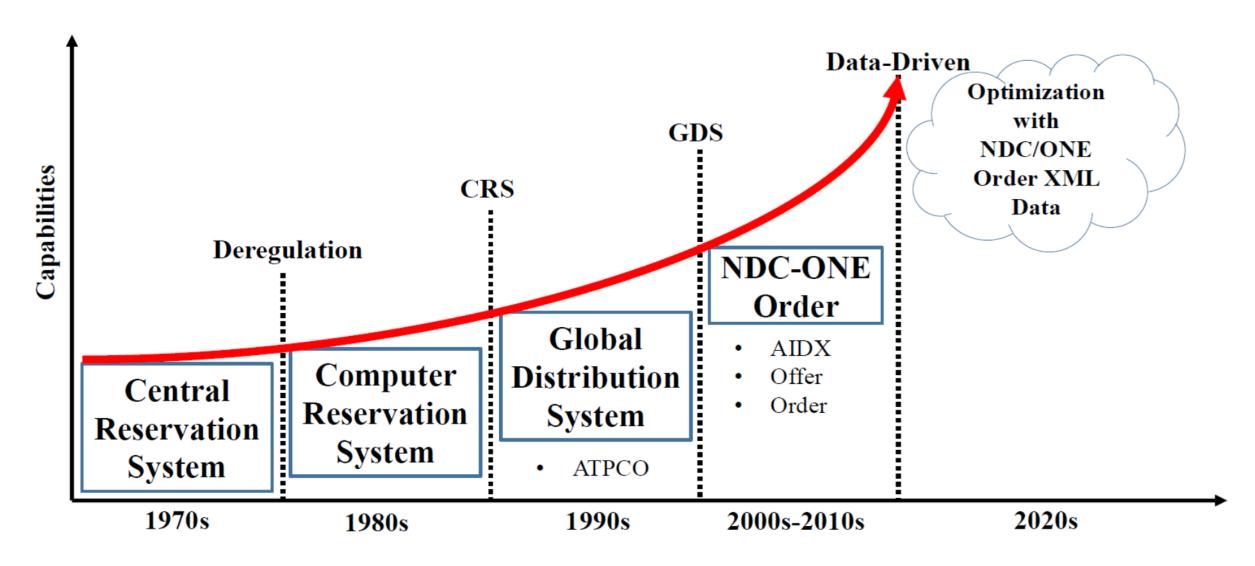
Data-Driven in Aviation-MEMAR

The Evolution of Pricing in Airline Revenue Management



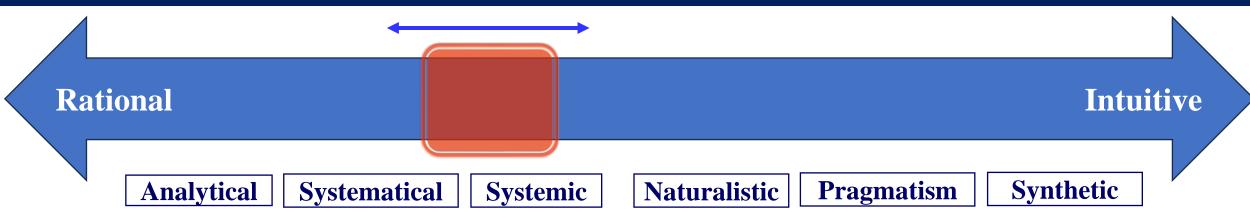
Introduction to Airline Planning and Management-Revenue Management-MEMAR

The Evolution of Distribution in Airline Revenue Management



Introduction to Airline Planning and Management-Revenue Management-MEMAR

Aviation Data-Driven Decision Making (AD3M)



- Cost-Benefit Analysis
- Need a lot of information
- Choose from a wide range of options
- Enough time to ideal decision making
- Step by step approach and Scenario-Based
- Teachable and Based on the models
- Decision making without prior experience
- Rule Of Thumb with abbreviations letter
- Linear and data-driven thinking
- Science-Based

- Acumen-Based
- Requires experience and skill
- Shortcut
- Real-time decision making
- Based on direct internal perception
- Based on direct internal comprehension
- Unteachable
- Non-linear and heuristic thinking
- Art-based