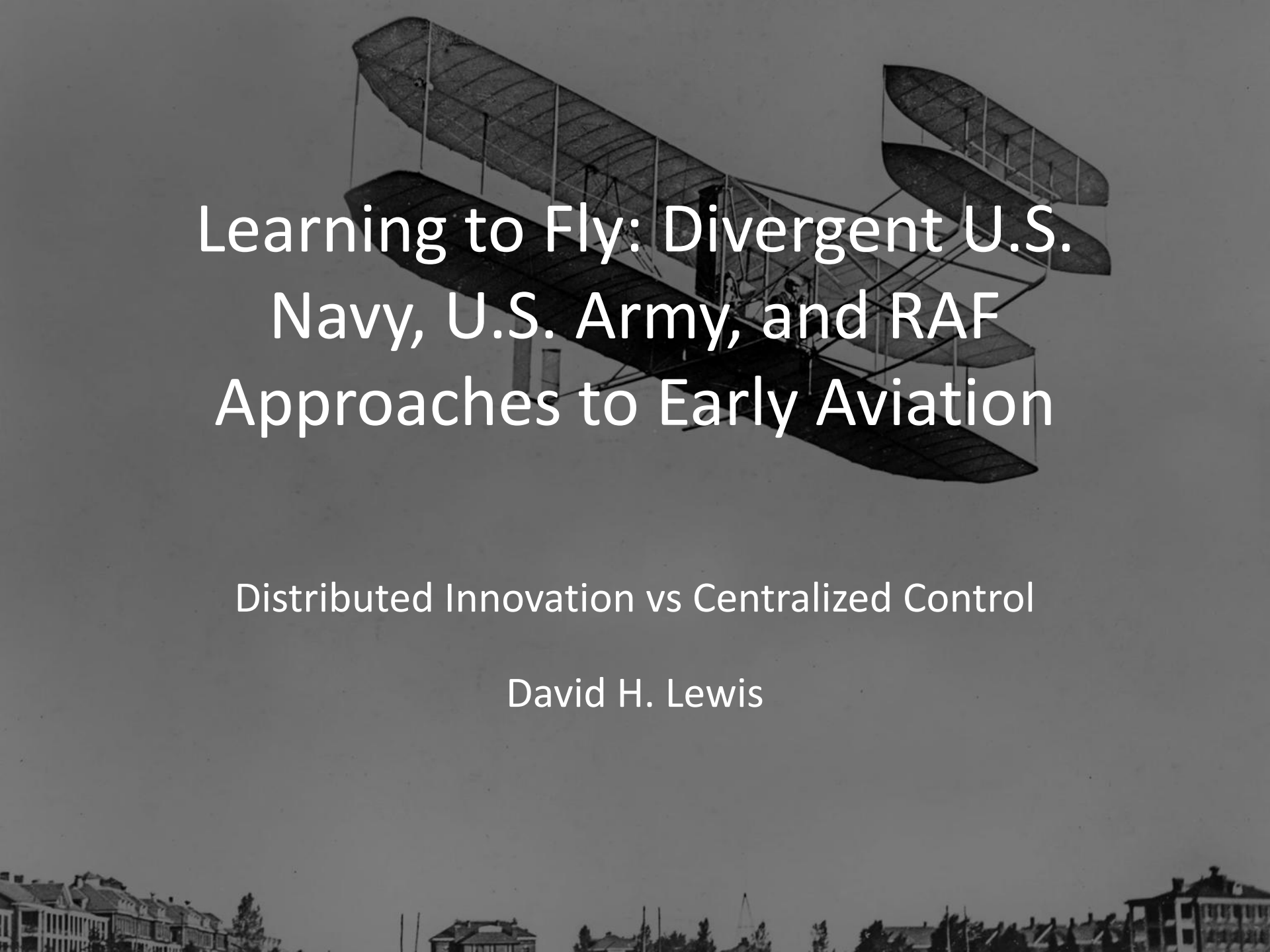


Learning to Fly: Divergent U.S. Navy, U.S. Army, and RAF Approaches to Early Aviation

Distributed Innovation vs Centralized Control

David H. Lewis

Research Question

- How do organizations absorb disruptive technology?
  - Interwar aviation provides a natural experiment:
    - U.S. Army
    - U.S. Navy
    - Britain's Royal Air Force
- Key argument: Innovation outcomes depend on how learning is organized.

