SafeZone

Whitepaper:

Bluetooth Smart *transforming security, safety and emergency response*

criticalarc

Unlock the power of Bluetooth Low Energy devices to boost safety

Executive summary

Since the launch of global positioning systems (GPS), location intelligence technology and data services have made major strides to improve personal safety for people on the move. But while GPS has long been the de facto standard for outdoor positioning, until recently there has been no widely accepted system for precise indoor positioning. Consequently, in multi-level buildings, underground locations and environments where GPS connectivity can be unreliable or lack precision, delays in mobile response and detection could leave individuals more vulnerable to risk.

However, with the relatively recent emergence of the Bluetooth Low Energy Standard (Bluetooth Smart), this is all set to change. Bluetooth Smart is the low-energy version of Classic Bluetooth that is focused on operating with today's smartphone technology. It can be deployed rapidly at low cost, is easy to configure, highly scalable, requires minimal infrastructure and has very low energy requirements. As a result, it is opening up opportunities to create high-performance, low-cost applications in locations where standard positioning and notification technology is unfeasible, unreliable or not economically viable.

In this paper, we'll explore why Bluetooth Smart's potential to transform security, safety and emergency response services in indoor locations is attracting the attention of health and safety professionals worldwide.

Context and challenges

In an uncertain world with increasing threats and fierce economic pressures, effective risk management is a priority for every organisation, to prepare for the unexpected and to ensure business continuity in the event of any disruptive incident. Organisations are seeking more effective, efficient and affordable ways to maintain robust safety and security measures for users across all of their enterprise domains.

From high-rise office and accommodation towers to monolithic hospital buildings, transport interchanges, sporting venues and retail malls – above and below ground – organisations have a *duty of care* to ensure their customers' safety.

This is being driven by multiple factors, including the need to:

- ensure major incident readiness;
- maintain a rapid response capability;
- enable regulatory reporting and compliance;
- enhance the customer experience;
- build & maintain brand credibility; and
- strengthen competitive advantage.

Smartphone-enabled safety

The better able an enterprise is to ensure the stewardship of those in its care, the better equipped it is to build trust and sustain a positive reputation. Integrating risk management, WHS compliance, emergency procedures and crisis communications capabilities with routine security operations and training can significantly reduce personal – and corporate – vulnerability. To achieve this, forward-looking organisations are taking advantage of ubiquitous smartphone ownership and location-based intelligence services to offer end-users improved safety and emergency response protection via their own smartphone.

The latest cloud-based distributed command and control (DCC) solutions enable health and safety teams to leverage the prevalence of smartphones as an integral part of their facility's security operations. Designed to multiply the return on their existing investment in fixed security infrastructure and human response resources, these solutions can dramatically improve incident response without further capital investment. By combining a comprehensive situational awareness system for corporate response teams with a smartphone app for users, the solutions extend the reach of first responders with transformative effect. While the best solutions use multi-layered communication channels, including Wi-Fi, mobile data and satellite communications to maximise connectivity, resilience and

performance in complex and sometime remote environments, indoor positioning has, until now, been something of an Achilles heel. Hence, the buzz about Bluetooth Smart's potential to enhance the quality of smartphone-based safety solutions.

Spotlight on Bluetooth Smart

Originally developed to support booming demand for Internet of Things (IoT) connectivity, a completely new version of Bluetooth was released in 2010. Branded Bluetooth Smart, it is also known as Bluetooth Low Energy, Bluetooth LE, BLE or Bluetooth Version 4.0+. It is a wireless communications technology that overcomes the key challenges of allowing always-connected devices to be deployed at low cost by minimising their energy usage so that they can effectively run on battery power for years. This creates opportunities to deploy arrays of low-cost devices to solve a range of problems, including addressing the confounding problem of locating people and equipment in a reliable and accurate fashion in indoor and underground environments.

Key benefits for use of Bluetooth Smart devices for indoor positioning include:

Energy efficiency: Power consumption is radically reduced by 50-99% of Classic Bluetooth, meaning that a Bluetooth Smart device, such as a beacon, can operate for years powered by a single coin cell battery, so no fixed power outlets or extra infrastructure is required. Similarly, by adopting a lighter communications footprint and through advances in mobile device design, the battery impact on paired devices has been massively improved.

Smartphone compatibility: With a similar communication range to Classic Bluetooth, Bluetooth Smart is supported by most mobile operating systems including iOS and Android ensuring its suitability for smartphone applications and multi-vendor interoperability.

Outstanding precision: An indoor positioning system utilising arrays of Bluetooth Smart Beacons, and the latest smartphone and cloud services can deliver accuracy of a few meters with high reliability – including the ability to pinpoint a signal source to a specific level of a multi-storey building – which is enough to facilitate indoor navigation and tracking of mobile devices.

Low-cost: Because beacon hardware and running costs are low, even a very large indoor network can be cost effective, quick to install and simple to operate.

Scalable: There are no limits to the number of devices and people who can be utilising this technology simultaneously. This allows coordination of potentially thousands of people in real time, thus giving large organisations the ability to handle any scale of incident.

Speed: A Bluetooth Smart-based indoor positioning system can be configured to allow smartphones to calculate and transmit their multi-storey geo-location in less than a few seconds. This is significantly faster than Classic Bluetooth, Wi-Fi and GPS – which is critical in real-time response and tracking situations where every second counts.

Stringent security: Rigorous industry-grade security with 128-bit AES data encryption ensures that the integrity of Bluetooth Smart can be relied on by safety and security teams.

Flexible architecture: The versatile nature of the development framework makes it easy to create novel applications with innovative features. This allows any investment in Bluetooth Smart Technology to be reused across many business areas.

