
From Over the Horizon …
The Imperative for Change …
Preparing for 21st Century Warfare

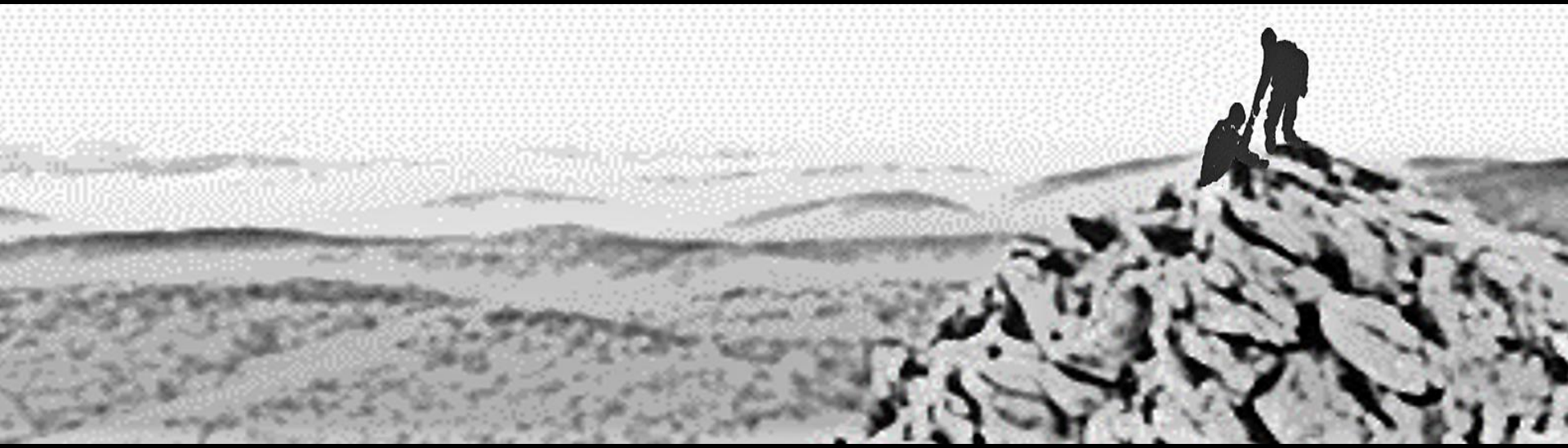
Anticipating Change … Value and Impediments

"During the 1990s … authors offered forecasts of military technology appearing by the year 2020 … The overall accuracy … was assessed as quite high … pointing to the potential value of such forecasts …"

Long-Term Forecasts of Military Technologies for a 20–30 Year Horizon: An Empirical Assessment of Accuracy
Kott and Perconti, Army Research Lab

"DoD does not have an innovation problem; it has an innovation adoption problem …"

Eric Schmidt, Chairman, Defense Innovation Board



"Culture Eats Strategy for Breakfast …"