Interwar Aviation Problem

- After WWI aviation proved useful but unresolved:
  - Reconnaissance and artillery spotting
  - Maritime patrol
  - Strategic attack possibilities
- All services faced the same challenge:
  - How to integrate aviation into military institutions.

Three Organizational Approaches

U.S. Army: aviation as revolutionary transformation

Royal Air Force: aviation centralized in an independent service

U.S. Navy: aviation as an operational learning problem

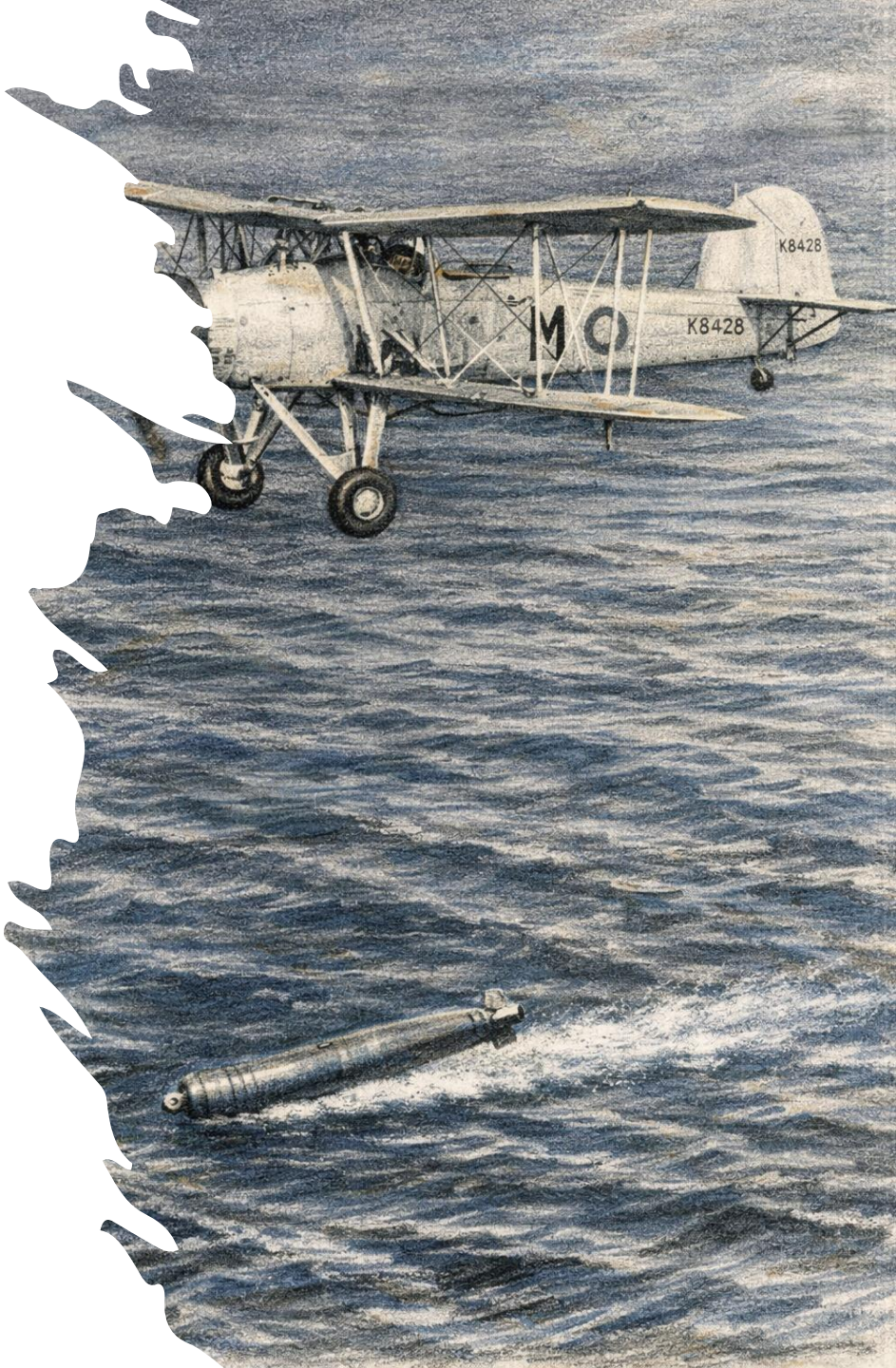
Different governance structures produced different outcomes

