

Gaining a Competitive Advantage Through Wargame Enhanced Innovation

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Introduction

By better understanding the total utility of innovations we can better understand how wargaming can help increase that total utility.

Being better at maximizing the total utility we can gain a competitive advantage over our potential adversaries.

Structure

- 1/3 Foundation
- 1/3 Small Groups
- 1/3 Compilation
- Next

Foundation

- Two Read Aheads
- Matt Caffrey
- Tom Choinski
- Sugio Talahashi
- Bill Simpson
- Several Papers

American Competitive Advantages

- Historically, we have enjoyed two advantages:
 - Brute Force: Overwhelm our enemies with stuff
 - During WWII the US manufactured over half the munitions produced – by both sides.
 - Tech Edge: Employ weapons our enemy can not counter
 - During the Gulf War the US fielded weapons our adversary could not see.
- Contemporarily, both advantages are eroding
 - Brute Force: Several nations and coalitions of nations are approaching and are likely to exceed our economic power
 - Tech Edge: The globalization and commercialization of science and technology is creating one common tech base

A New American Competitive Advantage

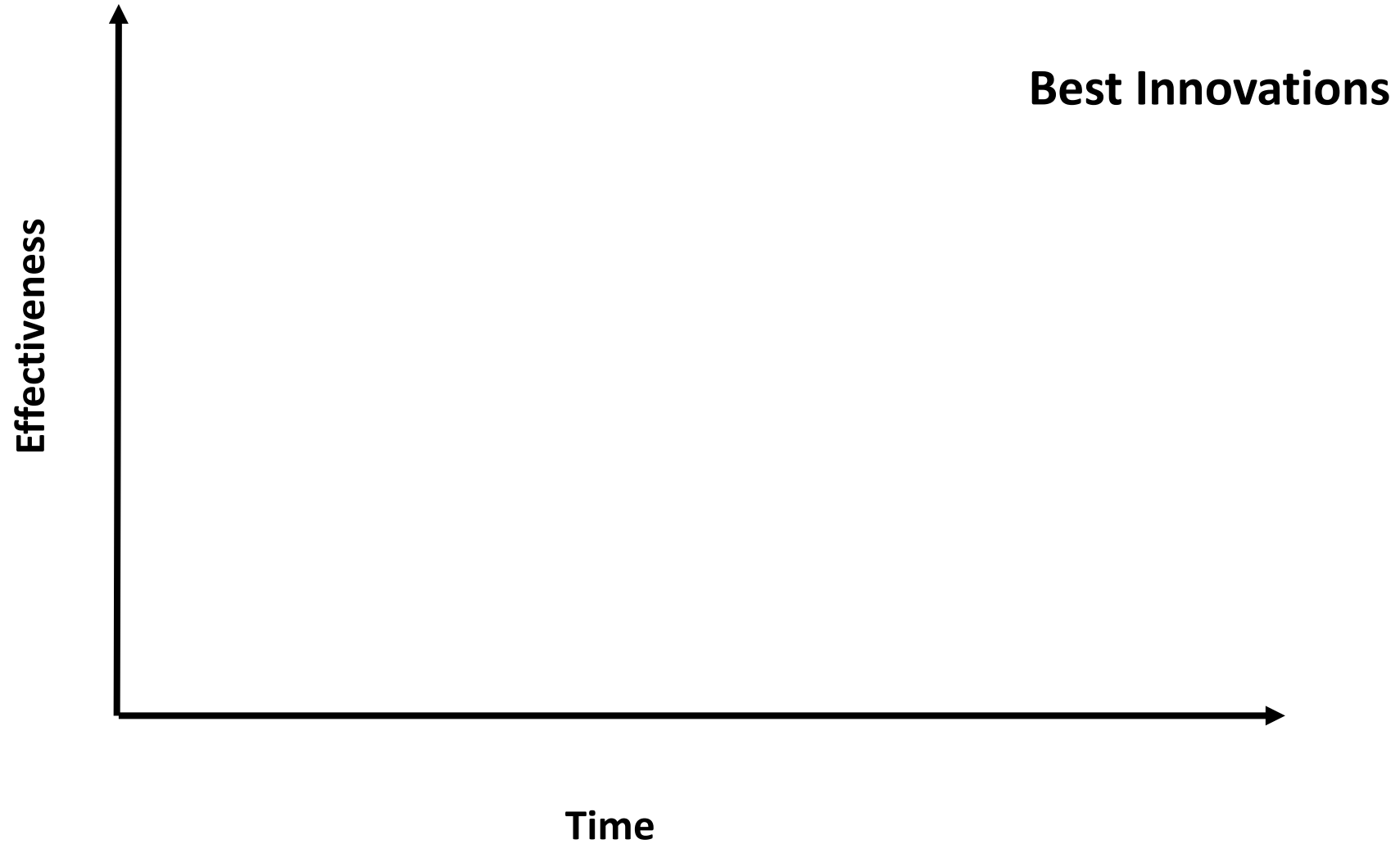
- Create greater competitive advantage through more effective innovation than our adversaries.
 - Using roughly the same tech base and similar sized economy, implement innovations that create a greater total competitive advantage.
 - As our adversaries will be innovating also, simply innovating will not provide an advantage, our innovations need to have relatively more impact, longer
 - What criteria can be used to determine the most impactful innovations?
 - Can criteria Bell Labs adopted decades ago be adapted for military use?