Peter Drucker

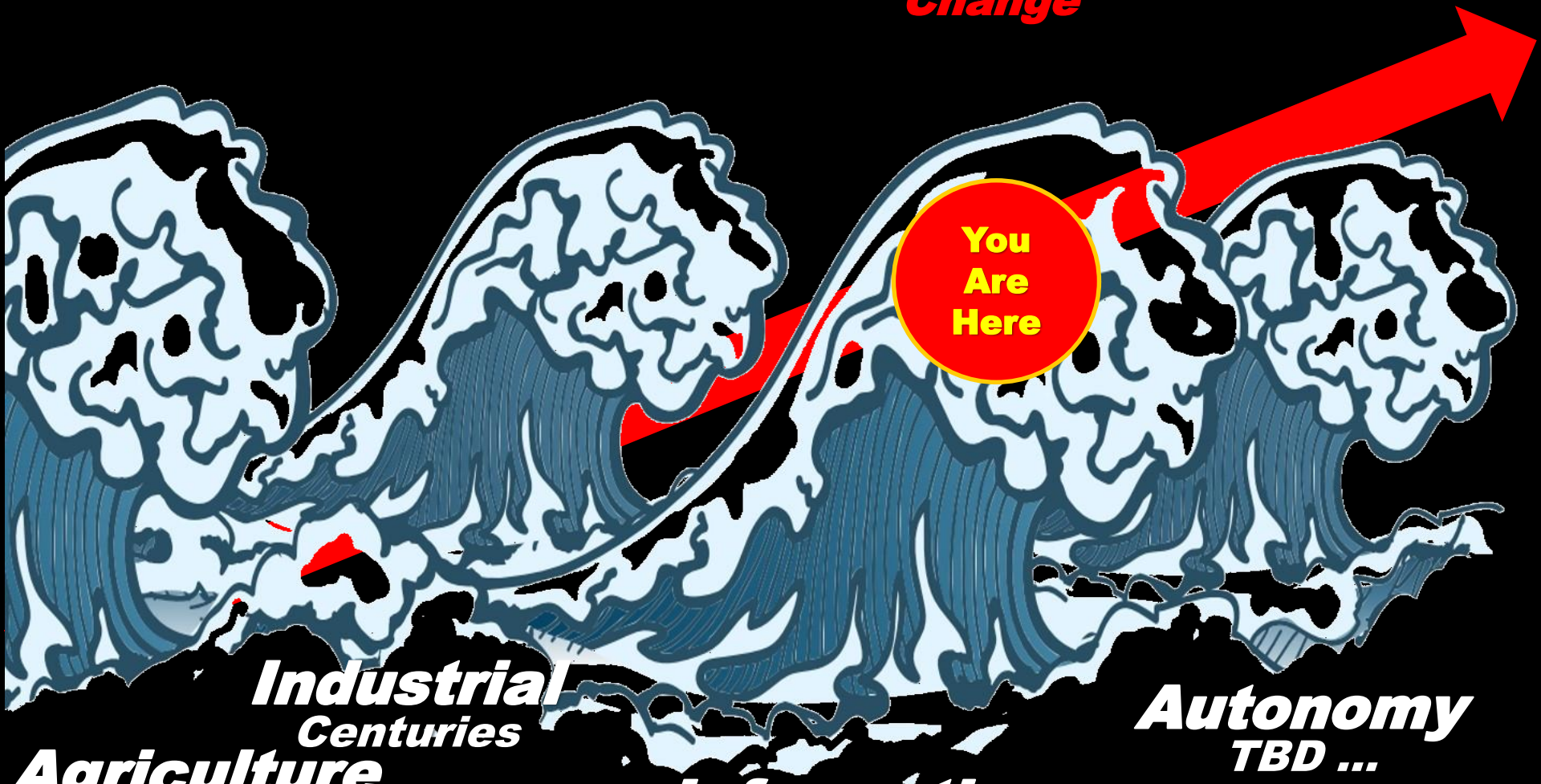
Why Change … Profound Costs of Not Getting It Right…

“The Great War differed from all ancient wars in the immense power of the combatants and their fearful agencies of destruction, and from all modern wars in the utter ruthlessness with which it was fought. . . . When all was over, Torture and Cannibalism were the only two expedients that the civilized, scientific, Christian States had been able to deny themselves: and they were of doubtful utility.”

The World Crisis, 1911-1918 : Chapter I (The Vials of Wrath), Churchill, Butterworth .

