wayra
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Telecommunications

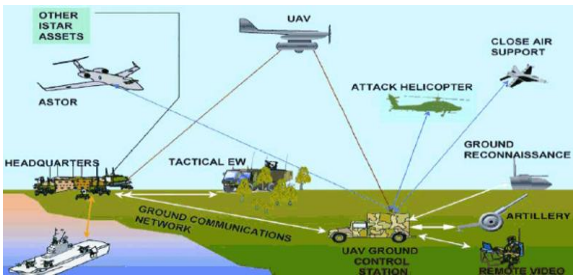
Its role in defense and emergency response

Content

Market Overview

Network-Centric Warfare: Internet of Military Things (IoMT) 1

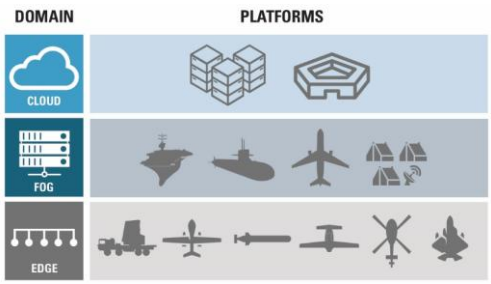
Network-centric warfare, exemplified by the US Army's Integrated Battle Command System (IBCS) and NATO's Federated Mission Networking (FMN), enhances real-time coordination and situational battlefield awareness. These systems integrate sensors and shooters across multiple domains by connecting autonomous systems through machine-to-machine communication, enhancing decision-support, and command and control.



Edge Computing 2

Edge computing processes sensitive or time-critical data directly at the point of operation, reducing dependence on centralized cloud infrastructure. For instance, AI-assisted analysis of drone or radar data can occur in real time, even when connectivity to headquarters is unrealiable.

In military IoMT environments, this distributed edge computing approach is particularly valuable. While Mobile Ad Hoc Networks (MANETs) provide resilient, infrastructure-free connectivity among vehicles, drones, soldiers, and sensors, embedding edge nodes within this network enables real-time processing and lateral data sharing at the tactical edge.



Artificial Intelligence, Cyber & Quantum Technologies 3

AI is transforming military operations through improved analyses, automated threat detection, and decision support, including AI-assisted target identification and co-pilots for autonomous flights.
Cyber capabilities serve both offensive and defensive roles, disrupting adversary systems while protecting own networks. In addition, armed forces are developing quantum technologies to provide secure communication on the digital battlefield.

Drones & Robotics 4

Modern battlefields are increasingly shaped by unmanned platforms such as robotic quadrupeds, which support troops with reconnaissance, logistics, and security tasks while minimizing human risk. Combining autonomy with mobility, these systems move across difficult terrain and carry sensors or payloads, proving highly versatile in recent military applications.

MANETs

Overview of MANETs

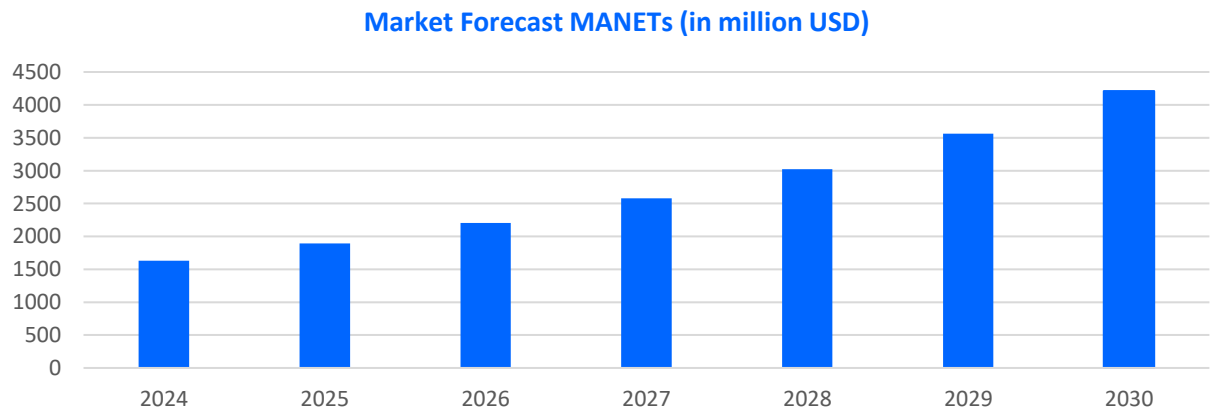
Mobile Ad-Hoc Networks (MANETs) are decentralized, self-organizing wireless systems where each node can send, receive, and relay data without relying on fixed infrastructure. They dynamically adapt as nodes move or change, making them ideal for mission-critical scenarios such as military operations, disaster response, and remote-area communications where conventional networks may be degraded or unavailable.

