



The Compass

The impact of software-defined radio on C4ISR

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Evolving software-defined radio (SDR) technology continues to have a significant technological impact on operations for C4ISR. According to recent [research](#), the global C4ISR market is estimated to be worth approximately \$133 billion by the year 2020.

One of the main factors driving SDR in the defense market is its interoperability and integrated solutions. The defense market is worldwide and includes major western markets like the United States and Europe, but also transitioning markets from countries such as Australia, Brazil, Indonesia and Turkey.

Defense market challenges

The outlook for the international defense market is challenged by the changing warfare environment and the need to achieve interoperability between systems. The communications platforms currently used by military personnel are arduous to access and manage – not to mention the hardware being operated on the battlefield is both substantial and large.

Officers on the ground have to labor to operate multiple devices utilizing different software architectures in order to communicate. As a result, effective communication and response can be compromised.

In order to keep pace with the ever-changing military technology landscape and operation demands, an enhanced integrated platform is essential to provide highly interoperable and versatile communications.

These platforms will also strengthen the response for governments to react swiftly to global events.

What makes software-defined radio the ideal solution?

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Modern warfare is dramatically different to how the military operated during the Cold War. Military personnel on the battlefield now are connected to command centers in real time, collecting and sharing situational awareness data.

As equipment purchasing processes in the military take time, building integrated C4ISR is unfeasible at present. In order to work with current systems effectively, SDR becomes the ideal solution as it is highly adaptable, interoperable and secure. This platform not only enables performance, reliability and scalability, but also core requirements such as flexibility, modularity and portability. This makes it easy to integrate multiple communications devices to function on a single platform. That means the future of C4ISR is smaller integrated systems with a common single interface.

With SDR, integration with government proprietary hardware and software is possible as solutions can be combined to provide synergistic end-to-end support. With budget cuts on the horizon, SDR also becomes the most cost-effective solution to provide military personnel on the frontline a conclusive advantage to manage evolving threats.

Integrated C4ISR with SDR

A key advantage in building an integrated C4ISR with SDR is that it enables a wide operating frequency. With high-performance SDR platforms, manufacturers can develop an enhanced integrated C4ISR that has the ability to conduct protocol translation.

SDRs are designed with multiple inputs and outputs, which allows for seamless integration with current systems. Further, as operations are enabled through software, with a flexible enough hardware platform, there is no longer a need to modify the hardware portion. For example, the full duplex transceivers offered by Per Vices operate on a frequency ranging from DC to 6GHz and are built with a highly stable internal reference clock (+/- 5ppb) and a dual SFP+ backhaul providing up to 20Gbps transfer speeds.

SDR will also enable significantly enhanced deterministic phase coherency among all receive channels with flexibility to modulate or demodulate different wireless signals and protocols, as well as multiple receive and multiple transmit chains.

Whether the defense market chooses to change their communications systems with a major overhaul or by updating current technology, SDR has a significant role to affect either outcome.

Stephanie Chiao is the product marketing manager at Per Vices Corp., a company specialize in developing high-performance software-defined radio (SDR) platforms.



About [Stephanie Chiao](#)

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