

TOP-5 RECENT TRENDS AND CHALLENGES IN DEFENSE AND AUTOMOTIVE INDUSTRIES





#1 TREND

ENVIRONMENTAL FRIENDLINESS
AND SUSTAINABILITY



#1 CHALLENGE

EMISSION REDUCTION

AUTOMOTIVE INDUSTRY

The industry has been working according to the European Union Emission regulations with the main goal to **increase the number of electrified vehicles** (battery electric, hybrid, fuel cell, and plug-in) aiming at net-zero emissions.

This, in turn, causes a number of issues and challenges:

- ▶ Electric vehicles are promising only in the case of producing energy from renewable sources.
- ▶ Full electrification is still hindered for a number of reasons: it costs a lot, high prices for vehicles, poorly developed charging infrastructure.
- ▶ As a result, some companies have been working on the alteration of an internal combustion engine recently.
- ▶ Some enterprises are researching the opportunities to use biofuel of algae in a combination of electrification and internal combustion engine.





#1 TREND

ENVIRONMENTAL FRIENDLINESS
AND SUSTAINABILITY



#1 CHALLENGE

EMISSION REDUCTION



DEFENSE INDUSTRY

The Defense industry has been following the Green Deal regulations as well. **The main goal of the Green Deal programme is to make the industries reach carbon neutrality.** For example, the Copernicus and Galileo programmes monitor green gas emissions and help to meet the Commission's intentions to slow down climate change.

- ▶ The Defense industry negatively affects the environment, and the environment, in turn, puts a lot of military operations at threat. The industry is the biggest energy consumer and affects the climate to a greater degree than other dimensions.
- ▶ In the US, climate change is regarded as a national security issue.
- ▶ According to DG Defence Industry and Space Management Plan 2021, European countries aim to reach carbon neutrality in the nearest future.
- ▶ According to the Roadmap for Sustainable Defence Support, the UK Defence industry is fully focused on following Net-Zero 2050 initiatives that include: carbon emissions; fuel and fuel substitutes and technologies; sustainability through the lens of the circular economy, recycling, reduction in use; sustainability-enabling technologies.



#2 TREND

FAST-GROWING INDUSTRY NEEDS RESULT IN MULTI-PROJECT ENVIRONMENTS AND DISTRIBUTED TEAMS

AUTOMOTIVE INDUSTRY

Customers expect to have something more than just a driving metal box on wheels, which is why automakers have been doing their best to meet the requirements. Innovative solutions are expected to produce intelligent traffic systems able to avoid collisions, send real-time notifications, perform remote monitoring, provide car diagnostics, and manage parking, and many other innovations.

As cars are becoming computers on wheels with great capabilities, and the customers' needs are growing day by day, the number of developments are growing at a high speed. In view of the number of ongoing projects, their complexity and urgency as well as the fact that the number of resources often remains unchanged, **the traditional waterfall approach to software development doesn't fit the automotive industry anymore.**

- ▶ Automakers have to go agile to stay effective.
- ▶ To ensure digital transformation and cope with enormous amounts of data to manage, they have to adopt a software solution capable of working with multi-project environments with high rates of uncertainty.



#2 CHALLENGE

THE NEED FOR A NEW APPROACH TO EFFECTIVE RESOURCE MANAGEMENT IN A MULTI-PROJECT ENVIRONMENT

DEFENSE INDUSTRY

As the number of threats at the international level is increasing day by day and as the industry gets fully digitalized, the number of projects in every country's defence sector is critically growing, too.

With regard to globally distributed employees that work as part of project teams, resource management here becomes complicated.

- ▶ One of the challenges is to find the best employee to perform a certain task regardless of their place of residence. This is where software solutions for managing projects and resources in multi-project environments are a must.
- ▶ Defence industry is the one with an increased number of risks and uncertainty, which is why the project and resource management tools become a necessity.
- ▶ The traditional approaches to project management turn out to be inefficient here, necessitating the need to become flexible and follow agile principles of work.