Military Applications and Advantages

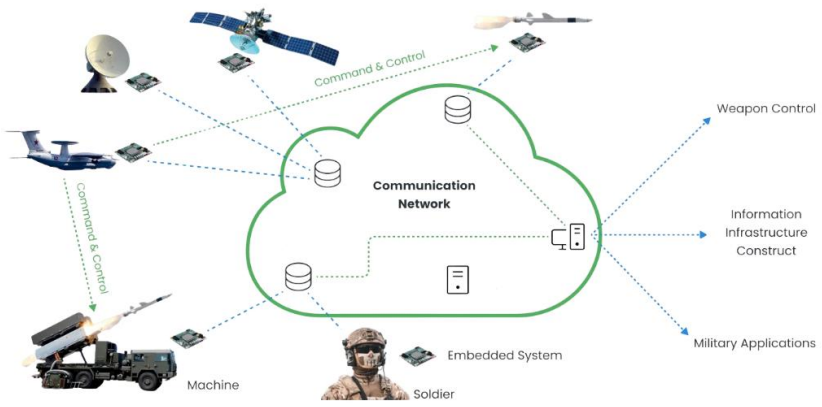
In military contexts, MANETs support Internet of Military Things (IoMT) systems, ensuring secure, real-time communication between soldiers, vehicles, drones, sensors, and command centers.
Their multi-hop design allows information to pass through multiple nodes, maintaining connectivity even when some links fail. Thanks to their mobility, redundancy, and resilience MANETs are essential for robust communications in unstable or contested environments.

MANET Market Growth and Scale

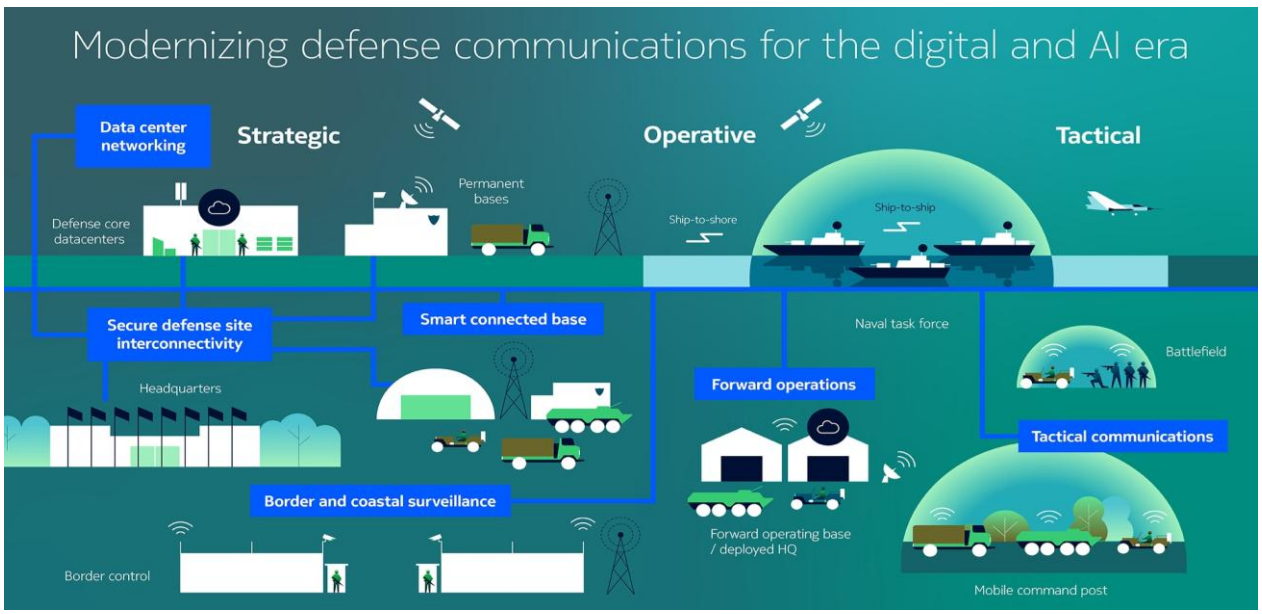
The global military MANET market is forecast to enter a phase of rapid expansion driven by defense modernization and network-centric warfare. Verified Market Research projects growth from $1.5 billion in 2023 to $10 billion by 2031, A2Z Market Research forecasts about 11% annual growth through 2030, while other market research[1] estimates a rise from $1.34 billion in 2024 to $3.24 billion by 2033. To reconcile these outlooks, we averaged the sources. Based on this composite model, the global market is expected to grow from about $1.6 billion in 2024 to nearly $5.2 billion in 2030 (≈21.71% CAGR).



