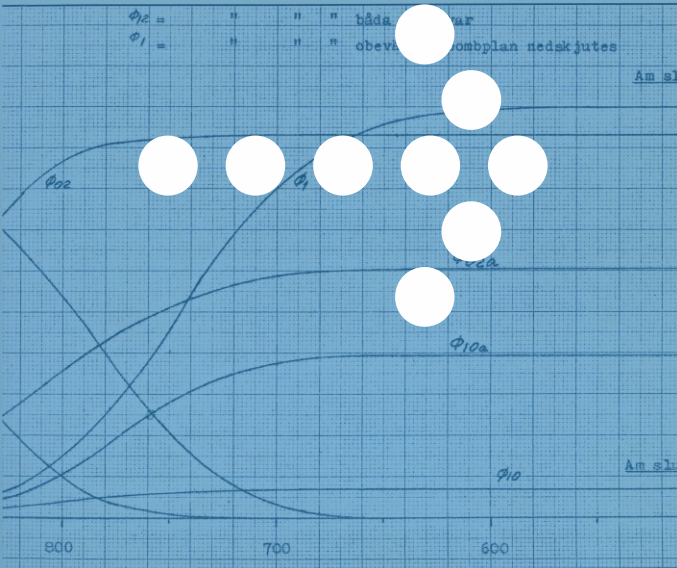


Eric Bergelin

PLANERINGSFORSKNINGENS GENOMBROTT

Försvarets forskningsanstalt och det
globala kalla krigets planeringsexperter



Military Adaptation in War and Requisite Variety

Jan Frelin



STUDIA HISTORICA UPSALIENSIA 275

The Adaptation Problem

- Surprise is the Norm
- The Nature of the War at Hand
- "Expect the Unexpected"
- Not Just Intended Surprise