Maximizing the Value of Economic Innovation

The Bell Labs model

- The Lab's efforts in basic science provided far more potential innovations than they had time/resources to develop
- Over time they developed a formula
 - Magnitude of operating profit
 - Duration of operating profit
 - Less cost of innovation
 - Equals total life cycle profit

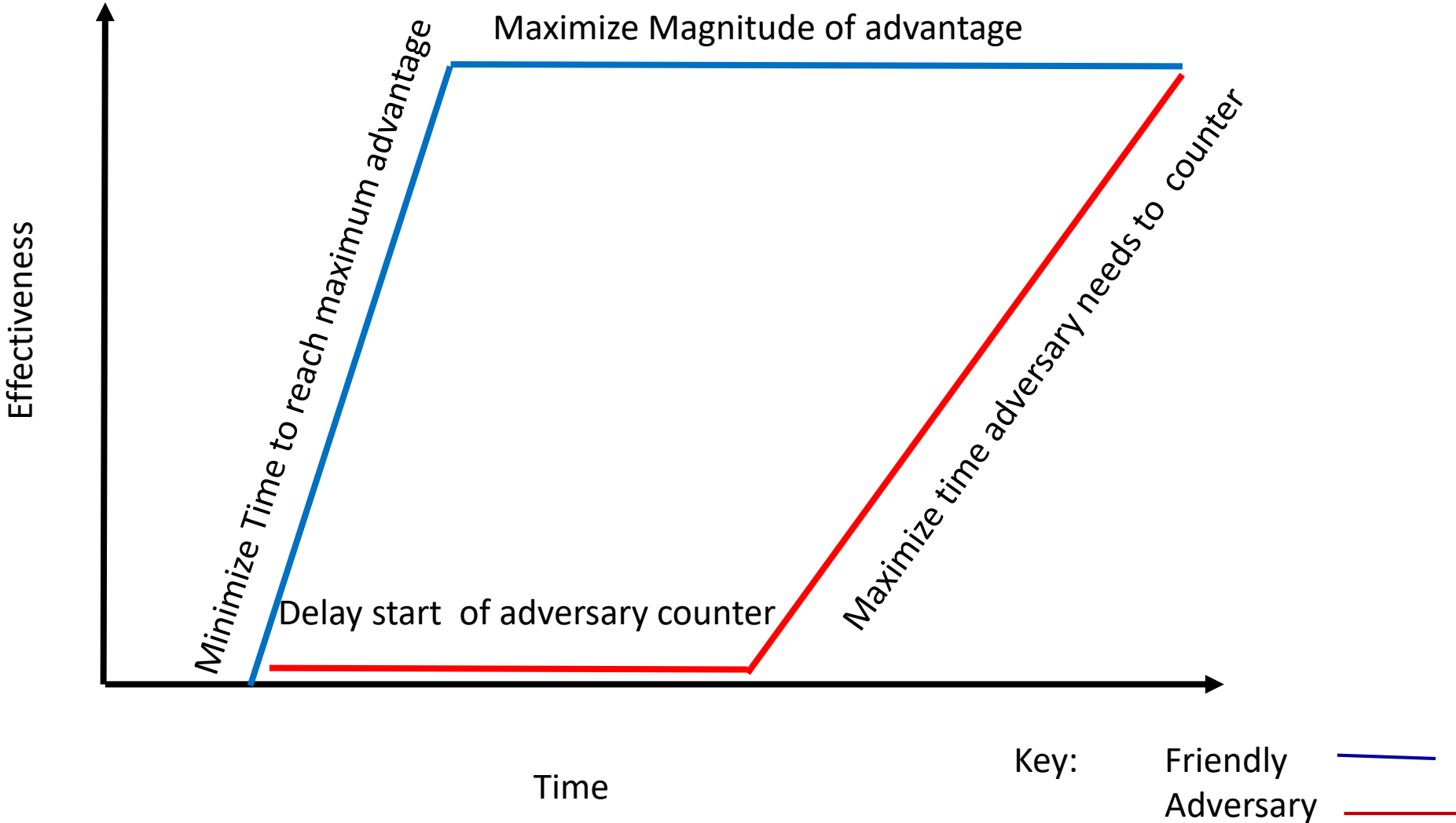
Maximizing the Value of Economic Innovation



