



Challenges and Opportunities in the Changing Science & Technology Landscape

(Capability Gap Changing Surprises – Avoidance and Exploitation)

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Briefing is SECRET



Agenda

- What to talk about?
- S&T through the Intelligence Community (IC) lens
- Defense S&T intelligence analysis
 - Guiding documents
 - Current organization
 - Future capabilities
- Partnering opportunities



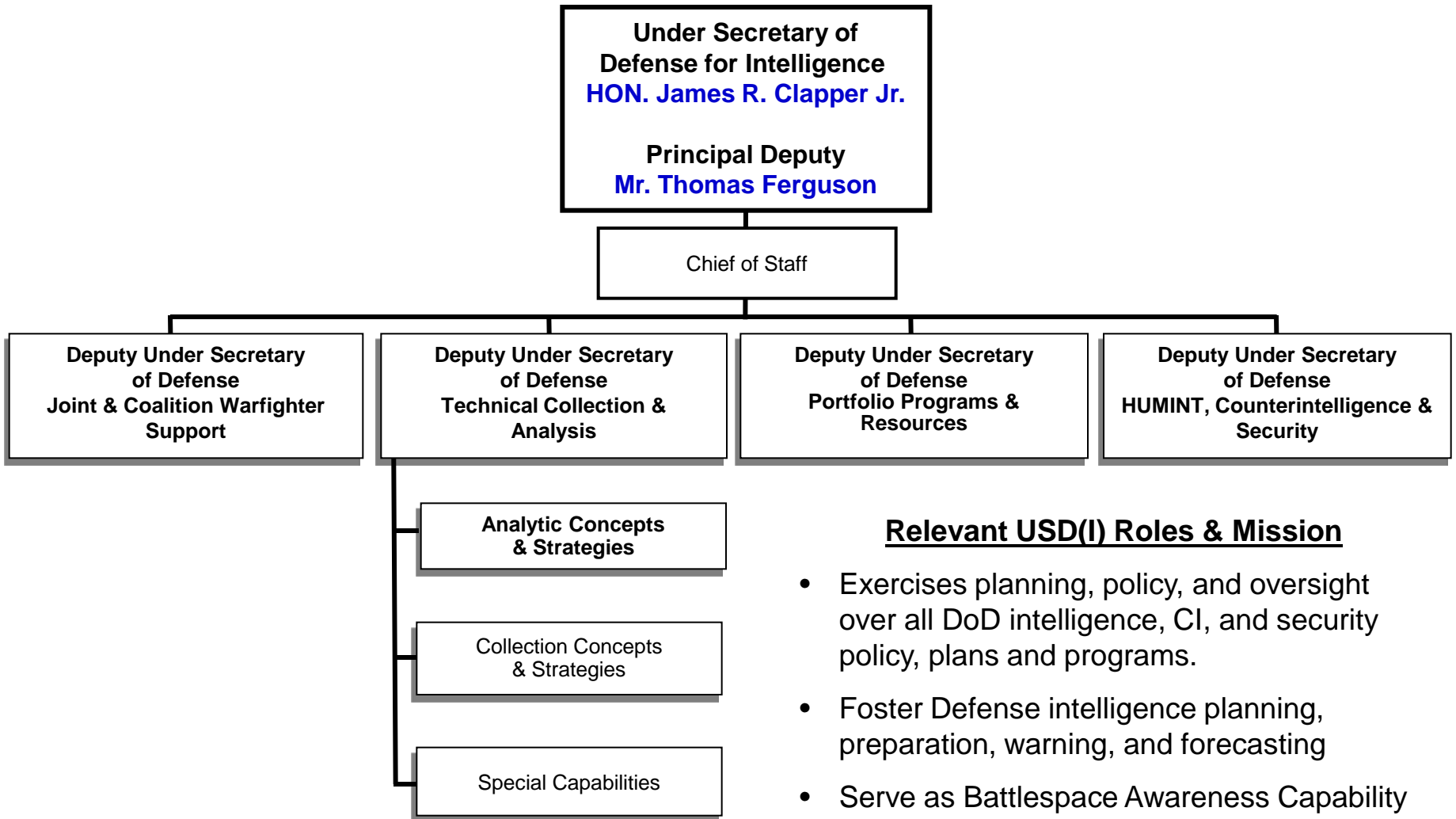
What to talk about?

