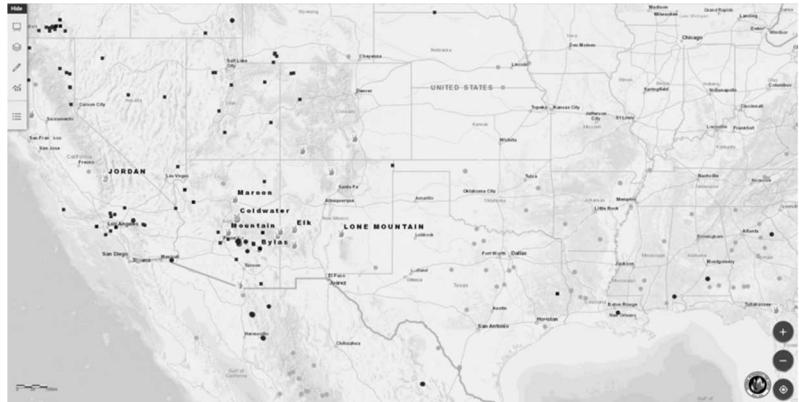


**2019 Wildfire Technology Industry Days**  
**26 June 2019**

# *Wildland Fire Fighting... Making the Knowledge Leap*



Myron E. Stevenson (Collabman)  
Stellar Solutions

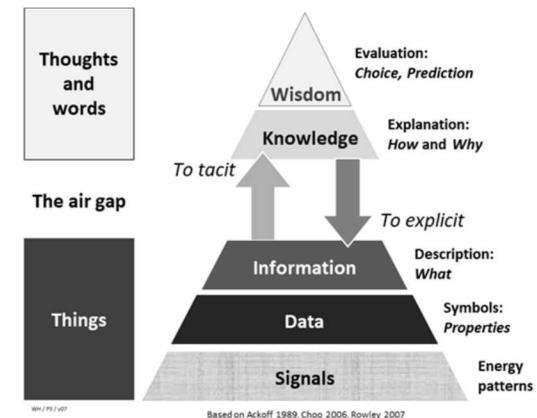
John H. Ganter  
Sandia National Laboratories

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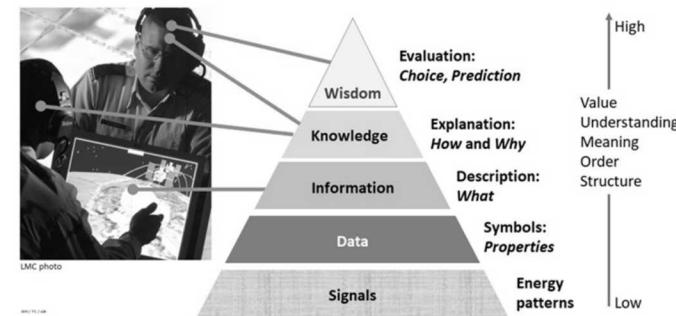


# Outline – Bottom Line Up Front (BLUF)

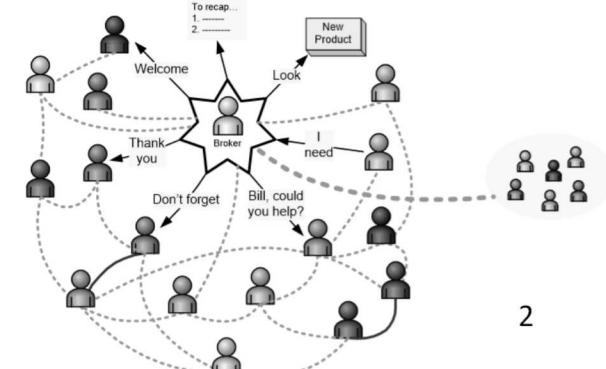
**Information:** Necessary and important but not sufficient for **Shared Situational Awareness** which *is in minds not machines* - must *design the tech to fit the people* and jump the air gap between things and thoughts



**Lessons Learned:** Hundreds of global operations, including rapid evacuations of personnel - *team of teams approach* using **collaborative chat** for real-time crowdsourcing and sense-making to jump the gap – **Can the Fire Community Adapt?**



**Change is Hard:** Must understand the **What, Why, and How** of real people doing real operations to transform operations - “*Ensure the velocity of decision-making out races the velocity of the wildfire*”



