Transforming National Security

Information Age

...The Logic

...The Dynamic

Globalization II

Globalization III

...The Opportunity

Vision: Broad and Sustained Competitive Advantage

- *Strategic Imperative*

- *Capabilities*

- *New Logic and Metrics*

- *Opportunities*

Industrial Age

Terry J. Pudas
Acting Director, Force Transformation
15 March, 2006

Transforming Defense

…The Concept

Elements of Transformation

- ☑ Continuing process
- ☑ Creating/anticipating the future
- ☑ Co-evolution of concepts, processes,   organizations, and technology
- ☑ New competitive areas/competencies;revalued attributes
- ☑ Fundamental shifts in underlying principles
- ☑ New sources of power
- ☑ Culture - attitudes, values, beliefs

- *New Strategic Context*
- *Broadened Threat Context*
- *Technological Threats Facilitated by Falling Barriers to Competition*

"The ultimate competitive advantage lies in an organization's ability to learn and rapidly transform that learning into action."

Jack Welsh

Transforming Defense

- ## New strategic context

  New Theory of War based on information age principles and phenomena

  New relationship between operations abroad and homeland security

  New concept/sense of security in the American citizen

- ## Broadened threat context

  State/Non-State

  Symmetric/Asymmetric

  Traditional/Unrestricted

- ## New technological threats facilitated by the falling barriers to competitive entry

  Immediate accessibility to highly capable low cost IT

  Opens key operational domains to competition: space, sea, cyberspace

To the extent we do not transform, we are at risk

Transforming Defense

- **Transform from Industrial Age to the Information Age**
  Implement Network Centric Operations

- **Ensure sustained competitive advantage**
  Assure Allies
  Dissuade competitive entry
  Underwrite deterrence
  Implement countervailing strategies

- **Broaden the capabilities base**
  Operational, Technical, Industrial
  Create new competitive areas
  Revalue competitive attributes for the information age
  Decrease capabilities cycle time

- **Leverage advantages and opportunities**
  Manage the devolution of "sunset" capabilities and processes

Achieve Speed and Agility vice Optimization

Global Trends

Globalization II → Globalization III
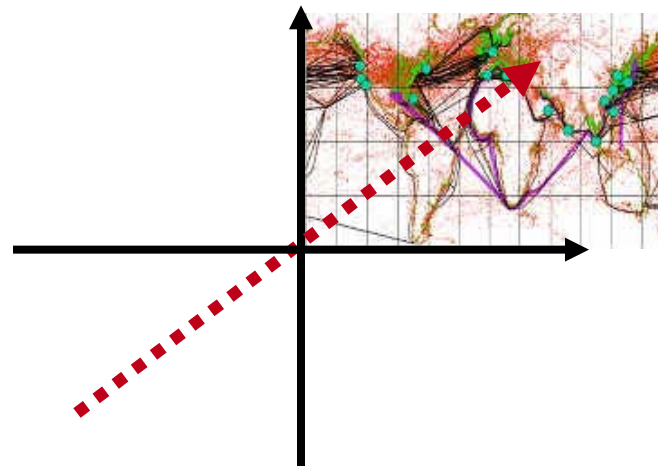
Industrial Age → Information Age
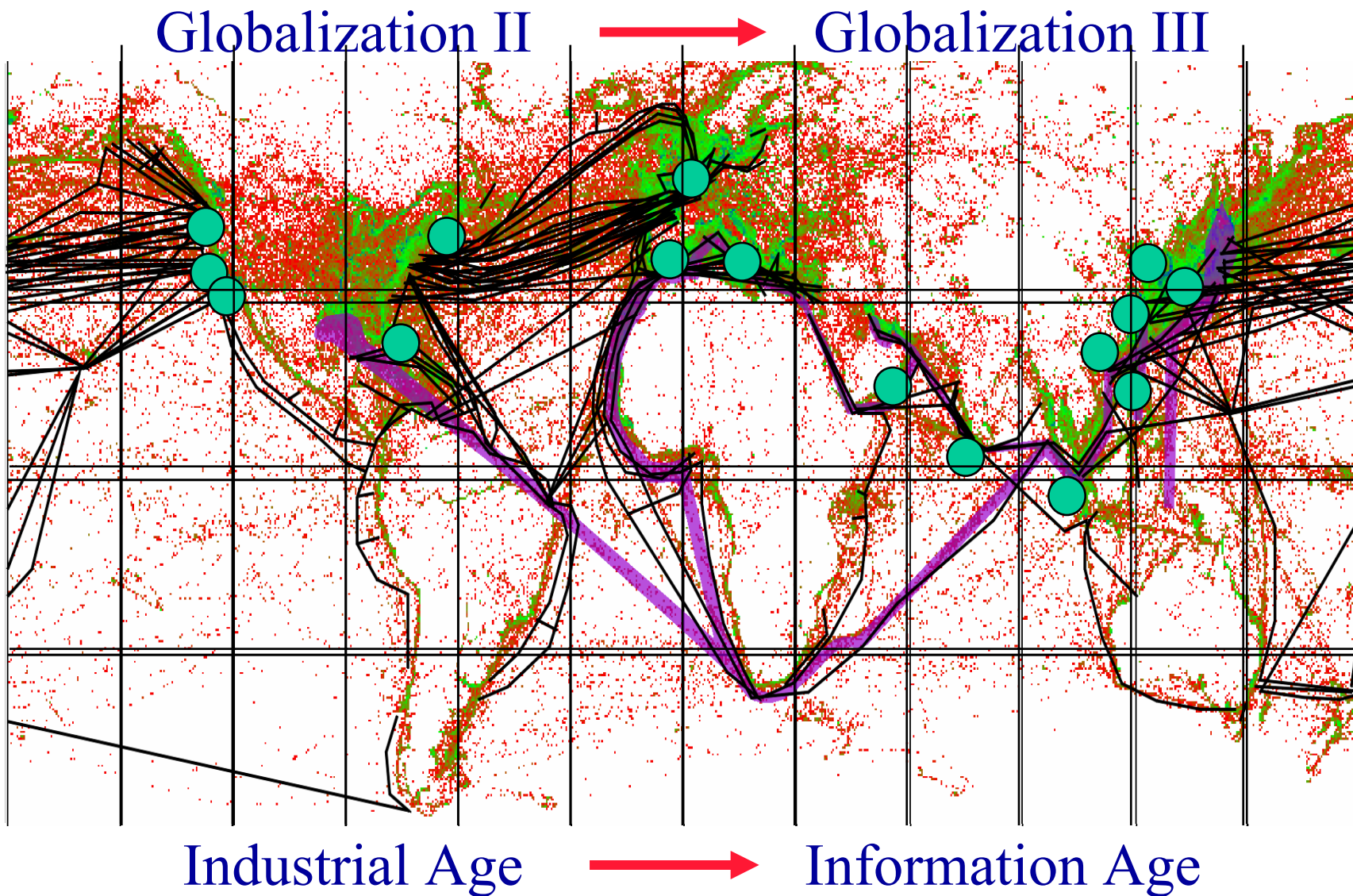
Trends in Security Competition

Information Age
- Short Cycle Time
- Mass Customization
- Adaptive Planning
- Interdependence

Globalization II
(1947 – 199X)
- Developed Rules
- Mature Markets
- Narrowing Customer Base
- Security = Defense

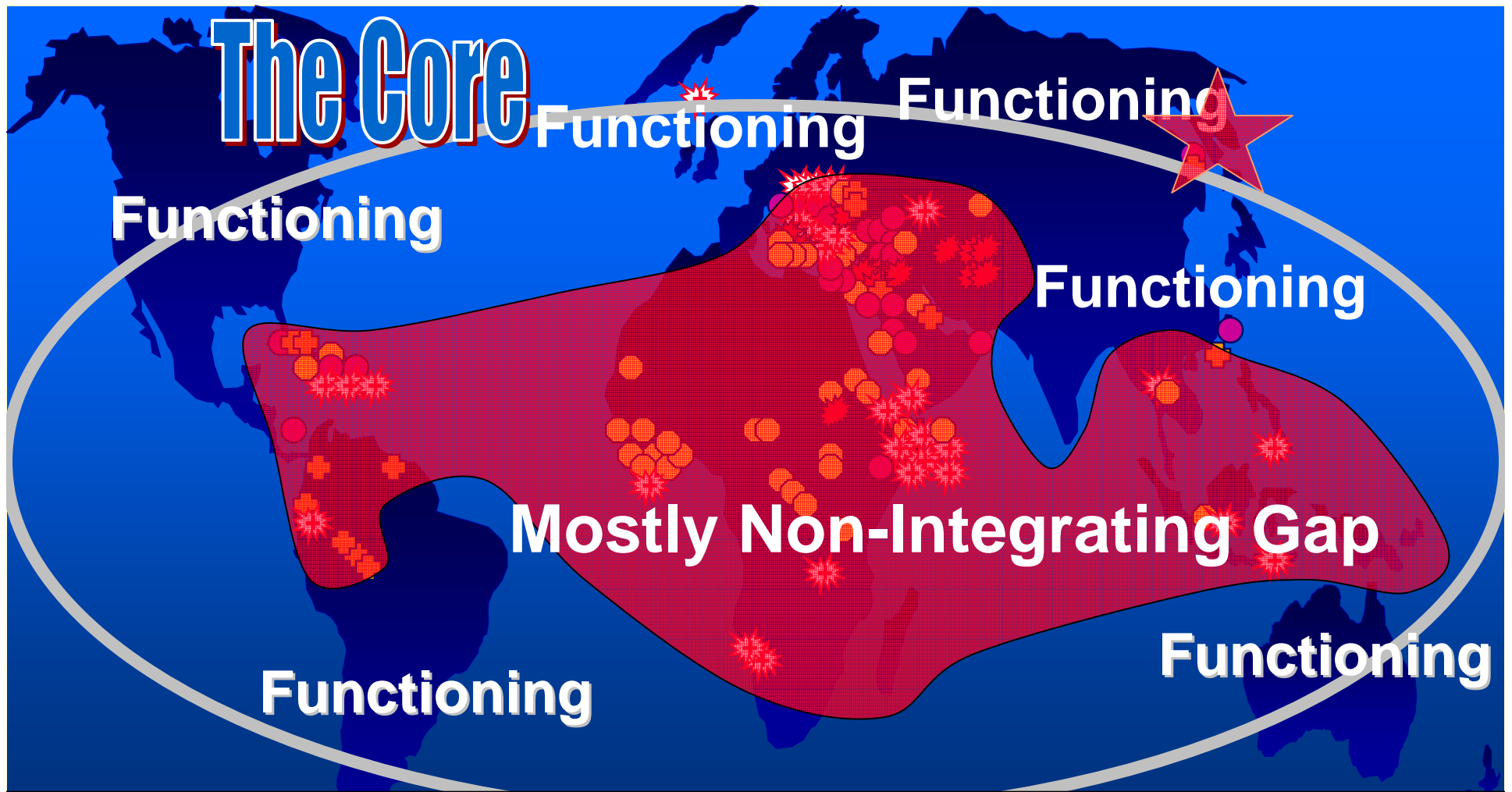## Globalization III
(199X – 20XX)
- Emerging Rules
- Market Opportunities
- New Customer Base Emerging
- Security = All Else + Defense

Industrial Age
- Long Cycle Time
- Mass Production
- Deliberate Planning
- Tortured Interoperability

