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Introduction

Information Superiority (IS) is essential to protecting and defending UK nationals from various threats. Whereas the utility of platform capabilities such as warships, submarines, and military aircrafts provide a very visible role in enhancing the nation's security, IS capabilities, whilst less visible, are the most critical capabilities in achieving the UK's defence and security goals. This paper, written by Intellect, will illustrate how these technologies benefit the UK's defence and security operations. Intellect is the trade association for the UK technology Industry, representing around 800 companies across the information technology, telecommunications, and electronics sectors. Its members include the strategically important companies active in the defence and security markets of interest to the UK.

IS provides the foundation for the UK's intelligence and information capabilities. These capabilities form the eyes, ears, and nervous system to the Ministry of Defence's (MoD) military operations. The UK's success in defending and securing the country from current and future threats depends on the country's ability to understand its adversaries' movements and intentions and the environments that they operate in. Gaining this understanding means that UK Armed Forces must be capable of continuously collecting (sense) critical data, interpreting what this data means by transforming it into useful and usable information or intelligence (understand), communicating this information to those who need it (share), and exploiting this information to make better informed decisions (decide).

Tangible benefits arising from various IS capabilities are evident in the context of the UK's current and likely future operations. For example, when conducting counter-insurgency operations, a strategy employed by UK forces in Afghanistan, information is the key capability for determining success. The UK must understand the operational environment better than the enemy, i.e., achieve information superiority. Industry's IS capabilities also play a critical role in ensuring the security and resilience of the UK, its public and private sector, and its critical national infrastructure. In this capacity, IS is critical in policing and emergency response activities.

By investing in these capabilities, the UK's defence and security operations benefit from

increased effectiveness in the precision of action and the ability to conduct joint operations, which often lead to reduced fratricide and improved survivability both of defence and security forces and equipment. Therefore, IS capabilities allow the UK to defend and secure the nation at a smaller cost, both in terms of money and the loss of life.

Sense

The technologies underpinning IS provide military and civilian personnel with the ability to sense what is occurring locally, in the surrounding region, and beyond. This is achieved by a wide range of sensor types, including infrared, visible, and radar mounted on a range of different platforms including manned and unmanned systems in all three domains (land, air, and sea), as well as human intelligence. In the context of current operations in Afghanistan, these surveillance systems can protect the UK's Armed Forces and equipment by detecting if soil has been disturbed – one indication that an Improvised Explosive Device (IED) has been deployed.

By collecting visual and signals intelligence and surveillance data, UK forces can monitor enemy locations, movements, and intent, obtaining a clearer picture of the physical aspects of the operational environment, which can be shared with other UK and allied units. Improved understanding of an adversary and surroundings helps mitigate the risk inherent in military operations and provides significant military advantage on the battlefield. Systems such as UAVs and hi-tech sensors in space can collect this data without putting service men and women in harm's way.
Electronic technologies used by the Armed Forces for eavesdropping on enemy conversations are available to other government agencies tasked with monitoring threats to homeland security. By legally intercepting visual and signals intelligence, security agencies can collect data that lead to early detection of terrorist plots.

Understand

IS capabilities also transform collected data into a useful and usable form. Understand capabilities such as visualization and social network analysis allow the UK's armed and security

forces to begin overcoming the technological challenge of bringing together information derived from a number of sources. These capabilities provide the armed and security forces with a clearer picture of hostile actors' location, identity, and intent.

In the context of the UK's counter-piracy operations off the coast of Somalia, signals intelligence systems on board a naval ship can intercept a conversation on an unidentified ship, which can determine the intent of those on board. This allows the captain to make a fully informed decision on the appropriate course of action.

By sorting through and transforming various pieces of disparate data into a picture, IS capabilities are critical in the Serious and Organised Crime Agency's (SOCA) activities. These capabilities enable SOCA agents to link what appear to be isolated criminal activities into a wider picture of an organised crime syndicate.

Share

IS allows the armed and security forces to get the right information, in the right format, to the right person, at the right time. In a modern highly connected world it is difficult to realise the challenges the military faces in communicating in a hostile military environment. In contrast with the developed world where many public facilities possess wifi, the UK military must be able to operate in regions of the world that have no fixed infrastructure –across all environments – land, sea, and air – and on a global basis so that information can be sent back to political and strategic decision-makers. IS capabilities help the Armed Forces overcome this barrier.

These capabilities provide the technologies that enable the military to share information, which leads to greater and more effective coordination between the Royal Navy, the British Army, and the Royal Air Force. By enabling improved command, control, and communication between the three services, IS capabilities allow UK Armed Forces to operate more effectively and efficiently.

Effective interoperability is also essential to coalition operations. The technologies underpinning IS allow for more effective operations with international partners and allies. Greater cooperation with allies has been recognized in both recent Government and Opposition Green Papers as an essential element of future national security. Moreover, UK personnel's ability to transmit and receive information to and from International Security and Assistance Force (ISAF) and US

Forces is critical to operations in Afghanistan, as the UK is dependent on many US information assets.

IS capabilities also provide the foundation for joint emergency response efforts. Communication and coordination are critical to conducting effective emergency responses, both in terms of sharing information and sharing resources. For example, Airwave has allowed for improved communication between emergency services.

New and existing IS technologies are improving crisis preparedness, response, prevention, as well as integrated emergency response missions. IS therefore provides the critical enablers to these essential emergency systems.

Decide

By strengthening the UK Armed Forces' ability to collect data, transform this data into a useful and usable form, and communicate this information between services, back to commanders in the UK, and with allies, IS capabilities enable faster and more informed decision-making on the battlefield.

Commanders are required to make the best decision they can given the limited information they possess. Today's IS capabilities offer the potential to provide more information on the location, movement, and intent of various actors on the battlefield and rapid transmission of this information to the person in most need of it.

In the context of the Armed Forces' operations in Afghanistan, IS is playing a critical role in rapid decision making. For example, based on the emerging norm of 'courageous restraint', IS is playing a vital role in achieving and maintaining Positive ID (or PID) – a requirement that must be met in order for a soldier on the ground to fire on an enemy. IS capabilities providing intelligence and information enable commanders on the ground to quickly receive PID of insurgents, enabling appropriate military force to engage adversaries rapidly whilst not resulting in civilian casualties.

IS also plays a crucial role in improving decision-making during a domestic emergency. The improved decision-making capabilities stemming from IS assets lead to a quicker and more effective response. In such emergencies, quicker responses often equate to a dramatic reduction in loss of life as well as mitigating the impact on the economy.

Conclusion

Industry's IS capabilities provide the added benefits of enhancing existing capabilities, thereby extending the value of legacy equipment and platforms and contributing to economic growth and job creation.

Compared to the photogenic and iconic platform assets that have long dominated the public image of Defence, IS has a relatively low profile. Yet, in the context of current and future operations, IS is more strategically and tactically significant than platforms. Information has become the critical factor in military success as well as preparing and responding to security threats. It has transformed from a supporting capability to the capability that underpins all other aspects of defence and security activities. If the UK loses the information campaign this will undermine the entire operation. As a result, Intellect believes that the effective exploitation of information, and thus the procurement of IS capabilities, needs to be at the top of the priority lists of the MoD and the agencies involved in ensuring the UK's security and resilience.

Intellect believes that the UK's defence and security forces are suffering from shortfalls in the following key areas, and therefore, require immediate attention:

- Information assurance
- Cyber security
- Bandwidth
- Understand capabilities