# Story Telling – Real-World Evacuation

**Direction:** U.S. Embassy will close due to a clear and present danger...



**Mission:** On or about \_\_\_\_\_, evacuate personnel and equipment – Life safety is priority-1



**Assets Available:** High-priority air and ground sensors along with national assets – produced a data tsunami



**What Happened:** Successful mission but – we found ourselves drowning in data, starved for information, seeking sense-making

# Lessons Learned and Could They Apply to Wildland Fire Fighting Challenges?

**#1** The challenge of vast and fast information is that more data often does not reduce situational complexity and ambiguity



**#2** The culture of tactical responsiveness inverted our traditional priorities – too late model



**#3:** Single viewpoint situational awareness is necessary but insufficient in complex, adversarial contexts



**#4:** We needed to make the “knowledge leap”

**The challenge of vast and fast information is that more data often does not reduce situational complexity and ambiguity**

**It's 0300 Sunday morning and the three questions are:**

***Has something changed?  
What could happen next?  
Are we still prepared?***

**The Fog of War is forever...**



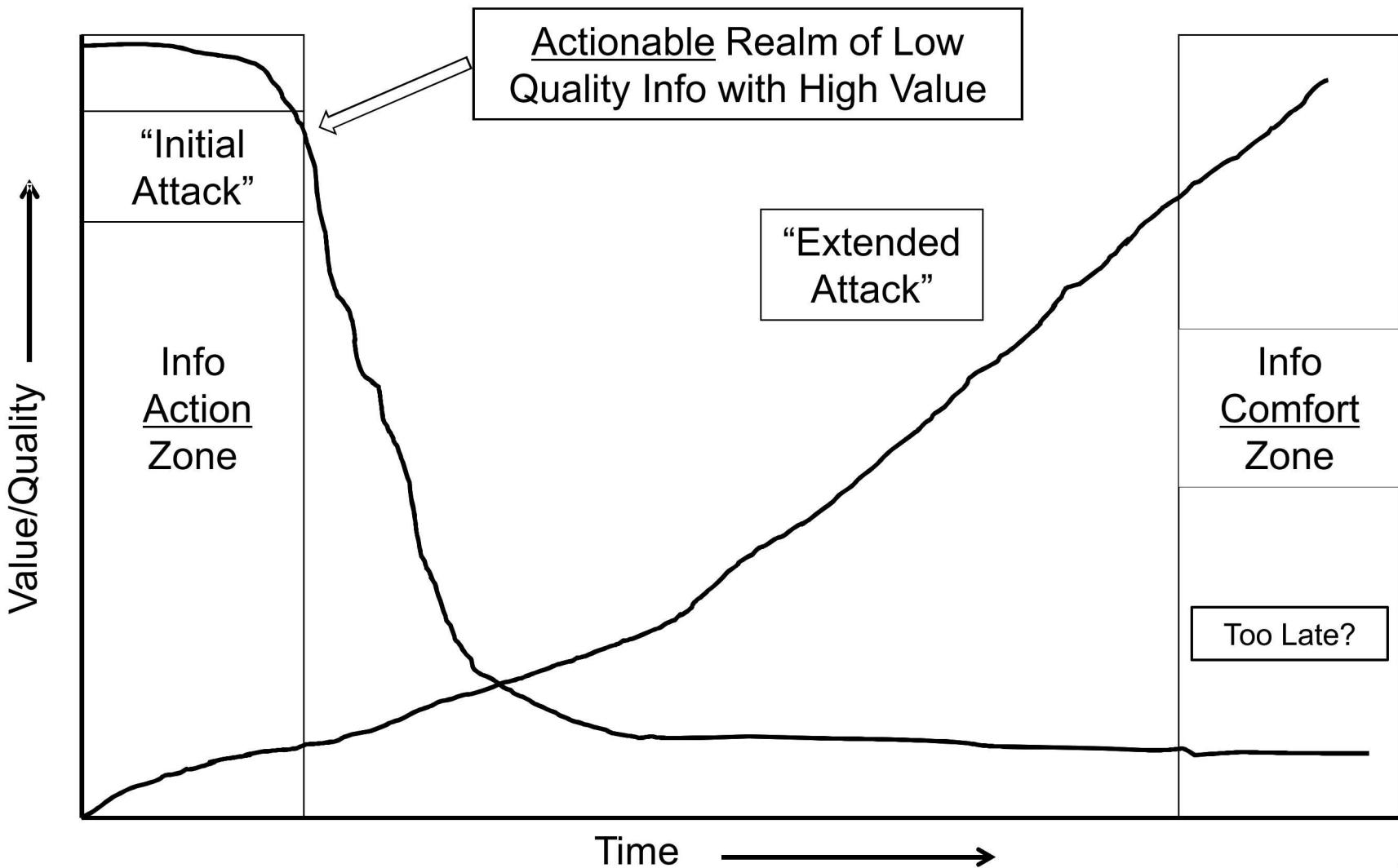
**Top-Down Solutions are insufficient:  
More process  
More hardware  
More software  
More bits of precision  
More quantification**