MANETs and IoMT



Telecom Providers	Telecom providers bring critical expertise in mobile infrastructure, spectrum efficiency, and secure communications to support MANET systems and IoMT. They can develop hybrid architectures that link mobile military networks with terrestrial, satellite, and edge-cloud services, while providing orchestration, quality assurance, and resilient network design.
Alignment of Civilian and Defense Systems	Civilian and military infrastructures are increasingly sharing digital technologies such as 5G, cloud, AI, and dual-use sensors, which serve both civilian and military applications. These applications range from battlefield surveillance to smart city management. As these boundaries blur, telecom providers are becoming critical partners in security, crisis response, and digital sovereignty.



Drones and Blimps

Although Flying Cell on Wings (COW) drones are a relatively recent addition to the mobile network landscape, they are just one of several technologies designed to extend coverage into areas where centralized infrastructure is either unavailable or damaged.

AT&T: Flying COW drones

AT&T's Flying COW drones (Cell on Wings) are air-based mobile cell sites used to restore or extend wireless connectivity when conventional infrastructure is unavailable. As part of AT&T's broader strategy to strengthen network resilience and support emergency communications, these drones could be used in military operations, quickly providing secure communication links in remote or contested areas.

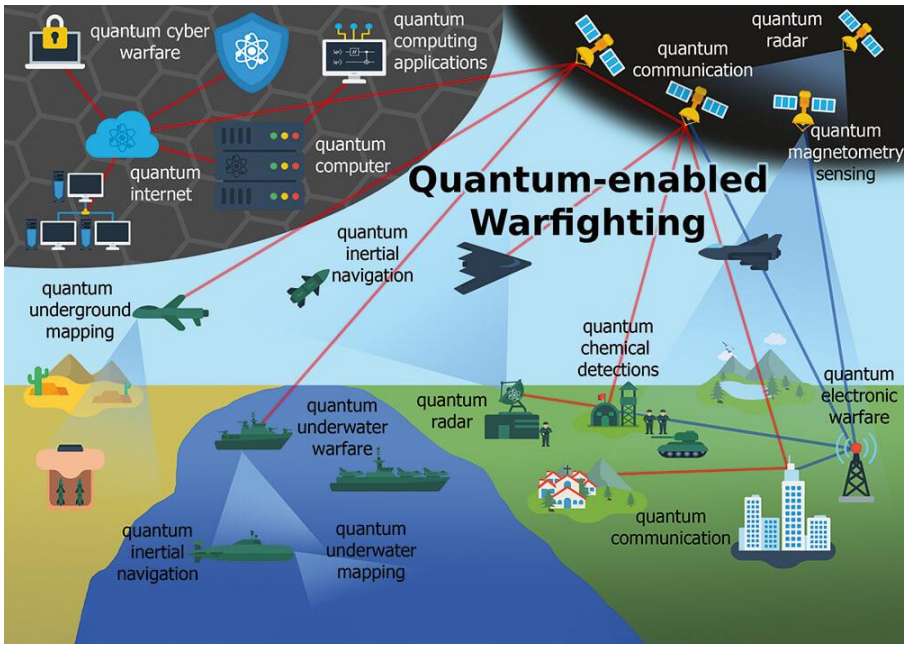
Legacy platforms

