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Industrial Product Service Systems (IPS²) – A Shift of Paradigms in Product Development

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Abstract

The customer's benefit of future technical products will be shaped by a product comprehension which will place product integrated or rather product accompanying service into the centre of product development.

In order to fulfil this pretension, an innovative, customer oriented comprehension of service and product performance is being developed in the range of the newly implemented SFB/TR 29 "engineering industrial product service system". This idea of product comprehension no longer regards services and products as segregated but rather as mutually determining elements, as a so-called "industrial product service system" or shortened "IPS²". This new philosophy of service and product components requires a fundamental shift of paradigms along the entire product life cycle.

In order to display the economical as well as the technical potential of the industrial product service system, an urgent demand occurs to be able to seize and illustrate the dynamic interaction between both product and service performance elements in early stages of product development. Therefore an integrated, computer-based modelling foundation is required, allowing the development of service integrated product schemes, based on customer demand profiles.

The offered scientific contribution does not only serve the enlightenment and establishment of the arising product comprehension, but far more presents the first IPS²-modelling approach towards integrating mapping of service and product performance elements in early stages of product development. On the one hand, the initial development steps of elaborating the "hybrid description language" is presented, in order to describe the performance elements by themselves as well as the consistent illustration of the dynamic dependences. On the other hand, the concept for "knowledge based modelling" and the implementation approach for a computer-based development tool are outlined. Both, the concept modelling language as well as the IPS²-modelling methods themselves, strictly fulfil the premiss to make abstractly developed models available for adjacent development views, as for example in order to provide conceptual model content developed on an abstract level for explicit product design or service configuration.