U.S. Army Approach

- Aviation framed as strategic revolution
- Advocates such as Billy Mitchell pushed:
  - Strategic bombing doctrine
  - Independent air force
  - Result: aviation became a political and institutional debate
- Learning concentrated within a small advocacy community.

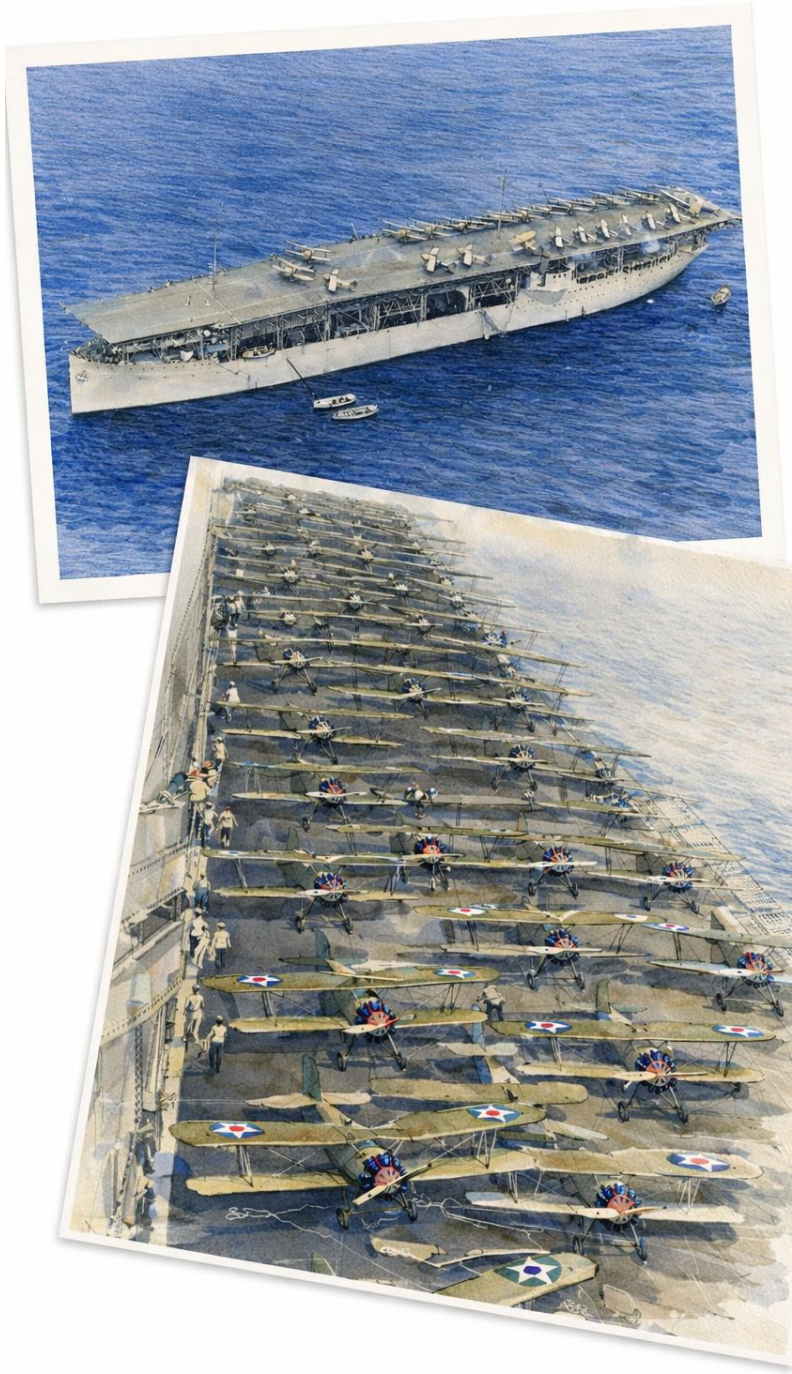
Royal Air Force Approach

- 1918 creation of the RAF centralized all airpower.
- Separated aviation from Army and Navy operators.
- Institutional priorities emphasized strategic bombing.
- Operational feedback from naval aviation was filtered or ignored.



U.S. Navy Approach

- Aviation is treated as an operational extension of the fleet.