Tethered aerostats are balloons or blimps that operate at altitudes ranging from around 300 meters up to 5 kilometers. They are long-established platforms for both telecommunications and defense. Compared to smaller aerial systems, they can cover much wider areas and handle higher data throughput, while remaining moored to the ground and connected via a tether that supplies both power and data. Unlike drones, however, they are fixed once deployed, serving as semi-permanent aerial towers rather than rapidly redeployable units.

In the military domain, tethered aerostats are well established as a go-to solution for replacing tower-based communication infrastructure and providing persistent surveillance. Their ability to remain aloft for weeks makes them crucial for continuous monitoring and communication support, though this endurance comes at the expense of flexibility compared to drone-based systems.

AI, Cyber and Quantum Technologies

As information on the battlefield becomes increasingly critical, AI, cyber, and quantum technologies are being leveraged to manage the expanding volumes of data and to protect it from manipulation or theft through espionage.



How all of these go hand in hand

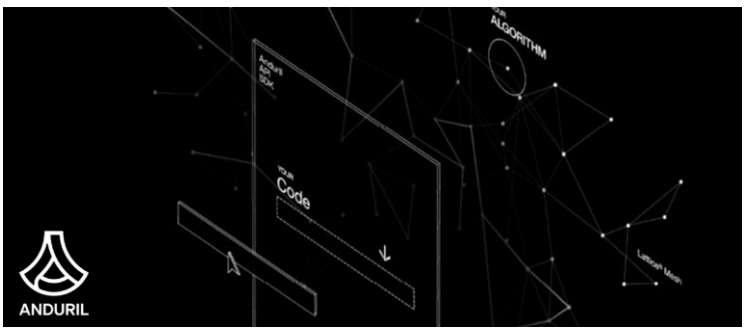
While cybersecurity has been a core capability since the earliest computers, keeping information secure and protected has become increasingly complex as AI and quantum technologies introduce new possibilities for both defenders and adversaries.

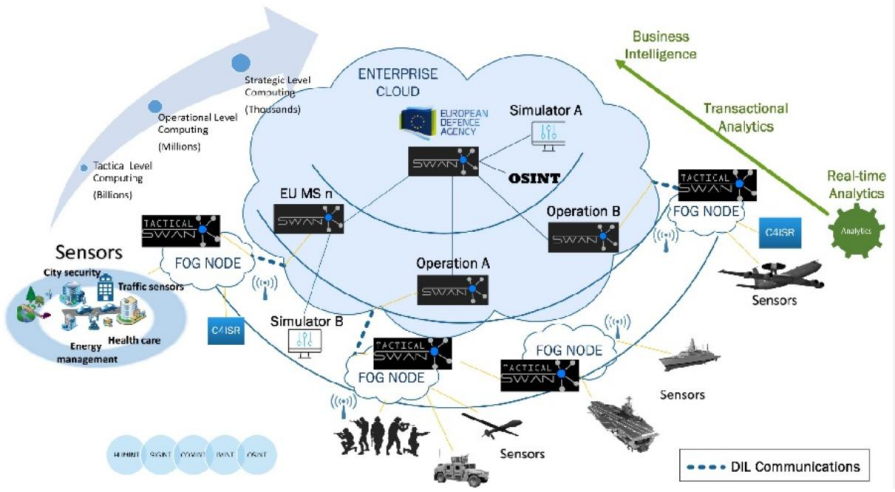
AI and machine learning algorithms are now used to protect networks and communications in real time, instantly sharing data about intrusions with all allied members of a network and neutralizing attack vectors as soon as a breach is detected.