Globalization III

The Core

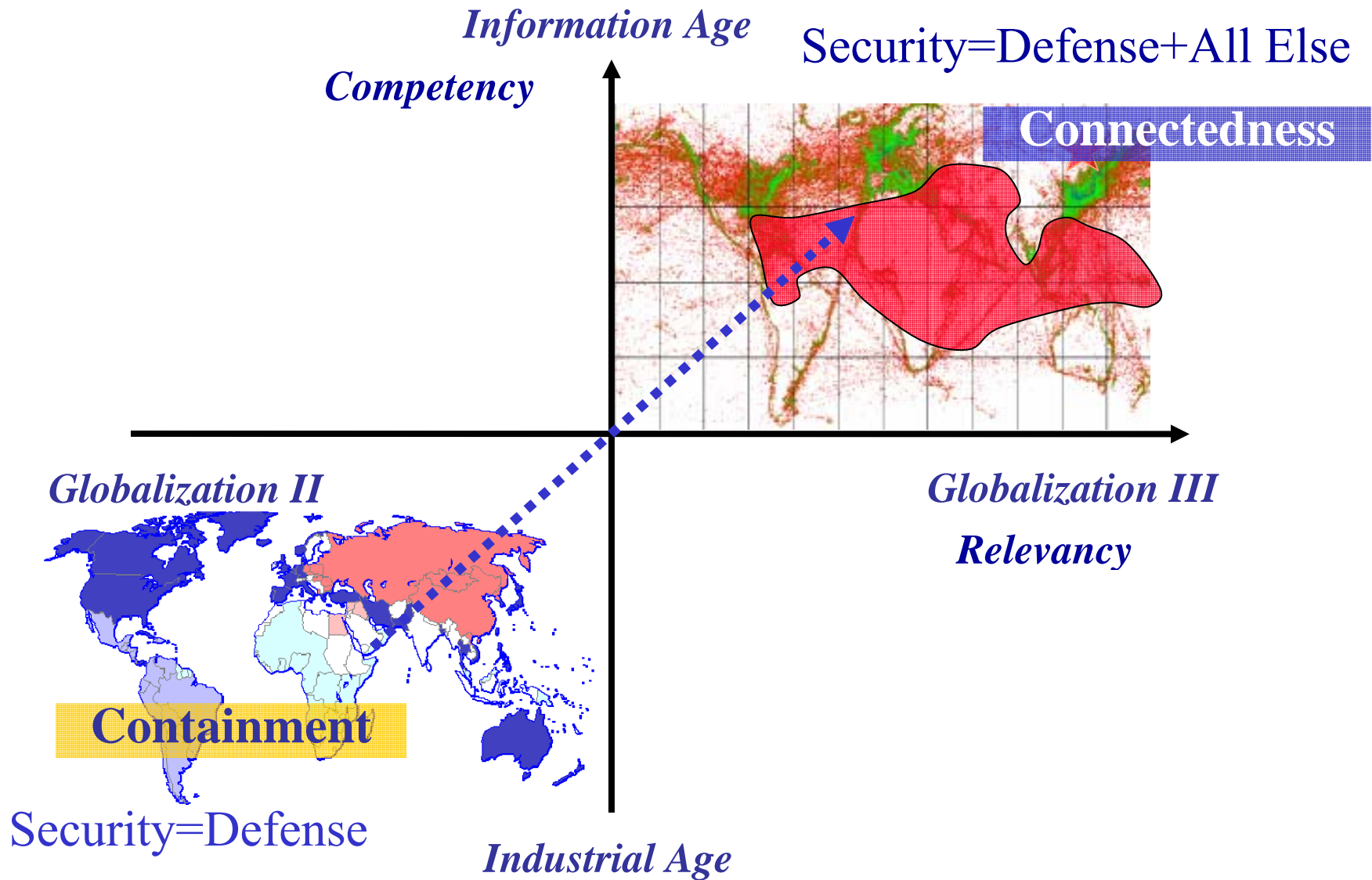Functioning

Functioning

Functioning

Functioning

Functioning

Mostly Non-Integrating Gap

Functioning

Functioning

U.S. Military Responses to Situations, 1990-2002

Evac's | Peace/Relief | Contingency Positioning | Show of Force | Combat

Shifting Strategic Imperatives

Information Age

Competency

Security=Defense+All Else

Connectedness

Globalization II

Globalization III

Relevancy

Containment

Security=Defense

Industrial Age

Security Environment

... *Four Challenges*

Irregular
Those seeking to erode American influence and power by employing unconventional or irregular methods

?

Catastrophic
Those seeking to paralyze American leadership & power by employing WMD or WMD-like effects in unwarned attacks on symbolic, critical or other high-value targets

?

Traditional
Those seeking to challenge American power by instigating traditional military operations with legacy and advanced military capabilities

?

Disruptive
Those seeking to usurp American power and influence by acquiring breakthrough capabilities

No hard boundaries distinguishing one category from another

Global Trends…Threats

…Strategic Response

Strategic Capabilities:

- *More preventative - less punitive*
- *Achieve unambiguous warning earlier*
- *More Special Operations like characteristics*
- *Operate with speed*
- *An intel / surveillance-based force*
- *Interoperability/interdependence*
- *Coping with Systems Perturbations*

Information Age

Globalization II   *Globalization III*

Industrial Age
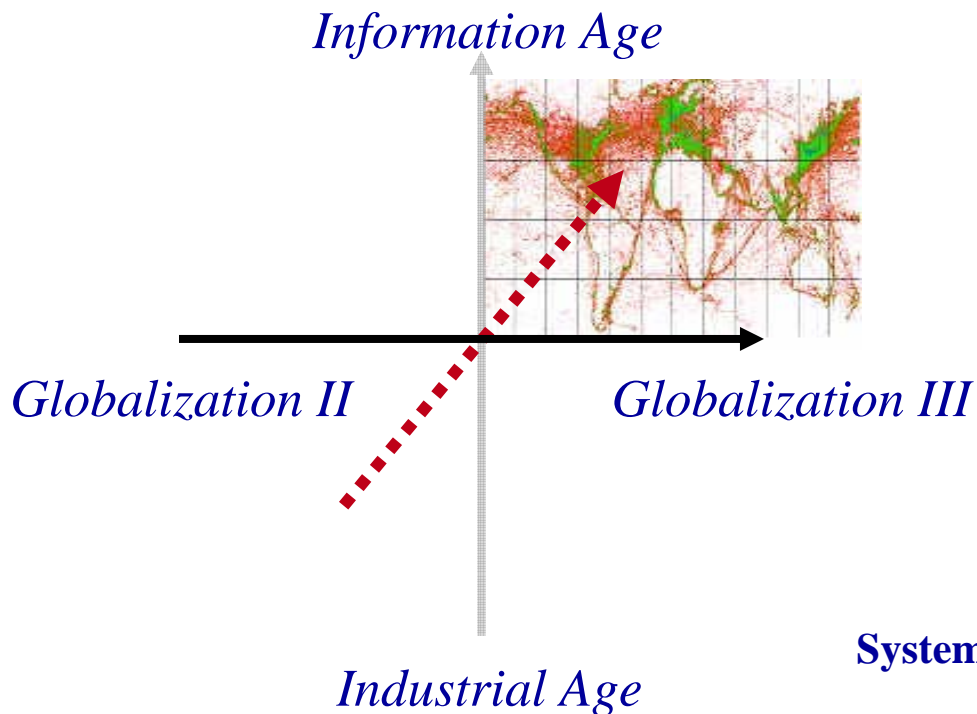
	----- [Great Power War?] -----		
System			
State	**Political Ideology**	**Hated Dictator**	**Hated Dictator w/Nukes**	**Nuclear Nationalists**
Individual	**Narco-terrorists**	**Regional Terrorists**	**International Terrorists**	**SEI***

* Super-Empowered Individual

Transforming Defense
...Characteristics of the Future Joint Force

This is the age of the small, the fast, and the many.

   Small: Power and size are uncoupled

   Fast: A shorter response with a faster rise time more precisely placed in time and space

   Many: The power of the collective at lower cost over a larger area

Rebalance for the information age

   "Demassification" through increased information fraction
   Networked components vice integrated systems

Operations based on assured access, information superiority, control of initial conditions and rates of change

   A priori access to the domains of conflict
   Secure a superior information position and convert it to a competitive advantage
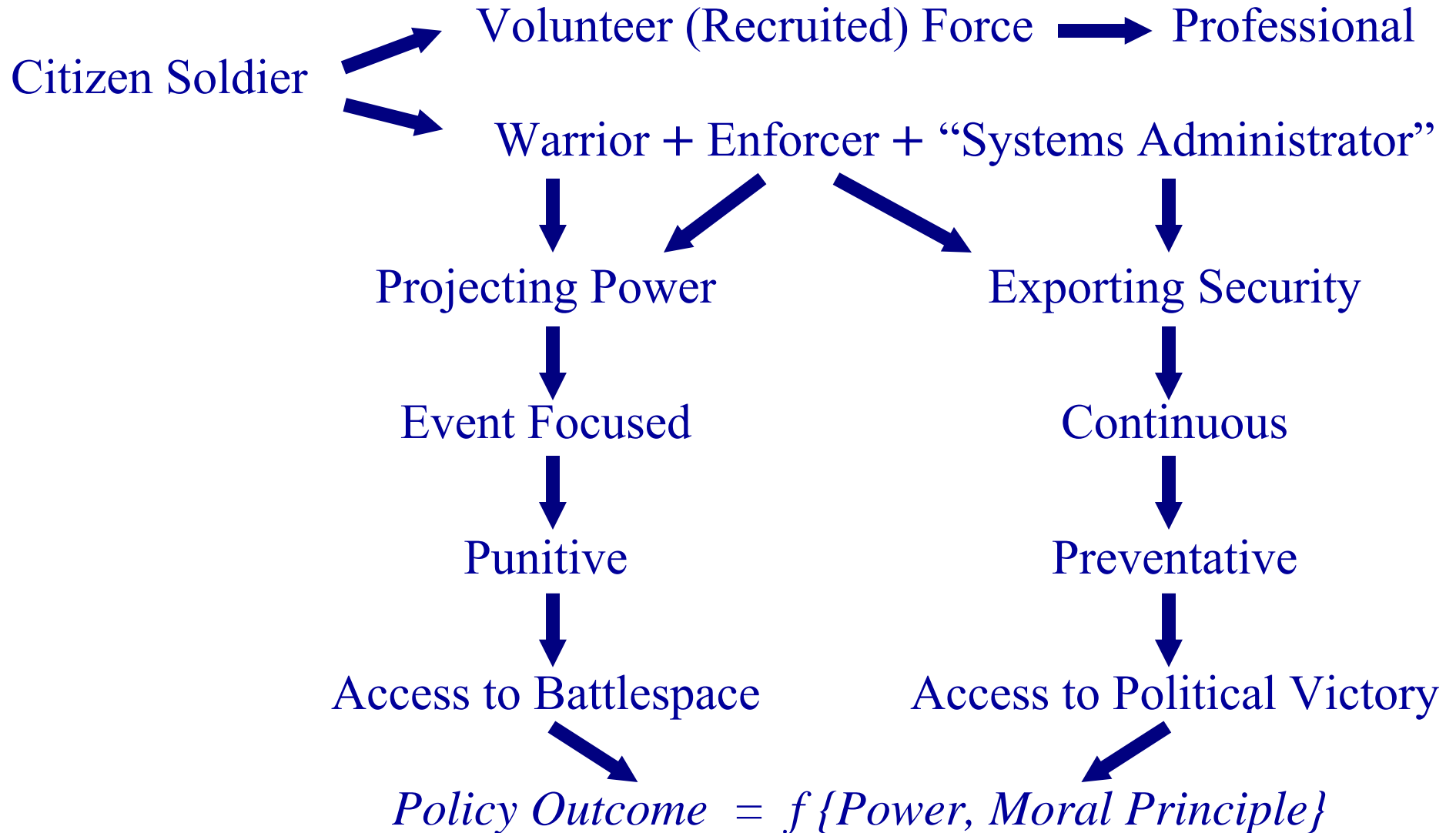   Leverage the path dependency of conflict

