

# FACT SHEET

## AUTONOMOUS SYSTEMS



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## INDEPENDENCE FROM HUMANS

**The Essence:** Systems with varying degree of independence from human beings when carrying out their function.

**Characteristics:** Autonomous systems execute behaviors or tasks with a high degree of *autonomy from human beings*. They will most often be a mixture of several other technologies: Robotics, Machine Learning, Big Data analytics, etc. There are three main categories: 1. *Scripted* - a preplanned script with embedded physical models is used to fulfill an objective with no human interaction after deployment, 2. *Supervised* – with automation of some or all of the functions of planning, sensing, monitoring, and networking to carry out the activities, while using the cognitive abilities of human operators, 3. *Intelligent* – with embedded attributes of human intelligence in software and controls used when making decisions, interpreting information, diagnosing and collaborating. Autonomous systems have the ability to gain information about their surroundings, move themselves without human assistance, avoid harmful situations and *adjust their methods* of executing tasks based on new knowledge.

**Business value:** Autonomous systems have the potential to increase productivity and efficiency, save costs, enhance security, and improve quality on products and services.

**Concerns:** Some autonomous systems – e.g. autonomous vehicles – have been plagued with maturing issues. Furthermore, there are ethical dilemmas these systems would need to deal with in certain situations which are not easily handled by software algorithms. E.g. “least possible damage” scenarios where human lives are at stake.

**Successful implementations:** Autonomous systems in certain forms have existed for some time, and have been known within the space industry, armed forces, law and order, offshore, transport, etc. However, the sophistication and new applications have developed considerably the last few years, and this will continue to evolve.

**Hot tip:** These systems represent considerable investments, and thus require a good strategy analysis. And do not forget to count in maintenance in your business case!

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