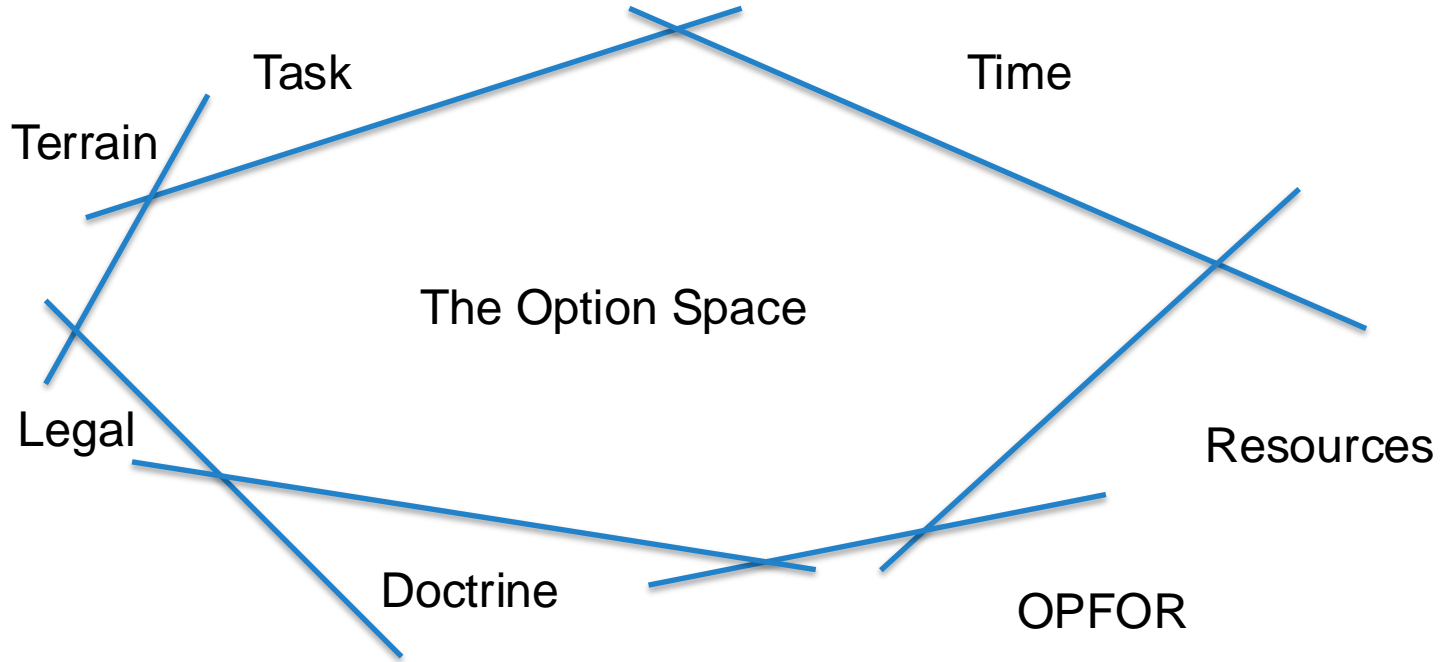
The Law of Requisite Variety

- "Only Variety Can Destroy Variety"
- Initially a game-theoretic treatment (Ashby 1956)
- Later a set-theoretic treatment (Ashby 1967)
- Concerned with surprise, distinguishable disturbances
- Applications in command & control
- Applies to competing systems
- Intended as a law of nature(?)
- Constraints are necessary for prediction...

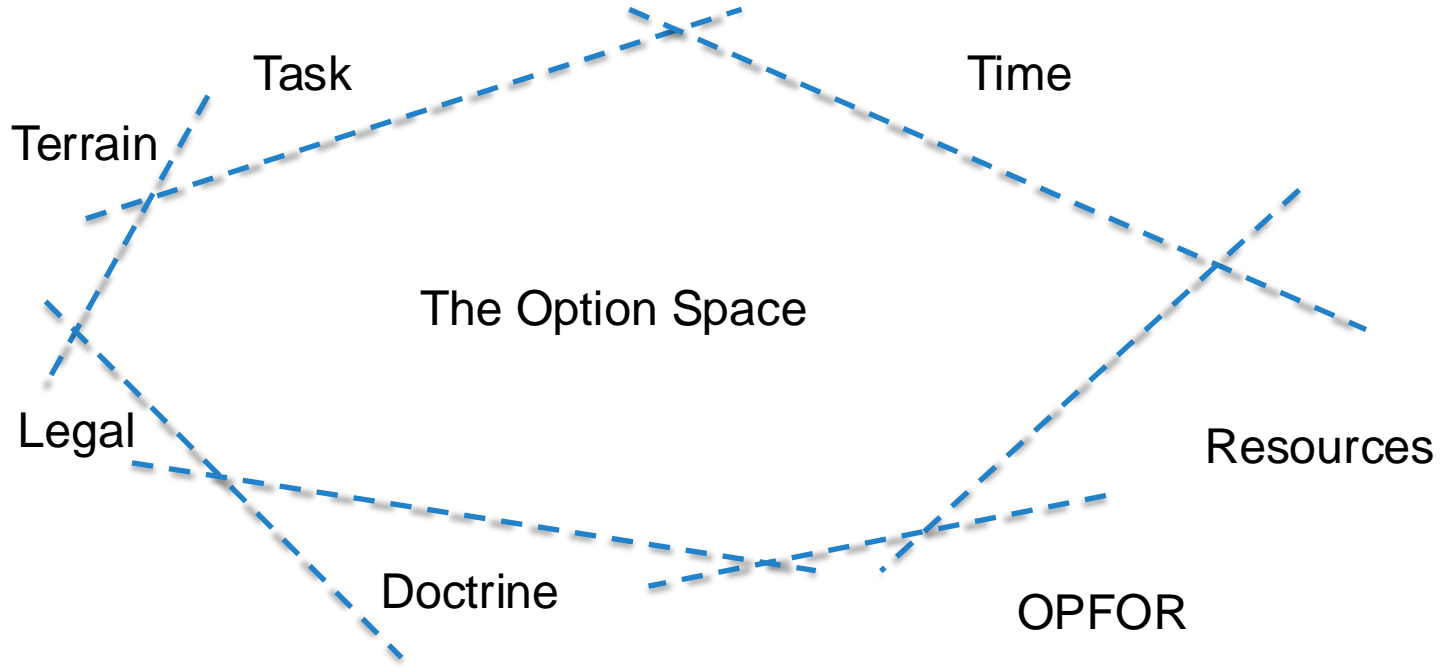
Brehmer's Constraints of the Military Option Space