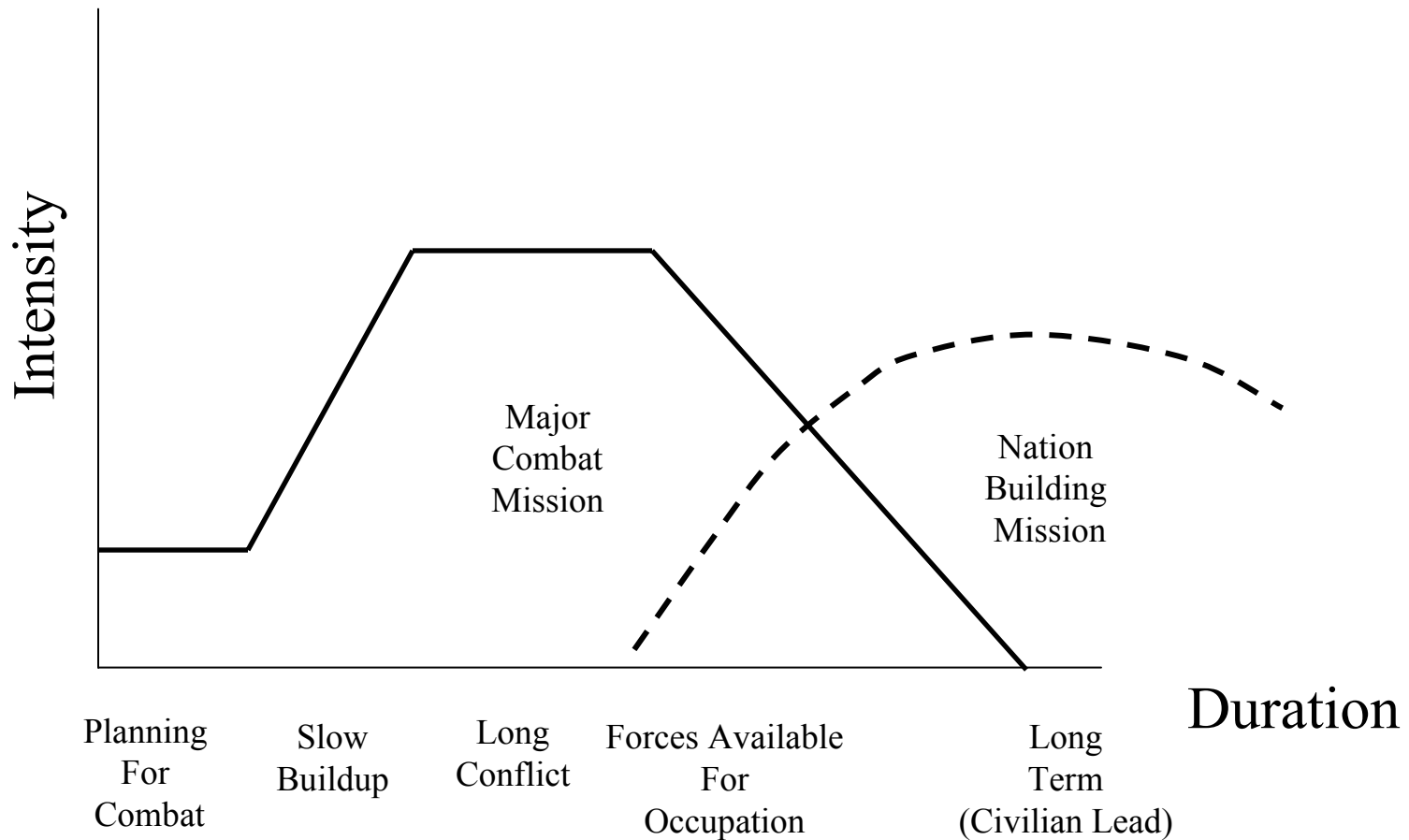Corporate change based on co-evolution and continuous adaptive acquisition

Top Level Issues

…Culture: Attitudes, Values, Beliefs

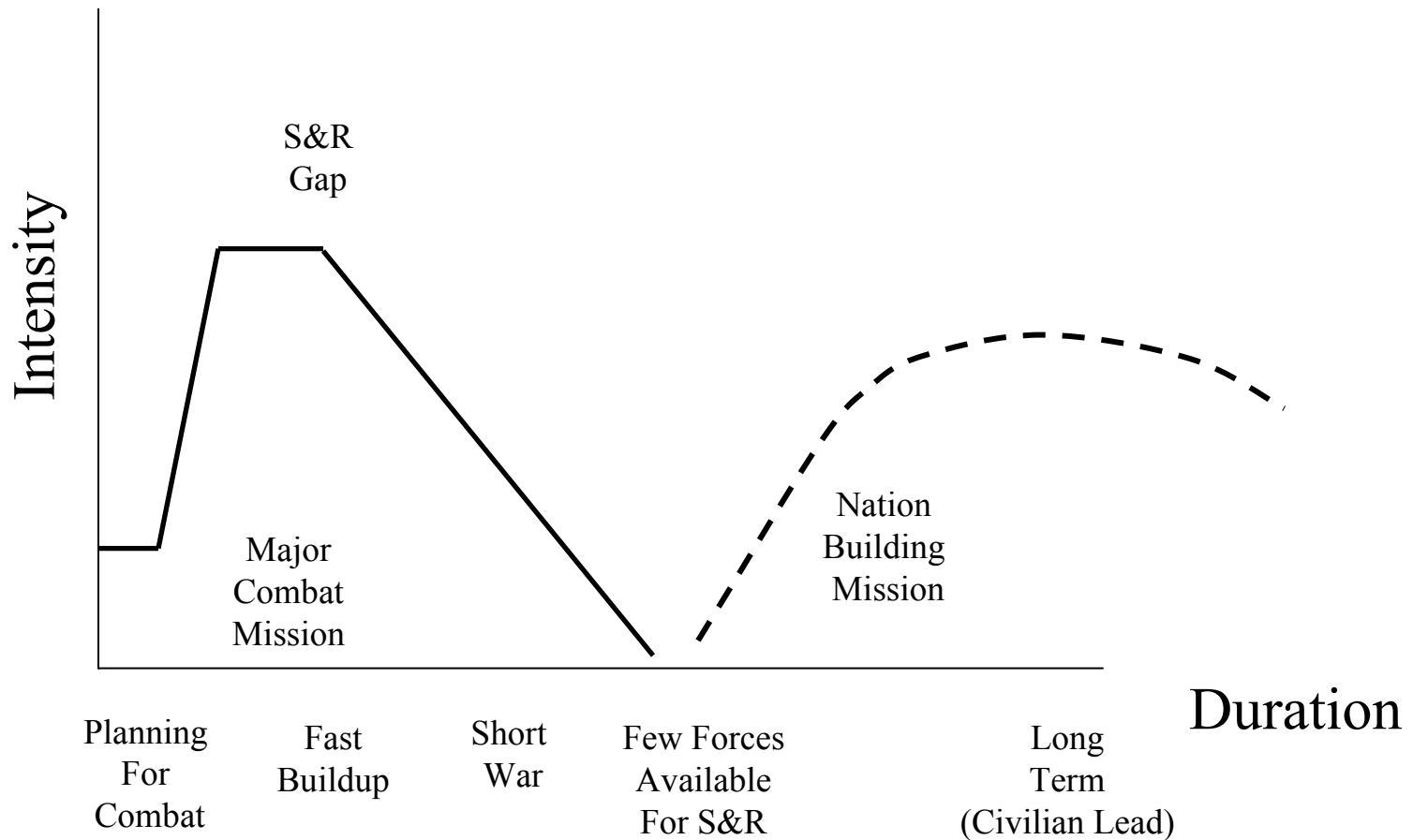Citizen Soldier → Volunteer (Recruited) Force → Professional

Citizen Soldier → Warrior + Enforcer + "Systems Administrator"

Warrior + Enforcer + "Systems Administrator" →

Projecting Power

Exporting Security

Projecting Power → Event Focused

Exporting Security → Continuous

Event Focused → Punitive

Continuous → Preventative

Punitive → Access to Battlespace

Preventative → Access to Political Victory

Access to Battlespace → *Policy Outcome = f {Power, Moral Principle}* ← Access to Political Victory

The Stabilization Mission Gap

…Traditional Model

Intensity

Major
Combat
Mission

Nation
Building
Mission

Duration

Planning
For
Combat

Slow
Buildup

Long
Conflict

Forces Available
For
Occupation

Long
Term
(Civilian Lead)

The Stabilization Mission Gap

…*New Challenges*

The Stabilization Mission Gap

…Transformed S&R Capability

Intensity

Major Combat Mission

S&R Mission

Nation Building Mission

Duration

| Planning For Combat And S&R | Fast Concurrent Buildup | Short War | Prompt S&R Operations | Long Term (Civilian Lead) |

TRANSACTIONS

RESOURCES

Anticipating Perfectly Predictable Surprises
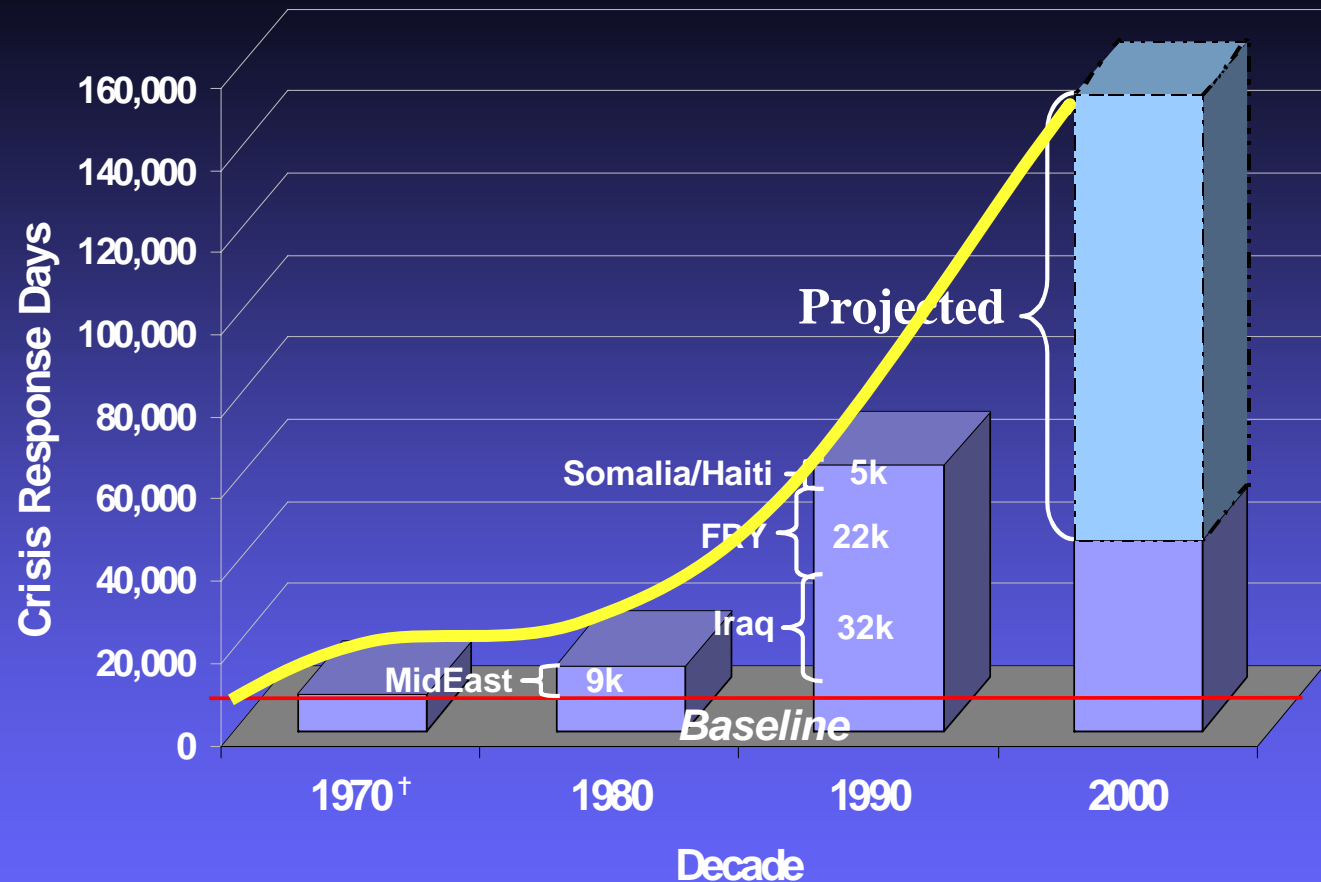
t_1 t_2 t_3