- Reoccurring observations from previous NDIA meetings
 - Pace, scale, and complexity of technology increasing
 - Negative trends in US S&T education and workforce
 - Impact of globalization on S&T center of gravity
 - Nongovernmental, commercial, privatization, etc.
 - Asymmetry and uncertainty in the future battlespace
 - “Current” processes remain unsatisfactory
 - R&D funding, tech integration, info sharing, warning, decision support, etc.
 - US technology dominance no longer assured

***Recognition that these are enduring issues.
This is our reality! Now what?***



Looking at S&T through the IC Lens



Relevant USD(I) Roles & Mission

- Exercises planning, policy, and oversight over all DoD intelligence, CI, and security policy, plans and programs.
- Foster Defense intelligence planning, preparation, warning, and forecasting
- Serve as Battlespace Awareness Capability Portfolio Manager

As of August 17, 2009



S&T through the IC Lens – Pace, Scale, and Complexity

- Important advances/applications require multi-disciplinary approach
 - Unlike academia & industry, IC organization not conducive
- Increasing amount of S&T information openly available
 - Access issues improving, knowledge management situation worsening
- Next-gen sensors/systems – data hungry, on-board data fusion
 - Unprecedented demands for all-source intelligence, required for system functionality
 - Modeling & Simulation (M&S) increasingly necessary



S&T through the IC Lens – **S&T Education and Workforce Trends**

- Relative decline in US science & engineering advanced degrees
 - Greater competition for technically-trained people
- Increase in foreign scientists trained in US and overseas
 - Knowledge transfer from US almost impossible to comprehend
 - Less visibility into underlying indigenous foreign S&T capacity
- Concurrent need for specialization and generalization
 - Stressors on the analytic core – from career path challenges to workforce currency to schizophrenia



S&T through the IC Lens – **Globalization and the S&T Center of Gravity**

- Shift in S&T center of gravity over last half century from government to multi-national corporations (MNCs)
 - Intelligence oversight has not kept pace
 - Decentralized decision making & technology transfer greatly complicate collection
- Economic & social drivers increasingly influence tech development & integration into society
 - Traditionally hasn't been a focus of S&TI analyst



S&T through the IC Lens – **Asymmetry and Uncertainty**

- Impact of S&T across the range of potential engagements scenarios
 - Low-tech application to high-end potential
 - Balance resources & focus against near- and long-term threats
- Battlespace awareness encompasses all domains
 - Learning curve for cyber & human domains (non-kinetic)
- Compressed decision cycles with greater information expectations
 - Reuters versus Rand



S&T through the IC Lens – **Unsatisfactory Processes**

- Acquisition regulations modified over the last decade to emphasize flexibility, agility, & innovation
 - Role of intelligence has been diminished & pushed to the right
- Compressed decision cycles with greater information expectations
 - Traditional requirement-production process not adequate



S&T through the IC Lens –

US Tech Dominance No Longer Assured

- Foreign S&T efforts in certain topic areas may surpass US capability
 - IC must be able to both warn of threats & identify opportunities
 - Increase in quality and quantity of non-English language S&T



Partnering Opportunities

Pace, scale, & complexity

S&T education & workforce trends

Globalization of S&T capability

Asymmetry & uncertainty

Unsatisfactory processes

US tech dominance not assured



**Expertise
&
Processes**



S&T Intelligence Guiding Documents

2002 Defense Planning Guidance

Defense Warning Office: ...establish by October 1, 2002 a defense warning office charged with **identifying sources of increasing threats to US interests in critical regions.** This office will also **identify opportunities to affect adversary behavior prior to & in the early stages of a crisis.**

Warning on Technology Development: ensure development of a robust foreign S&T assessment capability beginning in January 2003 to **provide the earliest possible warning of technological developments that could undermine US military preeminence.**

