

National Intelligence Writing Contest

Enabling the Sensor

Narrative: Combat Outpost, 2015

Specialist Walker took a knee. A long night on patrol had given way to unbearable heat. Setting the muzzle of his weapon on his knee, he reached for some water, when a shot rang out. Without hesitation, he dropped into the prone position, and shouted, "Where is the shooter?" A pulse at the end of his rifle indicated that he orient to his left. As he turned, he took a quick glance at the smartphone affixed to his wrist, seeing a bold readout: 287 degrees, 156 meters. With his rifle confirming his orientation, he peered through his sights and saw the unmistakable silhouette of his enemy reloading. With a red hue faintly enveloping the sight, he squeezed the trigger. It only took eight seconds from the first shot until the threat was eliminated.

The goal of getting actionable intelligence into the hands of the troops on the ground dates back to the dawn of war. Specialist Walker's actions were informed by a string of sensors, working in cahoots. The smartphone on his wrist identified the sonic pattern of a bullet passing by. Several of Walker's squad's devices also sensed and began to analyze the fragmented sound. Overhead, an unmanned vehicle had been patrolling the area of operations, specifically monitoring sixteen locations that were known or suspected enemy positions. The muzzle flash of the enemy rifle triggered a system that immediately published the data into the Brigade battle command system. Walker's audible request to his smartphone, simultaneously sent his data to the system, while requesting an immediate analysis. Using relatively simple mathematic algorithms, the system pinpointed the shooter and sent the data

to SPC Walker, with visual representations in his rifle scope and on his wrist mounted smartphone.

Narrative: Corps Operation Center

A new dossier appeared on MSG Francis' screen. He had seen the name under the picture before—but the name was akin to asking for John Smith in his hometown of Annapolis. Still, the picture was decent, and it was clear that this guy was a key to the new IED ring that has caused so many problems lately. He typed an additional comment in the process box and moved to the next file. Within minutes, he received an alert. "Got him, already?" he muttered.

The program MSG Francis is using took his commentary and prioritized the suspect's information into the biometrics database, which is accessible to the combat outpost checkpoints. As people filed by the food point, a match was made, sending the data to the squad leader responsible for securing the checkpoint. Without incident, the suspect was apprehended and sent back to the Corps headquarters for additional questioning.

These two narratives highlight a growing avenue for intelligence gathering and dissemination. It's all about the data. How do we get the data to the people who need it in their time of need? How much raw, unprocessed data should be accessible to the Soldier in the field? What are the capacity requirements for the network to ensure reliable connections to the data? How do we manage offline access to relevant data? How do we test interoperability of the sensors and end user devices? What is "good enough" security?

One of the challenges that face the Intelligence community is how to give the user what he or she needs without overwhelming their senses. For generations, end users and leaders'

situation awareness has been encumbered by the opaque “fog and friction” of war (Clausewitz, 1832/1976). With the growing number sensors and collectors on the battlefield, information overload is a growing problem. It has been shown that information available at the time of need allows the operator to gain cognitive understanding, leading to the best decisions (Endsley, 2000), yet too much information has also been shown to result in degraded performance (Lansdown, 2004).

This balance of the right amount of information to make available to the user is difficult to strike. The answer is to provide applications that the user has the ability to customize based on the mission and the user’s preference. To that end, military investment in end user applications, customizable user interfaces and data retrieval and presentation techniques must be at the top of the list of problems to research. As we begin to determine the quality and quantity of data our Soldiers are able to individually absorb in the field, we will come to realize the extent that our network infrastructure must be improved.

With that, traffic on the network, particularly in bandwidth disenfranchised areas like the forward edge of our battle space, needs prioritization schemata based on the type of data and the user’s mission.

Greater emphasis must be placed on making data and analysis available earlier to the end user, even if that analysis comes with caveats of unreliability. There cannot be a greater despair than the Intelligence analyst who examines a fatal interaction with the enemy and says, “I knew that would happen, but didn’t get the information to the right people.” Users must be

empowered with access to filtered and unfiltered information, while automated tools have to be created to allow the sensors to inform each other.

Sensor interoperability is also a challenging task that requires investment and consideration. The increased power of the smartphone provides a promising advancement for the end user. With the prospect of every Soldier connected to the network, with instant access to relevant queries, smartphone technology is clearly the foundation for a Revolution of Military Affairs (RMA).

