Disruptive Technologies

Innovation or Disruption?
The Impact of Changing Technology upon ISR Capabilities

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Agenda

- Battlespace Awareness Portfolio
- Innovative or Disruptive?
- Disruptive Technologies
  - Persistence
  - Sensors
- Today’s Disruptions Resulting from Yesterday’s Innovation
- The Future
  - Technologies
  - Processes
  - Our Challenge
- Discussion
Battlespace Awareness Portfolio

Resources

- MIP: 62%
- Other DoD: 38%

USD(I) Oversight

- Battlespace Awareness Capability Portfolio Responsible for all ISR Capabilities
- Military Intelligence Program enables ISR dedicated funding
Innovative or Disruptive?  
*It’s a Matter of Perspectives*

**Department of Defense**
- Maintains warfighter effectiveness
- Enables combat on our terms

**SMALLER--FASTER--BETTER**

**Industry**
- Customer focused
- Value network

**SURVIVAL IN COMPETITIVE GLOBAL MARKET**

**Innovation Key to Warfighter Success**
- Managing the downstream effects
- Integration and interoperability
- Data overload

**DATA-TO-KNOWLEDGE**

**Disruptive Attributes**
- Profit motive
- Shareholder perspective
- The rise and fall of companies

**NEW PARADIGMS BORNE OF INNOVATIVE TECHNOLOGY**

All Innovation Has Disruptive Attributes That Must be Actively Managed
Disruptive Technology

Persistence and Sensors

Historical

- Stealth
- Night Vision
- Biometrics

Future

- Persistence
- Sensors
- Disruptive Technology

Irregular Warfare

Conventional Warfare

Application Predominance

Disparate Innovative Technologies

Similar Disruptive Consequences
Disruptive Technology

Persistence

Extreme Persistence in our Grasp
Disruptive Technology

**Persistence**

- **Global Hawk**
  - 28 hrs, 60,000 feet, 2000 lb
  - Operational

- **Reaper**
  - 24 hrs, 40,000 feet, 1000 lb
  - Operational

- **PTDS/PGSS**
  - 24 hrs, 20,000 feet, 400 lb
  - Operational

- **Predator**
  - 24 hrs, 20,000 feet, 400 lb
  - Operational

- **Global Observer**
  - 7 days, 55,000 feet, 400 lb
  - Demonstration Phase

- **Phantom Eye**
  - 10-20 days, 65,000 feet, 1,000 lb
  - Development Phase

- **ISIS**
  - 10 years, 65,000 feet, 3,000 lb
  - Early Development Phase

- **Endurance Airship**
  - 20+ days, 20,000 feet, 3,000 lb
  - Near Demonstration Phase

**Persistent Local Coverage**

- **Persistent Regional Coverage**

**Disruptive Implications**—Volume, CONOPs, Bandwidth, PED and Storage
Disruptive Technology

Sensors

Radar and LIDAR

Synthetic Aperture Radar

SOUTHCOM FOPEN

RC-12

ALIRT Point Cloud

Foliage Penetration

Wide Area Surveillance

Disruptive Implications—Volume, Bandwidth, PED and Storage
Wide Area Surveillance

Current Activities to Support Wartime Ops

End-to-End Development, Integration and Fielding

$400+M

Ground Systems

Deploys Existing Systems
And Procures Added Capability
$300M

Communications And Bandwidth
$50M

WAS
Dissemination Enhancement

ISR Network Modifications to
10 Network Radios

WAS PED Automation

Ground Processing Analysis
Processing, Exploitation And
Dissemination
$60M

Balancing Collection & Production With Dissemination & Distribution
Wide Area Surveillance

Demonstration Imagery

Single Sensor Provides **Tailored** Real-Time Images to Multiple Users
Persistence and Sensors

Disruptive Attributes of Innovative Technology

Greater Persistence and Improved Sensors Exponentially Increased the Amount of Information Available

More Collection = More Data
However
More data ≠ More Knowledge ≠ Actionable Intelligence

- Collection outpacing ability to transport, store and process
- Volumetrics, variety, and velocity are growing
- Challenge--discriminate IW the threat from the clutter
- “Behavior discernment”
More Collection = More Data But
More data ≠ More Knowledge ≠ Actionable Intelligence

- Data pipes are saturated
- Storage is approaching saturation
- Disruptive tendencies are accelerating and solutions are lagging

One ARGUS Can Consume Bandwidth of Ten WGS’, Even With

Illustrative of Data Movement/Storage Problem

Persistence and Sensors
Disruptive Attributes—Data Movement & Storage
Persistence and Sensors

Disruptive Attributes—PED

More Collection = More Data
But
More data ≠ More Knowledge ≠ Actionable Intelligence

- Automated exploitation is sparse
- Human analysis capacity is optimized
- Threat signature development lags
- Problem will get worse

Adding Analysts--Linear Solution to Exponential Problem & Not
Future Disruptive Technologies?

Flexible Acquisition & Modular/Integrated Technologies Key to

Intelligence Fusion
Translating Information to Actionable Intelligence

Advanced Signals Intelligence
Forensic Maturation
Advanced Analytics
Micro Air Vehicles

Automated/Aided Target Recognition
Hyper Spectral Imaging
Human Terrain Analysis

High Definition Imagery

United States of America
The Classic Conundrum

Joint Capabilities Integration & Development System

Planning, Program, Budgeting & Execution

Defense Acquisition System

1+ Year Cycle

2+ Year Cycle

5-10 Year Cycle

= Program of Record fielded in 8-13 yrs

Lessons Learned & Capabilities Back into Enduring Processes

Quick Reaction Capabilities

New Capabilities Needed More Rapidly Then the System Allows
Disruptive Attributes of Innovative Technologies

This is Our Challenge!

Balancing the ISR Enterprise Through Multiple Paradigms

Platforms & Sensors--Collection & Exploitation--Conventional & Irregular Warfare
“The challenge to provide the information, insight, and warning that allow our national military and civilian leaders to make better decisions ...has never been greater or more urgent.”
BACK UP
Wide Area Surveillance

Demonstration Imagery

Single Sensor Provides Tailored Real-Time Images to Multiple Users
Conference Goal

To identify technologies that enable us to fill gaps in capabilities required for conduct of irregular warfare and asymmetric threats