TIME
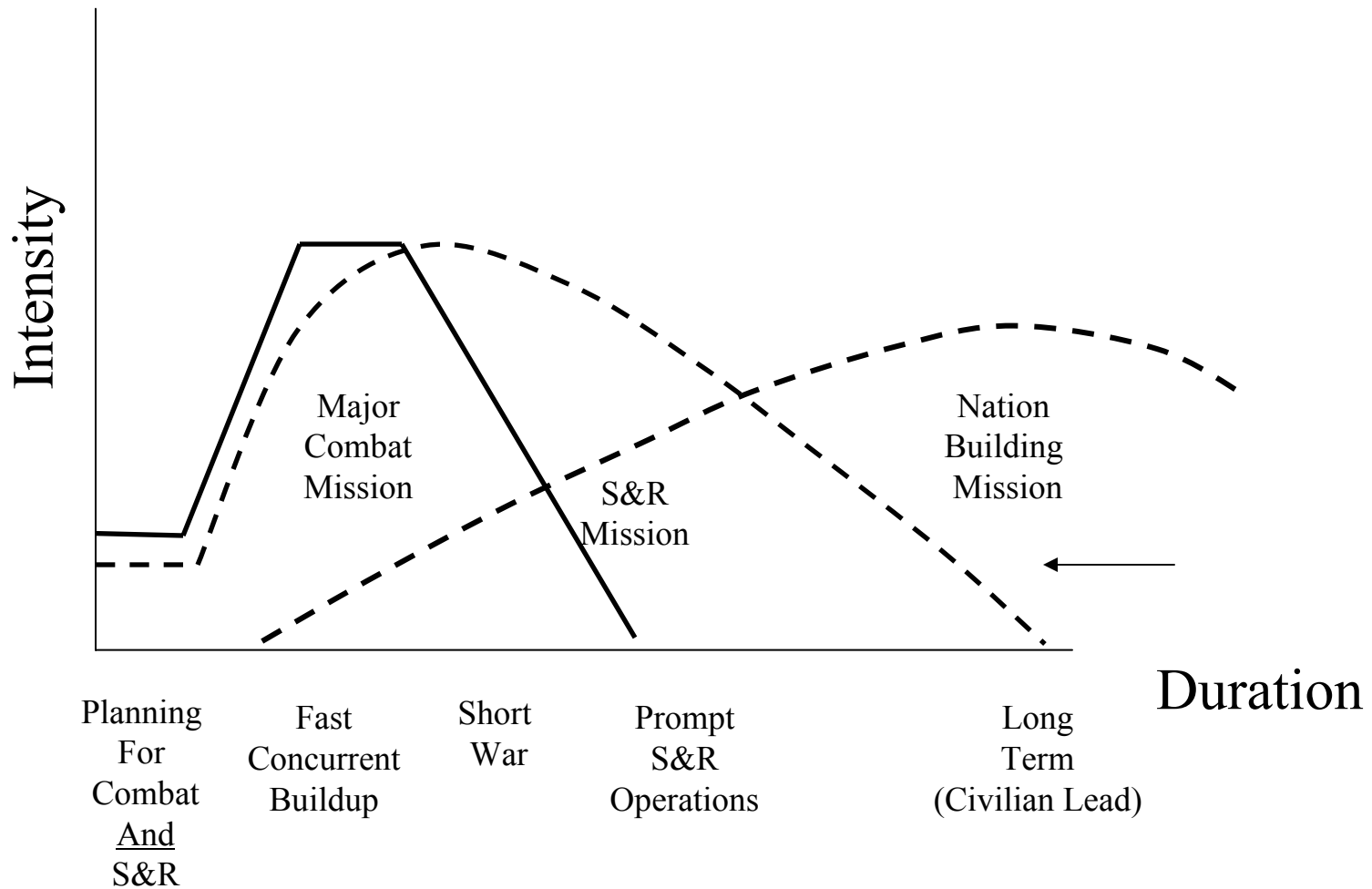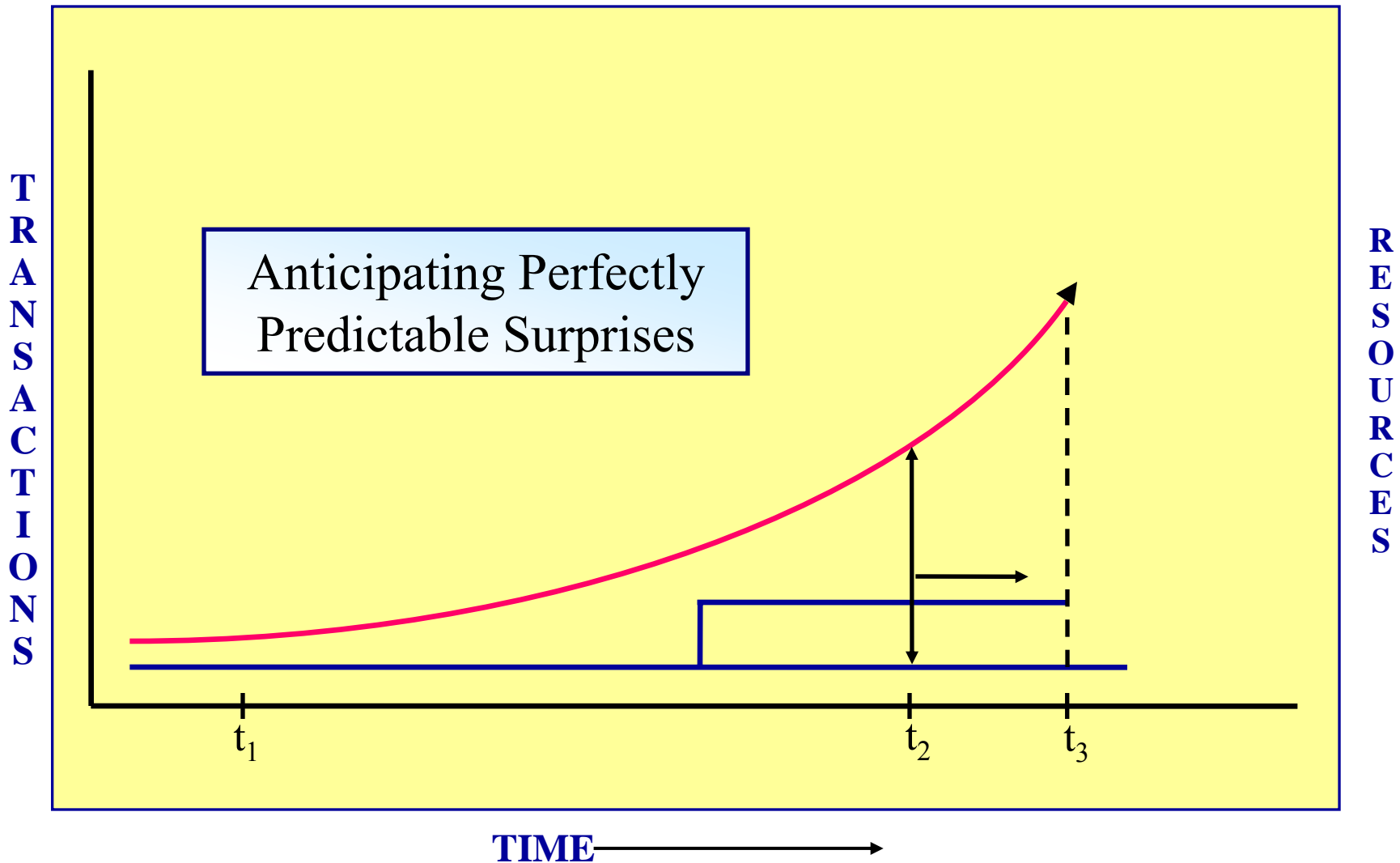
Global Trends and Implications

Policy Choices:

- *Engagement Policy*

- *Substitution of Capital for Labor*

- *Civil Component of National Security*

- *Allied / International Component*

Crisis Response Days (vertical axis)

160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0

Projected

Somalia/Haiti — 5k
FRY — 22k
Iraq — 32k

MidEast — 9k

Baseline

1970 †   1980   1990   2000

Decade

† Excludes Vietnam War
* Total number of response days for all operations by Army, Navy, Air Force and Marines

The Collection – Analysis Gap

…Managing the Inevitable
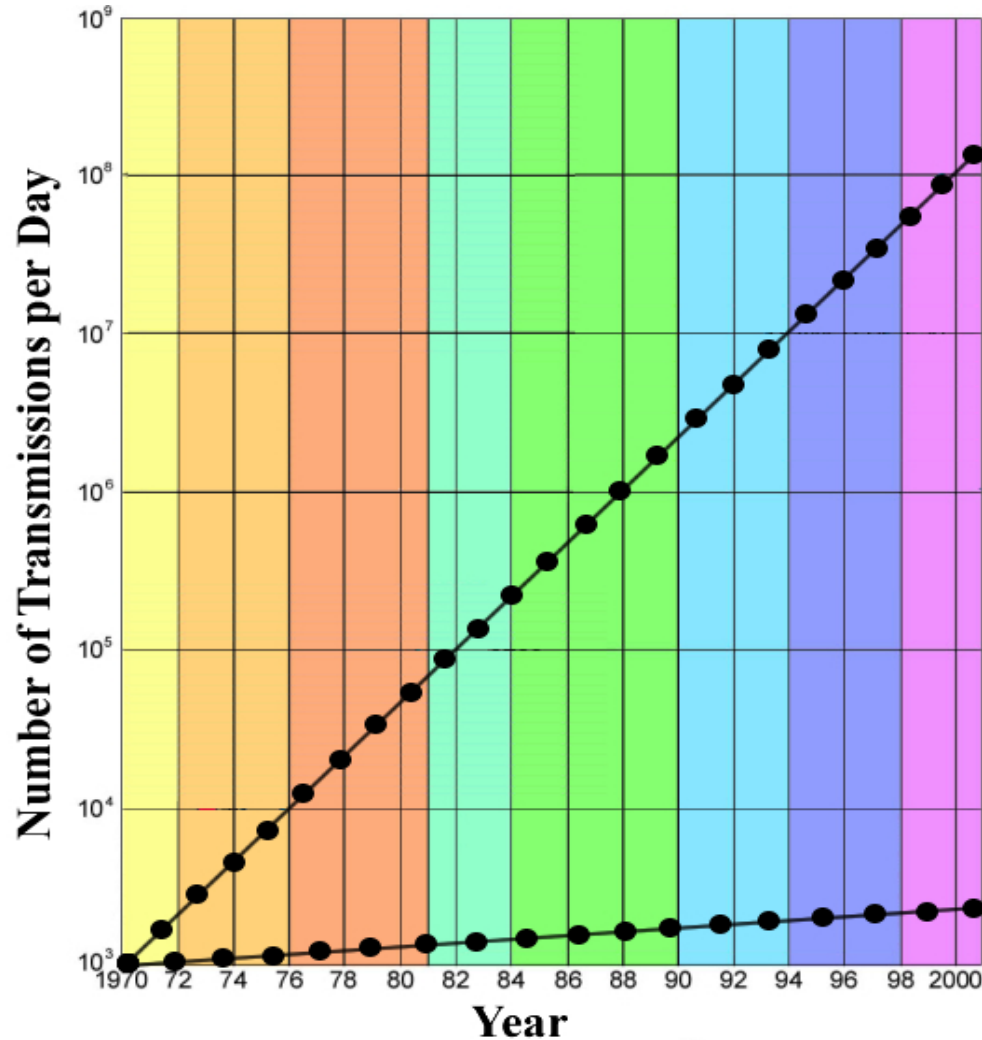
Policy Choices:
- *Automate Triage*
- *Automate Analysis*
- *We all become analysts*

Network Centric Warfare?

