Editorial

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Biographical notes: Mick Eekhout (1950) is a Professor in Product Development. His chair focuses on innovative processes for design, research and development of materials and building blocks for the building industry. He researches the possibilities for glass construction components and constructive systems. Also, ICT-driven design and 'blob architecture' are important research areas. He is leader of the Research Programme Concept House, which deals with the development of industrially produced tailor-made houses. He is Director of Octatube Space Structures bv, which develops three-dimensional architectural constructions. He has written several books and has won prizes, among others the Staalprijs and the Pioneer's Award 2002.

The first congress on Delft Science in Design was initiated by the Delft University of Technology Design Platform, installed some four years ago. The aim of the congress was to familiarise the public with the wide range of scientific designers working at the TU Delft in the different faculties by showing some of their work and inspiring the researchers to initiate new collaborative design processes with the 'synergy' of the mutual know-how and insight. Design should appeal both to students and to staff members of this university.

In a number of cases, design processes and designs are shown that are the result of interdisciplinary collaborations. In architecture, for example, interdisciplinary collaboration is quite common between architects, structural designers and climate designers. In some cases additional collaboration is organised with Ship and Yacht Designers and Aeronautical Designers. This leads to a new blend of integrated and collaborating teams of designers, producing remarkable artefacts.

A well-known thinker on technical design and a designer of composite lightweight constructions and structures is Aeronautics Professor Adriaan Beukers, who wrote the book *Lightness* with Beukers and van Hinte (1997), in which a wide scope of relationships between all kinds of design field are treated. The book offers broad excursions to biology, architecture, design, economy and ecology and shed a new light on the notion of lightness. The book has a follow-up in *Flying Lightness* (Beukers and van Hinte, 2005), a more aeronautic design oriented book. These books are also interesting for many non-aeronautic designers as many multi-disciplinary connections in design are described.

Design is regarded as the tunnel through which the results of scientific research are brought to society. In this sense 'design' as an academic activity is very near to the industrial world. Society and industry could very well be stimulated by the impulses from society-directed scientific design as displayed in the six papers in this issue.

The six papers, written by Koussios and Beukers, Vambersky, La Rocca and van Tooren, Badke-Schaub, van Genderen and Bots give an overview of what the TU Delft in all of its inventiveness and originality stands for and what scientific design can accomplish.

Sotiris Koussios describes the thinking from a geometrical envelope of a form in all of its algebraic analysis and consequences, through structural considerations influenced by the material properties of fibre-reinforced resin composites for volume containers. He speaks about reversed engineering in that the reinforcements are adjusted to the logic of the production process.

Jan Vambersky describes the development process of the load-bearing structure of a building near the Erasmus bridge in Rotterdam, departing form the sloping position of the 'Belvedere' building stabilised by an external buttress, the 'big stick'. The architectural whims had to be accommodated in an adequate way and the development of a proper stabilisation and building stiffness of a simple architectural requirement is astonishing, but convincing.

Gianfranco La Rocca and van Tooren explain the development of a design and engineering tool applicable in the complex environment of the development of new airplanes, the influence on different levels of size, in the subsequent design phases and for the different airplane components, where the sub-optimisations have to be coordinated and integrated to a total optimised end situation of a fully designed and engineered artifact. This Multi Model Generator allows the individual sub-optimisation of components while its place in the total artifact is ensured as well.

Petra Badke-Schaub elucidates on the methodological aspects of development of industrial products, usually taking place within a development team by means of creative steps such as brainstorms in the teams, the effectiveness of this approach in different situations and its influence on the other steps in the development process. Even creative thinking can be analysed and put in a position where it is most effective, even in a governing technical environment.

Piet van Genderen explains the development of a method for detecting landmines in order to neutralise them later, by means of radar technology. Land mines are a continuous danger for the entire population of post-war areas and zones, so the societal fruits of the development of danger-free detection and elimination are high. Further interdisciplinary development is to be organised including the skills of industrial designers to obtain a practical machine.

Finally, Pieter W.G. Bots describes the design of large scale socio-technical systems, such as infrastructures for transport, energy and telecommunication. Generally they are not designed and then constructed according to plan. Three types of design–system design, decision process design and institutional design–are identified as pertinent to large scale socio-technical systems and characterised by applying a generic conceptual framework to a case study. This characterisation provides some insight into the variety of design problems that must be addressed in the context of socio-technical system development.

Having absorbed the different contributions, the reader will notice that these processes are sometimes design-governed, i.e., scientific design or design by research and in other cases the processes are more scientific with minor influences of design, i.e., designing science, research by design. Designers are positioned among scientists by de Jong (2004) in his well-known saying that "Design is the combination of a desirable future, a possible future but most of all of an improbable future". The Design Platform of the TU Delft will stimulate 'design methodology' as a topic from which all designers can learn from each other's experiences, from the common to the specific approaches.

References

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