

UnityNet

A Globally Deployable Sensor for “White” Information

DEFENSE INTELLIGENCE AGENCY

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Abstract



“Fixing Intel”, a paper co-authored by MG Mike Flynn, Capt. Matt Pottinger, and Mr. Paul Bachelor (published January 2010), served as a tipping point in operationalizing concepts of Counterinsurgency, (COIN) and Stability Ops doctrine in a way that will forever change how we view our military role in Afghanistan and other areas of conflict throughout the world. A new tested and proven information sharing model now exists that directly supports the concepts that “Fixing Intel” establishes by providing an ISR platform that “senses” population-centric atmospherics and information critical to COIN and stability operations. This model, termed UnityNet, enables host-nation, open-information sharing environments in areas around the world of interest to the United States. UnityNet’s primary function is to expose grassroots, population-centric, socio-economic and governance information that is not readily accessible to military commanders, civilian policymakers, and other civilian aid organizations seeking to execute development programs, stability operations or counterinsurgency doctrine.

Introduction

In the early 1960’s, Sir Robert Thompson, a British counterinsurgency expert described the conditions necessary for defeating a rebellion. Of the thirteen tenants Thompson describes, four focus on population-centric responses: (1) People must be secure, (2) there must be a clear political counter-vision, (3) COIN forces must exhibit cultural sensitivity, and (4) there must be a systematic intelligence effort covering a wide spectrum of issues relating to both kinetic operations and population-centric issues such as governance, corruption, powerbrokers, services, etc.

The US has been involved in insurgent conflicts and stability operations since the American Civil War and has continued involvement through both Operations Iraqi and Enduring Freedom, however, it was only up until after the conclusion of US involvement in the Vietnam War that DOD refined Thompson’s concepts and has developed a doctrinal focus centered around the root causes of conflict and instability. Religious fanaticism, ideology, ethnic tensions, territorial claims, global resource competition, elitism, greed and the desire for power all emerged as symptoms of persistent conflict in the developing world. Recognizing that these emerging conflicts would require a different kind of response and force structure, DOD developed COIN and stability operations doctrine to address the asymmetric characteristics that evolve from other than force on force operations.

Counterinsurgency doctrine clearly recognizes the need for the American combat soldier to have a wider perspective than at any time previous in American history. The US Army Field Manual on counterinsurgency (FM 03-24) describes the need for a mix of offensive, defensive, and stability

operations conducted along multiple lines of operations. It requires Soldiers and Marines to employ a mix of combat tasks and skills more often associated with nonmilitary agencies.

Stability operations doctrine goes hand-in-hand with COIN doctrine specifically addressing what tasks the military retains vice what civilian agencies should be charged to perform. Stability operations doctrine stresses the need for the military to leverage all instruments of national power, as well as international organizations, Non-Government Organizations, (NGO), Private Volunteer Organizations, (PVO), Charities, Corporations as well as local/national indigenous groups. These tasks generally fall into one of three categories, representing the collective effort associated with a stability operation:

- Tasks for which military forces retain primary responsibility.
- Tasks for which civilian agencies or organizations retain primary responsibility.
- Tasks for which civilian agencies or organizations likely retain responsibility, but military forces are prepared to execute.

The concept of UnityNet falls in line with the third task, and seeks to act as an enabler to bridge the gap between civilian, military, and governmental stability operations efforts. Since Thompson's time, a profoundly destabilizing force has been developed that has changed our collective, global reality. That force is the Internet, and for good or ill, both it and the World Wide Web have had an enormous social and economic impact on every nation on earth, opening and exposing closed societies, enabling personal and cross-border communication, and forming a dense global matrix of integrated connections between people, their ideas and their resources. It is a force of destabilization to those who seek to control, and yet can still be a force of stabilization in societies with informed populations through the power of instant, global communications.

