

Five Minutes on ProHEAL
and the GDR Inventor Schools
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Hans-Gert Gräbe, Rainer Thiel

Leipzig University, Germany

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ProHEAL – Recent Publications

- ▶ H.-G. Gräbe, R. Thiel. ProHEAL – Social Needs and Sustainability Aspects in the Methodology of the GDR Inventor Schools. LIFIS Online, 15.08.2021.
http://dx.doi.org/10.14625/graebe_20210815
- ▶ H.-G. Gräbe, R. Thiel. ProHEAL Basics – Extended Version. August 2021. To appear in LIFIS Online.
- ▶ Rainer Thiel. Dialektik, TRIZ und ProHEAL (Dialectics, TRIZ and ProHEAL). Rohrbacher Manuskripte, Heft 21. LIFIS Berlin 2020. ISBN 978-3-7526-2015-3. (in German)
- ▶ H.-G. Gräbe. The Contribution to TRIZ by the Inventor Schools in the GDR. Proceedings of the TRIZFest 2019. ISBN 978-0-578-62617-8, pp. 346-352.
- ▶ <https://wumm-project.github.io/GIS>

GDR Inventor Schools – Facts and Organisation

- ▶ Over 300 inventor school courses in the 1980s (source: [RT1994]).
- ▶ Typical structure: 2 one-week courses in a guesthouse of the company.
- ▶ Participants bring their own problems.
- ▶ These are analysed and prepared in the first week according to the methodology. At the same time, the methodology is taught.
- ▶ This is followed by self-study at home (further analysis and preparation of the problem, patent analysis etc.).
- ▶ In the second week of the seminar, the results are discussed and the solution is developed further for application in production.

ProHEAL – the Problem Field Levels

The Technical-Economic Problem Field Level

Goal: Develop a *basic variant* from the social needs as (potential) requirements *based on the technical state of the art* and the available production and management experience.

Analyse it carefully based on the (multidimensional) ABER(1) matrix and identify all major technical-economic contradictions (TEC) (e.g. between functional requirements – German: **Anforderungen** – and legal **R**estrictions).

The considerations are person- and process-related and determined by the product-goods-purpose relations.

ProHEAL – the Problem Field Levels

The Technical-Technological Problem Field Level

Goal: Delimit the *critical functional area* in the basic variant as *core variant* in which the central TEC manifests itself. Find the technical means, effects and counter-effects and their relationships in this critical functional area and develop a suitable technological model.

Analyse this core variant carefully based on a ABER(2) matrix and identify all significant technical-technological contradictions (TTC) (e.g. low controllability of a required operation (**A**nforderung) due to **R**estrictions on the counter-operator).

The considerations are object- and function-related and determined by the technical means-action-counteraction relations.

ProHEAL – the Problem Field Levels

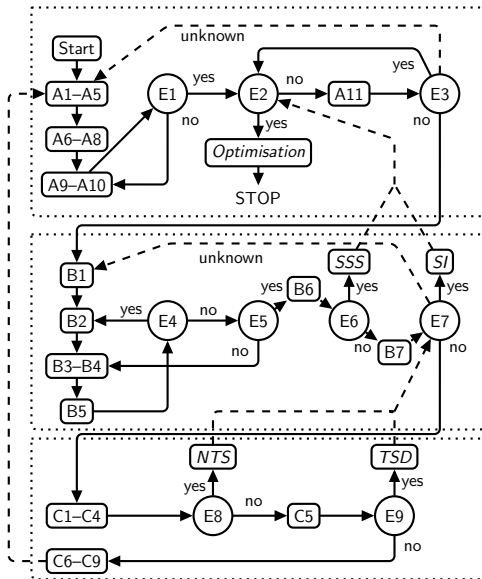
The Technical-Scientific Problem Field Level

Goal: Develop a scientific model of the *critical operational area* within the core variant and find an ideal operational principle that solves the TTC and avoids the harmful side effects.

Analyse this model carefully based on an ABER(3) matrix to identify all significant technical-scientific contradictions (TSC) (e.g. between known technical effects – German **E**rkenntnisse – and constructively required counter-effects as **R**estrictions).

The considerations are model- and event-related and determined by the field-factor-effect relations.

The Algorithmic Structure of ProHEAL as Diagram



ProHEAL – the ABER Matrices

ABER(1)	Functionality	Profitability	Controllability	Usefulness
A: Requirements				
B: Conditions				
E: Expectations				
R: Restrictions				

ABER(2)	Operand	Operation	Operator	Counter-operation	Counter-operator
A: Requirements					
B: Conditions					
E: Influence					
R: Restrictions					

ABER(3)	useful effects	side effects	counter-effects
A: Requirements			
B: Conditions			
E: Findings			
R: Restrictions			

ProHEAL – Contributions to a TRIZ Methodology

Due to the specific scope of application in socio-economic practices of large production units (combinates), ProHEAL differs significantly in some aspects from TRIZ in Altshuller's variant available at that time.

This refers **firstly** to the more detailed elaboration of *technical-economic contradictions* between social needs and technological possibilities. Although Altshuller is also aware of administrative contradictions, they are not seriously addressed in his work.

Secondly, ProHEAL early abandoned a monofunctional orientation. Value determinations are recorded under different aspects as evaluation figure at all problem field levels in the ABER matrices. Thus contradictions in the problem description are already identified during requirements elicitation.

Thirdly, in addition to solving a contradictory problem situation, the transfer of the solution into production also plays an important role in ProHEAL. Thus, even the solutions of contradictions on levels 2 and 3 are being returned to level 1 in node E2 to decide about the transfer to production.