Transforming Defense

"Networked Forces

Outfight

Non-Networked Forces"

"…it allowed us to make decisions and execute those decisions faster than any opponent."

Lt. Gen. David D. McKiernan
Coalition Forces Land Component
Commander, OIF
23 April 03

Network Centric Operations

The National Defense Strategy
of
The United States of America

2005

Capstone Concept
for
Joint Operations

August 2005

We will conduct network-centric operations with compatible information and communications systems, usable data, and flexible operational constructs.

A knowledge empowered force, capable of effective information sharing across all agencies and partners, will be able to make better decisions quicker, increasing joint force effectiveness.

Translates an Information Advantage
into a decisive Warfighting Advantage

Information Advantage - enabled by the robust networking of well informed geographically dispersed forces

Characterized by:

- Information sharing
- Shared situational awareness
- Knowledge of commander's intent

Warfighting Advantage - exploits _behavioral_ change and new doctrine to enable:

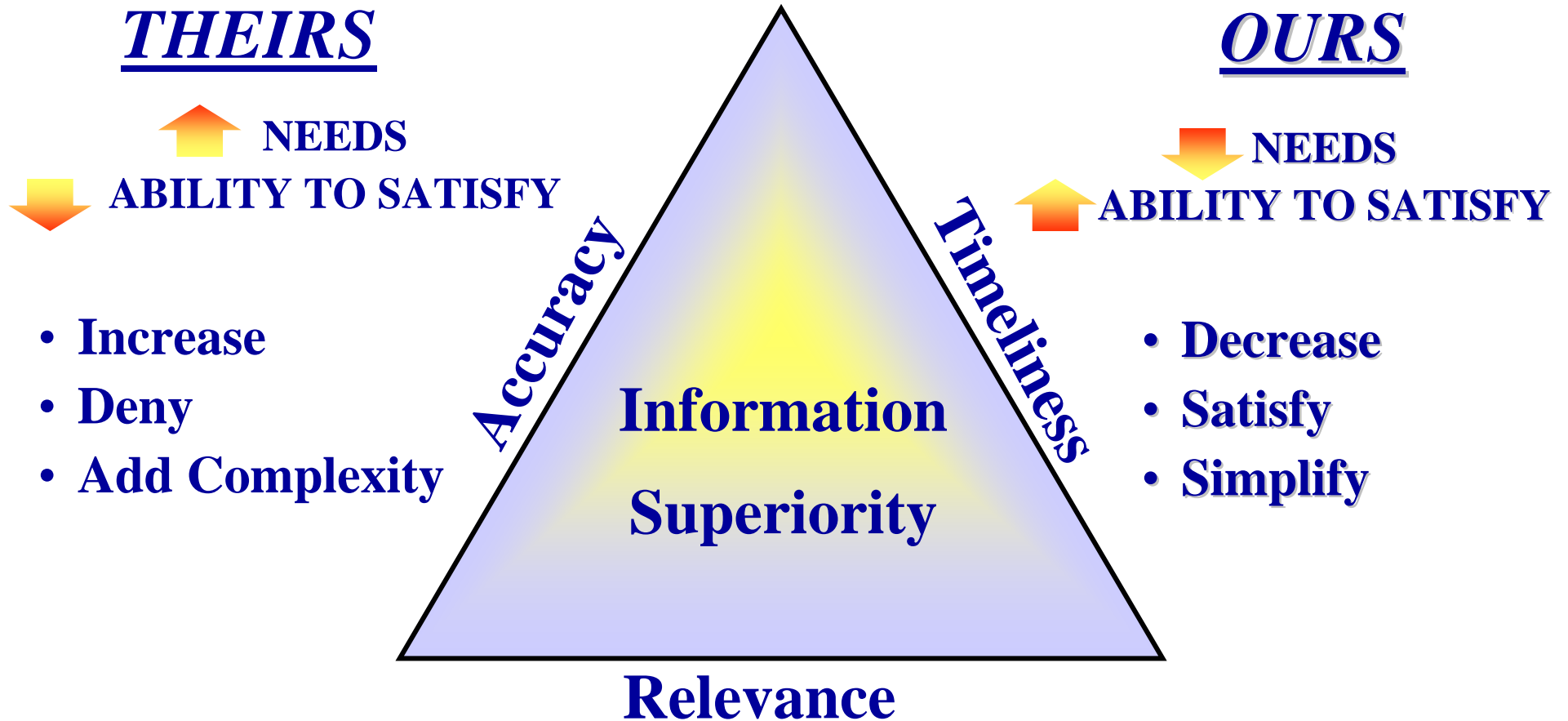- Self-synchronization
- Speed of command
- Increased combat power

The Implementation of Network-Centric Warfare
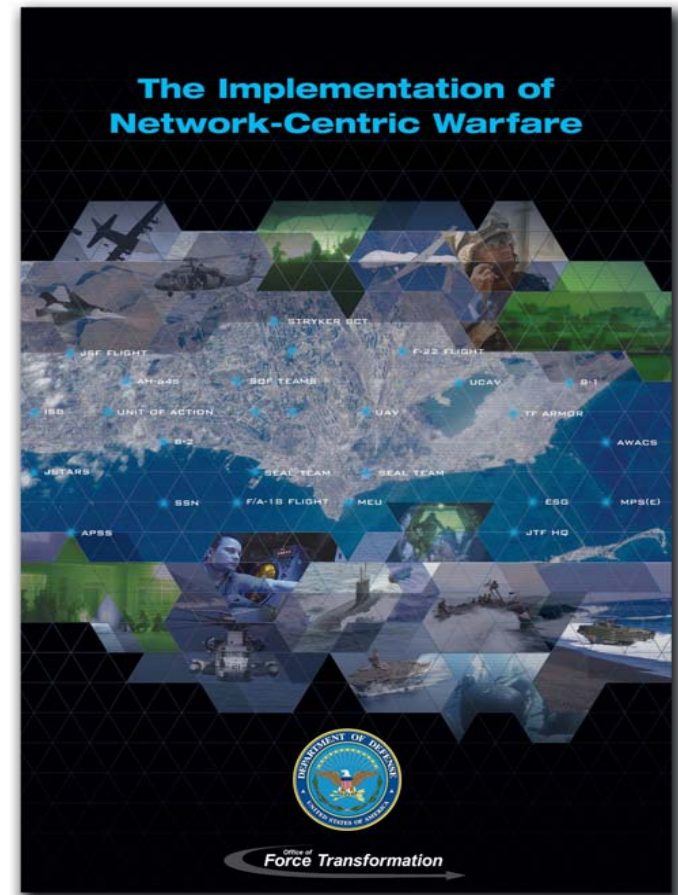
Information Sharing is a New Source of Power

Competitive Advantage

...New Sources of Power

THEIRS

⬆ **NEEDS**

⬇ **ABILITY TO SATISFY**

- **Increase**
- **Deny**
- **Add Complexity**

OURS

⬇ **NEEDS**

⬆ **ABILITY TO SATISFY**

- **Decrease**
- **Satisfy**
- **Simplify**

Accuracy

Timeliness

Information Superiority

Relevance

"We need a force which is designed and capable of fighting first for information superiority."
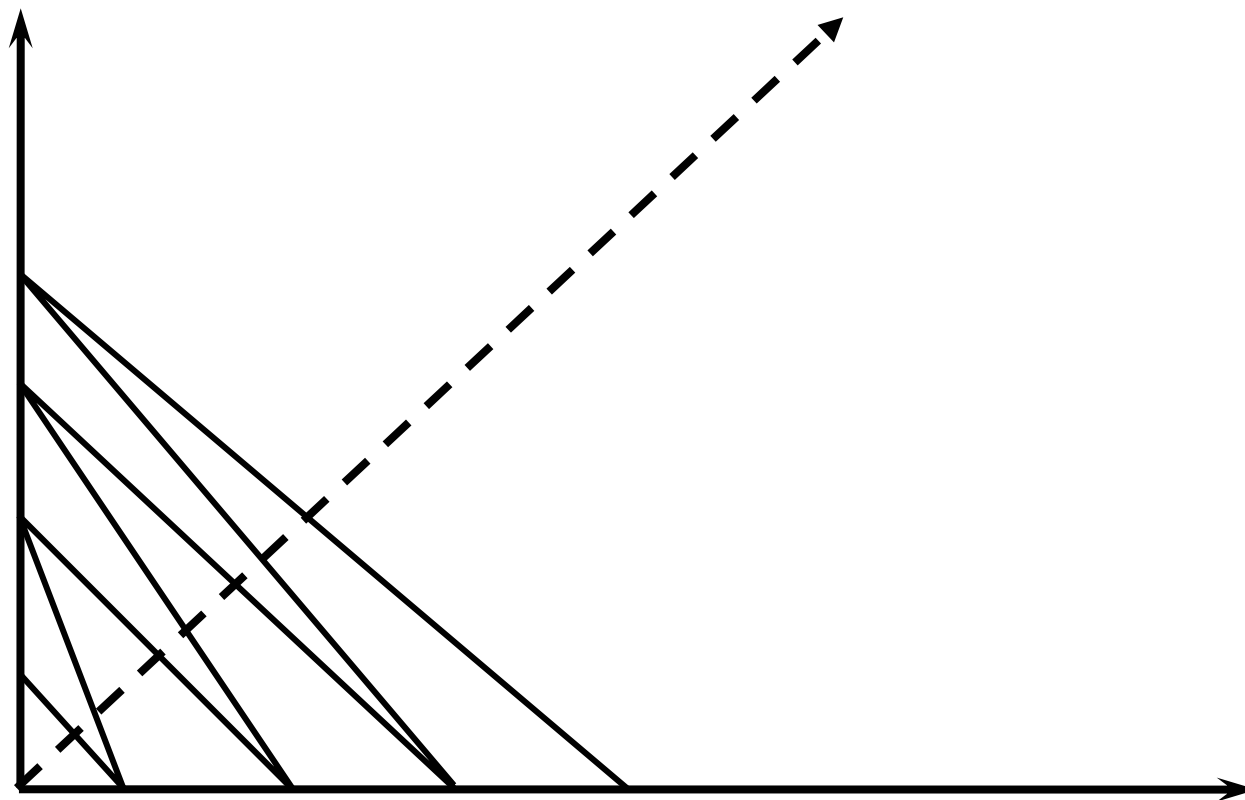
Learning Rate

