

יזקום

Terms & Definitions:

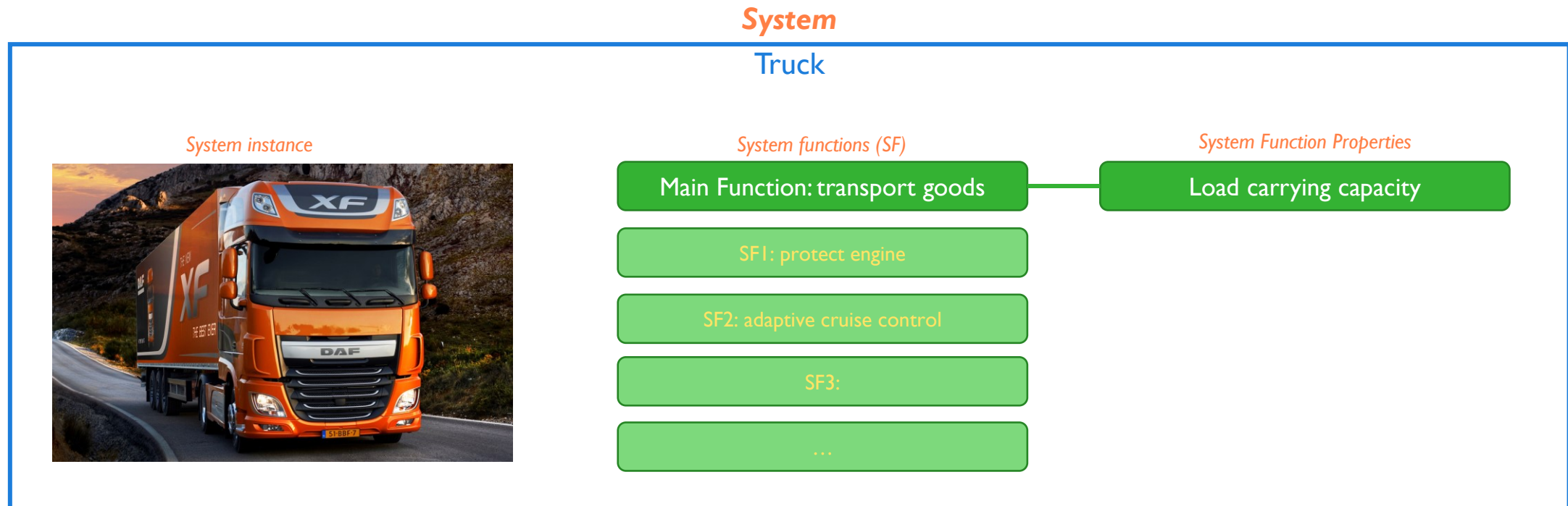
System Properties

Terms & Definitions



- A **Property** of a System or System Function
Something a System or System Function **has** or **is**

Let's consider a "truck" as a **System**, with "transport goods" as its main **System Function (SF)**, then the "load carrying capacity" is one of the **Properties** of that System Function.



System and System Function Properties



Other examples of System Properties (a.k.a. system qualities, system values, system attributes)

- the truck's **mass**
- the truck's **volume**

Examples of System Function Properties (properties that give the function dimensions)

- The truck's load carrying capacity to transport goods

System

Property

System Function

Once a Property is quantified, we speak of a **Requirement***

The truck's load carrying capacity to transport goods shall be 40 tons

Property quantification

* Depending on the specification phase, the quantification of properties can also be part of the design as **Design Decision** or during integration and test as **Product Specification**.

Property types



The following property types are distinguished:

| Property type | Definition | Example |
|----------------------|---|--|
| System Property | expression of a characteristic of a System or System Element | color, mass, volume, length, density, ... |
| Performance Property | Performance or quality characteristic of a Function of the System or System Element | <i>Which characteristics determine the performance or quality of the System? Speed (to transport people), Security (to handle information)</i> |
| Resource Property | Expression of a cost characteristic of a system's function | <i>What may it cost to achieve the required performance? Energy consumption, computation time, ...</i> |

Sometimes you may find yourselves debating whether a property is a performance or resource property. In the end, it does not matter, as long as you have identified the property as an essential part of the product's definition.

Example: consider the emission of NO_x as a property of the truck. Sometimes called an “**emergent property**” because it is the result of many design choices and emerges from the integration of the truck's parts to an overall truck characteristic. You could argue that “NO_x emission” is a performance characteristic as it shows how well the design is regarding emissions. Other people see this more as a cost-type property: “*What may it cost to achieve the truck's performance?*”

The property types as indicated above are merely intended to guide and support the Requirements Analysis process where the identification of system properties is important. It simply helps to look at a System from different perspectives in order to find required characteristics.