Diamonds of the Orgiton Theory

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***Abstract*—This work addresses the firstly arisen orgiton theory and summarises their key findings in the form of eight diamonds of orgiton theory. We first briefly introduce orgiton theory and focus then on these eight diamonds. We assign them to the first eight prime numbers without dedicating them to any related order, as their interdependency relation: §2 Orgiton. §3 Orgiton Grammar. §5 Directionality. §7 Osmotic Paradigm. §11 Emergence Theorem. §13 Emergence Contraction 1 =n 1. §17 Cybernetic Ethics. §19 Social Dynamics. We further give the prospected relevance of this work and possible applications concerning epistemological, theoretical and practical applications. As a possible practical application field, we will sketch the use in the field of Industrial Engineering and Management. Finally, we give conclusions and an outlook towards the further development of orgiton theory.**

***Index Terms*—Orgiton theory, emergence, selforganisational theory, philosophy of science, epistemology**

I. Introduction

The orgiton theory is intended to be an interdisciplinary theory that combines elements of a comprehensive set of theories to give a framework for a universal theory of the world. The basing theories are systems theory in social systems [1, 2], cybernetical systems [3] or general systems [4], selforganisational theory in general [5, 6], in biology [7], cybernetics theory [8, 9], graph theory [10–12], language theory [13, 14] and some others. Industrial Engineering and Management is a modern scientific discipline, which is widespread educated worldwide in university study programs. It emerged mainly from the two study disciplines, economy and mechanical engineering. In recent years, the 4.0 paradigm has arisen, affecting, e.g., Industry 4.0 [15], which originated as a political research agenda in Germany, and the parallel one in the USA called Cyber-Physical-Systems (CPS) (CPS see, e.g., across disciplines [16], and in manufacturing systems [17]).

II. Content, Goal and Methods

A. Content

In this work, we give in this Section first the goal, the methods, and the limitations of this work. In Section III, we list the eight diamonds of orgiton theory. In the course of the creation of the list, we each had roughly four overlapping and two individual diamonds named. Hence, we can regard this finding as an orgiton, as we will see later, so that we can think of ourselves as a two-person-social system or a social-o. In and how they are related to the world, society, sciences and Section IV, we discuss some aspects of the eight diamonds epistemology. In Section V we give some general applications, in Section VI, an application to the Industrial Engineering and Management discipline, and in Section VII, we give a conclusion and an outlook to our future research work on the orgiton theory.

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B. Goal

This work aims to give a comprehensive and illuminating summary of the orgiton theory, assigning selected core elements as the diamonds of orgiton theory, that is, elements that have a more fundamental and deeper meaning and impact.

C. Methods

This work gives an analytic description and natural language summary of elements extracted from orgiton theory. Partly there will be given summarising or supplementing explanations of the background, implications, and inter-/, intra-/ and cross-relationships to give a broader picture.

D. Limitations

The limitations of this work are that the importance and the choice of elements and their description are a subset of the orgiton theory, and it is a theory that is still and must be, according to its core principles, in the development phase. The diamonds presented here are the orgiton's theory Wittgensteinean Ladder [14, 18] towards knowledge gaining. This work is hence shaped by our personal views, although the work of you, as the reader, has to be done to complete it in a wider view of your own knowledge development.

III. Diamonds of the Orgiton Theory

In this Section, we present the eight diamonds of the orgiton theory and remarks about some of them.

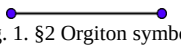

Fig. 1. §2 Orgiton symbol.

A. First Diamond-§2 Orgiton

The idea of an orgiton (see the symbol in Fig. 1) describes a cybernetical unit of a form-minimal, back coupling cycle, containing material, energy, and information flows. According to the emergence theorem §11, bifurcations can occur with regard to variables or dimensionality. This, then, intrinsically and extrinsically, gives a combinatorial possibilities room of directionalities §5, forwarding or backwarding to a reentry. The orgiton can be named by extending an "-o" to the name, by this referring to a general orgiton name construction, defining indices, e.g., *i* for a reentry that are counting feedback loops, analogously to the Poincaré planes' reentries in phase space of chaos theoretical

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dynamic physical event trajectories [19].

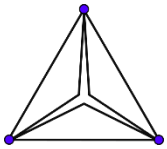

Fig. 2. §3 Orgiton grammar symbol.

B. Second Diamond-§3 Orgiton Grammar

The orgiton grammar (see the symbol in Fig. 2) is the natural language implementation of orgitonal information compression. This means that language can be compressed by a standard in its meaning, by this also osmotically applying to spoken and written language as diverse information channels. Naming the orgiton, as a reoccurring entity in natural language, is implemented by extending an "-o" to the orgiton §2 basing word or a back-arrow "↵", by this implementing different indices, and a dimensionality in reoccurring entries of the observed orgitonal entity. This can lead then to natural language use that can connect far and wide entities by structural arrangements, like compressed and near distance ad hoc rules, for e.g., abbreviation as a beginning, and can then be further extended aiming at compressing meaning, yielding by this semantic density and controllable preciseness of combinatorial interlanguage information relationships.