**The surprising bottom-up solution in this technical, formal environment:  
more informal interaction via social media...**

**“Who can we dialogue with?”**

## #2 - Tactical Responsiveness Inverts Our Traditional Priorities

Time Versus Value/Quality of Information



## Single-viewpoint situational awareness is necessary but insufficient in complex, adversarial contexts

**Situational Awareness:**  
maintaining a mental model of what has happened and is happening in your threat / opportunity environment +



**Situational understanding:**  
Using your mental model to simulate the near future and options +

**Problem:** An individual or a single team often cannot reconcile contradictory information and multiple causes and effects

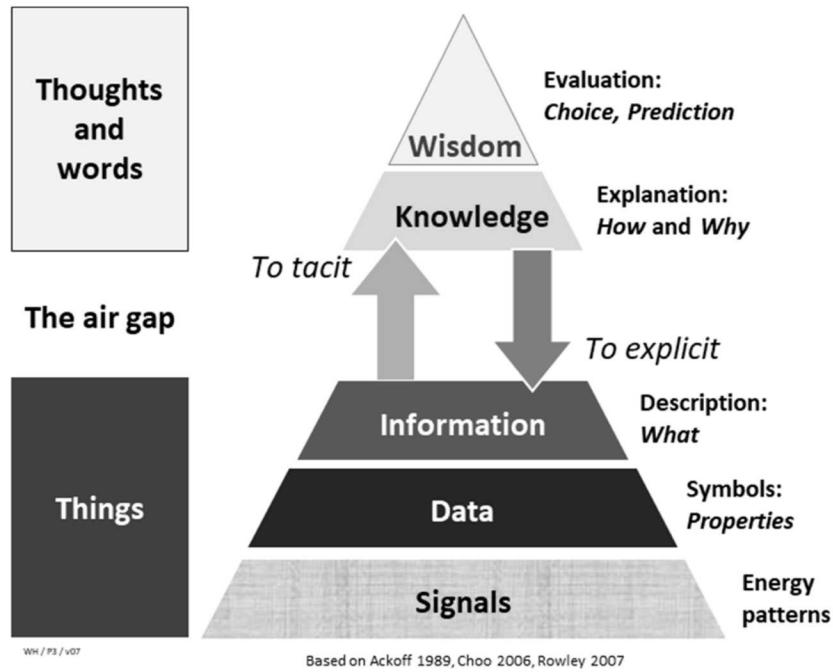
**Solution:** Rapid dialogue with people whose mental models are correlated but slightly different: “People look beyond information to triangulate reliability”\*

**“Anybody talked to the analysts about what they are really thinking?”**

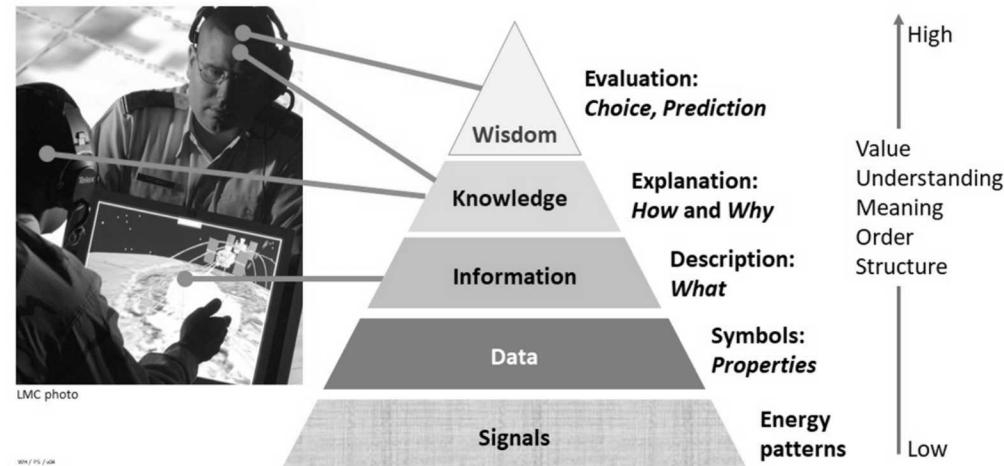
+based on Endsley; Klein; Weick, et al., 2005; others