- Task
- Time
- Resources
- OPFOR Options
- Doctrine
- Legal
- Terrain

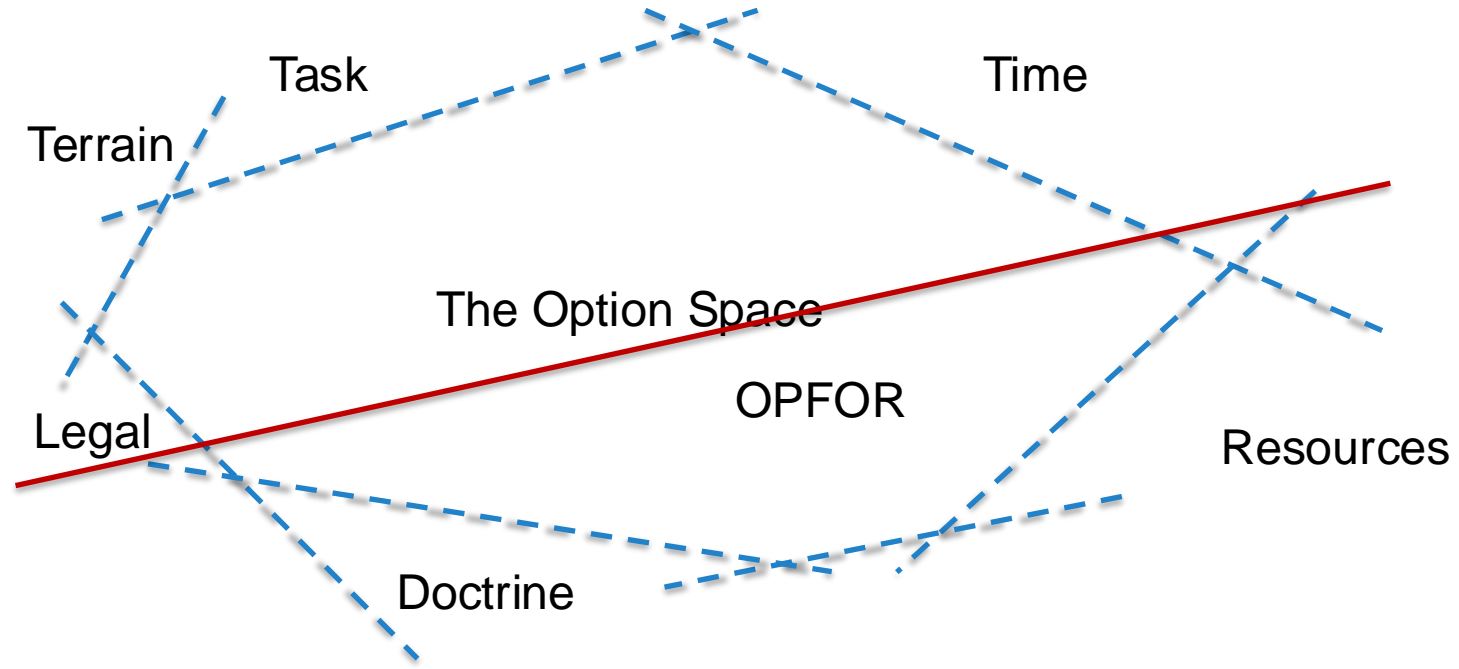
The Option Space



The Subjective Option Space

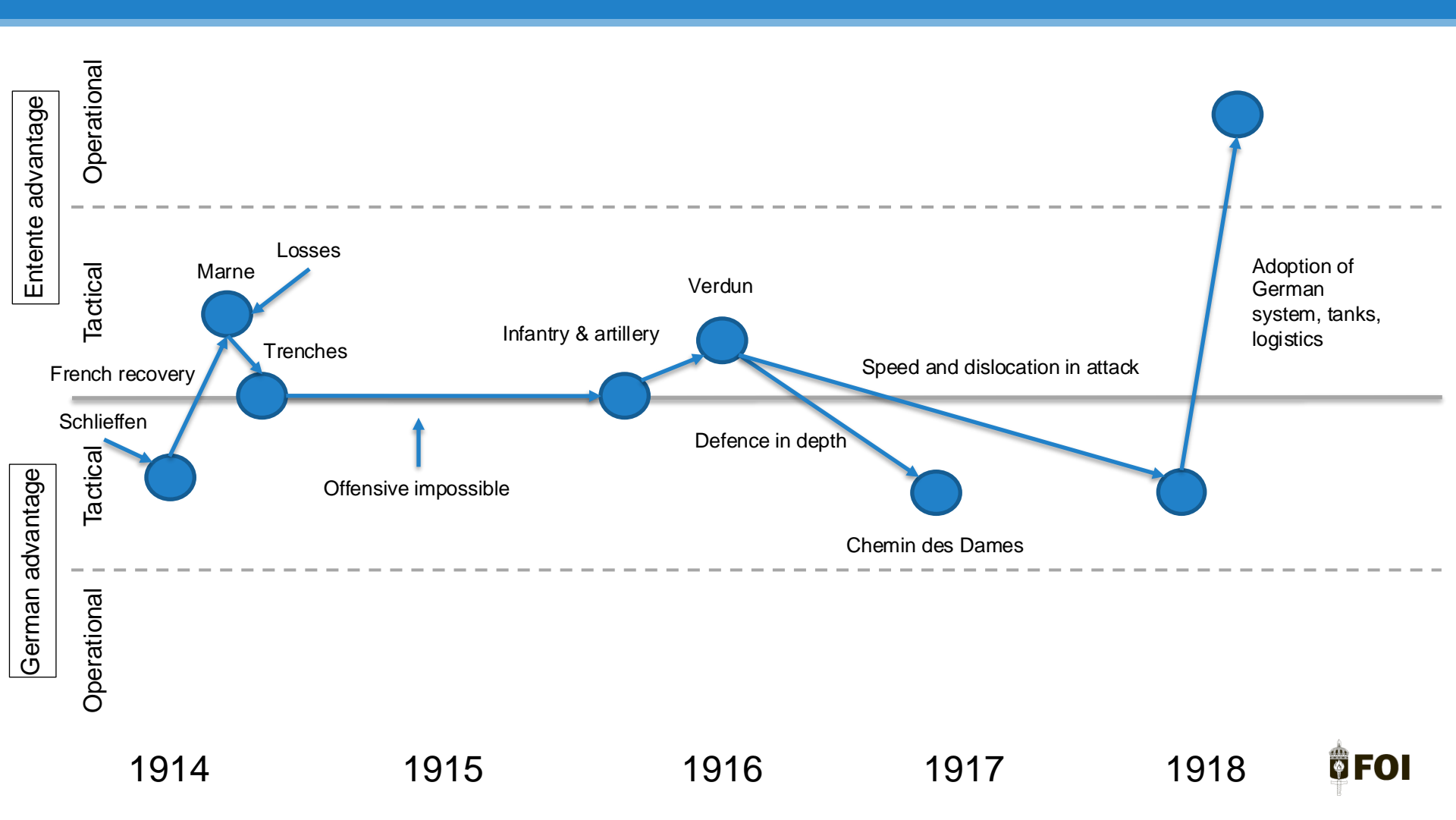