The Counterinsurgency Problem Set

COIN & stability operations doctrine calls for combat commanders to (1) establish a safe, secure environment that can facilitate reconciliation among local or regional adversaries, and (2) establish conditions that support the transition to legitimate host-nation governance, a functioning civil society, and a viable market economy. Doctrine urges the commander to possess an awareness and basic understanding of the groups that will play critical roles in influencing the outcome of the COIN effort, but are beyond the control of military forces or civilian governing institutions. These groups include the following:

- Local Leadership
- Informal Associations
- Religious Groups
- Families
- Tribes
- Private Enterprises
- Humanitarian Groups
- Media Outlets

Understanding the cultural norms, socio-economic processes, religious customs, political practices and complex person-to-person inter-relationships of an entire population is a tall order for combat troops and commanders whose duties are primarily concerned with kinetic operations and force protection. The knowledge-base for population-centric issues is termed 'white' information, and requires frequent involvement and consistent interaction with those same critical groups described above. In doctrine, it is the population that is the central focus of an effective counterinsurgency, and for whom we compete in a war for "hearts and minds."

In addition to cultural understanding and astuteness, commanders are required to work directly with local and national governments, armed forces, police, NGOs and PVOs to ensure a united effort.¹ While the established doctrine is sound in terms of dealing with insurgency, it does not address local governments that are predatory in nature, nor NGOs operating in the area that do not cooperate or are pursuing objectives that run counter to an effective COIN strategy.

The most important, conflict environment of current US interest is Afghanistan, wherein the question now becomes, “How do our military leaders do this in an operational environment that has, for the most part, it’s sensors focused entirely on ‘red’ kinetic (kill or capture) operations?” White information is gathered incidentally by Human Terrain Teams, Atmospheric Teams, Female Engagement Teams, Civil Affairs Teams and the like, and is primarily utilized by operational commanders within the context of kinetic kill or capture operations. Currently, white information compiled by these teams is rarely shared outside of the immediate reporting channel and as a result is not available to provide context or shared situational awareness. This is not caused by willful neglect, but most often stems from a mixture of insufficient remote communications capacity, ‘stove-piped’ reporting channels, and high turnover rates for deployed teams.² This problem is not unique to military-affiliated teams as many NGOs voice similar concerns that their deliverables go no further than a ‘tactical-level’ when passed to the next echelon.

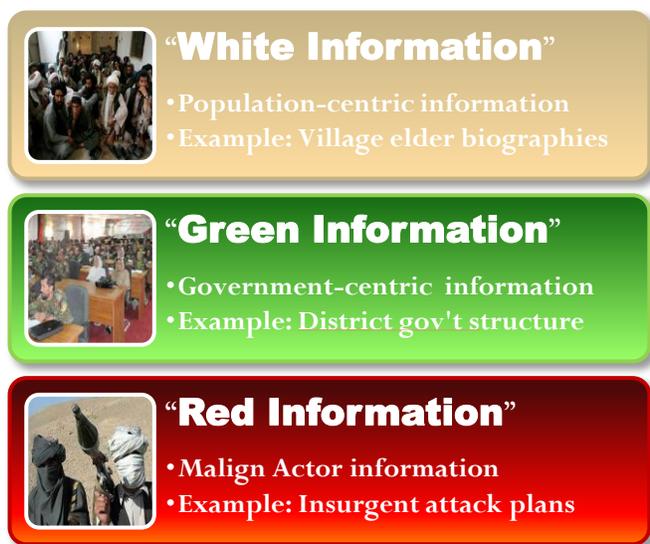


FIGURE 1: COLOR-CODED INFORMATION EXPLAINED

UnityNet is a new, open-source model that now exists to enable the gathering (and sharing) of white information. This model becomes, in essence, a sensor for white ISR. The basis of the UnityNet model has been tested and proven to function successfully in both Jalalabad, Afghanistan, as well as in Haiti, and is reproducible across the globe. This model has the potential to be exceptionally useful in recognized unstable areas of the world as a pre-emptive, totally non-kinetic counterinsurgency tool. The guiding concept of UnityNet is based on the assumption that an informed population and a cooperating group of informed international assistance organizations operating in an open, information-sharing environment will serve to pre-empt and minimize the drivers of conflict in third-world populations.