- Bureau of Aeronautics provided stable stewardship.
- Carrier experimentation beginning with USS *Langley*.
- Learning embedded in fleet exercises and routines.



Centralized vs Distributed Learning

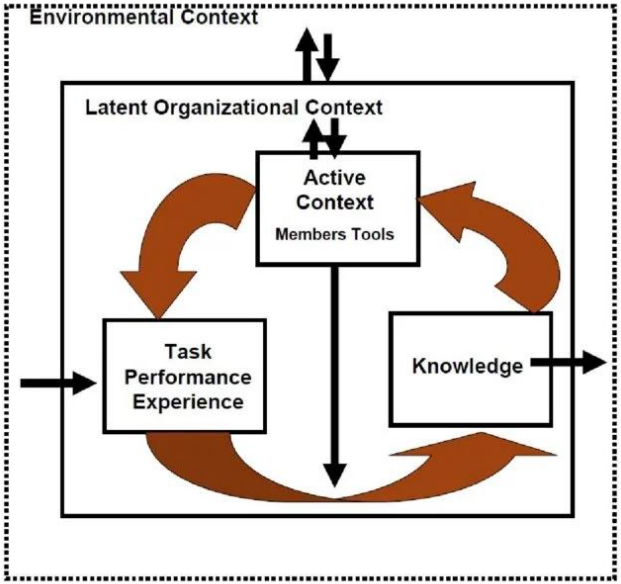
Army and RAF:

- Centralized authority.
- Doctrinal mandates.
- Defensive institutional behavior.

U.S. Navy:

- Distributed experimentation
- Feedback from operators
- Learning embedded in people, processes, and tools.

Organizational Learning Theory



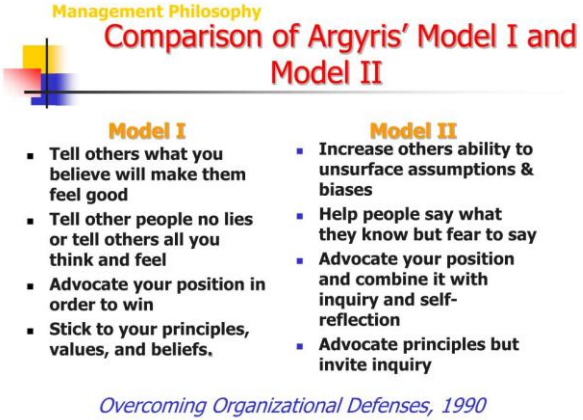
Linda Argote: Knowledge survives when embedded across

- People
- Processes
- Tools

Chris Argyris:

