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## Product development and design methodology research and application in industry

**Jan-Gunnar Persson**

Royal Institute of Technology – KTH, Sweden

Driving forces in product development (PD) and design are: Technology, Market and Society. Sustainability plays an increasingly important role in industrial PD; ecological, economic and social sustainability. The product life cycle, material recycling, reuse of components and energy conservation, has to be considered. Demand for customization is met by modular architecture. PD is a complex multi-dimensional process, integrating engineering design focusing on “hard” product properties, with industrial design focusing on “soft” product properties. A new type of designer is the design engineer, graduated within the field of industrial design engineering. Mechatronics represents another area of multidisciplinary products. The PD process is characterized by Innovation, Integration and Iteration. Integration refers to both technical integration i.e. multidisciplinary products and organizational integration and concurrent engineering (different disciplines participating in parallel). Iteration means loops in the PD process, significantly speeded up by the use of modeling and simulation software. Virtual prototyping is increasing. Systematic and structured PD is based on the first question “what” – i.e. functional requirements, followed by the “question “how” - i.e. generation of design solution concepts. Analysis of couplings and interdependencies between subsystems and components, by Design Structure Matrices and Function-Means trees, is another important issue. The well-known V-model for specification and verification at different levels of detail is commonly used. The industrial PD and innovation process is often carried out as a 3-stage process, separating strategy, development of core technology, and product design for volume production and market introduction. Market analysis and business environment is another important issue in PD.

### Biography

Jan-Gunnar Persson is a Professor Emeritus, MSc Aeronautical Engineering, Licentiate of Engineering/ Mechanical Engineering, KTH. He spent 20 years in industry: 5 years consultancy for computer supported product design and production planning, 15 years with Atlas Copco AB in technology and business development, e.g. on turbo machinery, compressors and rock drilling equipment. He was appointed Professor in Machine Design at KTH in 1988, with teaching and research in close co-operation with industry. Some of his areas of research are model driven product development, computer simulation, robotics, fluid machinery, thermal processes, and engineering design/industrial design integration.

[jgp@kth.se](mailto:jgp@kth.se)

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