

Heavy Lift Application

Opening the E2E Options

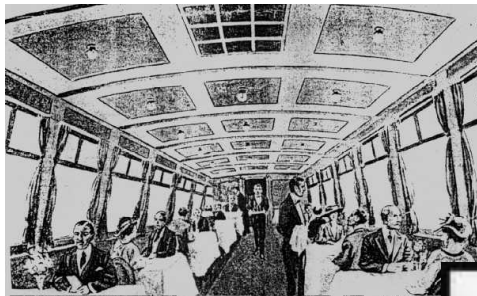


LMI

Some quick History

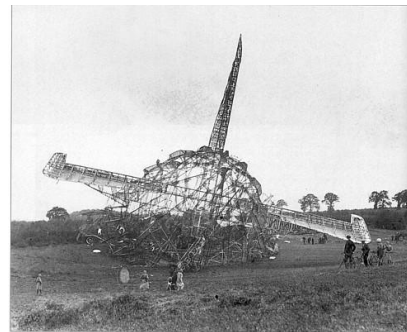
Early Uses

- Passengers Movement
- Ariel delivery of bombs
- Anti submarine



Early Issues

- Safety of flight
- Fire

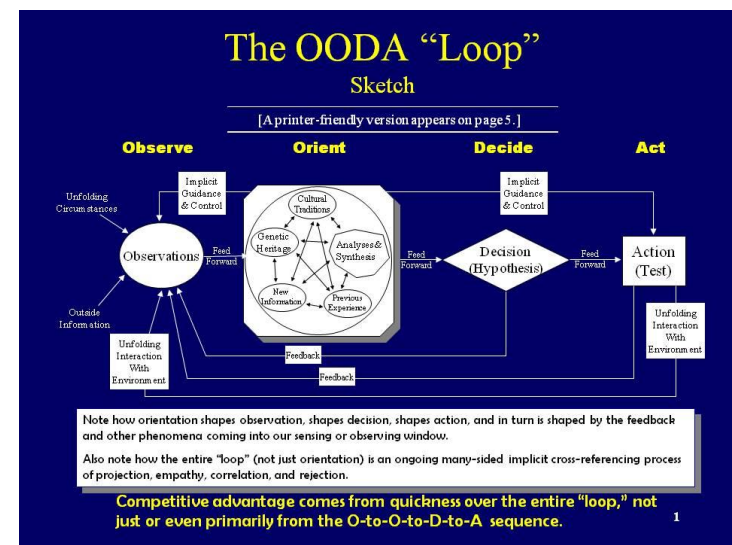


1997 JCS Question

- **Move it faster**
 - **Move Less**
 - **Don't move it at all**

Can we learn from Boyd

- Boyd said
 - Operate inside the other guys decision loop
 - You are always trading airspeed and energy in the performance envelope
- Thus we need to
 - Define the trade space
 - Seek the solution that allows for the OODA loop to work in your favor

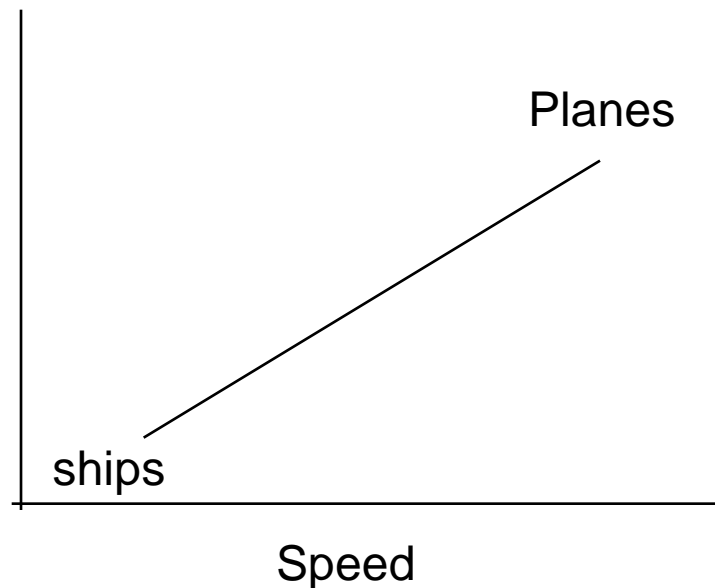


What has set the E2E limits

- The size of the lift platform
 - Interior dimensions (Height, Width, and Length)
 - Available useable payload (Payload available after fuel load)
 - On load and Offload infrastructure requirements
- How to measure speed
 - Speed of the lift platform
 - Time to mission ready in the objective area

What got folks excited in the late 90's

- Delivery of an Apache Battalion in one lift
- Speed to the market at a cost less than current air freight



What stopped folks in the late 90's

- Technology maturity
- Who was going to put the money up
- On load and off load infrastructure
- The “Giggle Factor”

How to define envelope of performance

- Minimize the time required to achieve operational capability
- Minimize objective area infrastructure requirements
- Maximize capability delivered in operationally relevant windows
- Minimize the reconfiguration requirements between modes
- Maximize the shared capabilities with the commercial market
- Minimize the fuel usage in FBCF terms

Assumptions

- Flight control technology can affect operational characteristics
- Materials will allow significant external envelope growth
- Buoyancy can be controlled and made into an advantage
- Reception infrastructure is neutral

Defining the Delivery performance envelope

- Cargo area – 100' x 500' x 24'
- Useable Payload ~ 1M lbs
- Useable on board power > 100 KVA
- Floor Load > C17
- Offload time < One hour
- Ground handling – Ground guide only
- Take off limits – VTOL/Hover capability
- Capable of In flight launch and recovery
- Detachable/configurable cargo POD with on board power and environmental control
- Fuel cost < than the cost per ton/mile for a B787

How do we do this

- Define the target mission profiles
- Define the cargo envelope
- Define the cargo interfaces

Some Potential Missions

- Delivery of an integrated C2 node in one Lift
- Launch and recovery of UAVs
- Delivery of an integrated emergency care system in one lift