



Synthesizing needs in system innovation through structured design

From current solutions - to basic needs and requirements - and back

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Introduction

In order to make modern western animal production systems more sustainable, it is necessary to (re)design systems that address a multiplicity of challenges at one time (system innovation). Adaptive improvements of one aspect of current systems often lead to undesired side effects on others. For instance: improvements on animal welfare by allowing for more space will easily lead to more local emissions, e.g. ammonia. This will occur as long as new solutions for one problem are added to current standards, practices and solutions.

RIO as a method for system innovation

The RIO approach (an acronym for Reflexive Interactive Design) is a set of methods applied in animal husbandry in order to interactively design and realize system innovations in complex and often controversial contexts like animal husbandry, in an effort to circumvent social and technical constraints for sustainable development. Figure 1 gives an outline of steps.

Structured Design as a basic feature of RIO

A basic feature of RIO is Structured Design (SD; Kroonenberg & Siers). In SD, design of new machinery, buildings and constructions starts from an elaborate inventory of needs and requirements of the prospective users and environment. In RIO projects on redesigning animal husbandry systems, the basic needs of live actors (animals, farmers, the general public and consumers) are key starting points. For each, a Brief of Requirements (BoR) is formulated.

Abstracting from short-term interests

Needs are to be differentiated from (short-term) interests, since they are the expression of fundamental preconditions for a good life, as perceived by the actor, or engrained in the actor's biological make up. Short-term interests may be context dependent, and may change over time. RIO aims at the synthesis of the needs of these different actors, instead of weighing the pros and cons of the various interests. By taking needs as the central 'currency' for this design approach, actors –like animals and man – can be treated symmetrically.

Abstracting from standard practices & solutions

It is essential that these BoRs are 'solution free'. Subsequently, the functions that should be performed are identified. Only after this, an inventory of possible solutions to these functions is made. By abstracting from current standards and practices, the space for new solutions that fit multiple needs is enlarged.

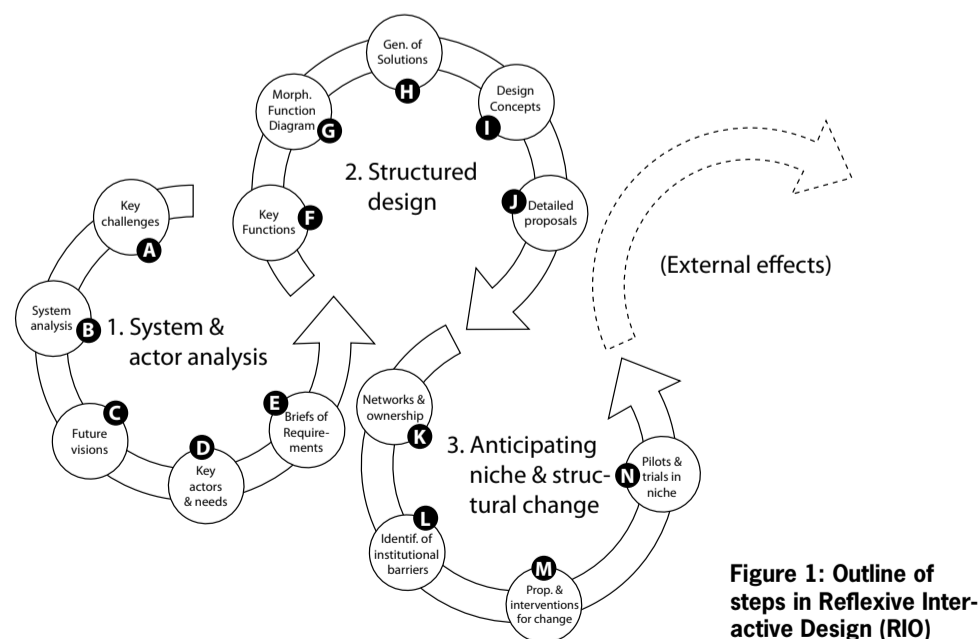


Figure 1: Outline of steps in Reflexive Interactive Design (RIO)