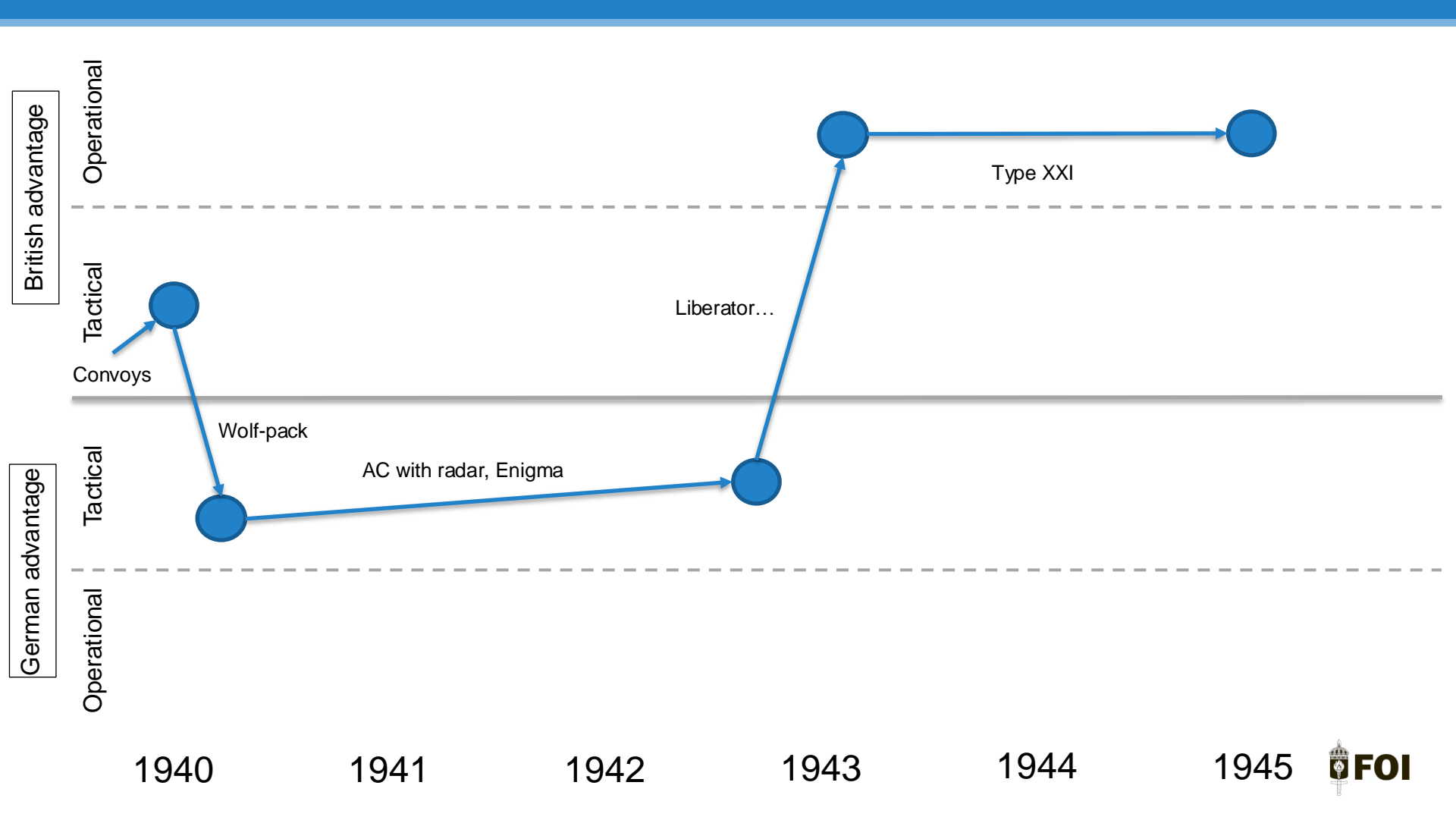
Vs The Real Option Space



Ashby+Brehmer

- ‘The variety is requisite at a specific point in time at which the commander is aware of at least one viable option in the real option space’
- Adaptation now Becomes Restoring Requisite Variety
- Requisite Variety was Used as the Criteria for Evaluating Adaptations





British advantage

Operational

Tactical

Convoys

Wolf-pack

AC with radar, Enigma

Liberator...

