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### **Novel Modelling Approach for Integrated Engineering of IPS<sup>2</sup>-Concepts in Early Development Phases**

Proceedings of the 16<sup>th</sup> International Conference on Engineering Design (ICED 07), Paris, France. -2007-

#### **Abstract**

This paper illustrates IPS<sup>2</sup>-characteristics based on a scenario with two distinctive solutions in order to enhance the basic comprehension of IPS<sup>2</sup>. The results obtained from the scenario are employed to construct an IPS<sup>2</sup> basic structure, which serves as a mediator between a specific, scenario-based, point of view and IPS<sup>2</sup> concept modelling in general. To overcome established distinctions between products and services, which hinder an integrated concept modelling approach, a shift of paradigm is proposed. Therefore an integrated modelling approach is design which is based on IPS<sup>2</sup>-objects & IPS<sup>2</sup>-process pairs as substitutes of disciplines' respective artefacts in order to model IPS<sup>2</sup> system behaviour during early phases of development. Building on this, a new concept modelling approach for IPS<sup>2</sup> is introduced.