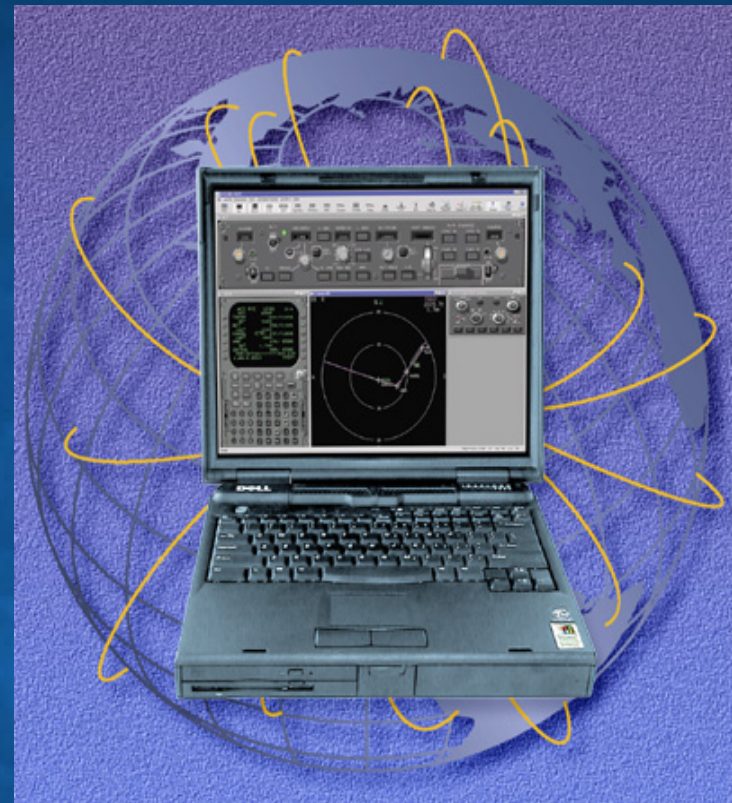




**CAE**

# **Simulation Based Aviation Training**

**Dr. Kamilia Sofia  
Vice-President Strategy  
CAE Inc.**





## Agenda

- Early Use of Simulation
- Typical Pilot Curriculum
- Early Simulation Benefits
- Challenges Today
- New Training Philosophy
- Value-Added Training
- Simulator Benefits



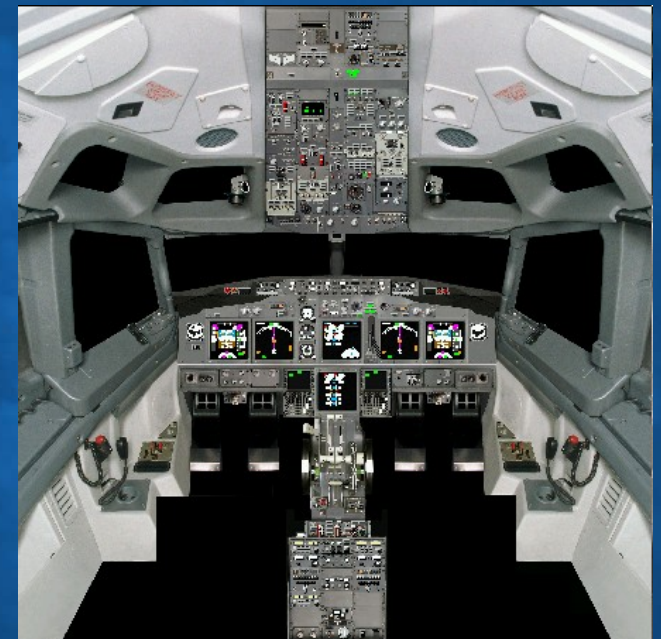
## Early Use of Simulation

- Past:
  - Procedural and operational training for pilots has traditionally been taught in the Full Flight Simulator (FFS).
  - Systems knowledge training was done in the classroom causing valuable time on FFS to be spent reviewing systems operations.
  - Training was restricted to the schoolhouse.



# CAE High Fidelity Simulation

- High fidelity simulation integrating:
  - Avionics
  - Systems
  - Schematics
  - Malfunctions





# Typical Pilot Curriculum

- General Operating subjects:
  - Ex radar, weather ... that is A/C independent
  - Mostly knowledge based
- A/C System's Training
  - Ex. Engines, fuel .... That is A/C dependant
  - Simulation can be used to allow interaction w/ the systems and system operation
- Procedural Training
  - Learning the procedures to operate the A/C
  - Reinforcing the system operation in integrated environment
- Flying / Maneuvers
  - Learning done on higher end devices or A/C



## Early Simulation Benefits

- A more proficient trainee at the end of training
- Normal and abnormal procedure training
- Emergency training
- Weather training