Type XXI

German advantage

Tactical

Operational

1940

1941

1942

1943

1944

1945



IDF advantage

Operational

Tactical

Tactical

Operational

Sinai

Lebanon

Gaza

Invasion

New weapons

Cast Lead

Protective Edge

Ball & chain

Volley fire

BATASH

Jointness

Demolitions

Close range

Tandem warheads, New actics

Tunnels

ERA

Tank losses to ATGM

Second Lebanon war

1973

1982

1985

1993-95

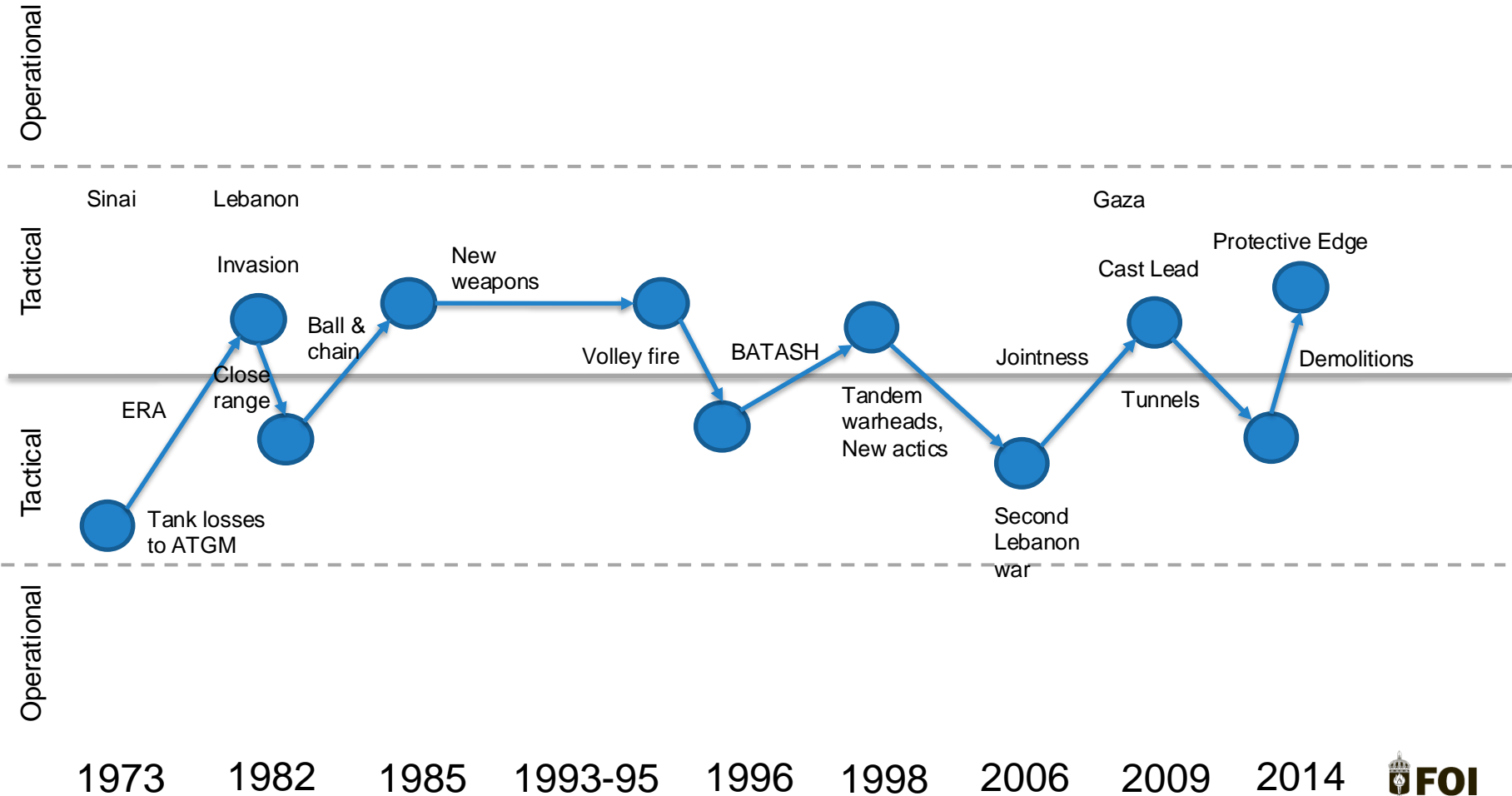
1996

1998

2006

2009

2014



Why is Adaptation Difficult?

- Ambiguity
- Rigidity
- Diverging Preferences
- Simultaneous Learning
- Nested Learning
- Constrain Information Flows

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How to Fail at Adaptation

- Defeated by Obstacles
- Run Out of Time
- Adapt to Equilibrium
- Trapped by Initial Successful Adaptation
- Maladaptation
- Less to Lose

Kauffmann's Screwdriver



Kauffmann's Screwdriver

- screw in a screw.
- open a can of paint.
- wedge a door closed, or open,
- or scrape putty from a window,
- or stab an assailant, or a friend,



- commit suicide,
- or as an object of art,
- or tie it to a bamboo pole and spear fish,
- or rent the spear to others and collect 5 percent of the catch,
- or with a rock, chop (slowly) down a small tree,
- or carve a stick or...

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Jury-rigging

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How do you adapt?

- Leadership Swaps & Political Pressure
- 'Jury-rigging'
- Experiments

How to Succeed at Adaptation

This Helps:

- More to Lose
- Combined Arms
- Knowledge Development
- Communities & Networking
- Production Capacity
- Proponents
- Education and Skills

The Adaptation Cycle

- A successful adaptation will create pressure on the opponent to adapt
- Until the war ends, the expected situation becomes a cycle of adaptations
- Adaptation is necessary but not sufficient
- Breaking the adaptation cycle