Abstract:
This paper focuses on the concept design of commercial vehicles in the early concept phase when manufacturers strive for an efficient balance between highly customized special vehicles and the greatest possible degree of standardization in their product portfolio. In this context, modularity and standardization strategies are crucial success factors for manufacturers and have to be considered in the very beginning of the vehicle concept phase in order to achieve not only sporadic but overall synergetic effects throughout the complete vehicle portfolio. Accordingly, the presented approach and integrated tool concept allow for solving this conflict systematically by focusing on architectural standards and standardized vehicle layouts as guide rails and aiming points for the engineering departments planning new vehicle concepts. The tools chain allows for developing concepts referring to customer profiles using parametric base geometry and simultaneously concept relevant vehicle characteristics are measured. Having added several single vehicles a KPI analysis for the vehicle portfolio shows strengths and weaknesses concerning the overall degree of standardization and gives starting points to revise poor standardized concepts. Subsequently, package and layout analyses can be performed within the Architecture Digital Mock-up, an early 3D representation of vehicle concepts.

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