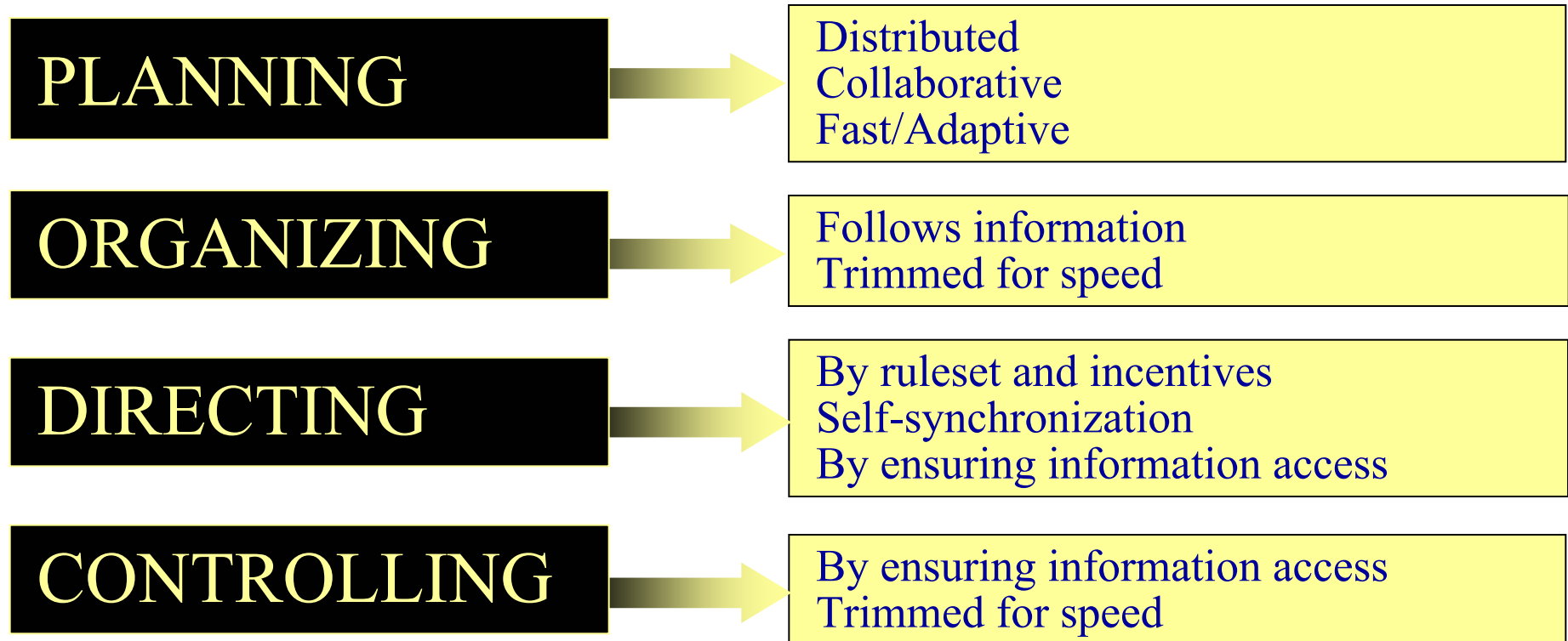**Competitive Advantage**

Information "Richness"

- Content
- Accuracy
- Timeliness
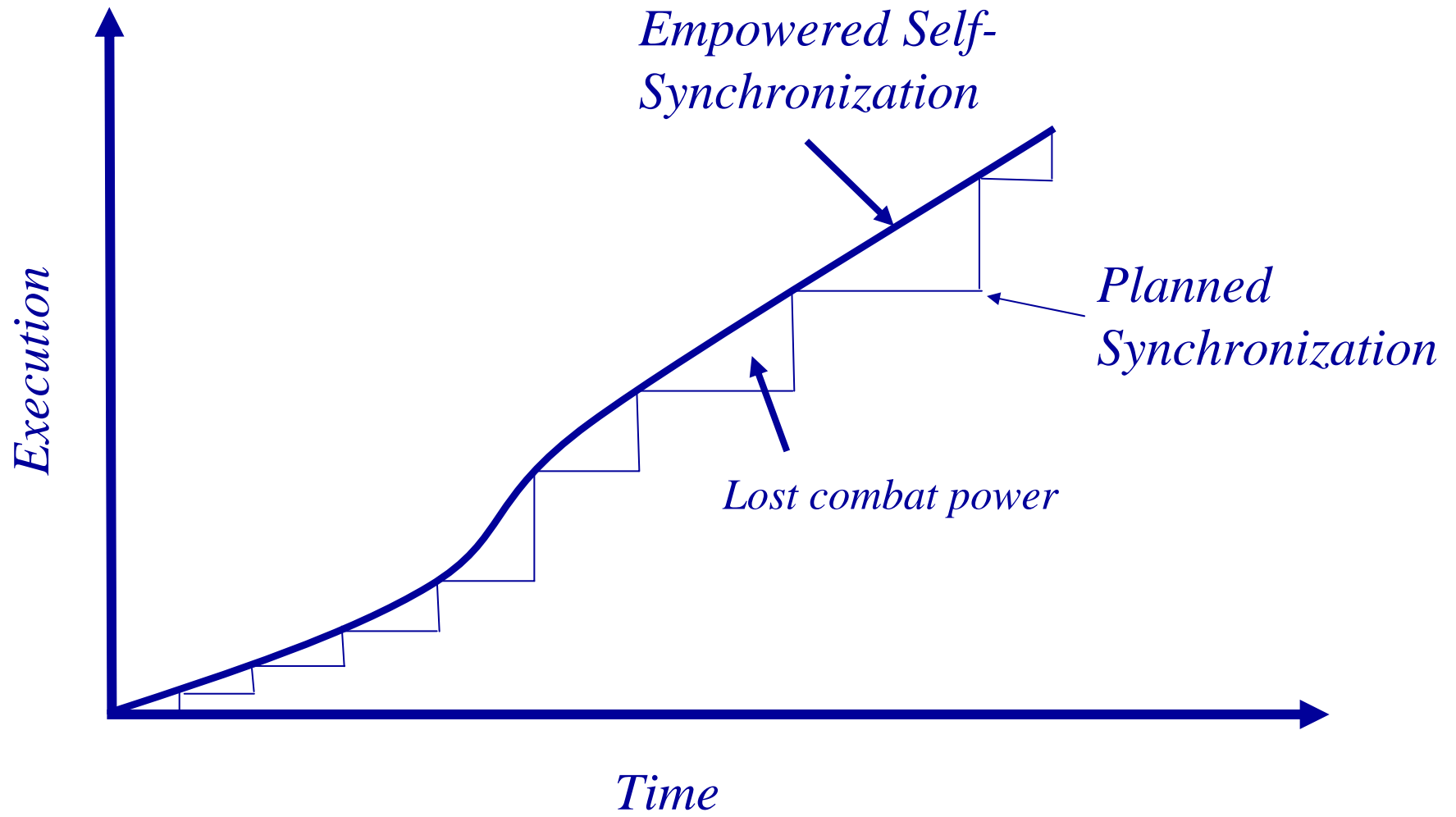- Relevance

Information "Reach"

Network-Centric Warfare

PLANNING	→	Distributed Collaborative Fast/Adaptive
ORGANIZING	→	Follows information Trimmed for speed
DIRECTING	→	By ruleset and incentives Self-synchronization By ensuring information access
CONTROLLING	→	By ensuring information access Trimmed for speed

It's all about information access and speed. . .

Ability to Adapt

Empowered Self-Synchronization

Planned Synchronization

Lost combat power

Execution

Time
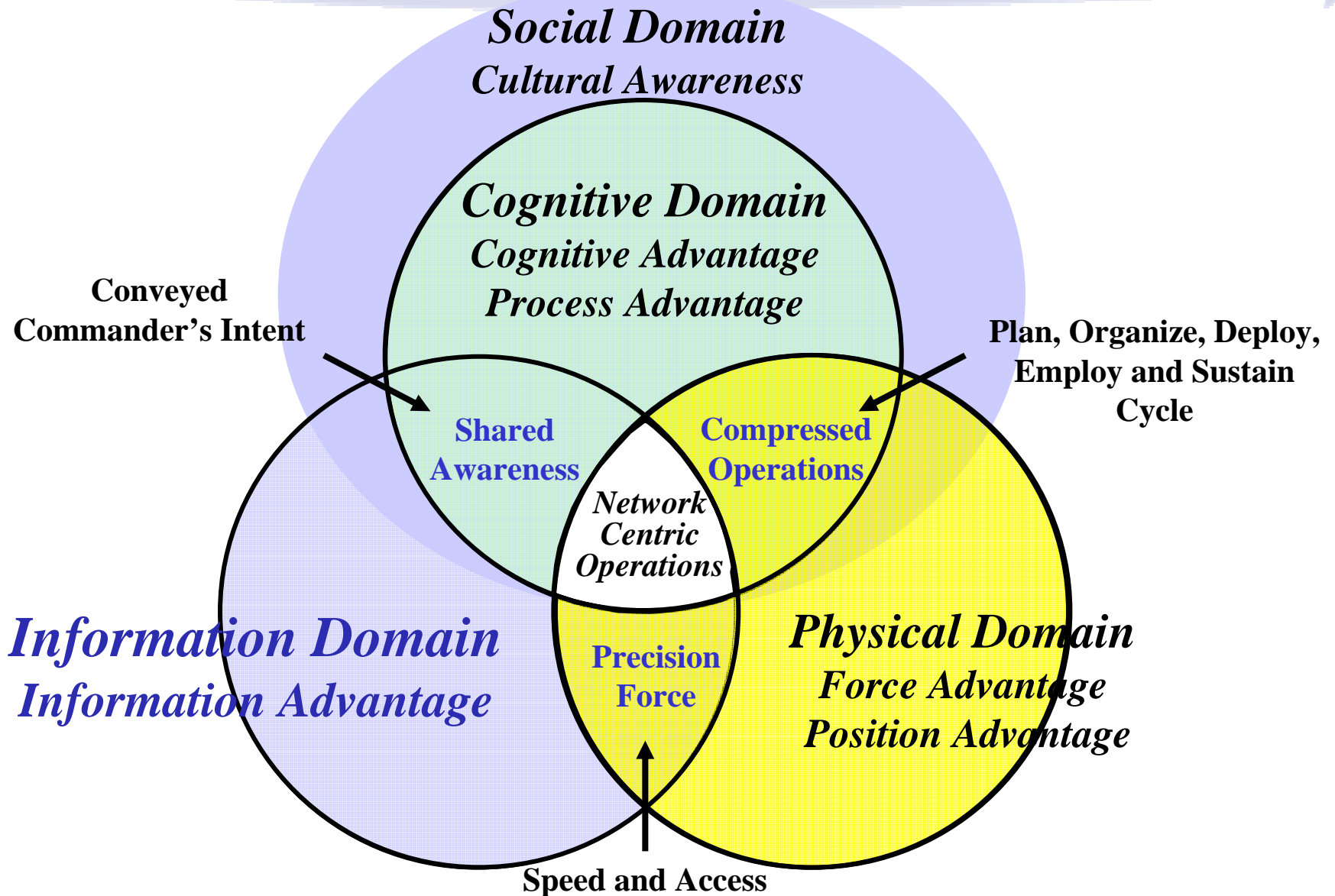
Competing in the Information-Age
...The Power of Network-Centric Operations

Social Domain
Cultural Awareness

Cognitive Domain
Cognitive Advantage
Process Advantage

Conveyed
Commander's Intent

Plan, Organize, Deploy,
Employ and Sustain
Cycle

**Shared
Awareness**

**Compressed
Operations**

*Network
Centric
Operations*

Information Domain
Information Advantage

**Precision
Force**

Physical Domain
Force Advantage
Position Advantage

Speed and Access

Effects-Based Operations

Findings From Combat

Land	Maneuver	≈ 60%
	Attrition	≈10%
Air	Lack of Knowledge/SA	≈80%
	Surprise	≈80%
Sea	Lack of Scouting	≈80%
	Surveillance	≈80%