- Model I – defensive routines
- Model II – collaborative learning

Distributed systems produce durable innovation

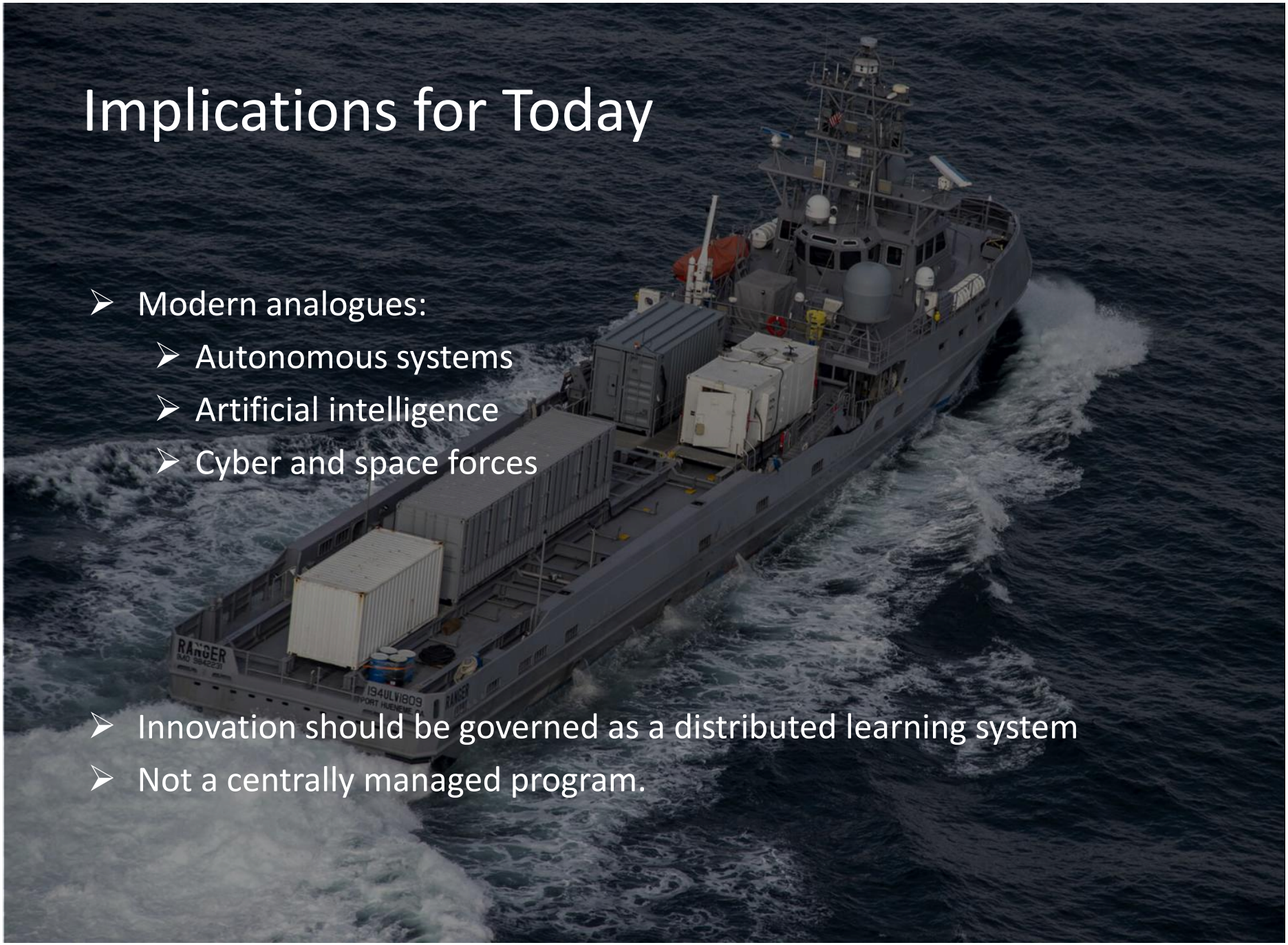


Outcomes by WWII

- U.S. Navy: integrated carrier aviation and fleet doctrine.
- Army: aviation learning remained partially isolated.
- RAF: strong institutional aviation, weaker operational coupling.

Organizational learning structures shaped capability

Implications for Today



- Modern analogues:
  - Autonomous systems
  - Artificial intelligence
  - Cyber and space forces

- Innovation should be governed as a distributed learning system
- Not a centrally managed program.

Conclusion

Technological adoption depends on learning architecture.

Centralized innovation systems risk rigidity.

Distributed experimentation enables adaptation.

Innovation succeeds when organizations learn collectively.