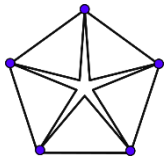

Fig. 3. §5 Directionality symbol.

C. Third Diamond-§5 Directionality

We understand the directionality (see the symbol in Fig. 3) as an ordering process. As also described in [20], the increasing directionality means a potentially higher order. This can be regarded chaos theoretically as an emergence into a higher dimensionality. Concerning networks in general, computational networks, communication systems, societal systems, and graph-theoretical described systems, this also means that (a) a particular functionality is given first as uni-directional, and (b) later bi- and multidirectional, leading typically to systems order increase in evolution. By this evolutionarily arises first a hierarchic system and later a democratic one, together with a complexity increase.

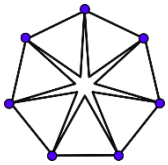

Fig. 4: §7 Osmotic paradigm symbol.

D. Fourth Diamond-§7 Osmotic Paradigm

The osmotic paradigm (see the symbol in Fig. 4) utilises the directionality approach §5 to stabilise all systems with regard to flow. In Ref. [21], we have defined the first principles, basing the approach on osmotic flows as a combination of distance sets and flow measures and extending it further towards a general osmotic paradigm in [22]. There exist methods in graph theory and others to model those combinations, of then knots and edges, mathematically and computationally, which makes this method largely applicable.

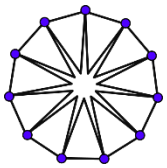

Fig. 5. §11 Emergence theorem symbol.

E. Fifth Diamond-§11 Emergence Theorem

The emergence theorem (see the symbol in Fig. 5) states that order in dynamic systems, or time-dependent systems, can be regarded as leading to stable trajectories or attractors of the underlying variable in the state space of those systems [23]. This means that order in a dynamical sense of, e.g., the selforganisationally living beings, is a temporary dynamic equilibrium resulting from growth, with regard to increase and decrease characteristics. It is a generalised condition with regard to a thermodynamically *open system* to develop selforganisational growth. Even to maintain this state, there has to be an outer system with infinite flow, which can be regarded as equivalent to being an open system. In [24], we have supplemented this theorem by the emergence principle, which states that there is an increased direction change or mirroring in regions of emergence.

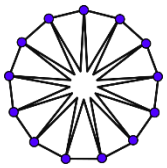

Fig. 6. §13 Emergence contractions 1 =n 1symbol.

F. Sixth Diamond-§13 Emergence Contractions 1 = n 1

The emergence contraction (see the symbol in Fig. 6) is a basic process that compresses information into smaller and shorter units, by this giving increased semantic density or a higher elemental gravitational field. Basic applications are logic analyses, dating back to Socrates and Aristoteles, the system of equation systems, basically comprising a deductive system in mathematical sign-determined form. Here the "=" sign indicates the emergence contraction, unfolding higher orgitonal meanings by the reoccurring same "=" sign, by this building orgitons of higher order with index n, or giving a reentry [25]. The orgiton grammar §3 is an application, as well as the emergence theorem §11. Famous new applications are the relativity theory that compresses the concepts of room and time in the room-time emergence contraction employing the Minkowski transformation of the Lorenz equations (see also [26], yielding *higher order orgitons* as invariants of reality construction: room-time-distances (i.e., also §11). By this, the first-order is defined by the independent observable room-time distances. In a second-order abstraction, we get by this out from the 4D-dimension seen flat the 3D and 1D dimensions of room and time. When we look at this transformation, energy and material become exchangeable, or in our diction, translational. And the Minkowski transformation is the orgitonal grammar for this relativistic

"reality" translation.

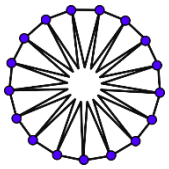

Fig. 7: §17 Cybernetic ethics symbol.

G. Seventh Diamond-§17 Cybernetic Ethics

Human rights Hr are protecting humanity in their existence, and they can be thought of as an own set of axioms that we summarise as cybernetic ethics (see the symbol in Fig. 7), and which are by orgiton theory, and other cybernetical approaches creating dynamic stable order standards.

Standardisation itself is an emergence contraction §13 application. It leads to higher efficiency by pooling, which means "mass" application or application of a large "number" of elements. This equilibrating process, which can be regarded as a highly efficient order generator, can even be easily misdirected by means of monopolisation, which then leads to, e.g., power accumulation in hierarchical topped or pyramidal systems by this possibly counteracting beneficial global effects.

If the order of the human-right-o decreases, humanity is at stake, which is precisely why they (Hr) are necessary for existence and peace, as well as their 'enforced' protection. For arguing with this, we have introduced the chain reaction argument, which cybernetically argues that humanity, as an orgiton, the human-o is in a dynamic, stable equilibrium in an open system that is growing or decaying. For order increase or existence, the world has to stay open, as Popper says [27], to be an open society, and by setting dynamic order trajectories or attractors (i.e., emergence theorem §11 and also [24], in the form of human rights.

Due to the property of open systems, and with this growing complexity, higher existential order also means an increase in standards or the growth of the human right-o, the human rights orgiton.

Setting the rights into the "right order" means gaining dynamic stability of the principally unstable condition of life, existence and reality.