The Jalalabad Pilot

The genesis of the proposed UnityNet Model began in Nangahar province of Eastern Afghanistan in a PVO that, in conjunction with the Rotary Club, sought to connect Jalalabad with San Diego as “sister” cities in order to connect doctors and other professionals for health and civic projects. The result of this

¹ The information that commanders acquire from working with (and around) host-nation government organizations is termed “Green” information. In many conflict situations throughout the developing world, local governments are often part of the problem and not the solution for a variety of reasons (e.g. failed state, gov’t-in-exile, rebel group coups). While UnityNet is certainly open to governmental participation, the primary mission of the model is to synergize white data from willing civilian organizations.

² To be clear, there are several databases that do exist wherein this information can be stored; however, the issue is not that a repository for this information does not exist, but that this information rarely makes it to the migration stage in the first place.

effort has been an incredible, organically-grown, open-source model for information sharing. The pilot program in Jalalabad provides internet connectivity and an information sharing repository to NGOs, PVOs, medical services, schools, local Afghan community groups and locals citizens. It connects organizations and people in Jalalabad to the World Wide Web and global partners in a way that, to the authors' knowledge, has never before been attempted in the international aid community.

The framework for the Jalalabad pilot began as a single, satellite internet connection in a former United Nation Operations guest house frequented by many of the NGOs that worked in the area surrounding Jalalabad. One PVO, in an attempt to connect Afghan medical doctors with other doctors throughout the



FIGURE 2: A FAB-FI TRANSMITTER/RECEIVER

world via the internet, extended the internet to the Jalalabad hospital using a homemade, mesh network comprised of several point-to-point connections (nicknamed “Fab-Fi”) that were developed by the FabLab at Massachusetts Institute of Technology. The point-to-point connections use a very low-tech, but effective, wooden parabolic shape covered with chicken wire, and used a commonly available wireless router at the focal point to beam a signal across to a receiving Fab-Fi access point several kilometers away. The local Afghan “techies” have since organically expanded the mesh network from the first point at the Jalalabad hospital to over 50 nodes maintained by local Afghans. The Fab-Fi’s simple, materially agnostic design has made it relatively easy to reproduce these nodes out of a variety of locally available and inexpensive building materials.

Concurrently, the residents at the guest house and other ex-pats taking advantage of the free wireless service at the guest house realized the advantages of sharing experiences, information and data, and began to share electronic documents using a common, portable drive. Utilizing thumb drives, people could upload and download documents at will. At one point the guest house lease-holder offered a “Beer for Data” program³ that encouraged a concept he called “radical inclusion” for data sharing. The result has been astounding - NGOs in the area now coordinate their activities to maximum effect. Local and district governments are now provided information about their areas that was previously unavailable, and local hospitals and medical clinics are connected to the global medical community.

The FabLab further provides a perfect illustration of how open-source sharing can produce very tangible benefits for end-users – NGO, community organizer, and US Government alike. In Jalalabad, released imagery is shared in an open and transparent environment for NGOs, PVOs, and others to download for their own purposes and projects. Two of the NGOs utilized the imagery by adding geo-location data for micro-hydro power sites and rural health clinics, respectively. They returned that imagery as an improved product for use by all who may have need for this information. In this instance, local and district governments utilized the products for their planning purposes. This process minimizes the potential for unnecessary duplication of effort by participating organizations and provided value to the local government that had neither the resources nor the capability to create these products. Students, district governments, virtually anyone, can find data that can be of use, and improved for a more complete

³ The “Beer for Data” program that the guest house ran incentivized the sharing of information amongst expats by offering one free beer per visit to any patron who provided some sort of data file on projects that they, or others, were working in the area. This program was so successful that the guest house lease-holder ended up with over 1terabyte of data ranging from irrigation project plans to educational training curricula.

picture of the local area's development, infrastructure, economics, and demographics. Imagery, in this instance, becomes a force-multiplier through cooperation, integration and information sharing. This model is often referred to as "crowd sourcing" because it leverages the law of large numbers within a system that views information as open, transparent and available without reservation, control, or structure in order to achieve goals that would otherwise be too cumbersome or expensive for a small group to accomplish on its own.

The Jalalabad experience of bringing people and technology together in an open-source process model has evolved into a force that has brought significant change to Nangahar province. It is this experience that we propose to emulate in the future form of UnityNet.