\*Brown & Duguid, 2000, *The Social Life of Information*.

# Situations remain hard because data and machines are necessary, important but not sufficient



**Human communication blends information and knowledge**



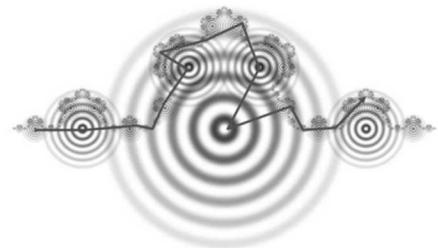
## Accelerate the Social



## Discover Others



## Accelerate Interaction



## Email



**Social Media  
& Chat Rooms**

## Collaborative chat allows situational awareness / understanding across semi-cooperative organizations

Team of teams approach



**Sensor ops tribe**



**All-Source Analysis tribe**

20:10:15 Hugh: @Sam, what does \*your\* crystal ball tell us about near-term situation? It appears the opportunity for mis-calculation is high ...your thoughts sir?



**Crisis Cell tribe**

Human Net is built on:

- Crowd sourcing
- Tradecraft
- Best practices
- Behavior modeling

Chat - easy to use, easy to configure, cost effective, low-impact

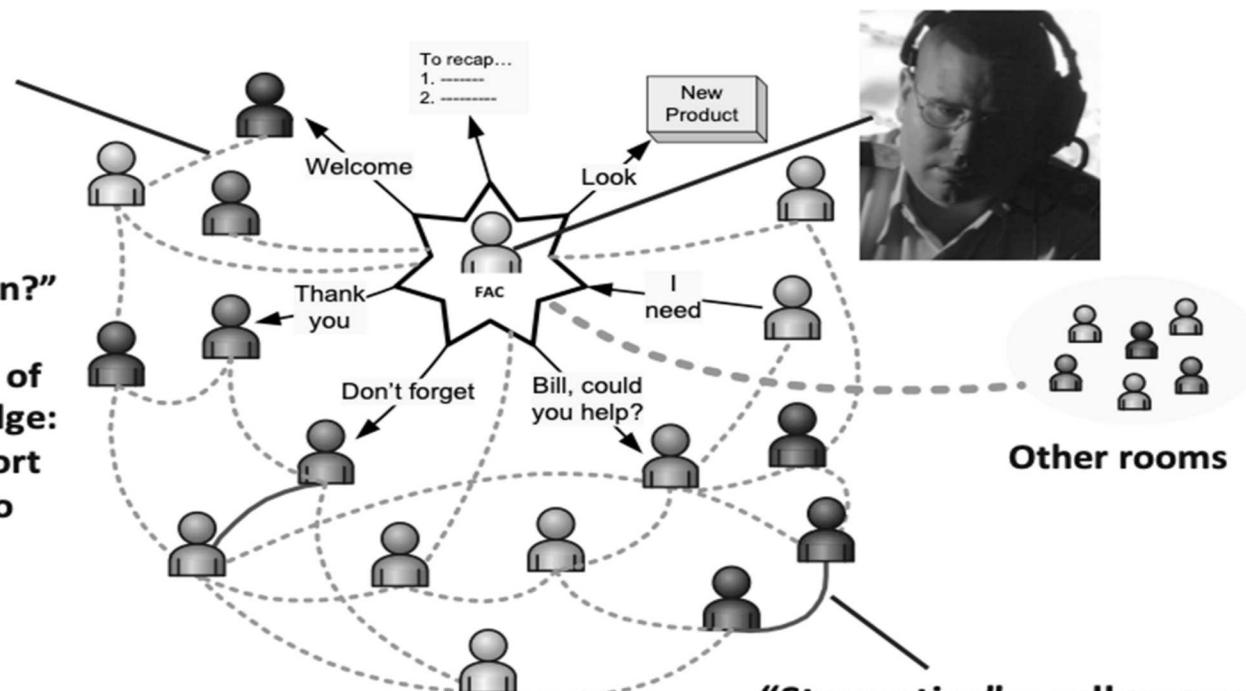
# How Does a Large, Online Chat Space Work?

