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– Studium fundamentale –**

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To whom it may concern

Reference Letter for Ralf und Gitta Peyn's Software-Project FORMWELT

Worries that artificial intelligence someday might approach, overcome, and substitute human intelligence are not only premature but underestimate both the intelligence of the brain in its multi-dimensional space of the body and the intelligence of social behavior in its multi-dimensional space of society. What matters instead is the design of applications which combine artificial intelligence by machines with cognitive intelligence of humans. That way powerful memories, fast algorithms, and rich connectivity, on one hand, would be completed by an intuitively grown, partly self-conscious world-knowledge, on the other.

For such a combination of artificial and human intelligence there exist currently two fascinating perspectives of development, as there are (i) the control of statistical machine learning programs by human intelligence and (ii) the control of human intelligence by structured programs enabling the set-up of logical spaces describing certain kinds of knowledge. FORMWELT by Ralf and Gitta Peyn is pursuing the latter way. It relies on the idea that humans mostly know what they know and do what they do but more often than not don't know what they do or necessarily do what they know. The bodily, mental, and social knowledge of human beings in pragmatic nexūs of action constitutes a complexity which is used, updated, and enlarged at any moment but is never fully comprehended. Intuition, language and world knowledge give us anchoring and orientation without necessarily engaging also our self-consciousness.

FORMWELT by Ralf and Gitta Peyn offers a logical space of the construction of behavioral purpose and of knowledge about the world which already has an impressive range and scope. It can be used to embed smaller and bigger projects within it in order to test sequences, conditions, frames and presuppositions by means of that logical space. FORMWELT is a programming language within the logical space of tautology (à la Ludwig Wittgenstein), which does not construct and test the truth of a reality but the pragmatic use of references and chains and networks of references. A consciousness exploring verbalizations and the senso-motoric intelligence of a body are not substituted by the machine but presupposed as external conditions of the evaluation of a program. The decisive operational modus of FORMWELT thus is the double testing of (i) a knowledge with respect to the logical space of its possibility and (ii) the logical linking of propositions with the true space of a reality. The overall purpose of FORMWELT is not simulation, but the getting of consciousness and, subsequently, the opening of design spaces not seen before.

Ralf and Gitta Peyn built this FORMWELT in the last years with great competence and lots of energy. The current state of the project, as far as I can see, is that of the development of a kernel, that is of a running program without applications. The important next step will be to go online to open FORMWELT for applications and to let it learn from its applications.
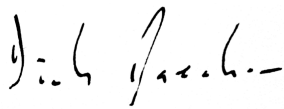
To me it seems highly desirable that ways and means will be found to enable FORMWELT to go online. The programming language of FORMWELT in an exemplary way combines every-day comprehensibility with machine-logical networking and it does so by offering users a shared way to work and develop the language needed. Every user is learning from the program, and the program, from every user. The proof of this essential feature can only be given when FORMWELT is online and is used in a distributive and participatory mode.

Among the most important fields of use of FORMWELT Online will be education and business. FORMWELT Online as I guess will be able to support self-organized processes of knowledge acquisition and knowledge probing as much as project-based design tasks of problem analysis and problem solution. From a detailed presentation of FORMWELT I got the impression that the language of the system is to be learned easily and fast because any one learning step is readily translated into an operation to be mastered. Learning and reward here are almost one. Without exactly getting into contact with a programming language let alone machine code the user nevertheless is subjected to a tight control by a logical space which she at the same time can both master, extend, and change. In education and business, to name just those two fields of possible applications, only those software solutions attract attention which like a smartphone app soon become highly individual versions of themselves. This moreover increases the "fun factor" when using the app which is relevant for engaging both the cognitive and emotional intelligence of users. The program is not detached from, and indifferent

towards, its individual use but instead complies with it and bears witness of it. With respect to one's own individual language and to one's own world knowledge, yet in both perspectives highly structured and thereby both shareable and simplified, every user and every users group produces its own program. Not least the high degree of structure increases the clarity of the respective language used and thereby increases as well the ability to translate it into foreign languages. In a globalized world of education this is as important as in the global environment of business projects.

Let me conclude by wishing Ralf and Gitta Peyn success and good luck with FORMWELT.

Witten, May 25, 2016

Prof Dr Dirk Baecker