UnityNet: Open-Source at the Heart

UnityNet is built around the concept of the open-source model. Open-source describes practices in production and development that promote access to the end-product's source materials. It exposes a product for both use and development in a free and open environment. That product might be a software application, a report, an image; anything that may have value to others. As actors in this model add value to existing products through modifications and upgrades, they in turn create an improved or value added product available for others to use or modify freely for their own needs.

The open-source process model of UnityNet is enabled by a complimentary technology solely based on open-source and freeware, allowing for crowd-sourcing technological improvements at a very low cost and low risk. Open-source software allows anyone to leverage information through common open-source standards, reducing the tendency to create proprietary products unusable or unaffordable by others. As this concept is operationalized in developing areas of interest, the UnityNet node can be "turned over" to local nationals for sustainment without the need to release GOTS/COTS software with the subsequent licensing, subscription, derivative proprietary rights, and/or other releasability issues.

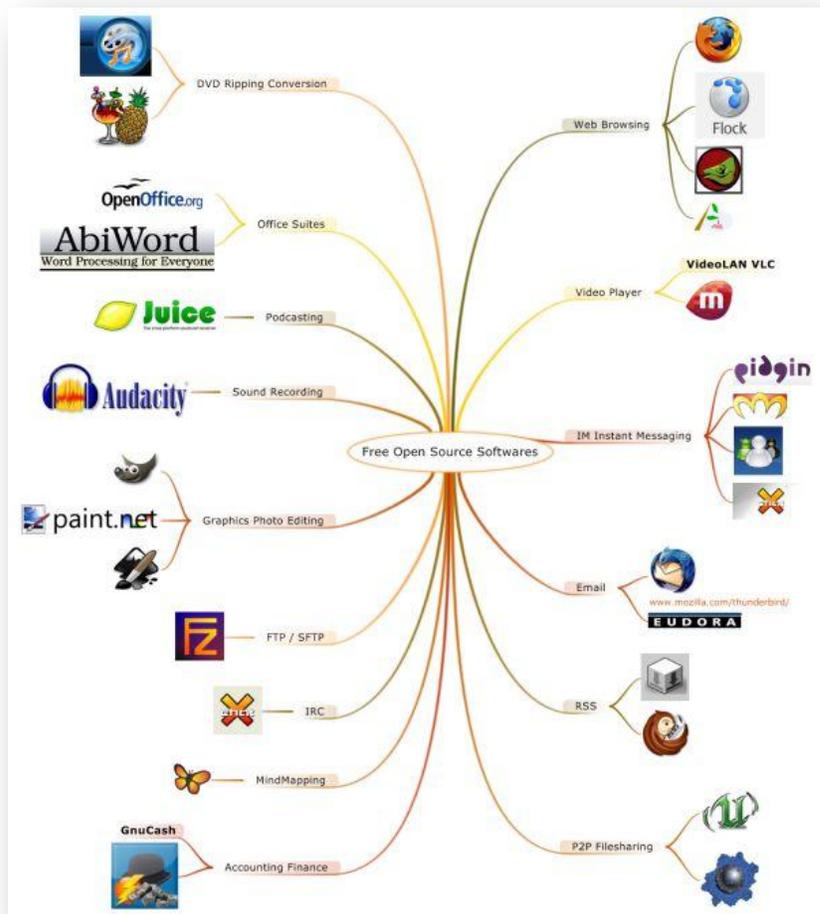


FIGURE 3: COMMON OPEN-SOURCE SOFTWARE

The latest example of a UnityNet-like concept being used occurred during the recent earthquake relief effort in Haiti. SOUTHCOM released P3 Orion imagery of Haiti to the PVO, GeoCommons, who then used the imagery for a mass SMS “crowd-sourcing” operation with locals and aid volunteers to locate and map Indigenous Displaced Persons (IDP) camps, trapped victims, and assessments of damage. As GeoCommons added value through an informal, but very effective reporting system, utilizing volunteers with GPS cell phones, SOUTHCOM was able to use the crowd-sourced mapping data and imagery for cleared transit routing, and emergency relief efforts.

