Defence Intelligence Analysis in the Age of Big Data

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Introduction

Information has become a crucial part in various sectors stemming from business procedures to military operations. Each day, new innovations are being discovered in the field of Information and Communications Technology (ICT). In the next decade, the most challenging task will be to develop new ways to manage and utilise big data. The term big data refers to the exponentially increasing amount of digital information being created with the aid of new Information Technologies (IT) – such as mobile internet, cloud storage, social networking, the "Internet of Things" and the advanced analytics used to process big data. Big data has the ability to transform the qualitative and quantitative process of creating new knowledge. This commentary discusses the impact of big data on the defence sector.
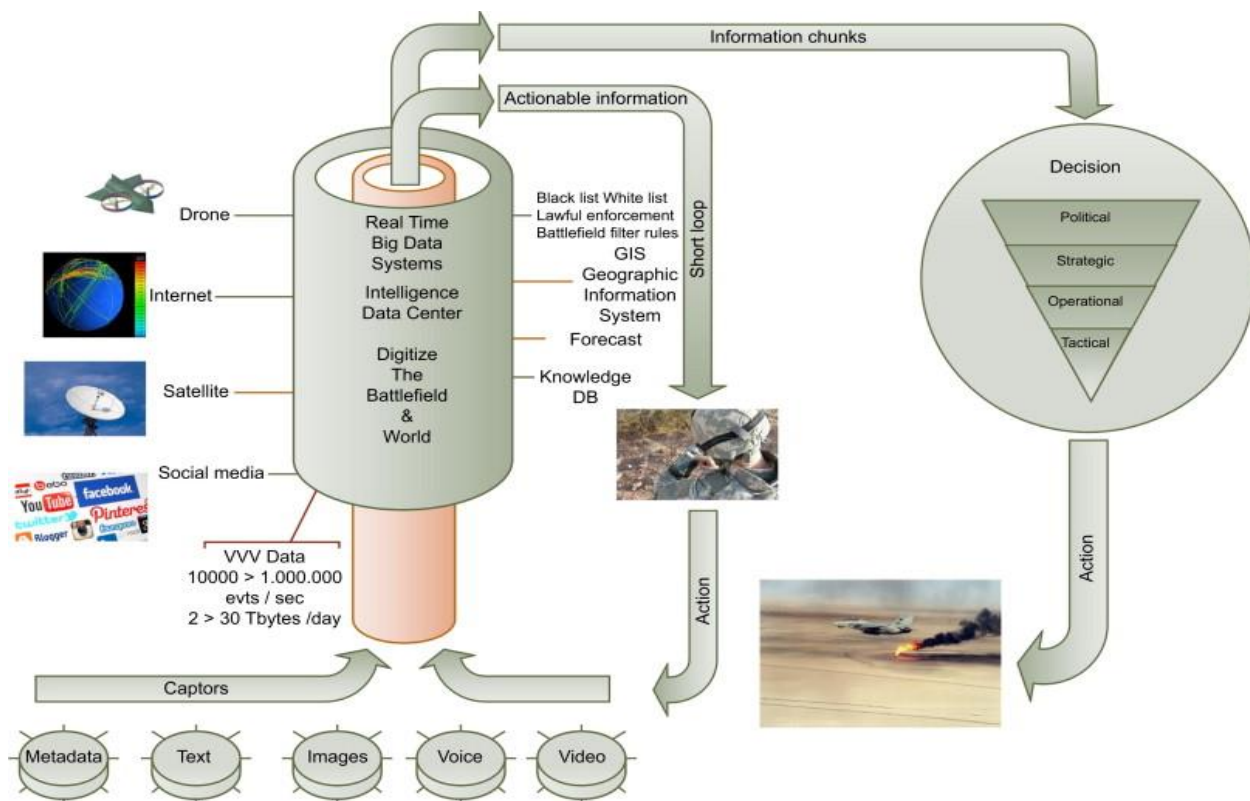
The Impact of Big Data on the Defence Sector