- A shorter training footprint
- Reduced costs



## Challenges Today

Increase efficiency and improve  
quality



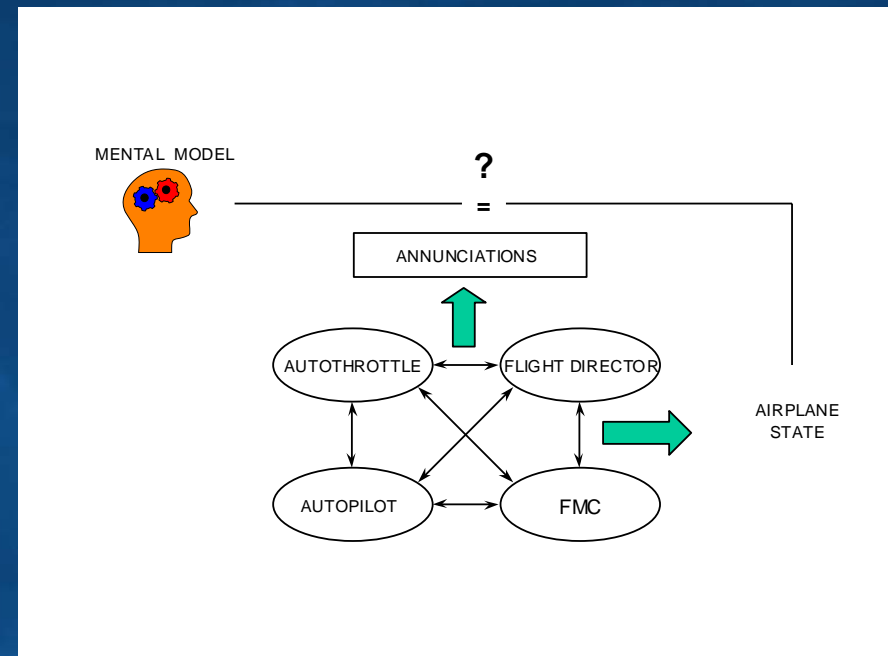
Change in Training Methodology



# Limitations with Traditional Training Tools

Boeing studies have shown:

- Current training tools fail to allow pilots to develop a simple, accurate mental model upon which to build knowledge and skills during training and line operating experience
- Pilots need a product that can support the long-term acquisition of automation skills and an accurate mental model

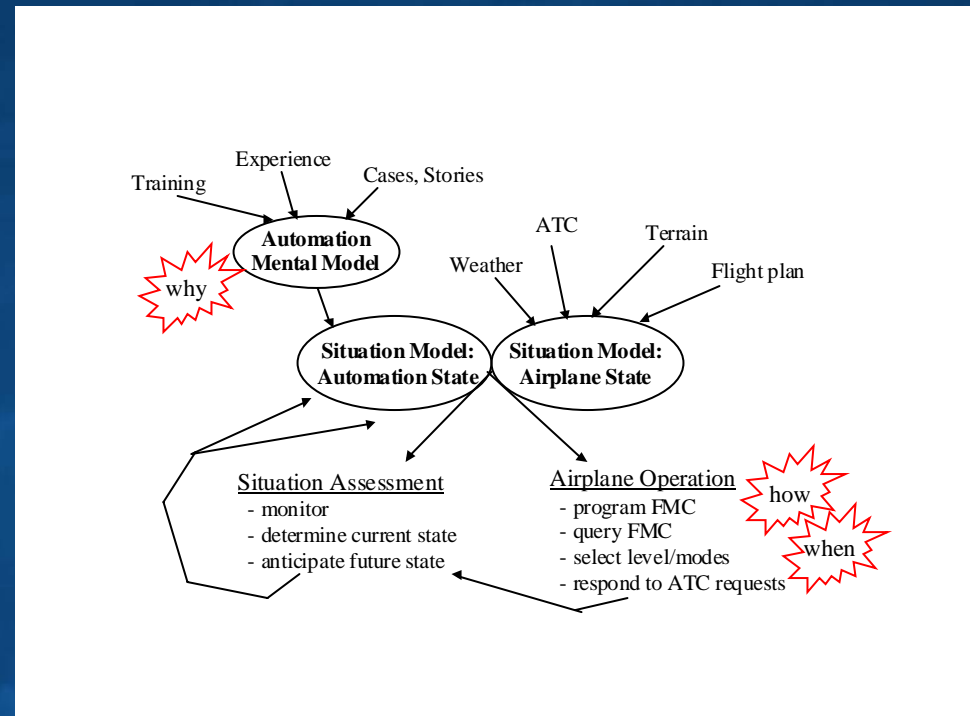


Source: The Boeing Company (Dr. Mumaw, D. Boorman and J. Griffin)



# The Training Solution of Choice

- Simulation allows pilots to understand:
  - WHY: the pilot's mental model
  - WHEN: automation skills
  - HOW: procedural skills
- Enhancing automation training by supplementing “how” with “when” and “why” lead to more efficient training
- Simulation model is at the center of a tool that allows the pilot to understand the WHY, WHEN and HOW



Source: The Boeing Company (Dr Mumaw, D. Boorman and J. Griffin)