Network-Centric Warfare

High Rates of Change

Closely Coupled Events

Lock in/Out

Speed of Command

Self Synchronization

Cognitive Domain
Cognitive Advantage
Process Advantage

Shared Awareness

Compressed Operations

Network Centric Operations

Information Domain
Information Advantage

Precision Force

Physical Domain
Force Advantage
Position Advantage

What's Valued

Maneuver

Sensing

Speed / Endurance

Numbers

Risk Tolerance

Networking

Shared Awareness

...The new competitive advantage
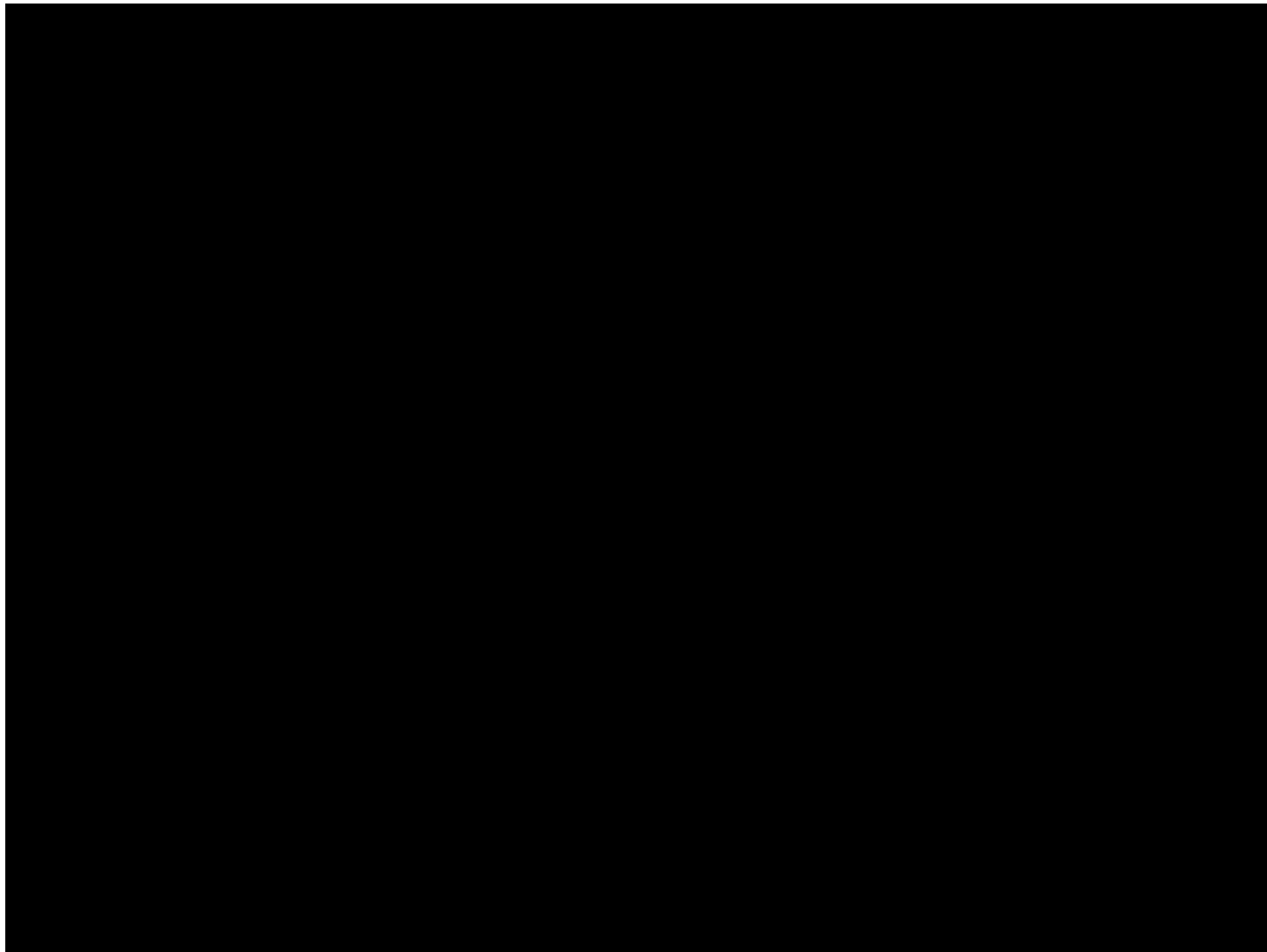
Source: New York Times Television – The Perfect War, 2004

Stryker Brigade

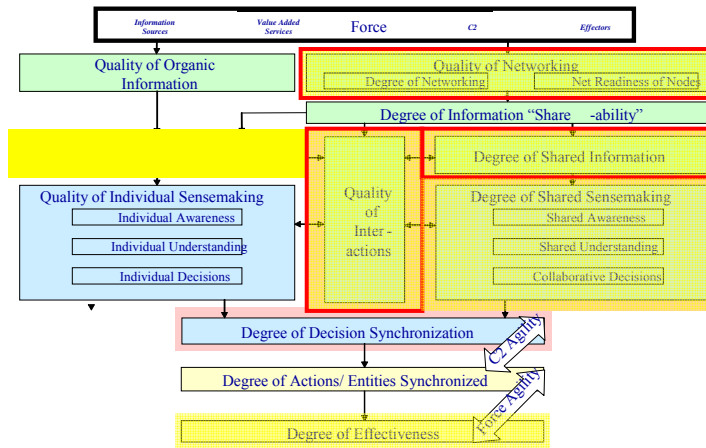## Scenario

- SBCT attack on Shughart-Gordon
- Certification Exercise (CERTEX) at Joint Readiness Training Center, May 2004

Area of Focus

Hypotheses

- Stryker Bde NCO capabilities provide significant information and decision superiority and increase force effectiveness and are a source of combat power

Findings

- Friendly Enemy casualty ration decreased from 10:1 to 1:1
- Increase in Individual/ shared information Quality from about 10% to ~80%
- Acceleration of speed of command from 24 to 3 hours in key engagement
- bottom line result: allowed CMD ability to control the speed of command

Western Iraq Case Study

- Western Iraq was the *__most "networked" theater of operations__*, operationally and tactically, in the history of warfare.
- *__Largest conventional & coalition SOF operation__* in the history of warfare.
- *__Largest scale use of tactical data-links__* in history of warfare.
- Only area of operation in Iraq where Blue Force Tracking information on SOF + conventional ground forces was provided via data link to fixed wing combat aircraft.
- Zero Fratricide: *__Only area of operations in Iraq where air-to-ground fratricide was eliminated__*

Identify Issues of Regret

… Candidates for Action Now

Warfare Elements

- *Fire* – non-lethals, directed energy, redirected energy
- *Maneuver* – seabasing, vertical battlefield, lift for operational maneuver
- *Protection* – urban operations, "biomedical countermeasures" cycle time
- *C2&C* – joint interdependency vs. interoperability
- *ISR* – demand-centered intelligence, tactically responsive space
- *Logistics* – joint demand-centered logistics

Risk Management (*creating on-ramps*)

- *Joint concept development & experimentation* – short cycle time / rapid iteration, concept-based / technology-enabled
- *Joint training* – live / virtual / constructive / distributed
- *People* – culture and organizations

Project *"Stiletto"*

Distributed Adaptive Operations

- Mass effects without massing forces

- Influence actions broadly

- Exploit the network

- Create high transaction rates

- Self-organize decision-making

- Generate organic intelligence

- Adapt rapidly

- Execute either distributed or concentrated operations

- Create overmatching complexity

LOA	80'-0"
Beam	40'-0"
Tunnel Width (4)	5'-0"
Draft (static)	2'-4"
Displacement	67 MT
Payload	15 MT
Fuel Load	10 MT
Classification	ABS
Main Engines	4 x 1650HP C-30 Caterpillars
Surface Piercing Propellers	4
Speed Max @ full load	50-55 knots
Range @ full load & max speed	500 NM
HP Required (total)	6200hp
Clear Height	15'-0"
Payloads	43% of Displacement

Project "Sheriff"

...Controlling the Engagement Timelines

The Capabilities

- "Speed-of-light Sensing
- Networked
- Lethal/Non-Lethal Options
- Active/Passive Options
- Kinetic/Non-Kinetic Options
- Survivability

The Technology

- Compact Active-Denial Technology
- Phraselator High-Power Direction Hailer
- Vector-Beam High-Power
    White/IR Spot Light
- Counter Improvised
    Explosive Device (IED)
- Active Protection
- Counter Sniper
- Rapid-Fire Kinetic Weapon
- Multi-Spectral Sensor Suite
- Armor Protection
- Integrated Electronic Warfare Suite
- Net-Centric Technology

Operationally Responsive Space
...TACSAT 1
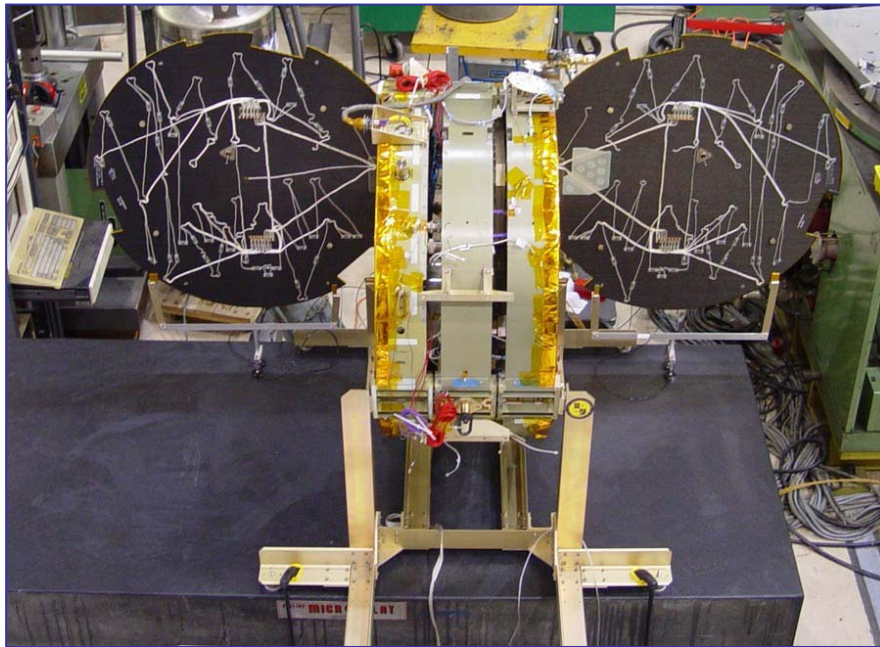
A capability on orbit within the planning time constraints of a major contingency