Enhance safety from towers to tunnels

Industry has been talking about intelligent or smart buildings for some time. However, after years of searching, Bluetooth Smart has emerged as the best-fit technology to support widespread uptake of smartphone services that depend on near-instant proximity detection and location awareness. It can therefore take smart building functionality to a new level by enabling the deployment of services that haven't always been feasible or commercially viable with other indoor positioning technologies alone, whether Wi-Fi-based or using dedicated ultra-wideband radio devices.

A positioning system utilising Bluetooth Smart beacons to deliver almost immediate 3D position can be

invaluable, particularly for locating individuals in any enclosed locations where the risks to individuals may be higher than average yet where standard network coverage and connectivity is less than optimal. Typical sites include multi-level buildings, carparks, high-rise towers, campuses, hospitals, leisure venues, prisons, retail centres, manufacturing sites, tunnels, basements, transport hubs and transit systems.

From proximity-based information services to lone worker monitoring and personal emergency alerts, Bluetooth Smart is opening up opportunities to deploy value-added features that transform reporting, ensure regulatory compliance and improve emergency planning, for example, to support evacuation and mustering. This capability can also be linked to core HVAC building utilities such as heating, lighting and air conditioning to enable authorised smartphone users to automatically activate these functions as required.

SafeZone and Bluetooth Smart Devices: a powerful security team

In addition to solving the perennial problem of locating people in indoor environments, when paired as a peripheral with a smartphone-enabled safety solution, Bluetooth Smart wearable devices and can strengthen the delivery of safety response services in a variety of situations.

SafeZone™ from CriticalArc is a leading example of how the mobile DCC approach is transforming personal security worldwide. As a cloud-based managed software service it shares locational and operational intelligence between response team members and the control room to provide a complete situational view. Sharing all relevant incident data in real time gives responders the intelligence they need to coordinate a fast, decisive response to any type of incident.

SafeZone's Smartphone app puts a help point or panic alarm in the pocket of every user, enabling them to easily raise an alert or request help direct from their own phone – without the need for a dedicated personal panic device or to install a wired panic alarm button. Everyone who downloads the app registers their basic personal details, ensuring that when they activate an alert the security team automatically receives the right information about their precise location, identity and any special medical needs. This also overcomes language issues and other barriers to rapid incident reporting.

Using a subscription model, SafeZone offers numerous advantages to enterprises without the ties and costs of traditional licensed software or owned-infrastructure. The model assumes the vendor takes all responsibility for managing, operating and supporting the IT environment as well as securing the confidentiality and availability of user data. Organisations thus need no additional dedicated in-house IT infrastructure or resources, enabling rapid implementation within days. Maintenance, upgrades and updates are included and can ensure ongoing compliance with regulatory requirements.

Extend enterprise safety

Pairing SafeZone and Bluetooth Smart based technology creates a low-cost, high-value model that offers enterprises an agile, accurate, user-friendly and cost-effective approach to better meet their duty of care and ensure mandatory HSE compliance.

In a currently available example, a one-click SafeZone duress button that negates the need for the user to first unlock their phone is a major benefit for people with limited mobility; in situations where discretion is vital; or where the severity of risk makes split-second speed critical. This feature is highly attractive for organisations with a mandatory requirement to mitigate risk for vulnerable lone workers, or those who engage with others in tense or high-risk situations that can quickly escalate to violence – replacing costly, inconvenient and unreliable static networked panic buttons - at a fraction of the cost.

Utilising Bluetooth Smart technology and acting like a dedicated remote control, the duress button triggers an immediate alert to the whole response team, along with user profile data, precise location and details of any special medical needs. The response team is then fully equipped to take immediate action or escalate the alert to the appropriate third-party emergency services, as is most appropriate.

The end result is faster responder activation, which inevitably results in better outcomes and more assured worker safety.

Safety plus…

While meeting health and safety requirements could be the catalyst to install a Bluetooth Smart beacon infrastructure or Bluetooth Smart enabled devices such as wearable one-touch duress alarms, once implemented the Bluetooth Smart infrastructure can be multi-purposed to support other applications for no additional cost so further improving the potential return on investment.

There is broad potential for Bluetooth Smart to support novel proximity-enabled applications across a wide range of markets including personalised information services, advertising, sales promotion, user engagement and entertainment. For the first time, introduction of technology on the basis of providing greater security and safety services can actually add value to the rest of the business. This cross-organisational value can greatly assist in justifying investment in such technology.

Key benefits in brief

Ideally suited to a wide range of safety applications and scenarios, the combination of SafeZone and Bluetooth Smart based technologies can deliver multiple benefits:

- Enhance the enterprise experience for your users
- Reduce the financial barriers to implementing better safety across the enterprise
- Extend safety to previously hard-to-reach indoor locations from towers to tunnels
- Ensure real-time visibility of at-risk individuals in designated safezones via check-in features
- Enable readiness for everything from personal assault to full-scale critical emergency
- Make it easy for users to request help via real-time, geo-located single-button alerts
- Create the capacity for targeted mass-communication to multiple audiences
- Improve operational efficiency and reduce corporate risk
- Capture comprehensive data for full reporting, compliance and continuous improvement
- Ensure business continuity while keeping costs and administration under tight control
- Demonstrate commitment to duty of care in order to safeguard trust, credibility and reputation.

About CriticalArc

A global technology company, CriticalArc designs and delivers the distributed command and control solution, SafeZone™, which is revolutionising management of Safety and Security across complex environments. Deployed in hours, SafeZone combines complete situational awareness with the mobile control needed for an efficient and coordinated response to incidents from every-day processes and events through to full-scale emergencies. Headquartered near Sydney, Australia, CriticalArc has offices and operations in the USA, UK and Middle East providing an international delivery capability and reach.

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