**CollabOps facilitators cultivate *weak ties* that induce cooperative behavior over social distance**

**“Weak ties”\* = acquaintances.**

**Orienting conversations:**  
“What’s going on?”

**Communication of explicit knowledge:**  
“We have a report you might like to see”



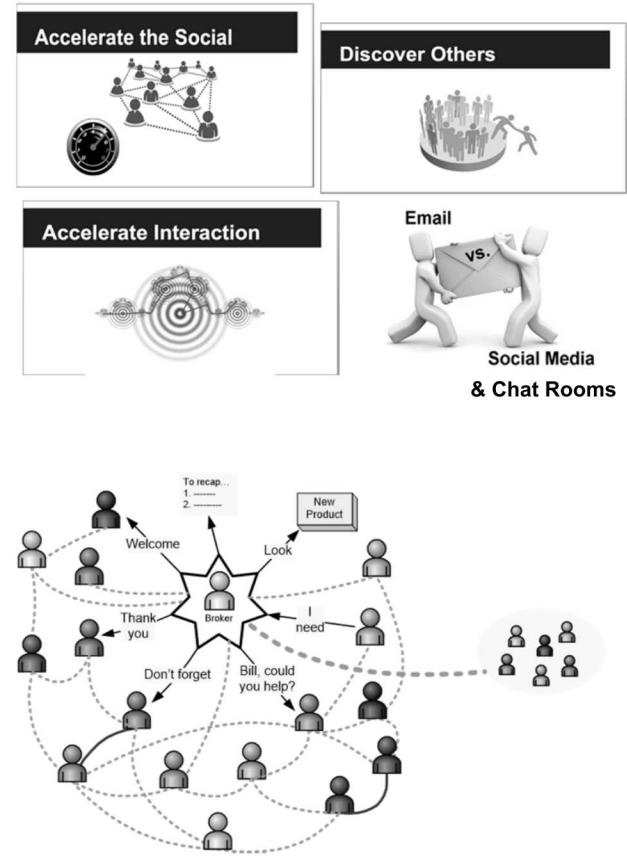
**Creation spaces:** “Environments that effectively integrate teams within a broader learning ecology so that performance improvements accelerate as more participants join” ([Hagel, Brown, & Davison, 2010, p. 18](#))

**“Strong ties” = colleagues.**  
**Tacit knowledge: know-how.**  
**‘Crucial conversations’: our risks, our decisions.**

