



February 2022

BLOCKCHAIN TECHNOLOGY AND ITS IMPORTANCE IN THE MILITARY APPLICATIONS

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Edited by: Rayan V Bhagwagar

Blockchain technology (BCT) is one of the much-discussed technological advancements like AI and quantum technology. Its significance rose exponentially with its extensive usage in the financial sector. Bitcoin, Ethereum, are some of the virtual currencies which have become household names for all virtual currency enthusiasts. However, this technology has its applications spread out into the military.

In general, this technology is about organizing and storing information in the most secure and trustable way with complex mathematical logic¹. For the military, BCT based systems provide secure and trustful communications, defence inventory management, tracking of the defence equipment imports etc. Going with its general applications, in the military space, BCT is wished to be used in the documentation, supply chain², logistics³. Though they appear to be simple and easy applications to be adopted, they can increase the efficiency in the defence services and also in the budget spending.

BCT application has become a common aspiration for militaries across the world. For India, its implementation has a bit more advantage compared to others. Here is one area to understand why it is more important. India has seen numerous scams (proved and alleged) anchored to military imports⁴. Some of the noted scams are - the Jeep scam of 1948, Bofors scam of 1987, coffin scam of 1999, Barak missile scam of 2000, Sudipta Ghosh Case of 2009, and allegations on Rafale deal. All these scams can be avoided if the defence tenders are automated using BCT. If the tender approvals and the entire project are designed to be monitored on BCT, there is no chance of fraud as all the pre-defined logic must be resolved and the payments to both the parties are logged onto a permanent and un-tamper able ledger. Even the documentation regarding the deal would be stored on unalterable blocks. This leaves a little room for tweaking the approvals and favouring one company over the other. Even if done, the entire approvals, money transfers, signed deals can

¹ Sanchez, S. L. (2017, June). BLOCKCHAIN TECHNOLOGY IN DEFENCE. 10 Upcoming Disruptive Defence Innovations(14). Retrieved from European Defence Matters: <https://eda.europa.eu/webzine/issue14/cover-story/blockchain-technology-in-defence>

² James Gatto, T. B. (2019, December 11). Blockchain Tech Has Numerous Applications for Defense. Retrieved from National Defence: <https://www.nationaldefensemagazine.org/articles/2019/12/11/blockchain-tech-has-numerous-applications-for-defense>

³ Simerly, M. T., & Keenaghan, D. J. (2019, November 4). Blockchain for military logistics. Retrieved from army.mil: https://www.army.mil/article/227943/blockchain_for_military_logistics

⁴ News18. (2013, February 14). *A brief history of defence scams in India*. Retrieved from news18: <https://www.news18.com/news/india/a-brief-history-of-defence-scams-in-india-590770.html>

be accessed without any changes to it by the investigation teams. This is one perfect example to show how important Blockchain technology would be in Indian military affairs.

Former Army Chief MM. Naravane, during the Indian Army's internal seminar themed 'changing characteristics of land warfare and its impact on the military' emphasized the usage of Blockchain technology⁵. In a paper written by scientists from the Defence Institute of Advanced Technology, India, it was espoused that BCT is one of the best to be used in intercommunication military networks⁶. It proposes network-enabled military operations using BCT. It provides secure message transmission in the battlefields, keeping track of the military armaments, enabling smart contracts in all the defence procurements. Army general's emphasis and a paper from the Defence Institute of Advanced Technology further reiterates the importance of BCT and its practicality.

BCT across the world

Across the world, states are racing to implement blockchain technology. Not just the military but they are focusing on dual usage. European Union believes that blockchain technology can impact various sectors across the EU and can become an integral part of the foundation building for digital EU. The initiatives such as the Digital Single Market initiative, Communication and Technology Directorate-General (DG-CONNECT), European Blockchain Partnership (EBP), European Blockchain Services Infrastructure (EBSI) is observed to have a lucid path for the development of civil-military BCT products.