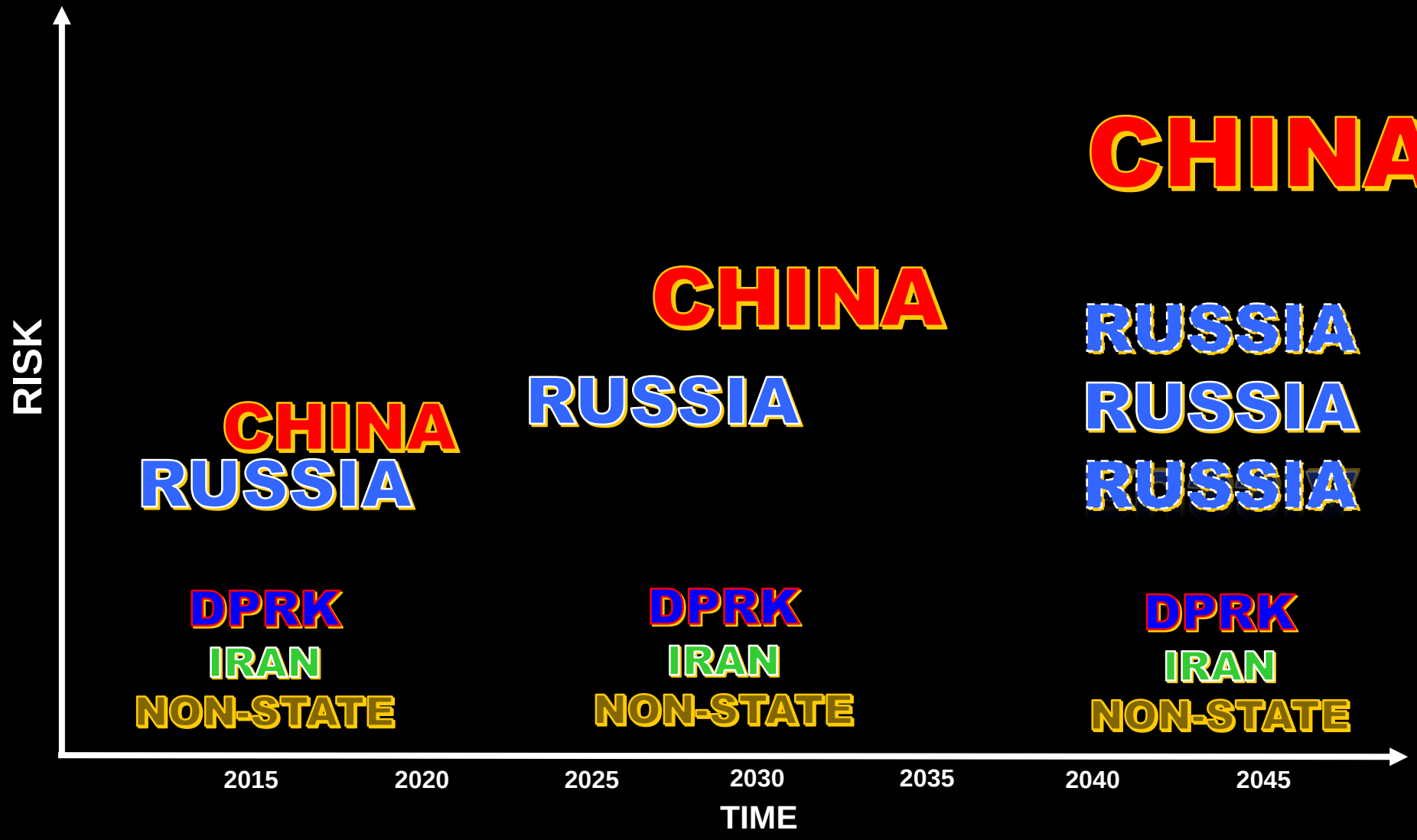
Change in Perspective ....

Scope, Scale, Complexity, Surprise, Speed, Lethality, Violence ... Fundamental Change



With acknowledgement to Toffler

Implications ... An Emerging Geo-Strategic Path



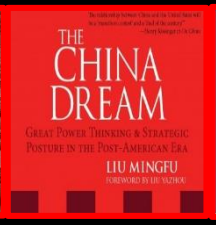
Convergence of geo-strategic and technological change make catastrophe possible … once again

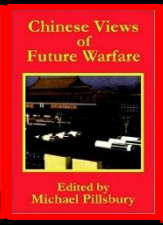
Implications … Coming Change in the Ways of War

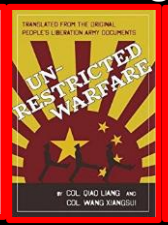
This … before the full impact of autonomy is realized …