Maximizing the Value of Military Innovation

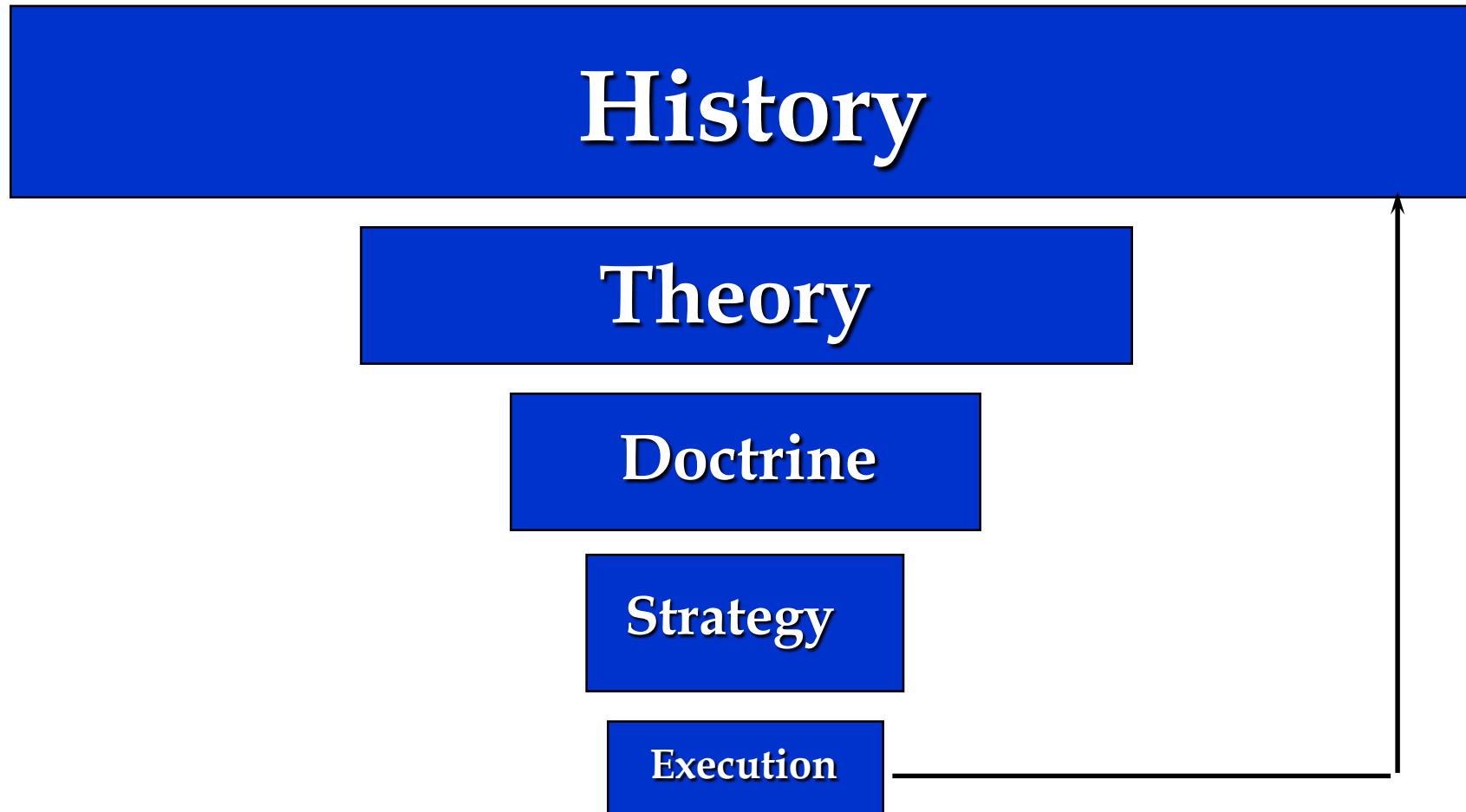
- Maximize magnitude of advantage
- Minimize time needed to reach maximum advantage
- Maximize delay of start of adversary efforts to diminish advantage
- Increase time needed for adversary to eliminate advantage
- Minimize cost of innovation