#3 TREND

DIGITAL TRANSFORMATION



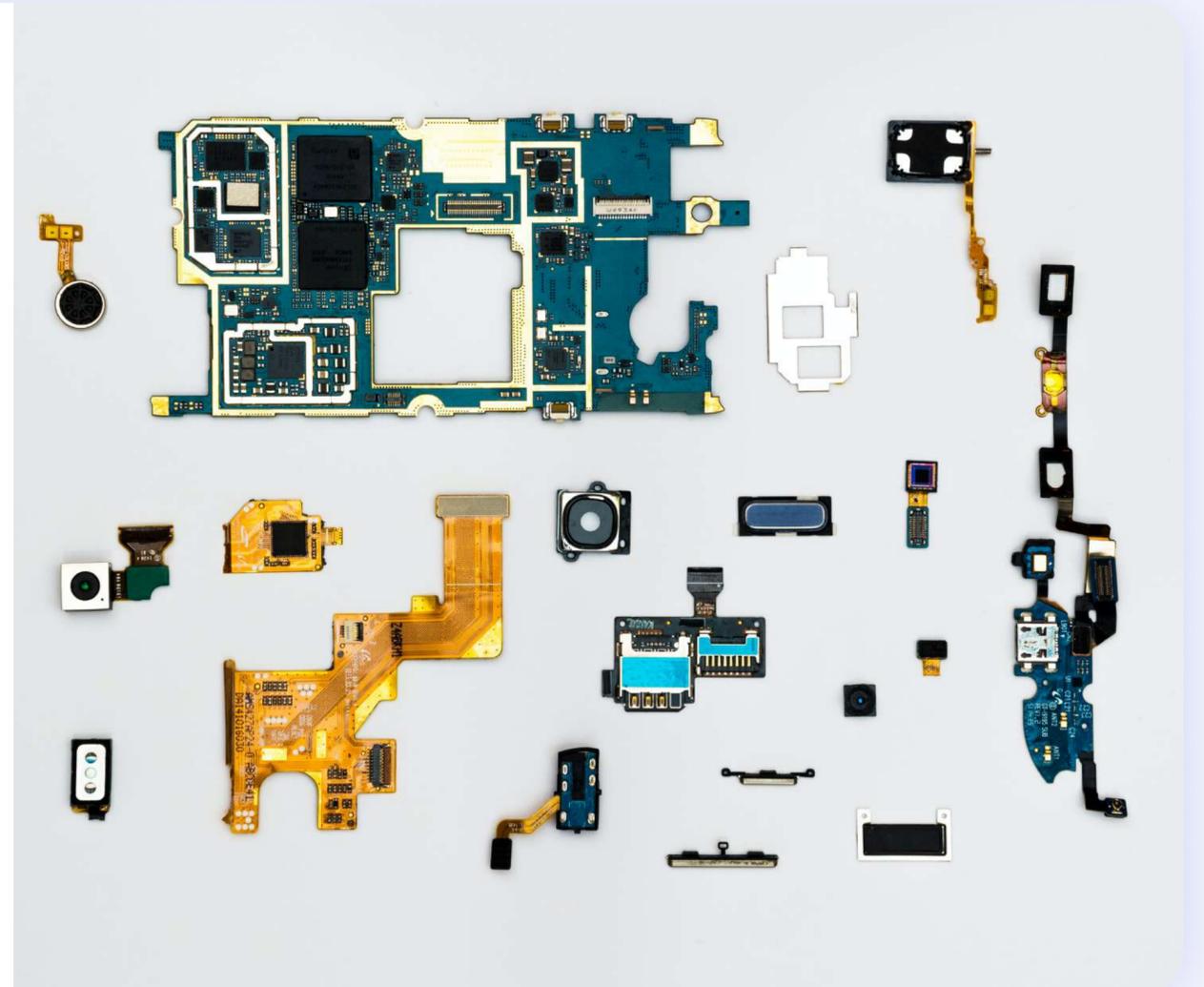
#3 CHALLENGE

CYBER THREATS

AUTOMOTIVE INDUSTRY

Automakers have to and do embrace innovation to take advantage of new opportunities in dimensions such as connected vehicles and mobility services. Digital transformation and the increased integration of artificial intelligence in cars and trucks has resulted in greater operational transparency, increased efficiency and greater cost savings across the industry.