In the case of the US, with the rising cyber-attacks, it is concluded that there is a huge lack of cyber security protocols in the communication channels. There are many incidents and media reports alleging either North Korea, China or Russia hacked the US databases. In its Information Resource Management Strategic Plan FY 19-23, it was noted that it emphasized the development of BCT based communication channels. Following that, in 2021, a cyber security firm—Galois received \$15.3M to design a system that will aim to secure data confidentiality. In addition, DARPA's Data Protection in Virtual Environments (DPRIVE) aims to develop BCT systems to tackle supply chain

⁵ ANI. (2020, March 4). *Indian Army will use blockchain technologies: Naravane*. Retrieved from Deccan Chronicle: <https://www.deccanchronicle.com/nation/current-affairs/040320/indian-army-will-use-blockchain-technologies-naravane.html>

⁶ Sudhan, A., & Manisha, J. N. (2017). Employability of Blockchain Technology in. *Proceedings of the International Conference on Intelligent Sustainable Systems*. doi:10.1109/iss1.2017.8389247

attacks, manage military logistics and create secured communication channels from the battlefield. US Navy and Airforce also engaged in developing BCT based applications for healthcare data management and communication channels, respectively.

Not only the western states, but rising China is also investing significantly in the BCT. The Chinese government invested in more than 500 blockchain projects from various domains including finance, defence, logistics and manufacturing. The People's Liberation Army (PLA) plans to use blockchain technology for managing the distribution of funds for intelligence operations, protecting data of defence personnel, weapons lifecycle, maintaining military logistics and making operations safer⁷. Russia also is vocal on the usage of Blockchain technology in its defence communications. Similar is observed with South Korea, which is actively looking to deploy BCT for secure defence communication and database management.

Following the general trend in the BCT projects and investments, major technology countries are keen to use BCT in remaking and securing their military communication channels, and database storage. After that, BCT is much applicable for logistics and inventory management. Accordingly, India can go ahead and quickly call for tenders to develop the BCT system to maintain the defence records. Its success will infuse confidence in the armed forces to extend the same for logistics management and inventory management.

However, it should be noted that only private blockchain technology is preferred in military applications. That means that carefully distributed nodes are to be identified. Which is, Blockchain nodes are to be distributed based on the existing military structure or design a new structure consisting of the Ministry of Defence, tri-forces for approving the transactions. There can also be a revamping of the structures to adopt the BCT in logistics and defence procurements. The extent of the structural change is not yet known as there has been no pilot study conducted in India. However, from comparative analysis, the extent of structural changes can be approximated.

One comparable example is to cite the requirement of institutional changes in the usage of BCT in the energy sector. Usage of BCT in money exchange for power means combining the electricity

⁷ Value Technology Foundation. (2020). *Potential uses of blockchain by the U.S. Department of Defense*.

producers and offering consumers the choice to opt from any producer⁸. When a consumer uses a BCT platform, the charge for the user will also be levied as per the usage and the provider. However, for this to be a reality, smart grids have to be established which takes power from major and minor generators. One of the most important innovations that arise due to this BCT payment platform is community energy generations. Payment will no longer be between the energy corporations and consumers but also between consumers, devices, and small-scale power generators like rooftop solar panels. The issue to implement this is the existing financial structure on which the payments are operated. Also, the power corporations' functional structure cannot accommodate the community energy generation or P2P power exchange. Because of the BCT enabled exchange platform, the existing corporations would lose their revenue and fall out of business. However, a structural change can solve this problem. If the revenue cannot be earned from selling the power, then tax the platform to charge the platform. Make a community tax for the usage of the BCT platform. The revenue model innovation should be wedded to technological innovation to make it market viable. Further, the functional structure of the power corporations or even the government should onboard Blockchain engineers to the power maintenance departments. There might no more be employees that collect currency bills or maintain the accounts. The grid is no longer manned only by the substations but there might be micro stations necessary as the number of producers increases.

This example shows that for utilising BCT completely, there has to be a change in the existing institutions if BCT is to be incorporated fully. Hopefully, the Indian military does not waste time and wait for other militaries to adopt this technology. It would be better to undertake complete, well-funded research and start deploying the technology. One of the best ways to understand the requirement of the structural changes and the impact of BCT is by creating sandboxes within the military. Then, use these sandboxes as the pilot testing areas. Last but not least, it is important to note that the primary question to pose is whether BCT is necessary to solve every problem? If the problem can be solved without using BCT, the military might as well go ahead with it.

⁸ Merlinda Andonia, V. R. (2019). Blockchain technology in the energy sector: A systematic review of challenges and opportunities. *Renewable and Sustainable Energy Reviews*, 143-174.

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