BeaconRelief™

BeaconRelief™, developed by RTI International, improves situational awareness for disaster response by providing auto-generated maps and real-time tracking capability in a self-contained, highly scalable, ruggedized, low-cost platform. BeaconRelief™ offers preconfigured sensors for ease of deployment and a user-friendly interface that allows relief workers to quickly and easily adapt it to all-hazard environments with minimal effort.

The Opportunity

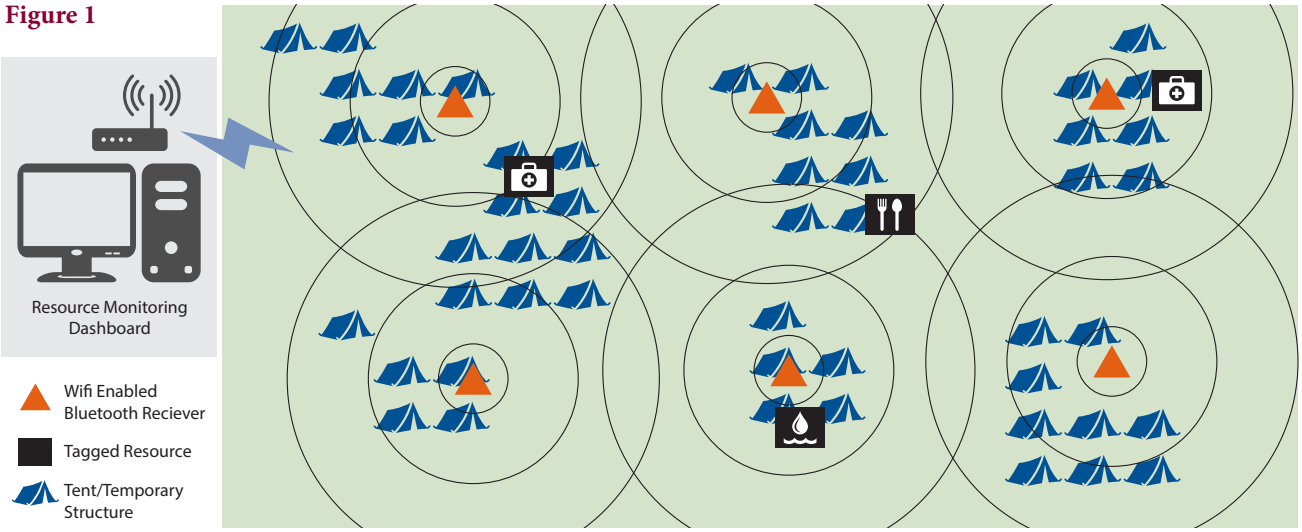
Several recent large-scale disasters have resulted from civil unrest, disease outbreak, and natural events. Mitigation of these incidents has required the delivery of support at an unprecedented scale. Disaster relief experts have identified an urgent need for increased technological capability to improve the provision of humanitarian logistics, including (1) more accurate, real-time situational awareness; (2) supply chain management; and (3) monitoring individual responders and displaced individuals with health concerns. Although methods for disaster mitigation in naturalistic settings are well established, they are nearly exclusively reliant on human resources due to cost and technical requirements that impede their wide-scale use. Low cost, low burden, scalable approaches do not exist for the improvement of humanitarian logistics. Therefore, responders must rely on personal ingenuity and decision-making based on inputs of low temporal resolution and fidelity. This practice undermines disaster preparedness efforts by governmental or relief agencies, efforts to evaluate improvements to crisis policy, and communities' ability to address the myriad of operational challenges associated with initial response and ongoing surveillance.

In a recent article, Raj Kumar discussed how technology can aid humanitarian organizations in their response to refugee crises; he also highlighted the importance of inter-organization collaboration and situational awareness. Mr. Kumar envisions a "just-in-time approach to logistics" and a way for "data to be stitched together automatically so that humanitarian agencies and governments could instantly see what's happening and who is doing what." BeaconRelief™ is a step toward this reality.

Technical Solution

BeaconRelief™ provides a self-contained, highly scalable, low-cost platform that can be deployed by disaster relief personnel with minimal effort to all-hazard environments. The creation of our system addresses a clear market need: low-cost, low-burden, objective measurement of humanitarian logistics operations that provides actionable data back to stakeholders and that has the potential to be deployable at large scale. Our approach capitalizes on a burgeoning consumer wearable device market that has resulted in a variety of low-cost, Bluetooth-enabled devices. It also leverages low-cost wireless connectivity solutions (e.g., 'mobile 4G hotspots') in conjunction with open-source software and low-cost computer platforms—such as Raspberry Pi—to create temporary local area networks

Figure 1



through which data can be collected and uploaded to the cloud. This centralized database stores the positions and movements of the various camp resources in real time.

Figure 1 depicts a high-level schematic of our approach; the basic components of BeaconRelief are

- A gridded network of receivers (Raspberry Pi units)
- Beacons (iBeacon or the Eddystone standard)
- High-throughput NoSQL database
- Communication API
- Streaming trilateration algorithms
- Web-based dashboard for monitoring and analytics.

The Need for BeaconRelief™

Relief workers face varying challenges in different camps; BeaconRelief™ offers a user-friendly interface that allows responders to quickly and easily adapt the solution to specific local contexts. Partnering with relief workers in the field will allow us to enhance the usability and effectiveness of BeaconRelief™ based on real data originating from existing deployments. These data will also serve as a guide for potential customers because customers can match their needs with existing use cases.

Presenters at the 2015 Humanitarian Technology conference highlighted the need for the "ability to map camp dynamics" and argued that "maps can serve as the graphical embodiment of SA." They also stressed the fact that current technology does not provide this mapping and SA capability. BeaconRelief™ provides such a solution.

More Information

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