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Classified By: [redacted]
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(U) Sentient

~~(U//FOUO)~~ Goal: Revolutionize the current National Technical Means (NTM) tasking and collection paradigm by employing an automated learning and adaptive cycle to maximize collection opportunities.

~~(U//FOUO)~~ Attributes:

- Leverage activity-based intelligence (ABI) methodologies
- Employ a problem-centric approach
- Apply multi-sensor data fusion
- Maintain target custody

~~(U//FOUO)~~ Technology approaches:

- Informatics – converting data into information
- Analytic sensemaking – exploiting patterns of life/behavioral anomalies
- Orchestrated collection – automating NTM tipping/cueing

Advanced Systems and Technology

~~(U//FOUO)~~ SENTIENT is an NRO/AS&T research and development (R&D) effort that aims to revolutionize the current single-source serial and linear intelligence process into a learning and adaptive cycle through activity-based intelligence (ABI) methodologies

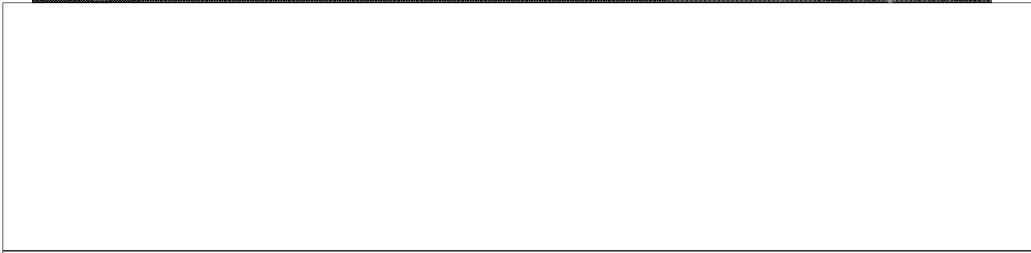
~~(U//FOUO)~~ Founded on a problem-centric approach that keeps R&D focused on intelligence application and relevance, SENTIENT employs analytic sensemaking, multi-intelligence fusion, and automated orchestrated collection to capture and maintain custody of dynamic targets and activities, delivering integrated intelligence

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(U) Today we live in a dynamic world – with dynamic foes without well-defined geographic boundaries are tightly prescribed tactics and techniques. To meet these new dynamic threats, we must adapt

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In order to continue to advance the NRO's current progress toward activity based intelligence, we must open our aperture beyond just the R&D effort called SENTIENT and embrace what is needed to truly scale and sustain ABI within the NRO and the IC. In this light, this slide addresses broad ABI objectives.

These ABI objectives address three important areas focused on the:

- relationship between human and computer
- adaptiveness of our intelligence process
- increasing our return on investment

Highlighting one from each group –

Man on the loop vs. man in the loop –there will always be a role for the analyst, but in a way that doesn't drive unsupportable time lags into our ongoing endeavor to speed intelligence information to our users

Learning – ABI must go beyond simple orchestrated collection (i.e. (b)(1)
) to tips based on detection and (b)(3)
 characterization of behaviors, patterns of life, and anomalies.

Data Source Agnostic – There is a wealth of unexploited data from non-traditional that can be used to cue our NTM collectors. We must become data source agnostic.

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(U) ABI is a Team Sport



- (U) Advanced Systems & Technology (AS&T)**
 - Research and development, proof-of-concept, prototype operations for a problem-centric, multi-INT, learning and adaptive enterprise
- (U) Mission Operations Directorate (MOD)**
 - Operates ABI capabilities and develops future concepts of operation (CONOPs)
 - Facilitates community mission development
 - Assesses readiness and performance of ABI capabilities
- (U) Mission Integration Directorate (MID)**
 - Provides intelligence subject expertise
 - Engages with intelligence community (IC) for mission development of multi-INT collection and analytic strategies
- (U) Ground Enterprise Directorate (GED)**
 - Acquires, integrates, and deploys Future Ground Architecture (FGA) applications and services to manage and exploit NRO collection capabilities in a multi-INT environment
 - Transitions mature SENTIENT and other ABI capabilities into the FGA baseline
- (U) Functional Managers (NGA, NSA)**
 - Approves models that drive collection priorities
 - Provides analytic subject matter expertise in individual intelligence domains
- (U) IC Customers / IC Users**
 - Provides mission needs; provides critical feedback on model value/satisfaction

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ABI is a Team Sport.

The NRO Directorates listed are coming together in unprecedented ways to further ABI within the NRO. Although SENTIENT may have been a significant pathfinder for the NRO, it is important to note and get your support (as NRO representatives) that SENTIENT is merely the pathfinder for the operational transition of ABI that is already occurring through transition into GED's Future Ground Architecture.

