Abstract:

Commercial vehicles serve a wide range of operational purposes so that a broad spectrum of conceptual configuration options, for example the number of axles or wheelbase and overhang, has to be offered to the customer. Resulting from the offered range of configuration options, the installation space for chassis mounted parts varies extensively, for example from the shortest to the longest available wheelbase. This leads to a high variance in positioning for chassis mounted parts and for the associated ladder frame components. In the past, layout patterns of chassis mounted parts were implemented to reduce said complexity. In order to ensure an economically viable relation of internal (technical solution space) and external (market-available options) variance, approaches for a standardization of layouts through unification were made. However, a standardized portfolio will only retain its stability as long as the portfolio does not undergo any major changes. Should internal or external causes lead to e.g. an alteration in the dimensions of just one component during the 15 to 20 year product life cycle, a standardized layout might become unsustainable. The main purpose of this paper is to methodically develop and define architectural standards regarding a specific modularization for chassis components as an example for complex technical systems. In order to properly deduce and record such standards, a holistic approach must be taken when creating the profile of requirements. As a first
step, the layout-specific requirements of each industry sector were recorded and translated into
technical specifications using a generic package sector model. Going from there, a retrospective market
basket analysis of all produced vehicles is conducted, the goal being to ascertain the most commonly
used combinations of chassis mounted parts for the respective industry sectors. Based on this data,
several layout proposals including different characteristics of chassis mounted parts are generated for
each industry sector. This overview of the different layouts based on market demand, along with further
technical requirements for the chassis, allow for the deduction and definition of architecture standards.
These architecture standards promise to retain the stability of layout definitions and foster further
modularization efforts.

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