Meanwhile, quantum technology, although still in testing, offers promising solutions for encryption key distribution. To ensure secure key transfer, distribution could be performed using quantum photons.
Quantum is also expected to play an important role in other areas of warfighting, as illustrated above. Telecom operators are actively advancing both quantum and AI technologies, already contributing to the strengthening of military and civilian defense.

Cloud- & Edge-Infrastructure

While cloud computing has been well established in civilian applications, militaries worldwide are developing their own robust cloud systems and exploring alternative technologies, such as edge computing, to gain an advantage in intelligence collection and processing.





Edge and Cloud: Complement-ary technologies?

On the battlefield, edge- and cloud-computing enable military commanders to exercise faster, more informed command and control. By moving processing power and AI analytics closer to frontline units (the “tactical edge”), forces gain real-time situational awareness and decision support even in austere environments.

For instance, the U.S.-based defense tech company Anduril Industries – now expanding operations in Europe – provides an AI-powered platform called Lattice that fuses sensor feeds and coordinates autonomous systems in a 3D “common operating picture.” Lattice is deployed on Oracle’s cloud infrastructure (OCI), including rugged OCI Roving Edge devices, providing warfighters with a secure command and control environment from the datacenter to forward-deployed units.

This approach allows troops to access the same mission apps and AI tools whether they are in a command post or on patrol, with data synchronized across classification levels.

The objective is to deliver real-time understanding, automated decision support, and dynamic machine tasking while keeping humans on the loop for oversight.

Startups in the Field

Startup Map Worldwide

Autonomous Systems & Robotics

GHOSTROBOTICS
Shield AI
XTEND DEFENSE

Communications and IoT

CHAOS
picogrid
Kela

Satellites and Space

True Anomaly
CESIUM ASTRO
SPACE & DEFENSE SYSTEMS
WARPSPACE

Edge- & Cloud-Computing

DEFCON AI
RESILIENCE IN THE FACE OF DISRUPTION
rebellion
ANDURIL

Startup Map Europe

Autonomous Systems & Robotics

BROSWARM
airvolve
UDS
unmanned defense systems

Communications and IoT

RSI Europe
MILITARY IOT
astrolight
GRANTA AUTONOMY

Satellites and Space

REFLEX AEROSPACE
BLACKSWAN SPACE
nano avionics

Edge- & Cloud-Computing

Arondite
unbound autonomy
Helsing

Your solution created by startups.

Wayra is the bridge between innovative startups and all o2 Telefónica departments. We help you rapidly solve business challenges and unlock new growth – from idea to implementation

What we do:

Startup scouting & matching:
We identify and connect you with high-potential startups from all over the world and our trusted ecosystem.

Risk-free pilots:
We design and manage proof-of-concept projects, covering all costs.

Agile setup:
Our fast-track processes mean solutions are tested and implemented quickly.

Long-term integration:
If a pilot is successful, we support seamless adoption into your department.

Why you should join:

Efficiency Boost

- Work directly with startups on your digitalization and operational challenges.
- Evaluate real business impact through hands-on testing, with minimal risk or upfront commitment.
- Rely on Wayra's expertise smooth adoption, ensuring successful scaling within your team after positive pilot.

Revenue Boost

- Collaborate with market-ready startups and scaleups to enhance your products and services and open-up new market potential.
- Build value-adding partnerships to pilot, market, and scale new innovative solutions and reach new customer segments.
- Tap into new business models and scale success across Telefónica.

Ready to get started?

Join 30+ Telefónica departements already working with Wayra to drive tangbilbe innovation.
Direct contact: **Nora Alfen**, Head of Venture Development – nora.alfen@wayra.org

Sources

Forecast:
Global Manet Market
Verified Market Reports

Verified Market Research

A2Z Market Research

Pictures:
Key Takeaways
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Artificial Intelligence, Cyber & Quantum Technologies

Autonomous Systems & Robotics

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Stratospheric Balloons and Airships – Aerostar

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