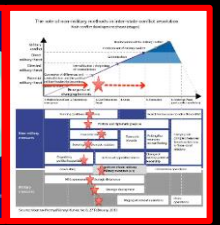
Implications … Harbingers of Change …

Nearly 30 years of Intellectual, Strategic and Operational Investment

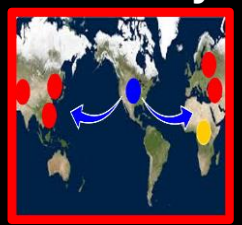







Proximity



Econ War

Space -Ctr Space

Cyber-EW-C2W/Ctr Cyber

Nuclear

Info Ops

Redundant ISR

Asymmetric Ops

SOF/Proxies

Anti-Access/Area Denial

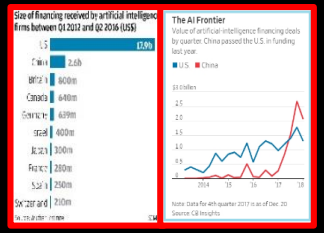
Overmatch

Training

Robotics

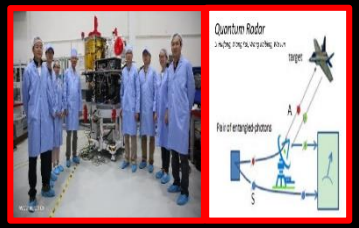
Hypersonics

AI



Bio-Convergence

Quantum



Tech Plans

Our adversaries are focused on the US and are comprehensively invested in securing competitive advantage

Implications … US Widely Challenged

- Strategic to Tactical Competition, Force Projection, Mission Command and Cyber Access at Risk

- Disjointed Approach puts International, Domestic, Regional Unity & Authority to Act at Risk

- Similar Uses, but Varied Reliance and Asymmetric Offensive Capabilities Making US Space Reliance a Liability

- Aging TRIAD, Strategic Symmetry and Tactical Asymmetry Challenges Escalation Control

- Asymmetric Threat Investments Challenge US Air Superiority, Interdiction & CAS

- Asymmetric Investments & Parity Challenges US Force Closure, Joint, Shaping & Maneuver Ops

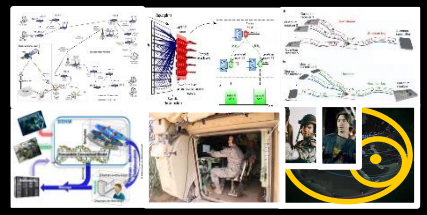
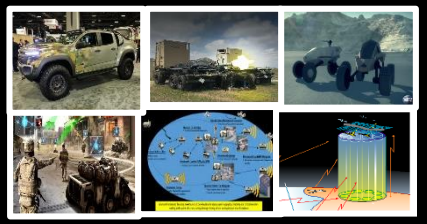
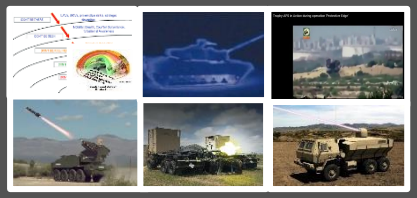
- US Remains Dominant, Though Joint Power Projection, Sea-Lanes and Sealift are Challenged

Implications … on Land … a Baker's Dozen

- *Scope, Scale, Complexity Expanded*
- *Airland Battle is Dislocated*
- *Detection means Destruction*
- *Forward Force Posture and Projection Contested*
- *Air-Ground Combined Arms Maneuver at Disintegrated*
- *Mission Command/PNT Contested*
- *Shaping Operations often on the Receiving End*
- *Tactical Parity is Reality in TOO many areas*
- *Terrain Matters … Proximate, Complex, Congested, Contested, Contaminated*
- *Echelons required for Resiliency, Depth, & Agility in the Joint, Intel, Fires, & Sustainment Fights*
- *Information Environment is Ubiquitous, Contested, and Both Opaque & Transparent*
- *Non-expeditionary Reach Back Ops are Irrelevant*
- *Competition Short of War sets conditions for War*