Disruptive information technologies have the scope to reshape the defence intelligence analysis. It can also have a profound impact on the all-source enterprise. There is a need to assess the opportunities and risks of the disruptive technologies at disposal. It is significant to sketch a background of the most crucial IT trends that are transforming today's economy and society. There is also a need to outline how big data could change the process of intelligence analysis. Big data has the potential to unlock huge efficiency gains. It further improves effectiveness through automation of labor-intensive tasks, creating new forms of analysis and presentation. Big data alone is not enough to transform the defence sector as its utility is limited in terms of making sense of complex systems and addressing knowledge gaps. Furthermore, big data has the capacity to transform the wider assessment agency enterprise.

The big data phenomenon opens up a new range of aspects and possibilities, starting from the off-shelf tools to complex business-process reforms. Intelligence community can use such tools to their advantage, for instance, Wikis and Chat help to facilitate better collaboration between analysts. Disruptive information technologies can recreate the trends in how data are collected, moved, stored and organised. It can reshape all-source intelligence.

Information has become increasingly social, mobile and local. This had led to the explosion of big data. Information has become social due to the fact that it is generated and transmitted by many users, rather than a few big producers. Information has become mobile because it is collected by sensors on many ubiquitous internet-connected mobile devices. Information is geospatially tagged which makes it local in nature. Such trends have made enduring changes in the field of Information Technology (IT). Portable devices have become the primary medium for connecting to the internet and it has become the most significant market for IT innovation. This market has led to new innovation in terms of data collection, intelligence, PED (processing, exploitation and dissemination) and analysis. The exponential creation of digital data has sufficient capacity for creating insight and knowledge through PED and data analytics. The flourishing field of data science is prevalent at the convergence of statistics, computer science and other concerned fields. The private sector is also using the data for prosaic tasks such as tracking a person's consumption patterns to better target advertising campaigns. The intelligence community's routine of work collection, PED and analysis is still hugely based on the traditional Cold War model. Nowadays, it is most important to cope with the key challenges of dealing with massive quantities of data and, in the process, compete with the lucrative private sector in order to attract the best skills of data scientists.

The fast pace of innovation and the need to harness big data are both enabling and driving the requirement for the creation of IT solutions that are customised and intuitive for the user.