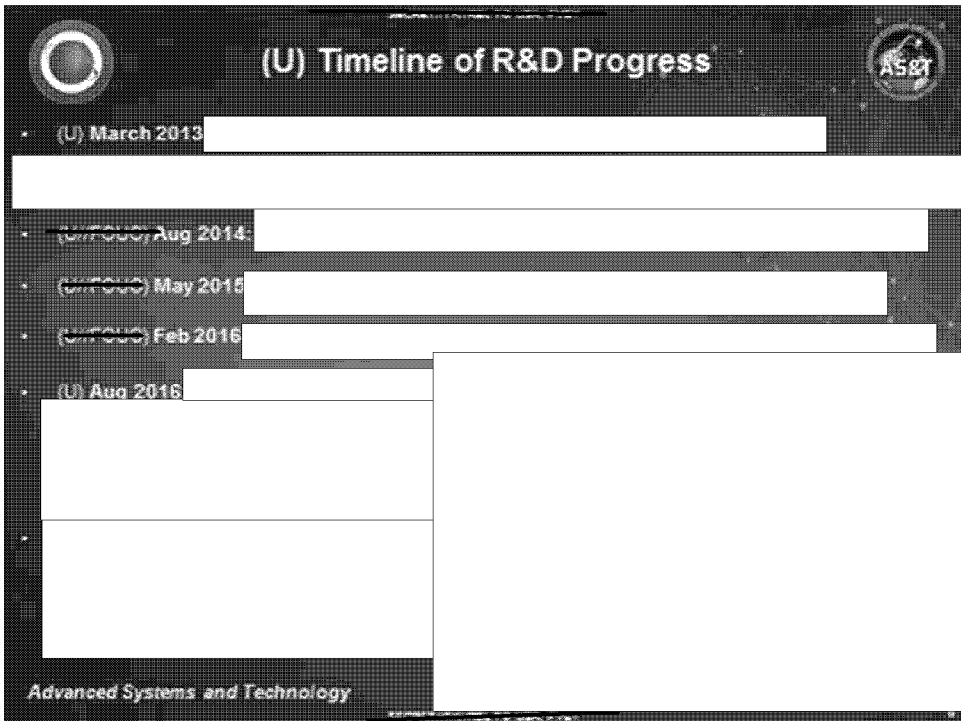
Each Directorate listed (as well as our Functional Managers and IC Customers) have important roles to fill in order to truly scale and sustain ABI outside of the SENTIENT R&D effort.

AS&T is focused on partnering with GED to make NRO ABI within the Future Ground Architecture a reality and a success.

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This slide shows **active ABI mission threads** developed through the SENTIENT effort.