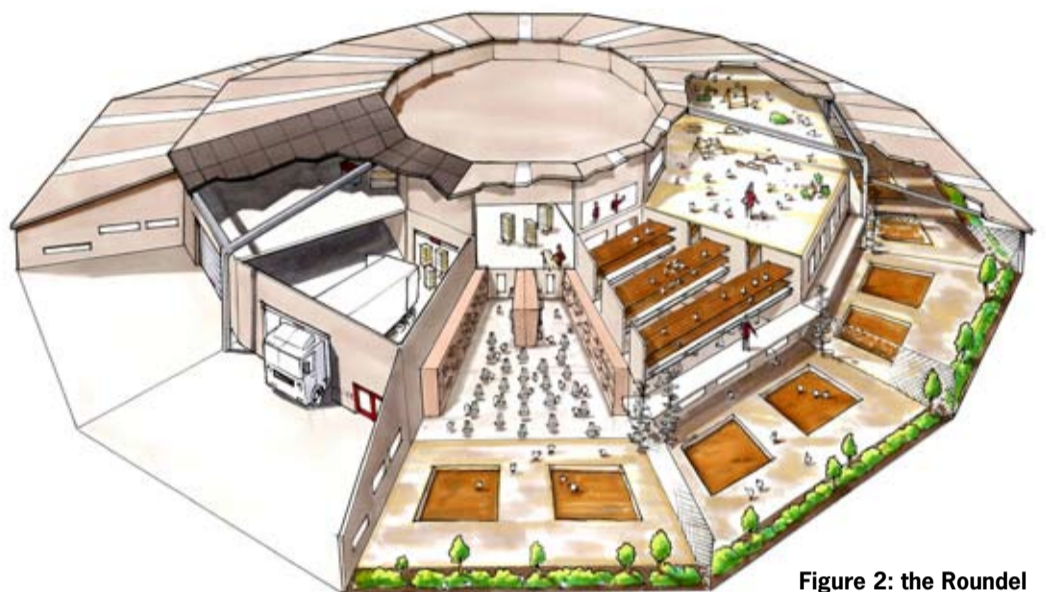


Figure 2: the Roundel

Results

In a previous project on laying hen husbandry (Houden van Hennen) the approach demonstrated that the approach is successful in synthesizing needs of different actors, thereby increasing animal welfare without compromising on labor circumstances, environmental concerns, or economy.

The Roundel

In the project Houden van Hennen two new designs for laying hen husbandry were made, in which the needs of the laying hen, farmer and citizen/consumer were synthesized. With the RIO approach, by abstracting from current solutions and practices, the designs were able to integrate a very high performance on animal welfare with economical and environmental considerations. Figure 2 shows the Roundel, a concept that has been further developed by the Vencomatic Company and a first Roundel house will be built in practice in 2008.

Acknowledgements

This poster was presented within the project Kracht van Koeien (BO-07-009), a policy supporting research project financed by the Ministry of Agriculture, Nature and Food Quality, and was subsidized by the KB7 programme Transitiekennis en -kunde. Special thanks to Sierk F. Spoelstra

Key References

- Bos, A.P. (Bram). 2008. Instrumentalization Theory and Reflexive Design in Animal Husbandry. *Social Epistemology* 22 (1):29-50.
- Bos, A.P. (Bram), and John Grin. 2008. "Doing" Reflexive Modernization in Pig Husbandry: The Hard Work of Changing the Course of a River. *Science, Technology, & Human Values* 33:480-507.
- Groot Koerkamp, Peter W.G., and A.P. (Bram) Bos. 2008. Designing complex and sustainable agricultural production systems; an integrated and reflexive approach for the case of table egg production in the Netherlands. *NJAS - Wageningen journal of life sciences* 55 (2):113-138.
- Houden van Hennen, Project team. 2004. Laying hen husbandry - towards a happy hen life, proud farmers and a satisfied society. Wageningen - Lelystad: Wageningen UR.
- . 2005. Programme of demands - based on the needs of poultry farmer, laying hen and citizen. Wageningen: Wageningen UR.