- Responsive

  < 2 Yr concept to on-orbit capability

- Low Cost

  Total cost of experiment less than $15M including launch

- Experiment

  UAV Components in Space

  Space/Air Horizontal Integration

  Designer Payloads

  TCP/IP Based: SIPR Net Accessed

  New commercial launch vehicle

- Operationally relevant capability

  Integrated into Combatant Commanders Exercises/Experiments
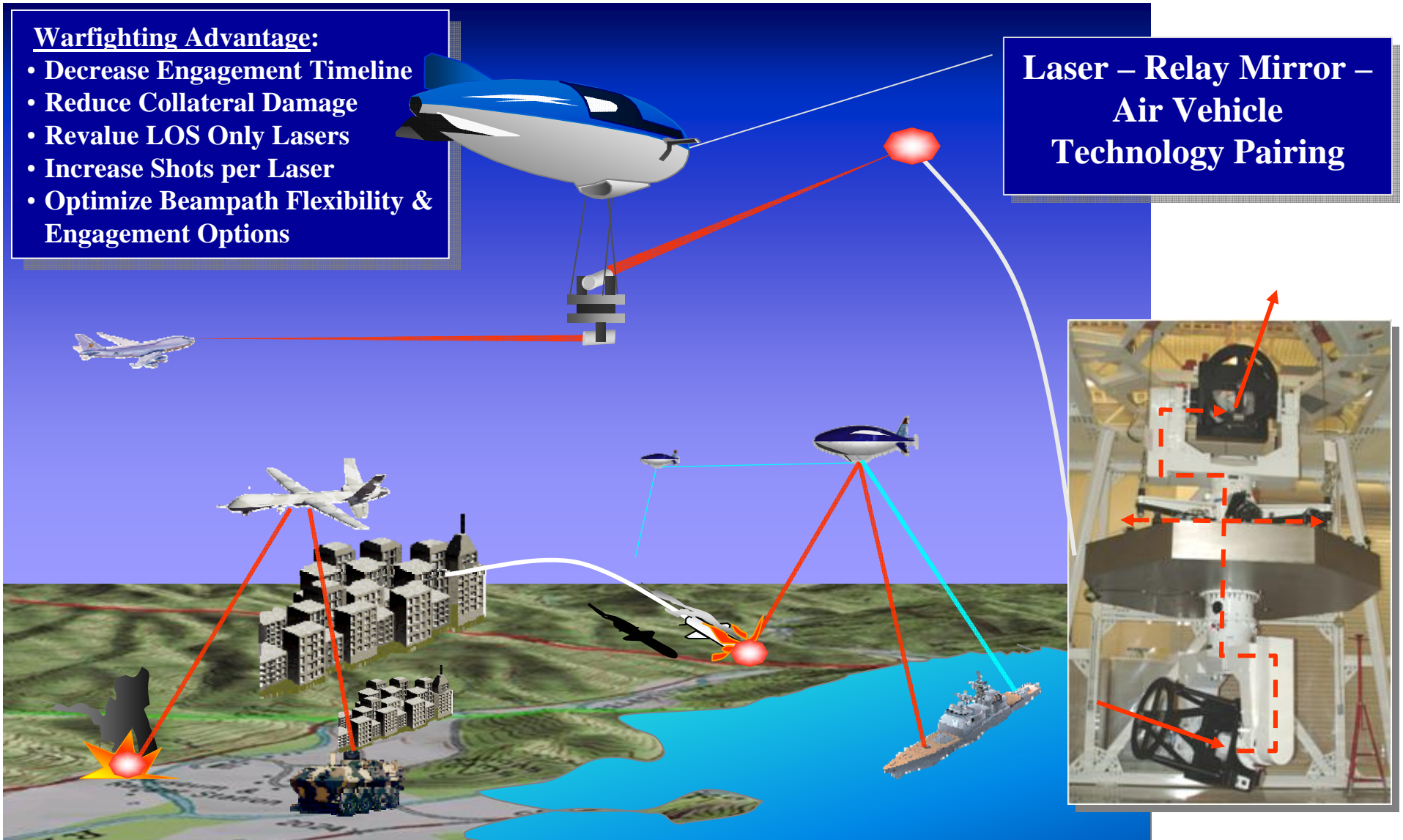
  Time / Capability Trade Off

Re-Directed Energy

Warfighting Advantage:
• **Decrease Engagement Timeline**
• **Reduce Collateral Damage**
• **Revalue LOS Only Lasers**
• **Increase Shots per Laser**
• **Optimize Beampath Flexibility & Engagement Options**

Laser – Relay Mirror – Air Vehicle Technology Pairing
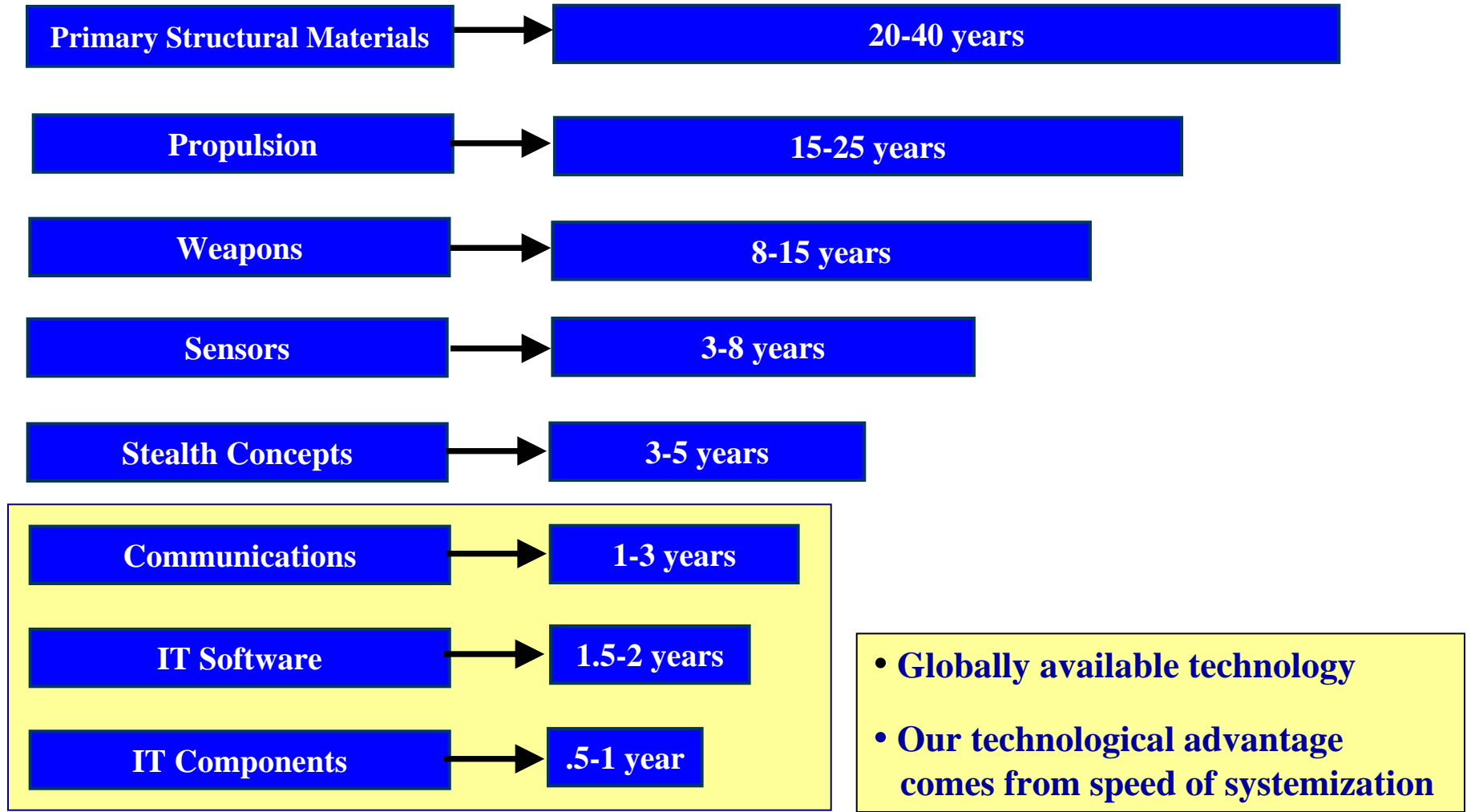
Strategic Approach to Cost

Key Elements

- *Decrease operational costs*
- *Achieve better ROI for less*
- *Broaden the capabilities base*
- *Create and preserve future options*
- *Manage divestiture*
- *Transform non-discretionary areas*
- *Impose cost to adversary*
- *Develop counter-cost imposing strategies*

New metrics create opportunities for new cost dynamics

Technology Trends and Cycles

Primary Structural Materials	**20-40 years**
Propulsion	**15-25 years**
Weapons	**8-15 years**
Sensors	**3-8 years**
Stealth Concepts	**3-5 years**
Communications	**1-3 years**
IT Software	**1.5-2 years**
IT Components	**.5-1 year**

- **Globally available technology**

- **Our technological advantage comes from speed of systemization**

Alternative Architectures

Focus in designing alternative architectures:

- Low unit cost
- Modularity
- Numbers
- Speed
- Networking
- Sensing
- Innovative designs
- Mass Customization

System
(Modules)

Integration

Platforms
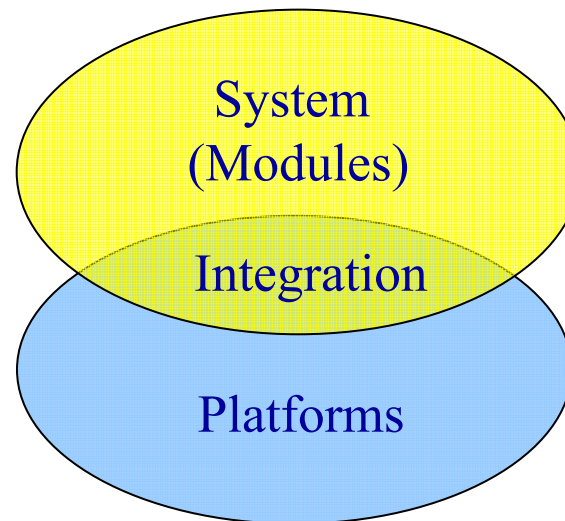
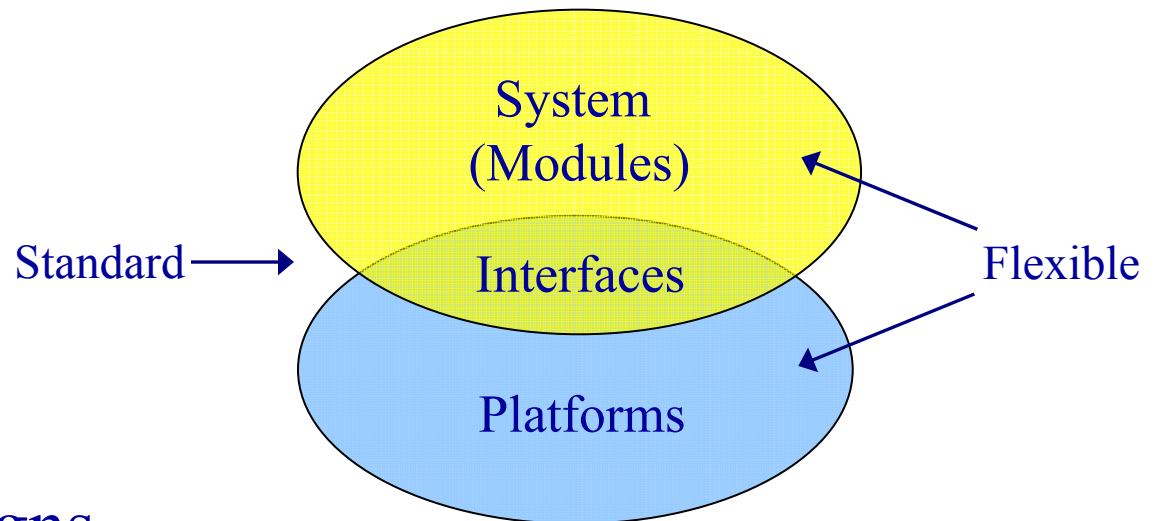*Preserve Strategic Advantage: innovation & the breadth, depth and diversity of the industrial base*

Alternative Architectures

Focus in designing alternative architectures:

- Low unit cost
- Modularity
- Numbers
- Speed
- Networking
- Sensing
- Innovative designs
- Mass Customization

System (Modules)

Standard →

Interfaces

Flexible

Platforms

Preserve Strategic Advantage: innovation & the breadth, depth and diversity of the industrial base

New Logic and Metrics

- Achieve higher <u>learning rates</u>

  Co-evolve concepts, capabilities and processes

  Continuous adaptive acquisition and experimentation

- Employ higher <u>transaction rates</u>

  Faster cycle times

  Speed of information and operational mobility

- Create and preserve <u>options</u>

  Technology on-ramps

  Broaden capabilities base

  Mass customization

- Create overmatching <u>complexity</u>

  Scalable

  The small the fast and the many