

# **Aerospace and Defense Technology: Big Data, Cybersecurity, 3D Printing and Block Chain tech are the emerging defense trends of 2018 and beyond**

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## **Abstracts**

Aerospace and Defense Technology: Big Data, Cybersecurity, 3D Printing and Block Chain tech are the emerging defense trends of 2018 and beyond

## **SUMMARY**

In the world of aerospace and defense, technological developments have always been a crucial aspect of staying ahead of rivals both for military and commercial players. Now though, perhaps more than ever, technology from other industries is starting to creep into the A&D world and could provide some highly useful new methods of production, learning and protection of assets. The major military players and significant defense companies are experimenting with the potential of many of these developing technologies and they could lead to some significant leaps in capability.

This new technology does come with problems however, and the changing nature of warfare between nations means that threats are increasingly coming from the internet and software rather than troops on the ground. This means players of all types need to be prepared for this technology whether they want to or not. These four technological areas include; 3D printing, blockchain, cybersecurity and big data all of which most A&D firms are now heavily involved in.

## **KEY HIGHLIGHTS**

The aerospace industry requires precision engineering to produce high specification parts. 3D printers have already proved their worth here: Airbus Group conducted a study to assess the effectiveness of 3D printing on a highly

standardized part - an Airbus A320 nacelle hinge bracket. They compared EOS's titanium printed bracket (using direct metal laser sintering) with a traditionally cast steel bracket. Airbus concluded that EOS's 3D printed bracket was stronger, lighter and produced 40% less CO2 emissions during manufacture. Moreover, because the 3D printing process used only the material needed to make the part, it eliminated any waste from secondary machining, thereby reducing titanium consumption by 25%.

Blockchain technology, often referred to as "distributed ledger technology" (or DLT) is a means by which the participants in a distributed network can each maintain a copy of an immutable ledger of transactions, and where transactions can be executed without the need for a single, central, coordinating authority. This has a wide variety of applications and many companies are very excited by the possibilities that this offers.

Cybersecurity has been a concern for aerospace and defense companies for decades, due to their roles as operators of critical military infrastructure and providers of essential hardware. However, concern over cybersecurity continues to climb up the defense agenda, driven by the increasingly interconnected nature of infrastructure, hardware and systems, and the growing number of attacks targeting defense related and critical operational information. Military hardware is currently undergoing significant change. Services are becoming ever more integrated through information sharing.

Resultantly, companies working in aerospace and defense are racing to develop cybersecurity systems that can withstand complex and penetrative attacks from governments and independent actors. The transition has been rapid and will undergo further change as artificial intelligence and machine learning begins to play an ever-greater role in the modern battlefield. Given the potential for disruption - such as the grounding of aircraft fleets, collapse of communication systems or general confusion in the command chain - the need for cybersecurity that is reliable and able to withstand cutting-edge attacks will become elevated beyond current levels.

## SCOPE

Examine the major trends in aerospace and defense technology

See how big data technology is becoming a big target for A&D firms

Explore the benefits of 3D Printing technology to A&D companies and militaries

Examine how cyber security has become such an important issue and how companies are trying to solve it

See how block chain technology is being pursued by A&D companies

## **REASONS TO BUY**

What technology absorbing the attention of modern military planners?

Where is the money going and is it being spent wisely?

Are all of the new technologies emerging actually practical?

What can we expect to see in future wars and does this make the world safer or less safe?

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### Executive Summary

3D printing has now evolved beyond prototypes

Blockchain in Aerospace and Defense is worth exploring cautiously

Cybersecurity in Aerospace & Defense is a vital industry outlay

Understanding and manipulating big data could lead to huge benefits

3D printing has now evolved beyond prototypes

Impact of 3D printing on A&D is growing and more parts can now be made with the technology

Aerospace weight reduction is one of the key applications

Printing on demand has been vastly improved

3D Printing is an ideal solution for spare parts

Applicable where necessary, but not the solution for everything

Transition from prototyping to actual parts

Regulatory approval is slow

For use in the field

Blockchain in Aerospace and Defense is worth exploring cautiously

Blockchain is a type of distributed ledger technology

Blockchain for tracking A&D company supply chain

Blockchain for state military applications is at an early stage of development

Blockchain to allow swarming of unmanned aerial vehicles

Cyber security and securing transactions between clients

Aerospace and defense companies involved with Blockchain technology

Key recommendations for aerospace & defense companies

AI and blockchain need to be watched simultaneously:

Treat blockchain as one tool in a well-stocked toolbox

Those not interested in blockchain, might need to focus on it regardless

Cybersecurity in Aerospace & Defense is a vital industry outlay

Cybersecurity is of vital importance in the A&D industry

Unique challenges facing aerospace and defense when implementing cybersecurity

Ransomware has affected all industries including A&D

Insider and privilege misuse is the main method of cyber attack

Denial of service (DoS) is getting more advanced with AI taking a key role

Key trends and threats in the cybersecurity industry

Expanding use of specialist civilian companies as threats mount up

AI and machine learning to lead development in military cybersecurity

Skills shortage threatens to make development harder

Ransomware is expanding as a threat with some notable recent attacks

Rising threat of cyber-warfare from secretly created virus weapons  
Understanding and manipulating big data could lead to huge benefits  
The Internet of Things, the cloud and AI are driving growth in Big Data technology  
Big Data used for intelligence gathering  
Big Data enables more integrated military operations  
Drones and autonomous technology rising in prominence due to Big Data  
Big Data is helping militaries to learn from business  
Major trends and opportunities in A&D big data software  
Edge Computing will be a highly useful tool but could be difficult thing to achieve  
It is hoped that quantum computers will speed up big data processing  
Cloud Computing is the crucial element that allows collection and analysis of big data  
Impact of big data on A&D will be significant and is now an essential military function  
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