\*Granovetter 1973, 1983

## Collaborative chat –

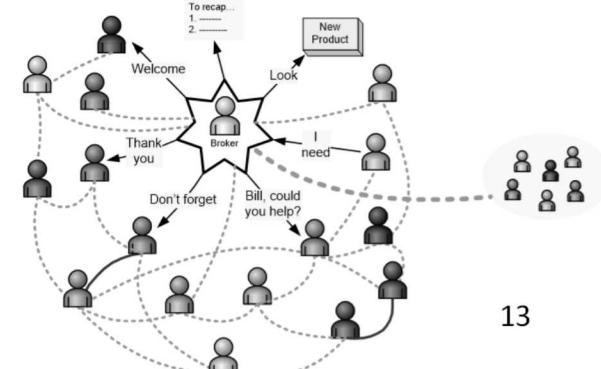
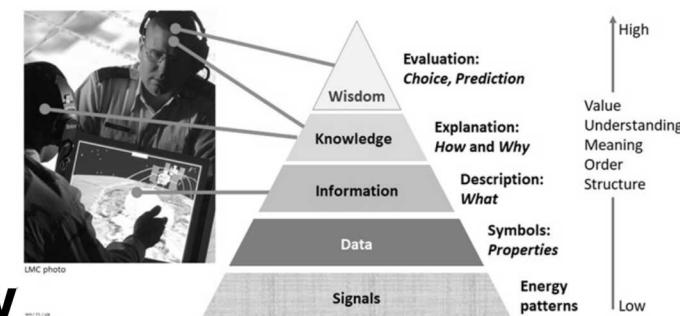
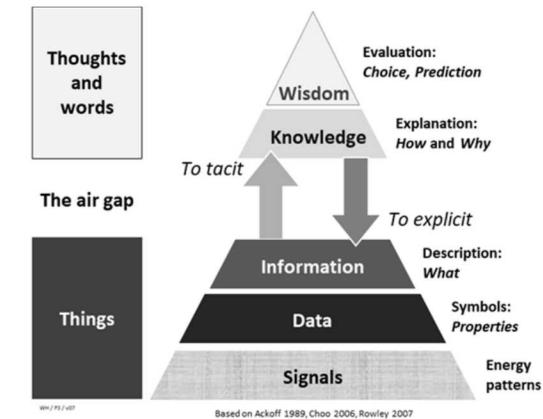
- Force multiplier for limited resources
  - team of teams approach
- Enhances, accelerates decision-making
- Focuses attention
- Brings diversity to sense-making
- Increases discovery
- Matches expertise to opportunities, faster



**Shared situational awareness** is in minds not machines so we have to make the tech fit into the teams

**Team of teams collaboration** using online, real-time **chat** for crowdsourcing and sense-making can help the wildland fire fighting community jump the knowledge gap

Must understand the **What, Why, and How** of real people doing real operations to transform operations - *“Ensure the velocity of decision-making out races the velocity of the wildfire”*



## Tailorable, Flexible, Targeted Mobile Training Team (MTT)

- **Individual** - Targeted one-on-one training
- **Seminars** - ~4hrs; Overview of the basics
- **Workshops** - 3 days; team-centric; tradecraft, best practices, scenarios
- **Full Course** - 5 days; full immersion; final project; certification provided
- **Leadership Overview** - High-level; return-on-investment (ROI) emphasis



**COLLABORATION SERVICES**  
The Human Dimension

Good Collaboration Can't Wait. Today's workforce needs more than collaboration technology to work effectively and be successful.

**Credentials**

- Training program designed by a former senior national level Intelligence Community (IC) collaboration facilitator and two current IC facilitators; certified to represent regional and functional National Intelligence Managers in unclassified, collaborative environments.
- Extensive experience with building and working in complex business environments with geographically and locally dispersed teams.
- Skilled in coaching, mentoring and training individuals in state-of-the-art online collaboration using cross-organizational, tradecraft and best practices - *learn by doing* approach.

**Expertise and Experience**

- Developed and implemented innovative collaboration concepts at Department of Defense (DoD) locations - these concepts remain in use today, continue to be replicated across numerous organizations.
- Manages NRO's Collaboration Enterprise Program Office.
- Trained and facilitated such efforts: program managers, collaboration operators and Intelligence Coordinators.
- Developed Concepts of Operations, Standard Operating Procedures and mission critical foundational documentation.
- Working with Wildland Fire Teams and Incident Response.

*"Crowd Sourcing, Tradecraft and Best Practices - Pushing Collaboration Beyond Technology to the Human Dimension"*



Stellar Solutions, Inc. is an engineering services firm that provides high-caliber talent to complex projects in defense, intelligence, civil, and commercial sectors.

Our Collaboration Program provides exceptionally qualified experts for the most demanding challenges facing our customers.

**Services Provided**

- Mobile Training Team (MTT): Single instructor who comes to your location; flexible, tailorable approach dedicated to your organizational needs.
- Individual: Targeted one-on-one training
- Seminar: ~4-hour overview covering the basics.
- Workshop: 3-days, team-centric; tradecraft, best practices - includes certification provided.
- Course: 5-day course, full immersion on understanding how the human dimension, enabled by today's tech, is used to enhance collaboration within your enterprise - certification provided.
- Leadership Overview: High-level, ROI focused



## What Does Information Consume?

**“What information consumes is rather obvious: it consumes the attention of its recipients.**

**Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it.”**

**Herbert A. Simon, Nobel Laureate, 1971.**



## Points of Contact

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Questions, Comments? -  
Interested in knowing more  
about the training?

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