UnityNet: Concept of Operation

The proposed UnityNet model seeks to promote information sharing by enabling communication and collaboration at the individual level and expose ground truth information that can be leveraged to stabilize areas of instability. It will encourage a self-sustaining, open-sharing environment serving the dual-purpose of connecting disadvantaged populations with the global community, while providing an open-source data-sharing repository of value-add products for local initiatives.

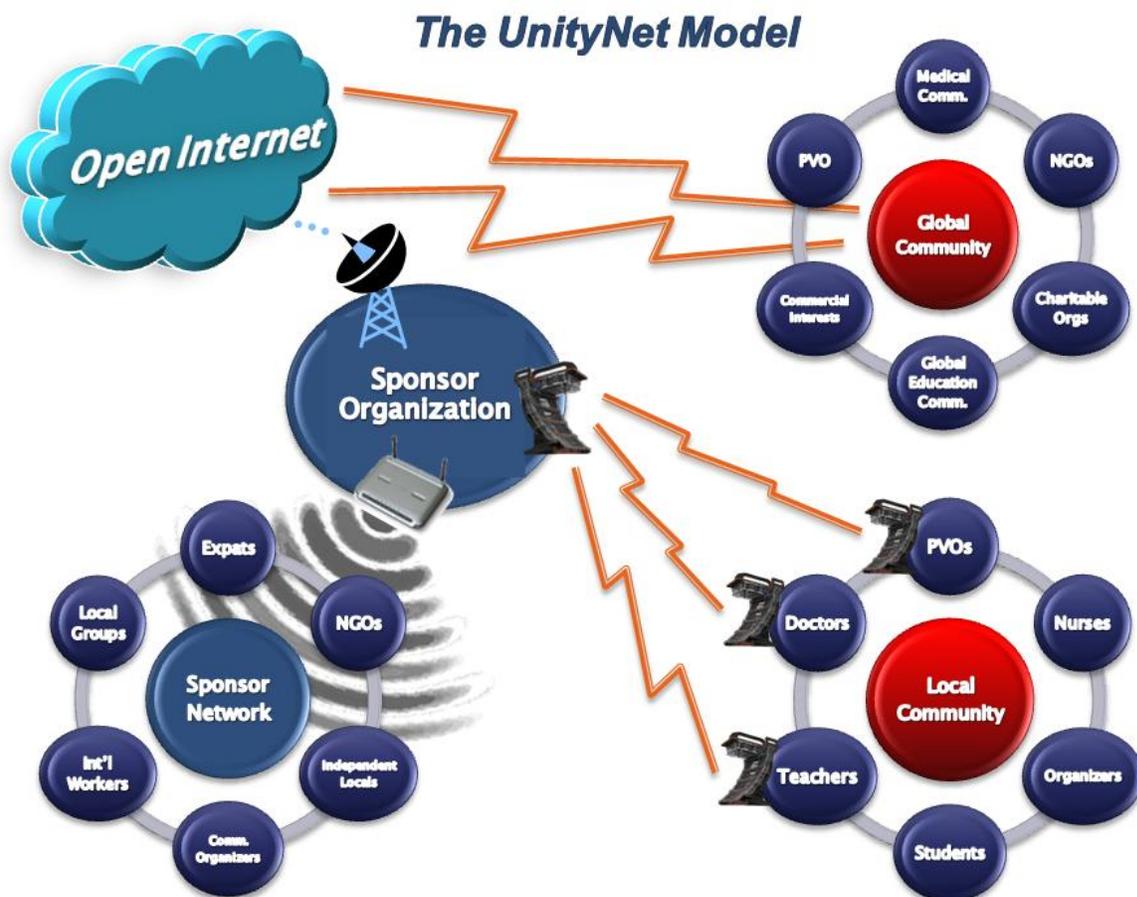


FIGURE 4: UNITYNET CUSTOMERS

The model seeks to extend stability operations doctrine as a preemptive counterinsurgency strategy, rather than being coincident with or following kinetic COIN operations. The underlying tenant of UnityNet is that open information, flowing and accessible on the internet, empowers the population and those assisting the population through "radical inclusion," bypassing predatory governments, local powerbrokers

and external international actors seeking control. That is to say, an informed population, supported by informed and cooperating international organizations, is more likely to make the best choices for their culture, their self-governance, and their future.