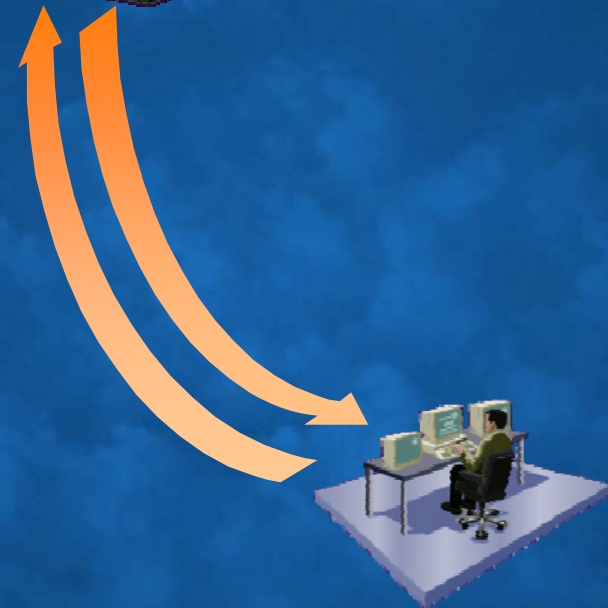


## New Training Philosophy

- Presently with a Simfinity Training Solution:
  - Use FFS simulation engine and advanced graphics to transfer some of the training to an “all graphic” device; that is, a more accessible environment.
  - Provide more “skill-based” instruction early in the training
  - Make available anywhere/anytime



**Full Flight Simulator**



**CAE Simfinity™**



# Simfinity™ Suite



**FMST**



**Self-Paced  
Simulation-Based Courses**



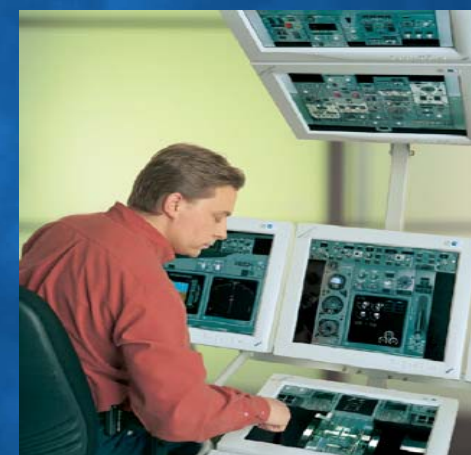
**Instructor-Led  
Simulation-Based Courses**



**Virtual  
Simulator**



**Virtual Maintenance Trainer**



**IPT**



# A Fully Integrated Training Solution

Entry Level Student



Practice Tools



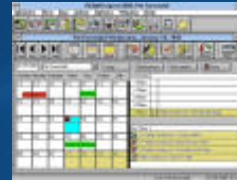
Self-Paced Courses



Instructor-Led Courses



Infrastructure



IPT and FTD

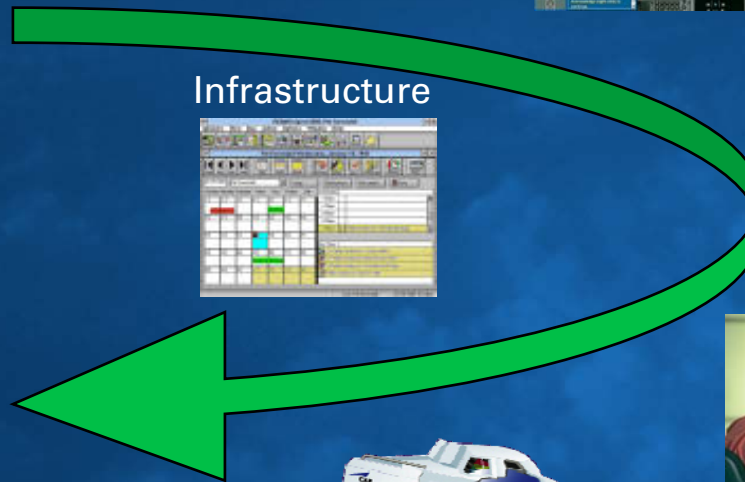
Type-rated Pilots  
And Proficient Techs



Training  
Center



FFS





## Value-Added Training

- Enhance classroom training as an instructor aid instead of chalk and talk
- Incorporate self-paced learning modules for knowledge and skills
- Maximum transfer of training
- Provide students with practice tools
- Increase access by implementing e-learning



## Value-Added Training

- Combines knowledge and skill-based learning
  - Teaches knowledge (systems) and skills (procedures) and evaluates both
  - Improves learning absorption/retention
- Allows proficiency-based training with guided practice and evaluation
  - Students practice and learn at own rate
- Can provide just-in-time training and can be an assistant for troubleshooting aircraft systems



## Simulation Benefits

- Improves the quality of training
- Provides an effective training tool for understanding complex systems
- Provides just-in-time training
- Assistant for troubleshooting aircraft systems
- Offers multiple financial benefits



# Simulation Benefits

- Financial
  - Direct cost savings
  - Indirect cost savings
  - Increased throughput



## Simulation Benefits

- Offers effective training solutions:
  - Increases quality of training
  - Reduces training costs
  - Increases training capacity