- ▶ The digital transformation has created a lot of benefits for both car makers and users. At the same time, this has resulted in increased rates of cybersecurity attacks that even threaten human safety directly.
- ▶ Today, vehicles have up to 150 electronic control units and 100 million lines of code. They're supposed to triple to 300 million lines of software code in 10 years, which poses a bigger threat to security because of the lack of special tools to protect these huge amounts of data.
- ▶ A major challenge for the industry on its way to digitalization is the rapidly delivered software updates enriched with reliable cybersecurity features.
- ▶ Transparency and centralized communication are essential tools in coordinating and implementing effective cybersecurity steps to ensure full data safety.





#3 TREND

DIGITAL TRANSFORMATION



#3 CHALLENGE

CYBER THREATS



DEFENSE INDUSTRY

Digitalization for the defence sector is arguably more critical than for any other industry to ensure the country's safety in both physical and digital dimensions and to get prepared for new forms of warfare.

Besides, the defence industry faces greater pressure to enable and deliver cutting-edge technologies, than any other.

Digital disruption has resulted in increased cyber threats.

The cyber defence has become an essential element of enhancing the digital resilience of the Defence dimension. Cyberattacks are becoming more and more frequent because of the close association of military equipment, operations and informatics systems. At the end of December 2020, the European Commission created the Cybersecurity Competence Centre and Network to advance and bolster the cybersecurity capacities of the European Union and assist in establishing a secure online environment.



#4 TREND

UNMANNED VEHICLES AND
OTHER INNOVATIONS



#4 CHALLENGE

MORE AI DEVELOPMENTS
REQUIRED

AUTOMOTIVE INDUSTRY

Shared mobility and autonomous driving are one of the main trends of the recent years. But a lot of research and testings should be done to make vehicle-on-demand services as comfortable and safe as possible. This refers to the AI-driven software that regulates the system of shared mobility by finding cars online, providing information about the trip, routes, and traffic jams.

Artificial intelligence is supposed to replace a driver's mind and make decisions without the human factor, thus, being able to prevent roadblocks and collisions. Researchers believe that AI applied in vehicle production can **boost manufacturing productivity by 39%**.

- ▶ Developing autonomous vehicles requires deep expertise in AI and machine learning. The testing of autonomous cars shows their imperfection and unreadiness to go on roads. It was supposed that self-driving cars would free humanity from car accidents caused by human error but in reality, software impairments may happen at any time as well as the mistake made by a person.
- ▶ Modern self-driven vehicles aren't fully autonomous due to the fact artificial intelligence still remains insufficiently studied and developed.





#4 TREND

UNMANNED VEHICLES AND OTHER INNOVATIONS



#4 CHALLENGE

MORE AI DEVELOPMENTS REQUIRED

DEFENSE INDUSTRY

Artificial intelligence is applied in the following areas of the Defense realm:

- Command and control;
- Cyberspace operations;
- Informational operations;
- Logistics;
- Lethal autonomous weapons;
- Surveillance and intelligence;
- Unmanned systems.

Autonomous vehicles will be able to fulfill tasks such as last mile resupply, providing front-line logistics support to troops and intelligence gathering, etc.

There is also likely to be a drive to swap autonomous vehicles into normal force structures such that a tank commander, for example, would be commanding largely autonomous subordinates rather than human crewed vehicles.