UnityNet: Strategic Intent

The overall strategy of UnityNet is to seed and enable host-nation, open-information sharing environments in areas of US interest around the world to expose grassroots population-centric, socio-economic and governance issues not readily accessible to military commanders or civilian policymakers seeking to execute development programs, stability operations or counterinsurgency doctrine. The goals of UnityNet are:

- Extend an information sharing environment to “other-than-US-Centric” organizations (e.g. Provincial Reconstruction Teams, NGOs, PVOs, charitable organizations, religious organizations, community groups, universities, schools, hospitals, medical clinics, and general populations).
- Seed an open-source technology infrastructure that local nationals can sustain, enabling the capability to spread “virally.”
- Create a ‘white ISR’ platform capable of passively gathering grassroots, population-centric data within a system that is transparent to all parties involved, and provides value-added products to its users.
- Operationalize a quickly deployable, low-cost, low-risk, repeatable environment useful in other areas where the US has interest in stability operations or crisis management operations.

UnityNet: Operational Overview

UnityNet will be operationalized as a tailored, “fly-away” kit, and packaged to be deployed rapidly into areas of interest where international organizations, governments, and populations have communications that are disadvantaged. As in business, the package deployment locations selected are critical to successful seeding of the information sharing environment. Willing sponsor organizations will be selected

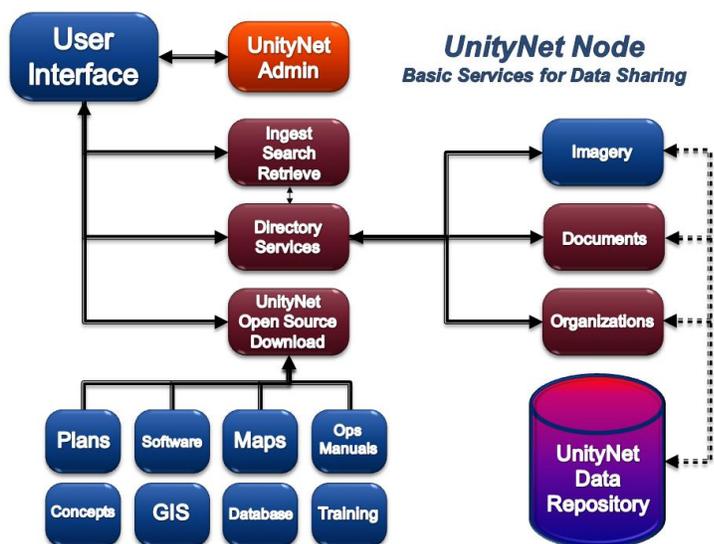


FIGURE 5: UNITYNET DATA SERVICES

based on centrality of location and availability of services (i.e. power, common access space, security). Once setup is complete, the sponsor organizations will become virtual kiosks of internet access. Internet connectivity will be acquired locally, if available, or by satellite if not readily available. The “fly-away” kit will make use of a mix of commercial off-the-shelf software (no custom or proprietary components) and open-source software packaged in a modular, small-form-factor system that will provide the plug-and-play capability necessary for initial “light up” of the internet presence in the specified area. Additionally, the kits will include pre-loaded, releasable imagery of the deployment area, and “How To” videos or podcasts concerning the functionality and usage of the UnityNet tools. The sponsor organization will be expected to announce the availability of free, wireless internet, encourage face-to-face social and business meetings to provide opportunities to share experiences, trade electronic documents and upload/download available information within the UnityNet environment.

To spread this environment “virally,” local nationals with sufficient technical acumen will be given training and plans on how to build low-tech parabolic “repeater” antennae to grow the point-to-point mesh network to other locations wishing to connect to the internet and the UnityNet open-source information sharing environment.

Training will be provided to the sponsor organization to ensure a full understanding of the open-source process, sustainable technologies, open-source software, and the UnityNet common operating principles. Funding for internet access, initial technology installation, imagery, training and operational support will be provided for one year with options to extend should operation remain in the best interests of the US.