Comprehensive challenges demand comprehensive solutions

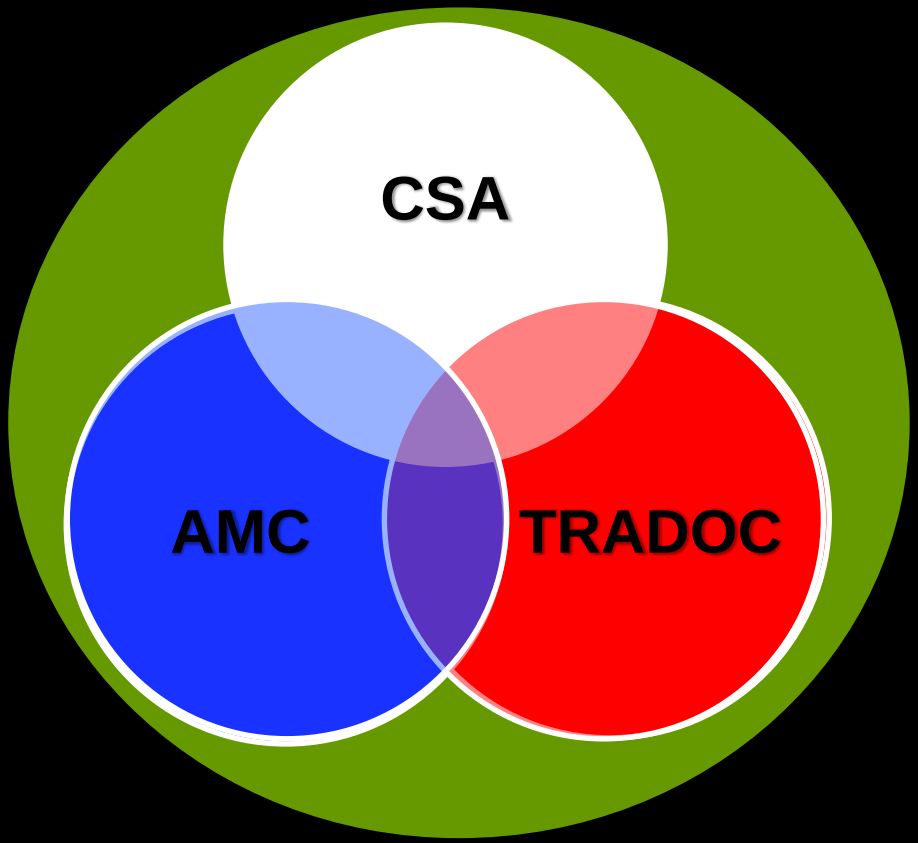
Implications … Challenges & Opportunities

	CHALLENGE	OPPORTUNITIES
	Sense, Understand, Decide on an Expanded, Complex, Congested, and Contested Battlefield	Traditional and non-standard ISR, Indirect Access … LEO, Small, Smart, Many, IOT, AI, UAS, LIDAR, Quantum Sensing, Cognitive Data / Decision Tools, Sensors and Networks at Scale and Range
	Harden and Diversify Networks against Contested EMS, Enable Leaders at all levels with agile Mission Command and Fused Data and Decision Support	Heterogenous, Agnostic Networks and Paths, Systems to Aps, AI, Neuromorphic Chips, Edge Computing, Quantum Coms/Computing, Novel RF, Pseudo Satellites, 5G, Expeditionary, Global to Local Cyber Tools
	Extend and Integrate Range & Effects of Kinetic and Non-Kinetic Fires	Energetics, Rail Gun, Spectral Guided Munitions, Boost-Glide, EW/Cyber Left of Launch, Cyber Indirect Access, Concealed Access and Presence, Sensors and Networks at Scale and Range
	Increasing Expeditionary Capability and Maneuver Agility and Lethality	Fuel Cell/Alternative Power/Energy, AI, Autonomous Systems, Manned-Unmanned Teaming, Energetics, Rail Gun, Vertically Integrated C2, ISR, and Fires System, Soldier as a System, Augmented Performance
	Increase Survivability Formations and Command Posts from Long-Range Indirect and Direct Fires	Signature Management, Active Protection, Hyper-Velocity, Rail Gun, Directed Energy, Sensors and Networks at Scale and Range

