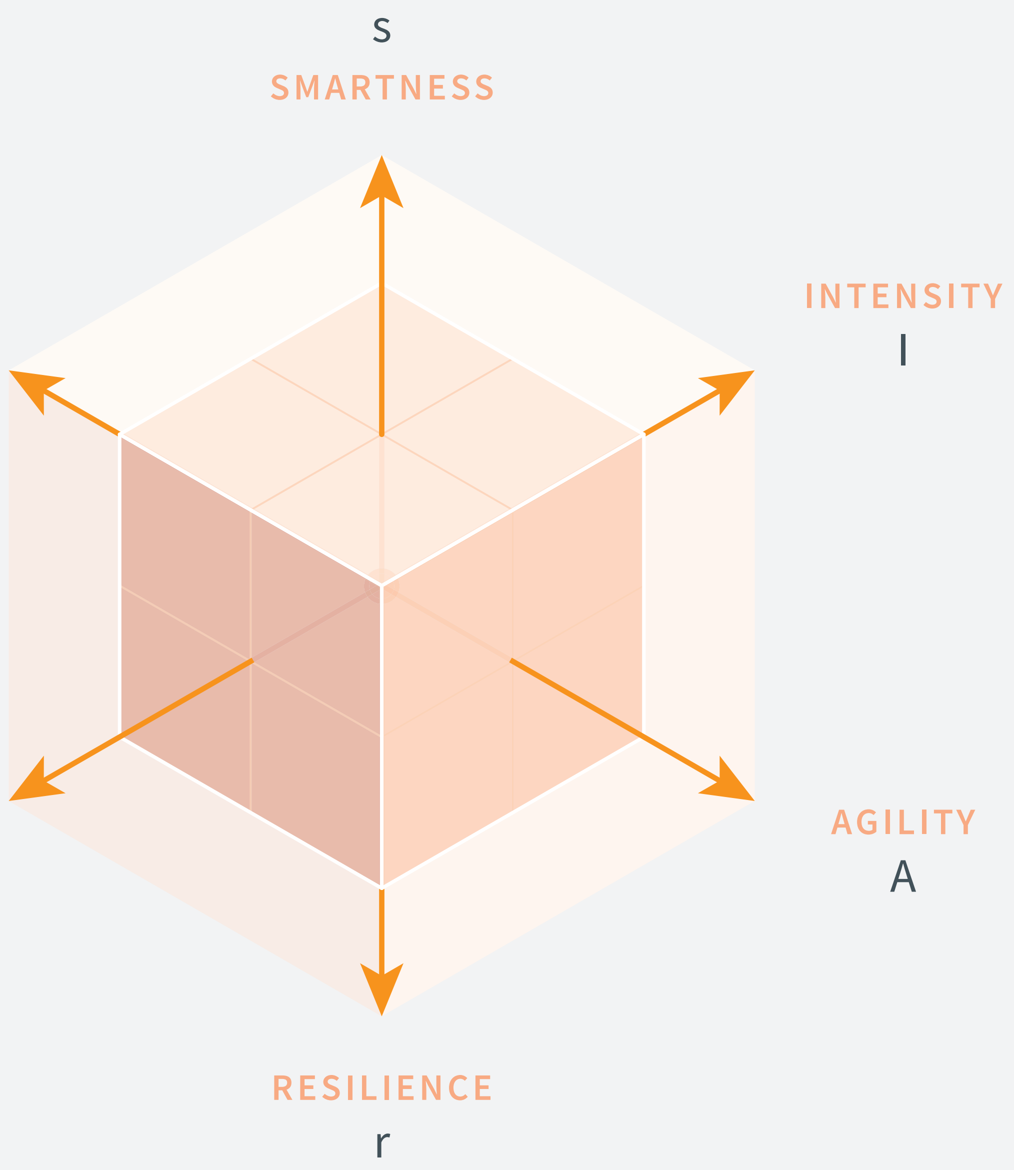
THRUSTER FRAMEWORK

The following model is a universal ***classification tool for propulsion systems***. In its three dimensions it describes the *six fundamental types of thrusters (ACIE-s/r)*. This framework serves unified standards, improved comparability and simplified communication.