Follow-on Guidance

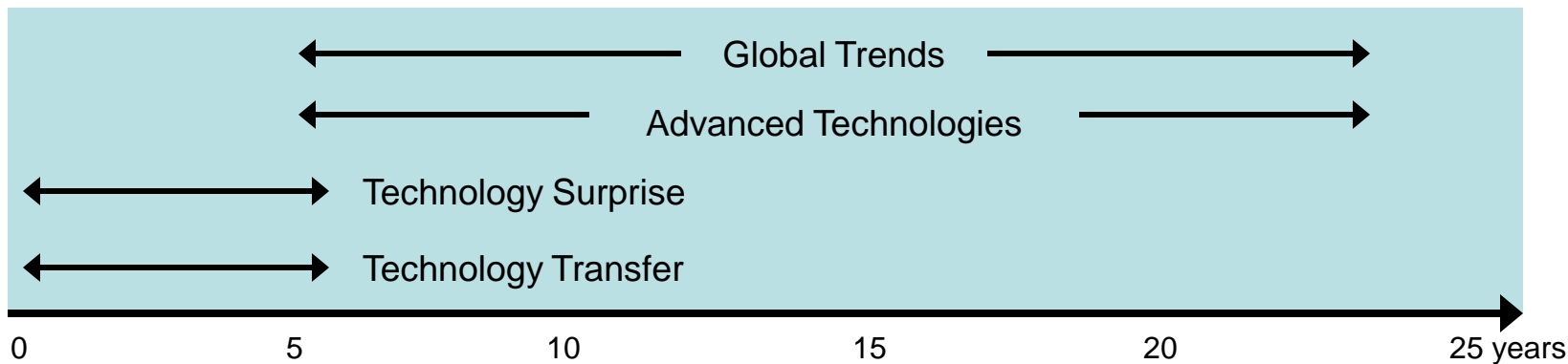
DNI Strategic Plan (MO5): ...anticipate developments of strategic concern & identify opportunities as well as vulnerabilities for decision makers.

Defense Intelligence Analysis Program: Create, enhance, & sustain the capability to understand & enunciate S&T advances that might transition to, or transform military capabilities.



Current Org – Defense Warning Office

- Analyze long-term (5-25 years) defense-related economic, social, political, scientific, & technical trends.
- Identify near-term (now-5 yrs) obscure, ambiguous, or unforeseen threats.