Maximizing the Value of Military Innovation



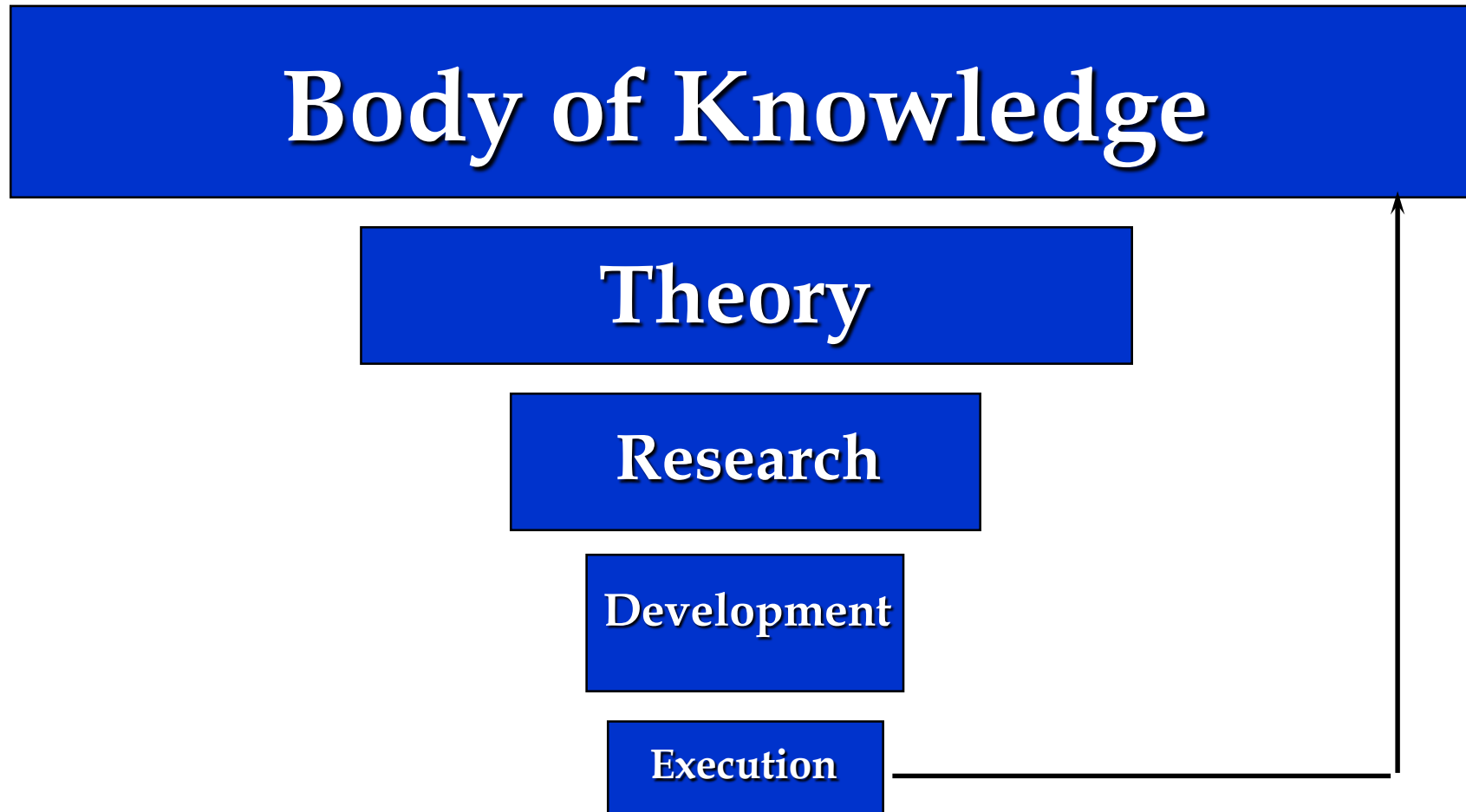
Normal Innovation Cycle

An Operators Prospective



Normal Innovation Cycle

A Technologists Prospective



Normal Innovation

Problem 1: Most Effective Innovation Seldom Obvious



YB-40 Hedge Hog

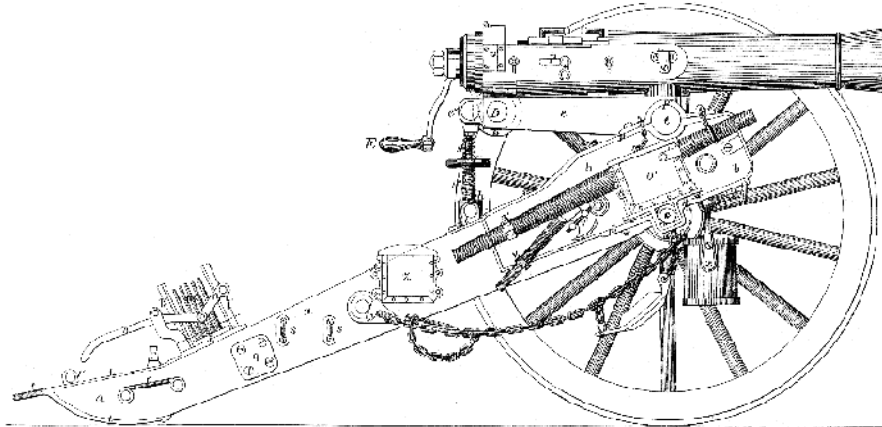


P 47 with Drop Tanks

Normal Innovation

Problem 2: The Historical Lag in CONOPS & Tactics

Mitrailleuse – 1850's

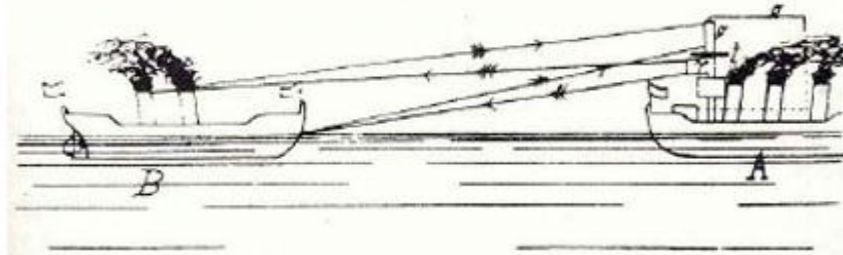


Telemobiloskop (radar) – 1904

Verfahren, um entfernte metallische Gegenstände mittels elektrischer Wellen einem Beobachter zu melden.