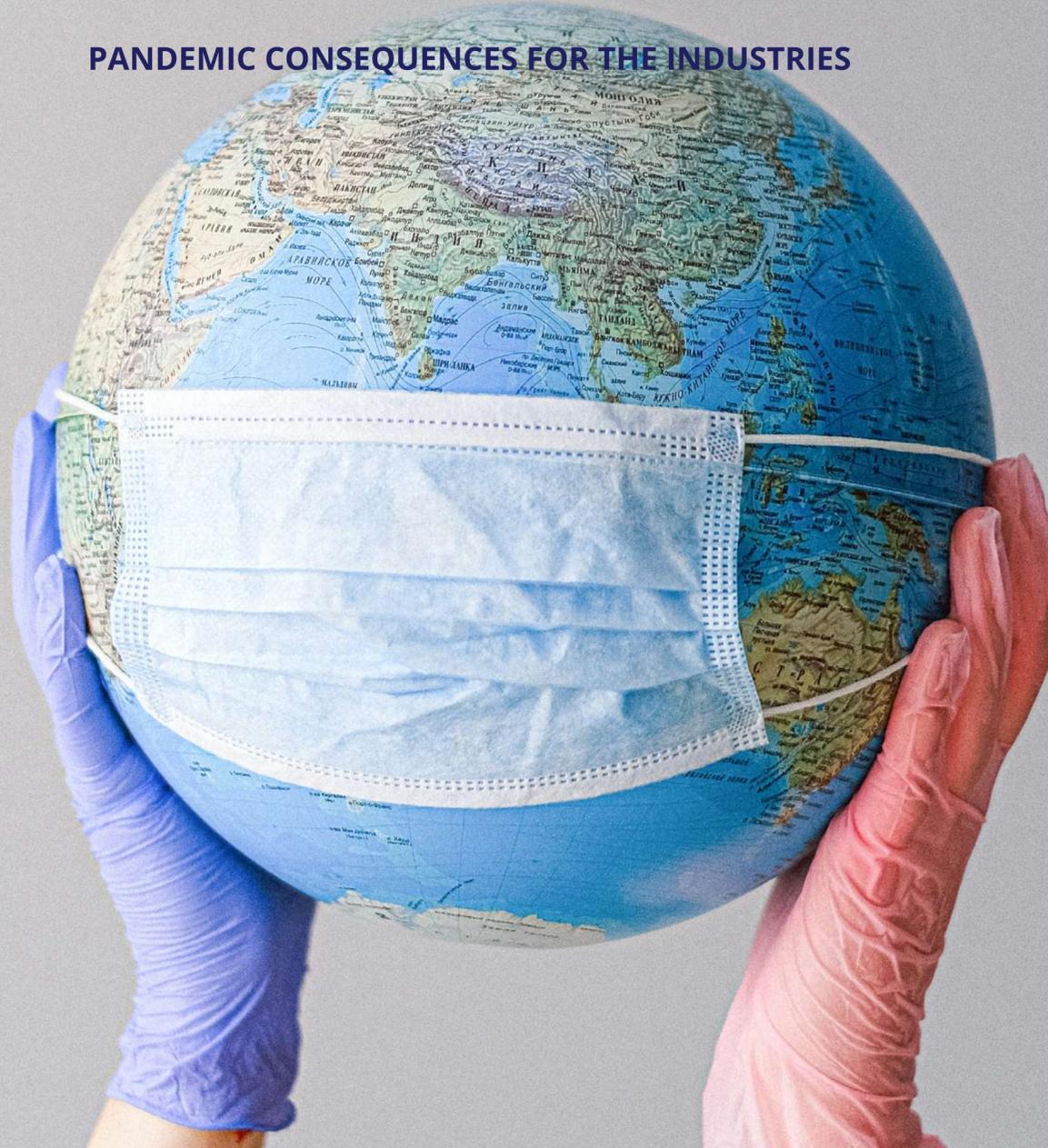
- ▶ As the technology improves, the ratio of autonomous vehicles to human crewed vehicles will alter in favor of the first.
- ▶ Many elaborations in the military field are a result of the attempts to adopt AI technology from the commercial dimension. Though this is hindered by the refusal of many companies to cooperate with the military for ethical reasons. Besides, the technology itself cannot be just borrowed, a lot of modifications and testing should be done before implementing it into military operations.





#5 CHALLENGE

PANDEMIC CONSEQUENCES FOR THE INDUSTRIES



AUTOMOTIVE INDUSTRY

The COVID-19 pandemic has affected the automotive industry in the following way:

- Closed factories;
- Unemployment;
- Disrupted supply chain;
- Extensive losses of automotive businesses;
- Freezing of projects;
- Postponing implementing new trends in the field.

The Society of Motor Manufacturers and Traders (SMMT) has prepared an initiative called Safe Harbor to support automotive suppliers affected by the COVID-19 pandemic in the UK. Its goal is to unite all the parties involved to discuss the pandemic challenges and find a way to improve the situation and save jobs.

DEFENSE INDUSTRY

The defence sector has suffered as a result of the pandemic with the following consequences:

- Retraction of forces from current affiliated operations;
- Cancellation of military exercises in 2020;
- Supply chain and research and development operation disruptions;
- Financial and job losses;
- Increasing military equipment production and transportation costs;
- Reduction of air travelling volumes;
- Budget cuts, R&D underinvestments.

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