Nowadays, using hefty user manuals or obscure text-based user interfaces have become obsolete. The major platform Palantir needs to provide support in two key areas: tailoring the product to customer requirements and in providing the ongoing software development support. A range of apps and dedicated software developers are integral for the analyst teams. The major breakthrough of this era is the internet and it will keep increasing the rate of big data as more devices join the platform. This will also drive the scope for a growing "Internet of Things (IoT)". IoT includes everything from household appliances to industrial robots and they can generate more data than ever, in turn, creating more potential for opportunities and risks. Emerging technologies are allowing users to take the internet even in remote regions leading to wider military use of Internet-connected IT and improved resilience to network failures.
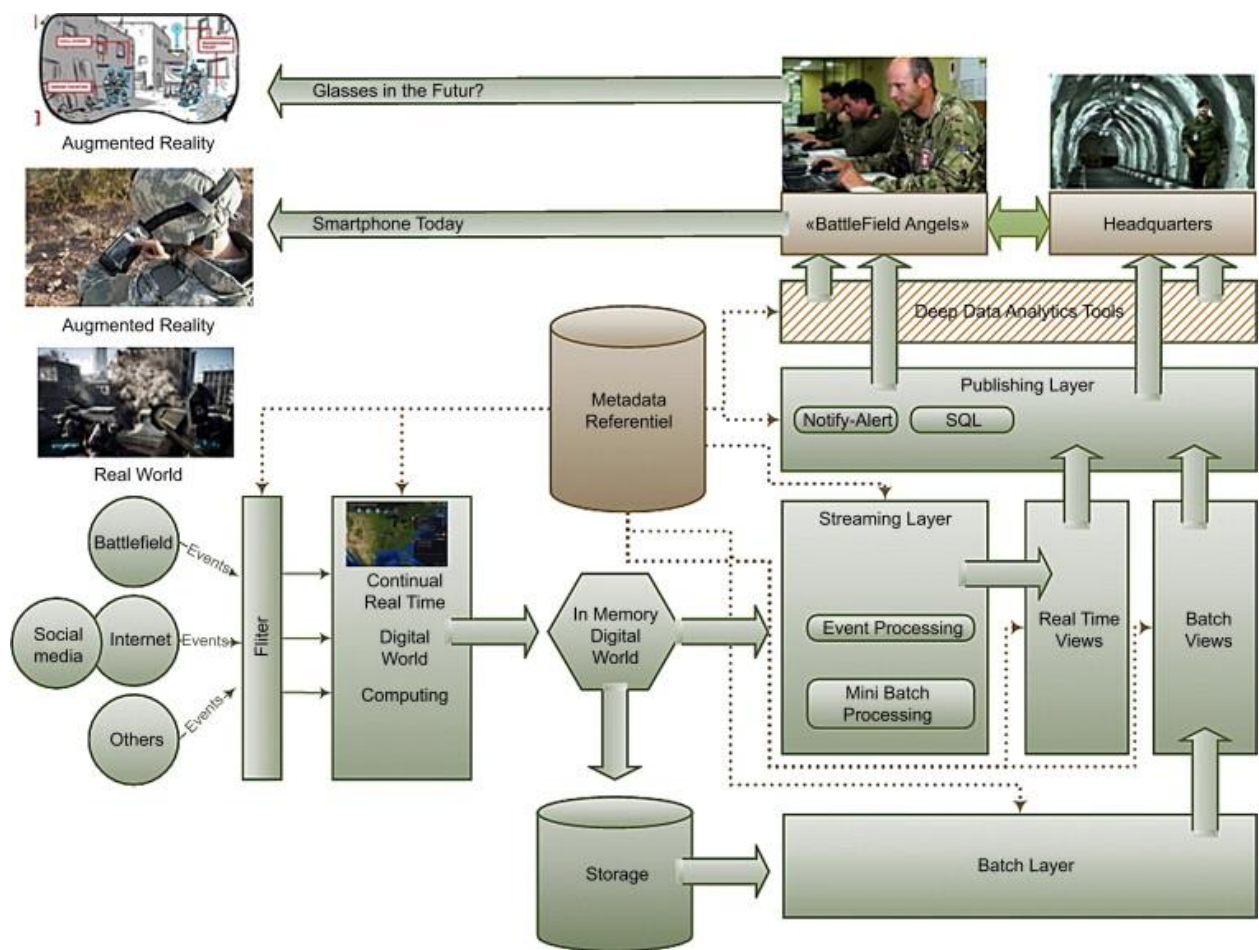

Figure 2: Military and Big Data Revolution (ScienceDirect)

Transforming Defence Intelligence Analysis through Big Data

The greatest promise of big data is to integrate and organise information in order to address the intelligence problems. Such new technologies are essential for transforming the process of collecting, moving, storing and organising data. This could give a boost to all-source analysts in terms of access to information, automation and productivity. Using big data allows the defence intelligence analysts to concentrate their finite cognitive capacity on the hardest and highest problems. Assessment agencies have the unique opportunity to incorporate new technological trends in order to change the fundamental principles of all-source analysis. Big data is applicable to a numerous defence intelligence problems: social network analysis, weapon systems modeling, trend analysis for tactical military intelligence or nontraditional warning problems and nascent analytic makes.