Patentiert im Deutschen Reich vom 30. April 1904 ab.

Fig. 1.



Mobile Observation Platform 1914



Trench Crosser 1916

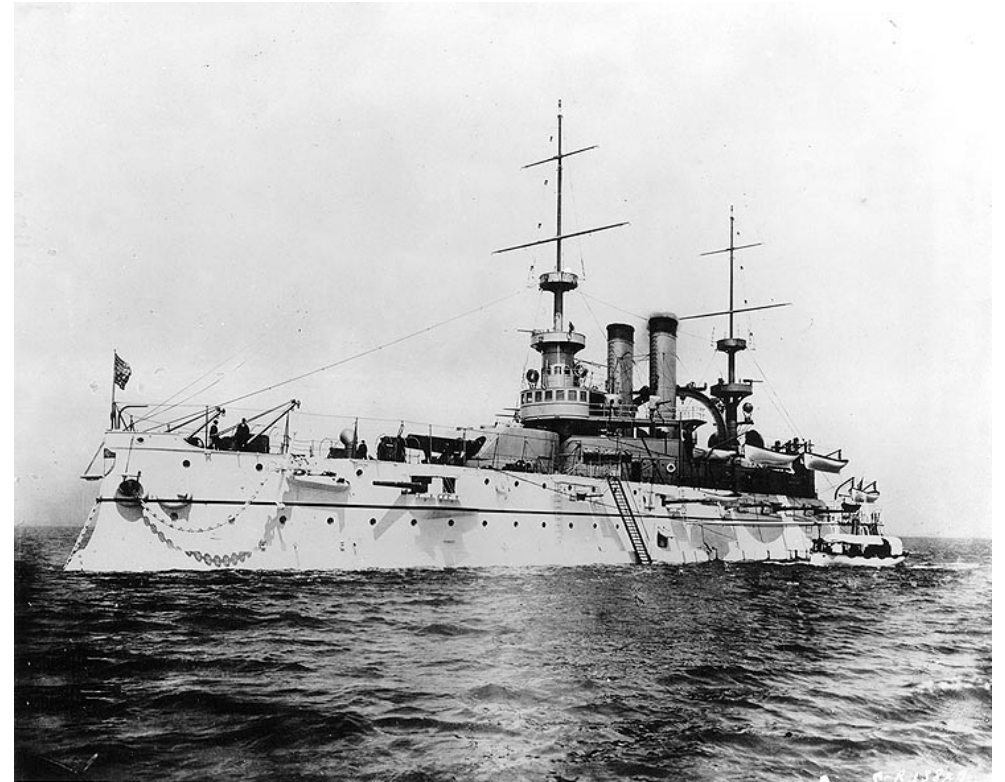


Normal Innovation

Problem 3: Without war how do you identify bad guesses?