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The *New Space Economy* is still undergoing rapid change and, in the paradigm shift of the space industry, is forming a „space network“ of a decentralised, open and collaborative nature.
The corresponding megatrends are above all the democratisation of space travel, a consistent modularisation of its goods and services and the decentralisation of all its structures. Common standards and open frameworks can only be beneficial here and are generally to be welcomed.

This *Thruster Framework* is used for quick orientation about the specialization of a propulsion system. For this purpose, an integral and visually memorable *model* with the following elements is introduced:

3 dimensions
6 classes
2 groups

These *three dimensions* represent all the basic requirements a thruster has to meet:
The first dimension is **THRUST** of course and is either *intensive* (maximum power per time or distance) or *extensive* (maximum time or distance per power).
The second dimension is **MOBILITY** and is either *agile* (maximum dynamic) or *certain* (maximum precision).
The third dimension is **COMPLEXITY** and shows the degree of integration of all the extremes: intelligent system integration and system adaptation *(smartness)* versus resistance and reliability *(resilience)*. Each direction thus corresponds to a whole class of propulsion systems.
These six classes are:

A-Class
All types of propulsion systems in this class specialize in the *mobility component*, are optimized for *agility* and offer maximum dynamics, versatility and the best steering options.
▹ AGILITY

C-Class
The propulsion types in this class are also specialized in the *mobility component* and show a focus on *certainty*, i.e. the precision and reliability of their performance, data and readings.
▹ CERTAINTY

I-Class
Propulsion units in this class are specialized in the *thrust component* and focus primarly on *intensity*, i.e. maximum power per unit of time or distance resp. maximum thrust and highest power peaks.
▹ INTENSITY

E-Class
The propulsion units in this class are also specialized in the *thrust component* and primarly focus on the optimum *extension*, i.e. particularly enduring, sustainable and economical time and mileage per unit of power.
▹ EXTENSITY

s-Class
All the thrusters in this class have a high *complexity component* and, thanks to an intelligent system software, can integrate several of the ACIE classes and individually call up their advantages. They show a high degree of *smartness* and are optimised for any form of (autonomous) adaptation.
▹ INTELLIGENCE (SMARTNESS)

r-Class
All types of propulsion systems in this class have a reduced *complexity component.* They show the highest possible reliability, resistance and thus *resilience*. Due to the maximum elementary construction manner they are particularly robust and safe.
▹ RESILIENCE

Thus the extremes of all three dimensions correspond to the general basic types and classes of thrusters. A *seventh class* is the so-called **X-class**, which lies right at the intersection of all the others and, as a sort of universalist among specialists, tries to combine as many of its advantages as possible. While all specialisations are as pronounced as possible and always complement an opposite class in their dimensions, the X-Class shows general characteristics that are as universal as possible and stands on its own.

In addition, all these classes can be divided into *two groups*:

Firstly, the *four primary classes* ***ACIE***, from the dimensions ”thrust“ and ”mobility“, and secondly the *two secondary classes* **s/r**, from the dimension ”complexity“.
Primary classes correspond to exclusive basic needs. The A-class, for example, more to the practical aspects of imponderable explorer missions, the C-class more to the theoretical requirements of precalculated research missions, the I-class more to the progressive nature of unpredictable peak performance, and the E-class more to the conservative nature of routine endurance performance.
Each primary class works at a very specific level of complexity, from highly complex operating systems to elementary simplicity and resilience (s/r).

This model of the Thruster Framework is universal, global and total in its semantics. All classes can contain many types, but can also be comprehensively integrated into the whole.

Furthermore, they can be combined in any way, as long as they are not mutually exclusive in their dimension:

For *example*, a propulsion system for a certain megaconstellation, which is characterized by extensive use and calculated precision, could be described as an *EC-class* thruster. If this thruster is still particularly simple and safe, the title could also be ”ECr“. If, on the other hand, the thruster is highly complex and maybe also capable of making autonomous decisions, it is more likely to be an *ECs-class* propulsion system.