Yet, it is not just being connected that makes it so powerful; rather it is the access to the data. When consumers use their personal smartphones to access banking, email, information and social networking apps, their sense of satisfaction stems from being able to get “my data”. Even something as simple as being able to lookup start times at a movie theater or book reservations have a personal feel, because they have such an impact on how users retrieve data, influencing their personal information gathering processes. It might seem trite to consider Soldiers saying, “This is my smartphone. There are many like it, but this one’s mine,” yet that sums up the relationship many people have with their smartphones. It is no surprise that members of the so-called “Me Generation” are the ombudsmen and propagators of social networking and Web 2.0. Tim O’Reilly (2005) defined the concept of Web 2.0 as a Web platform with ubiquitous, un-owned, ever-changing data, which encourages user participation, with users (co-developers) who expect rich user experiences.

Let’s talk about a common type of app that people can find in a variety of formats on every modern smartphone: a business review app. With this app, the user can plan their

consumer experience by finding out which businesses are closest to them and how the community has rated these businesses. “I wonder if there are any Italian restaurants near my hotel?” *Click. Ding.* “Yes, there are three. But which is best?” *Click. Ding.* “4 stars, 2 stars, 1 star. Well, I know where I am eating. But what is good there?” *Click. Ding.* “Try the chicken tetrazzini, it’s out of this world!”

What does that app look like in combat?

Narrative: Combat Patrol

SSG Tufte wasn’t the sort to air his frustrations to his platoon leader, but this was his third deployment and his experienced Lieutenant often provided a stabilizing soundboard. “I was finally learning the ins and outs of the village in sector Tango and the battalion sends us to sector Bravo! I’ve been in this country three times, patrolled a thousand miles in a hundred villages – why do they have to send us somewhere new?” The Lieutenant, an avid fan of the movie “Patton” said, “I was here before.” Tufte knew his LT hadn’t been to Bravo, and gave him an inquisitive glance. The Lieutenant pulled out his smartphone, opened an app and started reading about the village. Pointing, he said, “The house on the hill was an insurgent hotspot two years ago.” He shifted his glaze across the street. “That green house had a confidant named ‘Sammy’ that helped the guys who were here in February.” He handed the phone to Tufte. “Five stars! Let’s start there.”

The ability to have historical, geo-referenced data available to a patrol provides an immediate resource to those Soldiers. In today’s environment, how long would it take for a house-by-house historical report to be provided to a patrol? How much information gets

passed from one patrol to another – when the patrols are two years apart? Is that information still valuable or relevant? As combat patrols become more familiar with a locale, they might discover information like, “the right side of this street offers more cover if a firefight occurs.” This experience and these reports can get lost in the minutiae.

How hard would it be to create Tufte’s app? The current era of smartphones are perhaps not yet secure enough to field the app, though technically, it is an app that is not too difficult to create. As smartphone operating systems become more robust and secure, this is precisely the kind of app that needs to be created and connected to the battle command and intelligence systems and networks. Not only does it give information to the Soldiers on patrol, but it also is a data collection tool that allows Intelligence analysts the opportunity to examine raw data, providing a forum to propose their assessments to the end user of the intelligence in both historical and real time settings.

With Web 2.0, the users expect to participate in the data exchange. The next generation, Web 3.0, represents an era where the semantic web will conduct sophisticated tasks in the background, analyzing how environmental and informational changes could impact the users (Berners-Lee, 2001). This automated process is even more personal than today’s social networking experience in that the “machine” will know what you need, at the point in time and space that you need it. Our current Intelligence gathering and dissemination tools must begin to evolve toward providing those features and fidelity of information to the users, in personal, customizable ways. Some users want text; some users want pictures. Some want a

vast amount of information to prepare them for a mission, while others just want the broad strokes.

The end result is a computing environment where the users can more readily consume recommendations made by the analyst. It is all about the data and the user experience. We owe it to the experts who pore over battlefield information, analyzing it in meaningful ways, to make their analysis available to the scores of men and women who fight our battles and patrol the streets of conflict. The Soldiers are the sensors, and every effort must be taken to empower the sensors, enabling them with critical information at their time of need and in the manner of their choice.

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