Ram

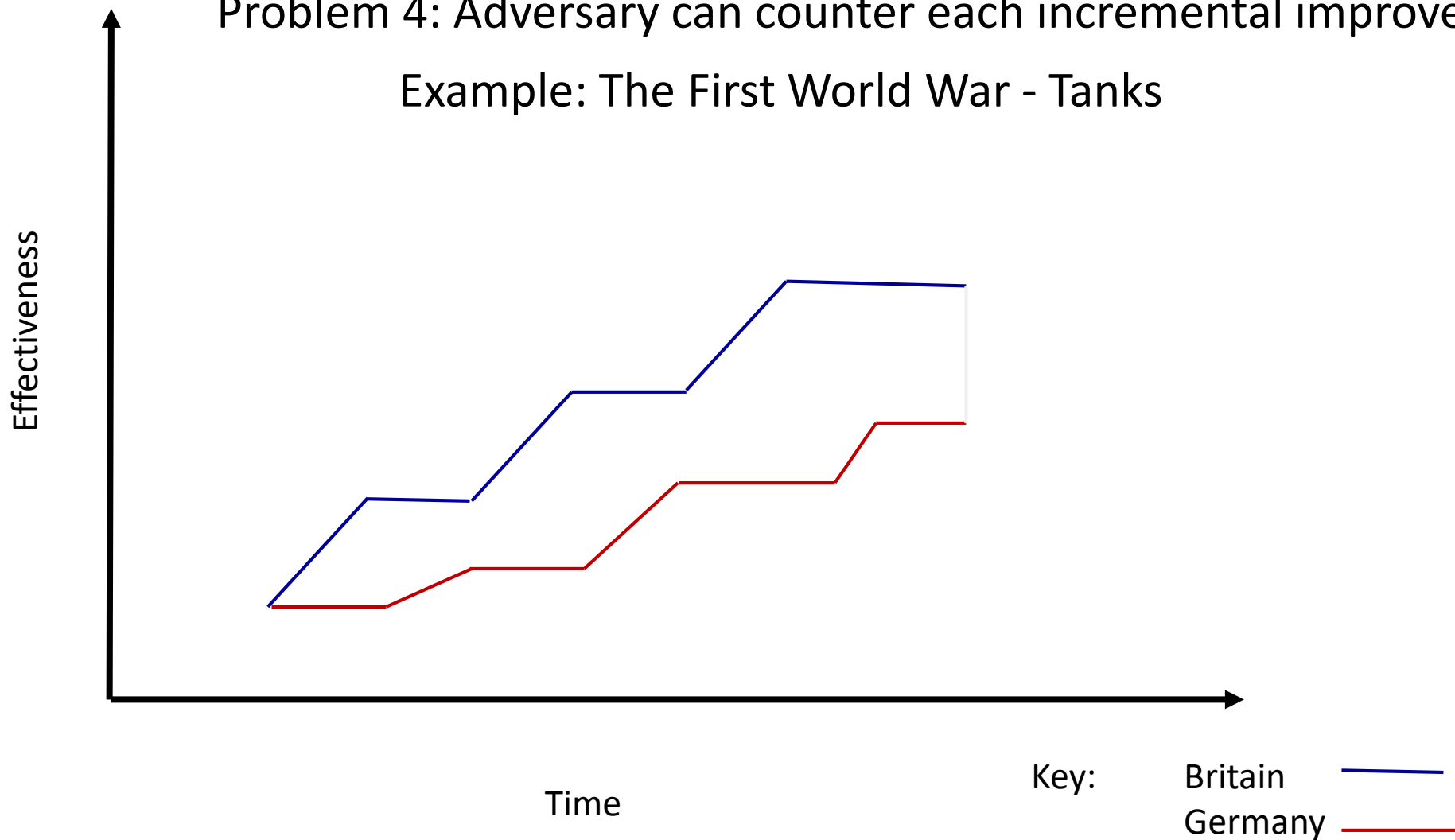


Dynamite Ship

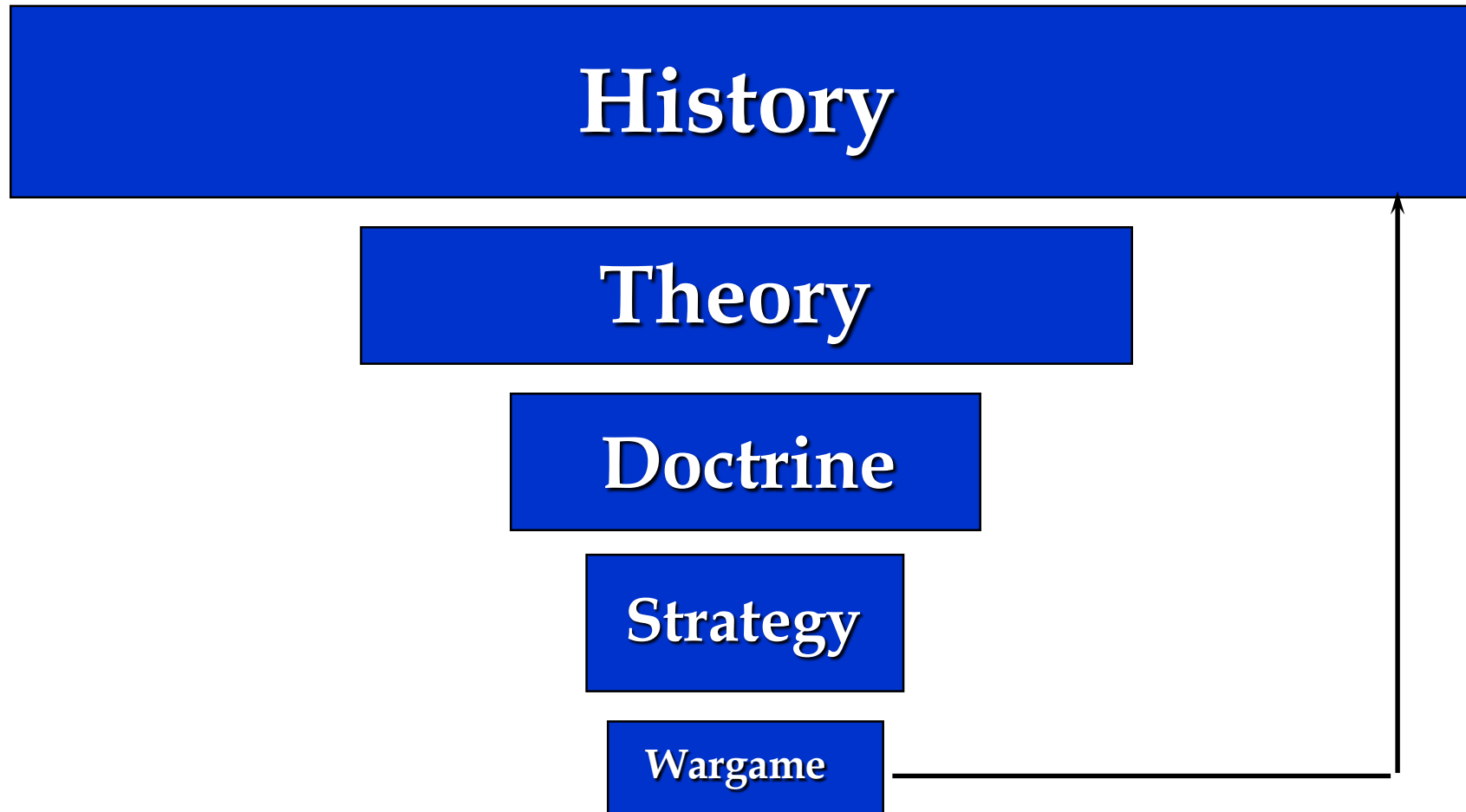
Normal Innovation

Problem 4: Adversary can counter each incremental improvement

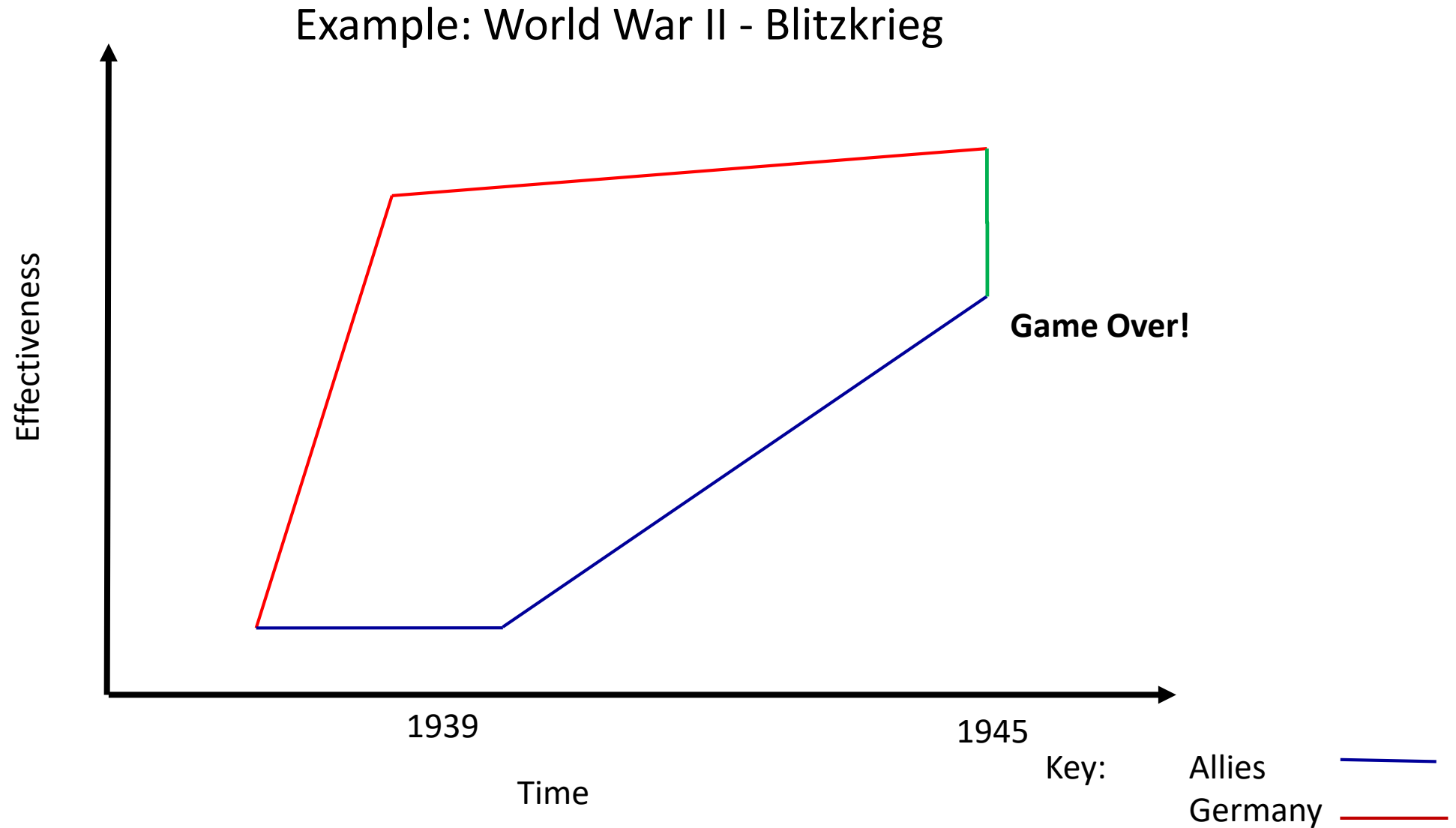
Example: The First World War - Tanks



Innovation Cycle With Wargaming



Innovation Cycle With Wargaming



Maximizing the Value of Military Innovation *Through Wargaming*

- Maximize Magnitude of advantage
 - Competition of ideas, best ideas come to the top
- Minimize Time needed to reach maximum magnitude
 - CONOPS worked out before system fielded
- Delay start of adversary efforts to diminish magnitude
 - Harder to steal what does not exist
- Increase time needed for adversary to eliminate advantage
 - Anticipate enemy counters and prep to counter them
- Minimize cost of innovation
 - Optimum features/counters to Red anticipated earliest, reducing changes