The core essence of using big data is that little effort can help to acquire more information. Big data is mostly reliant on automation. When the architecture and algorithms are set, the data could be collected, stored, organised, moved and managed with less additional effort. The application of big data to all-source intelligence will make retrieval of manual information a redundant practice. Automation will make the process smooth and convenient. Manually pulling data from various sources requires huge quantity of labor and big data can create an automatic and persistent push of data to defence intelligence analysts. Even before the data reaches the analyst, big data could refine the push of data. Big data would save the effort of analysts and introduce new forms of innovation through automated data collation. The mass data could be used in the following aspects: identify intelligence gaps, unexpected correlations and associations, or anomalies or irregular behaviour. In the practical field of applications, big data could come handy in terms of finding patterns in a terrorist target's pattern of life, tracking military targets automatically even in wide-area surveillance, cueing for humanitarian assistance and disaster recovery support. The significance of big data can be found in the five V's illustrated in the figure below.
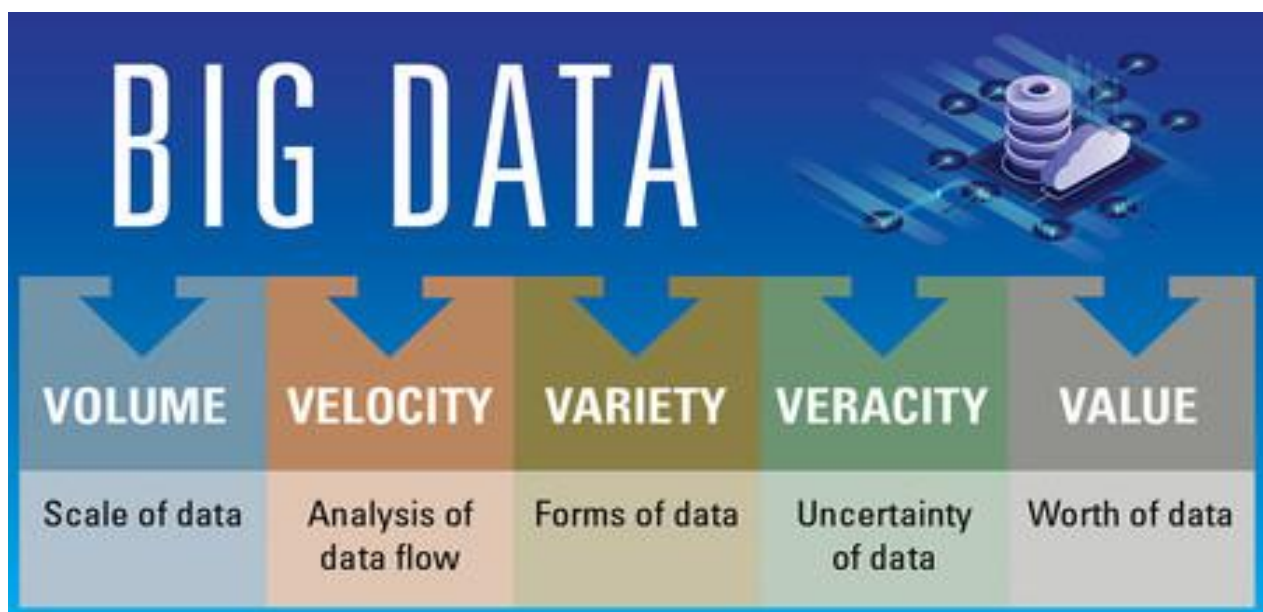
Figure 3: Five V's of Big Data (Military Embedded Systems)

There are some major challenges in case of introducing the new forms of innovation. The key technical challenge is to process unstructured data more efficiently. New ways need to be discovered in order to deal with such data. Integration of big data with the governance policy and framework is still a pivotal aspect. Setting the standards for the intelligence agencies is a crucial determinant in case of vetting and quality assurance of data. The other areas of concern are: establish security and legal compliance protocols for sharing data across organisations, establish robust security measures to protect data from spoofing, cyber exploitation, insider leaks, standardise the tagging and coding of data for use in data analytics. When all these measures will be taken on an effective level, use of big data in defence intelligence analysis will accumulate the best results.

Conclusion

Big data can bring innovative trends in the sector of defence intelligence analysis. Big data can transform the work of future analysts and if used rightly, it will have positive implications for all the levels of defence intelligence including the foundational military intelligence.

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