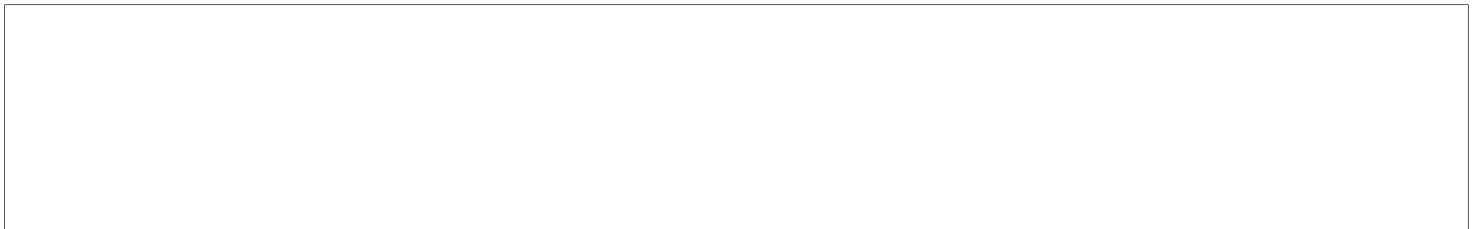
Threads shown in **gold**

Threads shown in **white**

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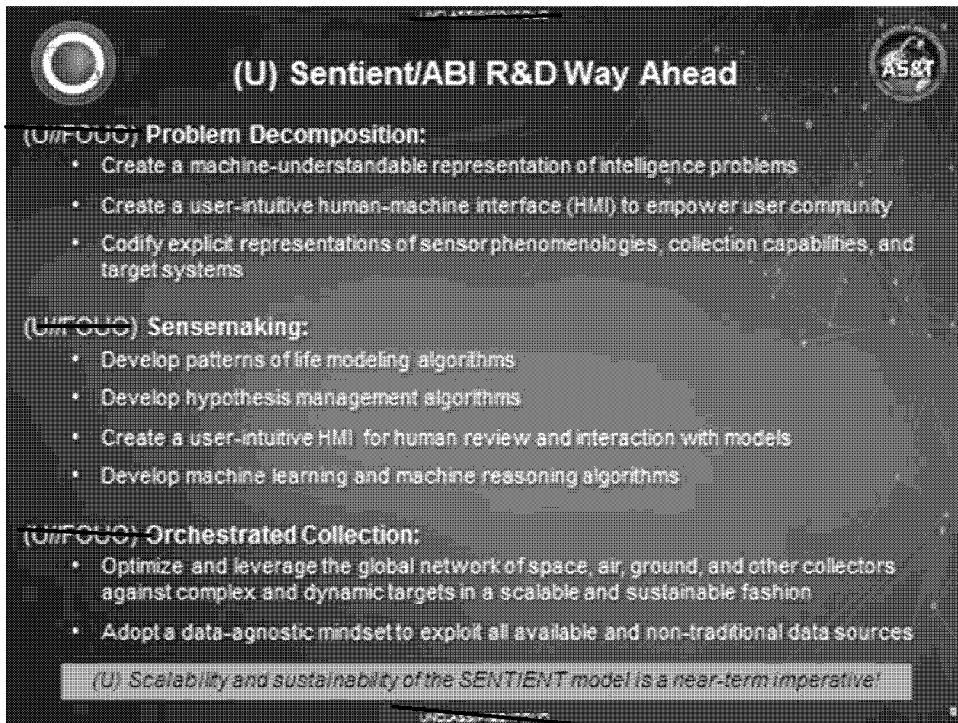
CLICK – New in 2016 annotated by blue arrows

CLICK – New in 2017 annotated by yellow arrows



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(U) Sentient/ABI R&D Way Ahead

(U//FOUO) Problem Decomposition:

- Create a machine-understandable representation of intelligence problems
- Create a user-intuitive human-machine interface (HMI) to empower user community
- Codify explicit representations of sensor phenomenologies, collection capabilities, and target systems

(U//FOUO) Sensemaking:

- Develop patterns of life modeling algorithms
- Develop hypothesis management algorithms
- Create a user-intuitive HMI for human review and interaction with models
- Develop machine learning and machine reasoning algorithms

(U//FOUO) Orchestrated Collection:

- Optimize and leverage the global network of space, air, ground, and other collectors against complex and dynamic targets in a scalable and sustainable fashion
- Adopt a data-agnostic mindset to exploit all available and non-traditional data sources

(U) Scalability and sustainability of the SENTIENT model is a near-term imperative.

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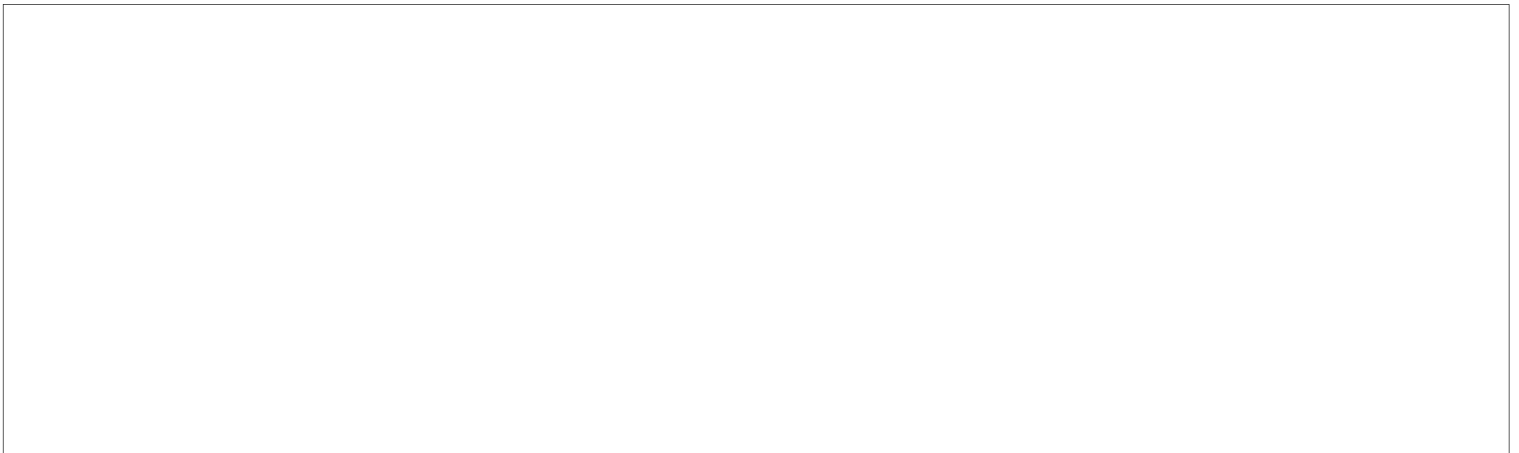
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This graphic pictorially represents our ABI Roadmap – showing the shift toward:



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