Foundation

- Tom Choinski – nature of Innovation
- Sugio Talahashi – importance of acting in insights
- Bill Simpson – designing wargames to promote innovation
- Several Papers

Characteristics of innovation

- Focused on winning, relative to adversary
- **Organizational openness to risk – sustainable risk**
- Proactive approach
- How can wargaming help innovation
- Increase pre-combat looks at military problems
- Provide venue for those w/ views contrary to status quo

Characteristics of innovation

- Surfaces hidden assumptions
- Brings tacit knowledge to the fore
- **Fits w/in existing cycle of research/decision cycle**
- Innovation implementation plan
- Articulate improved benefit associated w/ a proposed innovation
- Post-game reports can be used to highlight decision-maker actionable items

Maximizing Advantage via Wargaming

- Wargame for results
 - Screen out low-payoff innovations
 - Put blue in positions that force innovation
 - Incorporate as much of innovation chain as possible
- Look outside of DoD community
 - Incorporate experience from tech, production
 - Wargame learning processes of self and adversary
 - Wargame whole of society (Economy, culture, education)

Implementation for Advantage

- Impact decision-makers
 - Work and produce within decision cycle
 - Explain in their language
 - Build trust through results
 - Find/Produce champions
- **WG Tool Kits**
 - User Friendly
 - Flexible
 - Cheap (in\$, time & manpower)
 - Repeated use and success leads to credibility

How Might We Use Wargaming to Expand the Caffrey Box?

- Thread 1: Increase Cognitive Diversity Brought to Bear on/in Wargames
 - Outsiders/Members of General Public
 - Sci-Fi authors, futurists
 - Not just middle aged white guys
 - Collaboration across entire spectrum of DOTMLPF and across entire spectrum S&T, R&D, Acquisition
- Thread 2: **More/Better/Selective Use of Deep Rigor**
 - Physics based models, risk analysis, overlayed and integrated, data analytics
- Thread 3: Policy Wargames
 - Primary topic is the whole of government approach that China uses to steal IP. Need to figure out how to Wargame policy approaches to this; also cyber

How Might We Use Wargaming to Expand the Caffrey Box?

- Thread 4: Go further upstream and wargame the geopolitical situation first; also more use of alternative futures in geopolitical wargaming
- Thread 5: increase intentional variability that players see. Variations in variables, introduction of new verbsets, asymmetrical abilities
- Individual Idea (no thread): publish several “fake” wargaming outputs to deceive and confuse the adversary, make them chase results (delay the adversary innovation in the Caffrey curve)
- Individual idea (no thread): simultaneous wargaming from cyber space to meat space and vice versa

Next

- Web site
- We need to be our champions

Back Up



Wargame - Concept Pyramid



Wargame

- Cost Neutral Alternatives
- Synergies Explored
- High scope/low granularity

- In-depth focus
- Credible adjudication
- High granularity/low scope

- Fast, easy
- Min false +/-
- Low granularity & scope

Cross Domain

60-200 participants

Deep Dive

12 – 60 participants

Discovery/Filter

1 – 12 participants

Concept

- IOC/FOC
- Detailed Cost
- Draft CONOPS

- Draft employment
- Credible data
- Adjudication guide

- Clear description
- Technically Feasible
- Production Feasible

Questions

We can promote, protect and increase our national security innovation advantage through wargaming

- Fast, easy wargames will stimulate the bottom up flow of the best new ideas
- Small, rigorous wargames will ensure those ideas are as they seem
- Larger, cross domain wargames will help integrate new systems and new ideas with existing inventory and doctrine, and:
 - Identify cross domain synergies
 - Socialize new opportunities

S&T Enabled Innovation

Two Paths to the Same Destination

Military Technical Revolution

- Technology
- Ops Concept
- Organization

Revolution in Military Affairs

- Ops Concept
- Technology
- Organization

The Role of Wargaming In Maximizing the Value of Military Innovation

- Maximize magnitude of advantage
 - Facilitates the competition of ideas, increases odds highest impact picked
- Minimize Time needed to reach maximum advantage
 - Allows CONOPS to be developed and improved BEFORE first employment
- Maximize delay of start of adversary efforts to diminish advantage
 - Adversary does not see our incremental improvements, late start countering
- Increase time needed for adversary to eliminate advantage
 - Enables the anticipation of counters and development of counter-counters
- Minimize cost of innovation
 - Initial specks closer to ideal, fewer/smaller expensive changes