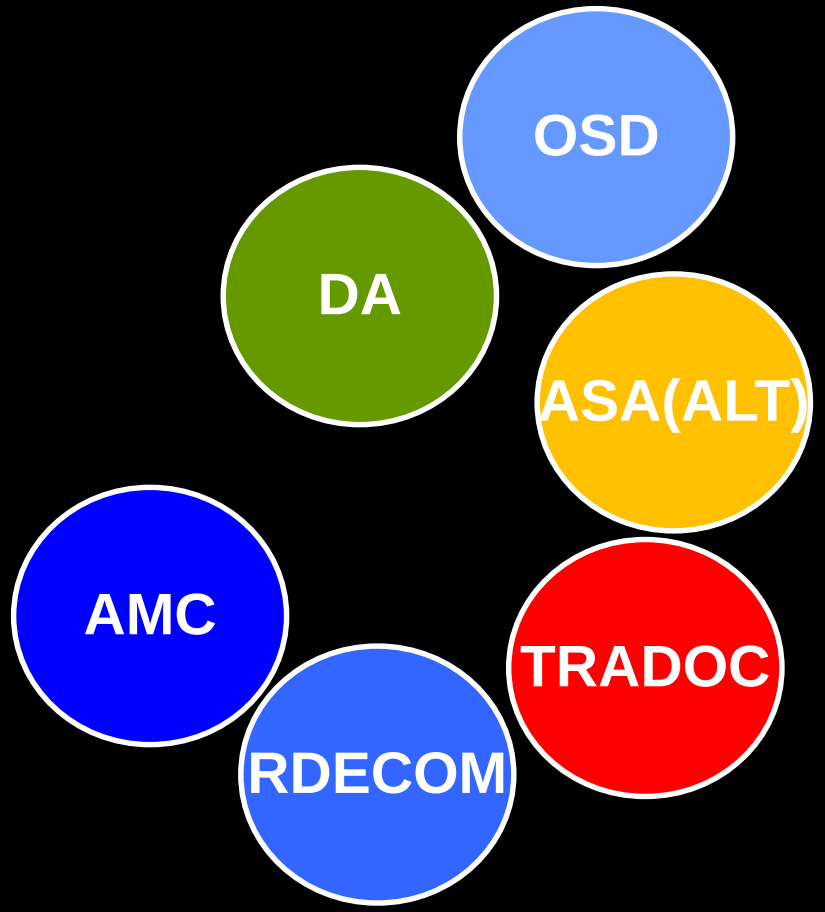
Innovative solutions abound, don't let adoption be the challenge …

Innovation … the Imperative of Futures Command

Big 5-Division 86
1970s-1980s



Post-Cold War
1990s-2000s



"…our Army will establish unity of command and unity of effort that consolidates the modernization process under one roof."

Enabling Success

Qualities

- Expeditionary
  - Mobile, responsive, agile and durable forces
- Order of Magnitude Improvement
  - Incremental improvements are needed, but not sufficient
  - Adversary investments and ambition demand step changes to restore and maintain overmatch
- Reduced Burden
  - Cognitively, Physically, Organizationally, Logistically
  - Leader, Soldier, Unit

Innovation

- Imperatives
  - Leadership
  - Culture
  - Organization
  - Problem(s)
- Traits of Success
  - Sponsorship and continuity
  - Catalyst to initiate
  - Lessons Learned applied
  - Anticipation of the future
  - Intellectual leads the physical
  - Concept to focus
  - Opportunity to exploit
  - Expertise to develop
  - Experiments to evaluate
  - Network to refine

"The best way to predict your future is to create it."
Variously attributed to Abraham Lincoln and Peter Drucker