UnityNet: Benefits

The underlying principle of free and open access to the internet with an open-source information sharing environment can be a counter intuitive concept for intelligence and IT professionals concerned with security and releasability of information. However, imagination and risk management are not mutually exclusive. The UnityNet model proposes revolutionary goals through evolutionary steps. Each UnityNet node represents a controlled, low-cost incremental journey as a local stand-alone innovative project, which is connected and evolving globally.

The benefits accrued vis-à-vis stability operations and COIN doctrine are:

- **Promotes stability in areas of conflict to reduce the need for COIN intervention by external actors; becomes a sensor for shared situational awareness before the tipping point of violence**
- Innovation that is self-sustaining and focused locally, but easily reproducible and extensible across the globe
- Creates an alternative media outlet through social networking
- Provides access to information otherwise unattainable from populations suspicious or afraid to cooperate with teams perceived to be actors in a conflict
- Provides access to “micro-information” about an area’s people, topography, economy, history, religion, and culture, enabling knowledge of every village, road, field, population group, tribal leader, and ancient grievance in a given area, without any offending foreign presence
- Low-risk, low-cost implementation; if the model fails in a particular area, the overall global model is not at risk
- Self-sustaining following Full Operating Capability (FOC)
- Wider aperture for gathering information, inclusive of all willing participants, from the local population to global participants
- Non-intrusive, open data harvesting with benign backup and recovery
- Builds partnership capacity in areas where there is very little US presence
- Developed social networks can become the key to self-governance and action from the bottom up
- Focuses on real problems facing populations that can enable a synergistic response from the US, the international community, local governments and local nationals, who can all have the same basis of understanding

UnityNet: Risks

- Powerbrokers may recognize that information is power and will aggressively attempt to control or pre-empt propagation
- Governments may attempt to limit access, or limit the free and open exchange of ideas.

- Sponsoring organizations, if not carefully selected, may have their own goals and objectives that inhibit “radical inclusion”
- Information overload may exceed technological capacity to store and disseminate data, information and knowledge
- Malign actors will have the same access as any other user

UnityNet: A Call to Action

We have come to a critical point in our contemporary history in which the United States cannot be ambivalent towards the issues of stability within other countries, and must proactively and preemptively engage before conflicts arise. Having a knowledge base of population-centric data well before the drivers of conflict grow to the breaking point gives the US military and civilian agencies more options to prevent conflict before having to respond to a counterinsurgency with military force. As a sort of ‘open-net’ equivalent of Voice of America, UnityNet will also try to serve the long-range interests of the United States by facilitating direct communications and cooperation with the peoples of the world. The globalization of communications and economics that has occurred in the recent past has made the world a much smaller place. What has been created now is a world in which each state, regardless of size, can disrupt global political discourse because of its own instability. Examples abound in our everyday news reporting of instability that could be mitigated by synergized organizational responses:



FIGURE 6: CONSEQUENCES OF INSTABILITY

Afghanistan’s continued environment of active insurgency; prolonged humanitarian crises in Haiti stemming from catastrophic natural disaster; political unrest in Kyrgyzstan and Thailand that threatens domestic stability because of limited governmental effectiveness; increasing ideological and religious radicalism in Latin America that is rapidly becoming a major funding source for international terrorist organizations; even the rise in piracy in the Gulf of Aden is directly attributable to the lawless instability that Somalia struggles against daily. Furthermore, in these areas denied to the USG, there is precious little “on-the-ground” understanding of what popular perceptions are within a country or locale that could be used to provide aid or assistance to quell instability without the use of force.

UnityNet has the rare opportunity to become a game-changer within the stability operations framework as an early warning ISR platform giving both DOD and civilian organizations the situational awareness to synergize groups and projects in a way previously unimagined. The UnityNet platform will maintain the neutrality that these organizations desire, while enabling global communications with all who desire to press forward in the betterment of those states that are so desperately need the collective assistance of the willing.

In closing, open information enables people to act in support of their own stability. Whether they choose to act or not will ultimately be their own prerogative, but with UnityNet in place they will at least have the knowledge and insight made available to them to give them that edge to take the initiative towards lasting stability for themselves without the need for foreign intervention.

Knowledge = The Power to Act