DWO-1
Foreign Materiel
Division

DWO-2
Strategic Plans &
Assessments

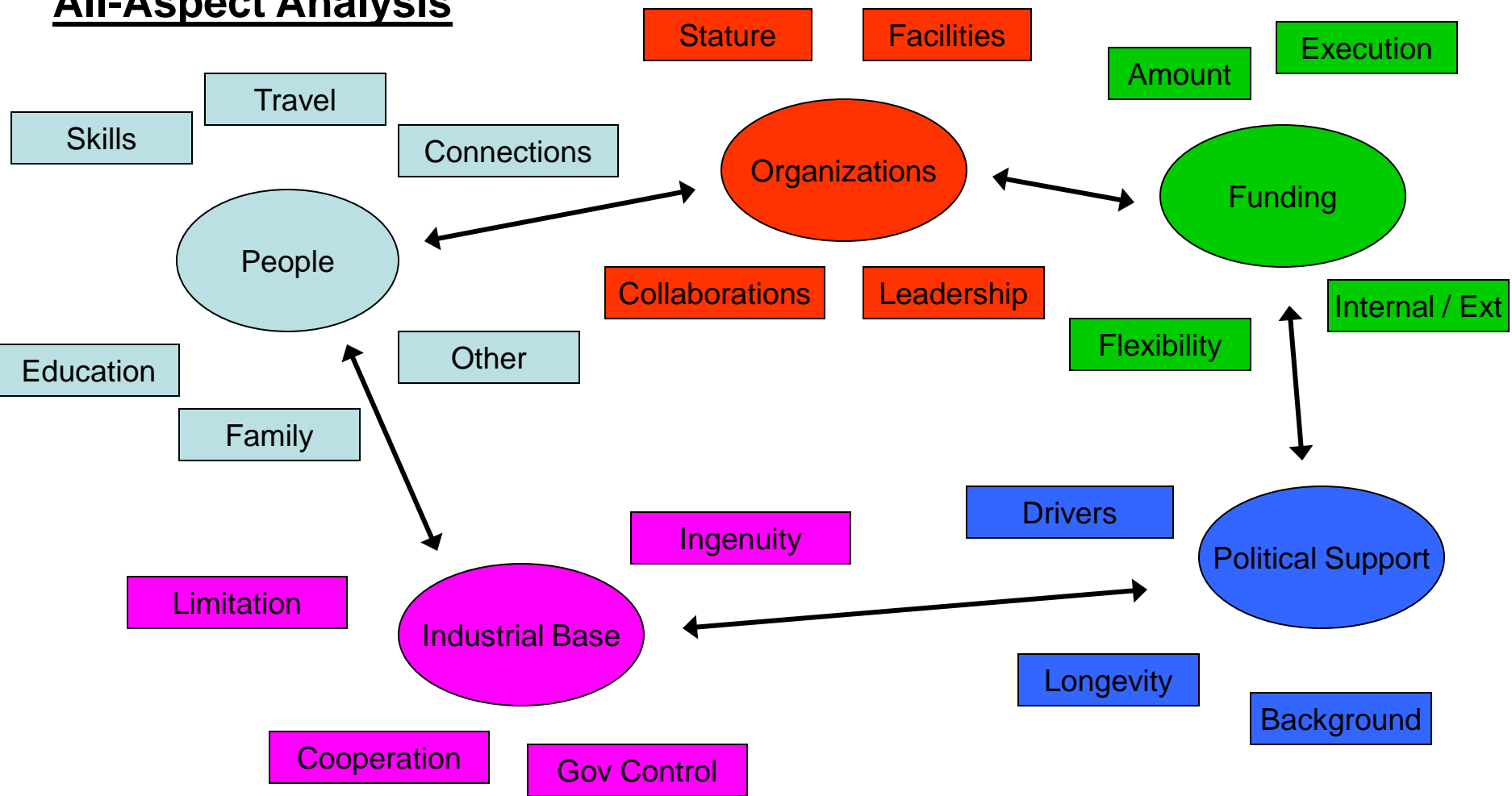
DWO-3
Acquisition
Support Division

DWO-4
Technology
Warning Division



Future Capabilities

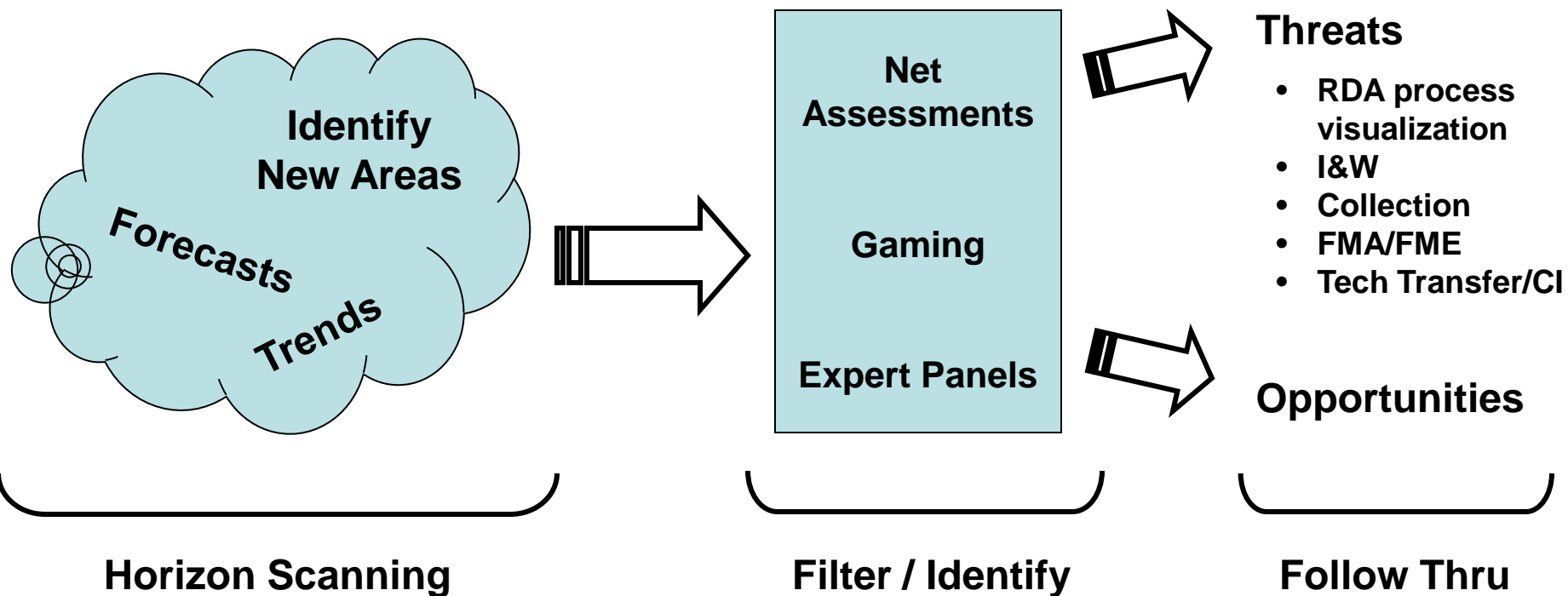
All-Aspect Analysis





Future Capabilities

Integrated Processes





Partnering Opportunities

- **Expertise**
 - Industry as a partner not a producer
 - Knowledge transfer
 - Continuing education
 - Career entanglement
- **Processes**
 - Knowledge management
 - Open source exploitation best practices
 - Horizon scanning
 - Production paradigm guidance
 - M&S plug & play



Questions?

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