

The Future of Military Technology - Five Developments in defence technology are changing the nature of modern warfare

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Abstracts

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SUMMARY

Defense technology is advancing at quite a rate of knots in 2017 and some remarkable new abilities are available for militaries to purchase. From robotic mules through to drone swarms and rail guns there are multiple areas of strong innovation in the defense industry. Some of these technologies have the potential to change how warfighting works in the future and in a new world where the balance of power internationally is more scattered between different multiple nations many are preparing for the concerning prospect of state versus state conflict in the future. However whilst some are game changing there are plenty of other technologies that are a black hole for money and resources, producing impractical, complex, expensive and unworkable machines. The key task though in this period of rapid development is recognizing the full implications of using a new technology indiscriminately, before it becomes a new, dangerous and counterproductive threat to world security.

KEY QUESTIONS ANSWERED

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?

SCOPE

Examine how military technology is developing and what the militarys are spending their money on.

Learn what trends in warfare are driving the changes being seen.

See how just how useful new technology is and whether or not money is being wasted on certain projects.

Examine how these changes might alter modern military strategy and just how the global balance of power is changing.

REASONS TO BUY

One of the largest levels of military investment is going into procuring equipment that can operate automatically, that doesn't require human operators and can back up units on the ground. This is funneling into all manner of equipment, from automated attack drones, self-driving convoys, automated submarine hunters and many other types of kit. The potential for protecting soldiers is very high, taking over some of the most high-risk jobs and working to protect troops on the ground. However, a lot of this technology comes with very difficult obstacles to navigate including the implementation of this equipment into a fighting unit and protecting it from cyber-attack, but beyond that there are a wide variety of moral and ethical dilemmas to negotiate too. Furthermore, much of this equipment will require a complete rewriting of military strategy and doctrine and for the time being there will be relatively incremental steps to introduce this tech, rather than giant leaps forward.

Stealth technology can be a complete disruptor in various military equipment types. The ability to avoid detection and attack or defend targets with the element of surprise, or complete surveillance missions under an enemy's nose gives one military a critical edge over another. However, a significant problem

with the technology is that the expense required to acquire it can be staggering. The cost involved in fact can be so high that it delays development by years in some cases and requires an enormous amount of secrecy in the design in order to keep it secret and still effective from other militaries. There may be much better ways to achieve the same effect particularly when considering some of the new technology options available today. Multiple countries are still pursuing stealth options and there are some much simpler and less expensive ways to achieve an element of stealth.

In the context of all the technological opportunities that are being experimented with in the defense sector, modern military strategy and doctrine will have to change too, right down to the core of the basic concepts of how to fight an opponent. Couple with this, the ethics and morality of how two human opponents should engage each other in a new world where automated machines are doing both the majority of the work and the killing itself, and a great deal will have to change in the coming years should many of the new technologies be adopted. The breakdown of the current structures of global power from a unilateral to a multilateral system is also likely to affect how common warfare is and whether there will be conventional warfare in future. Technology is producing some disruptive change in the way that warfare works from strategy through to power balances between states.

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Fire systems are becoming smarter, not all advances are practical though

Soldier systems and survivability have never been more important

Military strategy and the global balance of power is changing

Using autonomy and robotics to resupply, protect and attack

Autonomous trucks are still some way away, but leader follower system shows promise

Robotic mules could provide excellent support opportunities

Delivery drones could vastly improve battlefield logistics

Drones are tried and tested but have significant flaws currently

The US and China are locked in a swarm arms race, quantity versus quality

Sea hunter: one of the experiments with autonomous sea vehicles

Automated tanks will start to trickle into the market very soon

Currently these machines are far too expensive to be worth purchasing in many cases

Stealth technology is highly desired but it might not be worth it

The F-35 is the starkest example of a stealth program gone out of control

SU35 doesn't worry about stealth, but focuses on firepower, range and maneuverability and is much cheaper

Despite the lessons learned from the F35 program, other nations are following suit

Stealth is branching out into realms beyond just the air force

Stealth land options are now being used and they may actually have more merit

Stealth over numbers might be a long-term mistake

Stealth technology might become obsolete over time

Stealth technology has had a checkered history

Fire systems are becoming smarter

Smart munitions being developed for a variety of weapons

EXACTO self-guided bullets for snipers at live-fire testing

Self-guiding bullets have been in development by DARPA for almost a decade

Teledyne Scientific and Imaging also working on self-guided ammo

Self-guided bullets also being tested by other countries and could proliferate

MAD-FIRES being developed for artillery shells and machine guns

Millennium Challenge 2002 highlighted serious deficiencies in US naval doctrine

First application will be on naval cannon, but could move towards machineguns

Raytheon and Lockheed Martin developing weapons on MAD-FIRES platform

BAE and General Atomics have railguns in development

Railguns' effectiveness marred by power and coil consumption

Power consumption also inhibiting railgun deployment
Navy is looking into workarounds to effectively deploy railguns
Direct energy systems already have limited deployment
Laser system has been deployed on US warship since 2014
More powerful lasers are being developed
Airborne lasers under development by Lockheed Martin
Biggest obstacle to deployment is size of equipment
Soldier systems and survivability have never been more important
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New ballistic head protection systems are due to be introduced in 2020
New armor systems are in constant development, improving survivability drastically
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