A closed system, on the other side, is an anti-orgiton, which means that the forces are dominating towards de-emergence, and we have learned earlier that the forces are determined by the directions of the movements. Further, more an out (side)-controlled system, under any circumstances, decreases the inner freedoms [28], hence critically destabilising the system. On the other hand, dynamic guaranteeing openness redirects possibilities or degrees of freedom and, with it, the responsibility to persons, by this dynamically stabilising, despite increasing uncertainties. The reason for this is the selforganisational power of creating life, existence and reality as a double contingent loophole phenomenon.

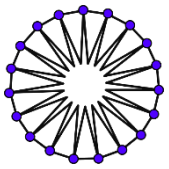

Fig. 8. §19 Social dynamics symbol.

H. Eighth Diamond-§19 Social Dynamics

The social dynamics (see the symbol in Fig. 8) is the part of the work that emerges at the arising increase in complexity. We have formulated first sentences that include natural language sentences that can translate straightforwardly into mathematical expressions. The social dynamics understood as a *theory of society* by Luhmann is based on communications processes and systems theory. According to orgiton theory, there can be formulated cybernetic models of these communication processes and translate abstract entities into each other by means of these processes, describing them as differently distant to each other, i.e., §7. The interdisciplinary applications may be accomplished by translating processes that are uni-/ to multidirectional in the flow direction of the observed variable.

I. Background of Some of the Orgiton Theory Diamonds

The word orgiton, according to §2, has been constructed from the word "organization" originating from the Greek and Aristoteles, which is a large living unit, and from which the word organ, as a small living unit, derives. To indicate, semantically dense, a *scalable relation* of these cybernetic units, the word orgiton can be understood as an intermediate composition of the words org(an)i(sa)t(i)on, and org(an)[iton], denoting () deletions and [] insertions of signs in the transformation from the basing word to the common intermediate word orgiton.

The osmotic paradigm §7 was first derived and further developed from Einstein's consideration regarding his 1905 [26] particle growth problem, giving an analogy to an osmotic flow field.

IV. Relevance of the Work

The relevance of this work can be seen as a framework that can also be formulated and integrated into other theories by these constituting elements of a theory that then comprises new and more complete frameworks that can be directly applied in natural language and other disciplines, like, e.g., in logic, mathematics, computational and material cybernetics applications. So orgiton theory acts mainly as a translation tool for bridging our daily life with more sophisticated cybernetic, functional theories of all sorts of complexity levels, by this having in focus the specific applications and relating to the ever non-private language principle (according to a seminar conversation with Peter Payer on 21st January 2022), as according to Wittgenstein, language cannot be private, as a social functional requirement, hence identifying it as our basic and intrinsic stone-age old tool, which has been refined by the centuries, by means of now increasingly cybernetical extension, ever emerging, and by this fueling, the increasing social gravitational forces, and acceleration, finally semantically.

The main importance of the work may be some meta-view that does not allow for simple deconstruction. It has to be reframed personally by applying the 'self-thinking principles'. Insofar as this work, as well as that of the readers, in the form of creatively new and re-thinking of the suggested elements, can potentially create a new order, and by this a gravitationally increased social field, this is triggering, self-responsibility, and finally decoupling double contingencies,

recreating the liberties we need in a highly compacted and compacting social gravitational field, due to "social forces", which we have "redefined" according to the osmotic paradigm §7, as a consequence of a movement into a direction, due to the double contingent cybernetic feedback looping.

V. General Applications of the Work

In this Section, we give some useful outlooks on how the orgiton theory can be applied most effectively and the potential and future benefits in epistemology, practical and theoretical applications.

A. Epistemology

The main applications of the work may be an application to epistemological principles of how to use and develop science with regard to inter-/ and transdisciplinarity. The universal questions are: "What is the world? How do we manage to survive in a changing environment and make future paths towards humanity's growth viable, as a species, as part of the evolution and the eco-system life?"

B. Practical Applications

Practical applications of the orgiton theory will be a system theoretic modelling by means of computer programs that link all scientific disciplines together, from the soft to the hard sciences, including every effort of humankind to gain increased personal and humanity knowledge. So these tools can be applied for future applications technologically, in society as total, up to personal safeguards, especially with regard to self-controlled knowledge-based decisions [29].

C. Theoretical Applications

The theoretical applications of the theory are foundations in different now single fields and the then possible interdisciplinary fields of society, science and philosophy. The implementation of what is science, as the epistemological applications indicate, gives further outreaching argumentation strings toward all science disciplines, especially concerning living systems sciences, as the transition from life to non-life can be described by this approach. The research work in these theoretical fields might be how to link different theories to one osmotic theoretic framework, which can be investigated with regard to interdependencies, redundancies and discrepancies. So, for the philosophical discipline, this will be then, e.g., the application to logic and its ever-emerging descendants.

VI. Application to the Industrial Engineering and Management Discipline

As the orgiton theory is a selforganisational theory that can be applied to different disciplines, widely and on different scales, we sketch here some possible applications to the Industrial Engineering and Management discipline.

A. Teaching and Consulting Aid

First, the diamonds of orgiton theory concept may be used as an educational tool for triggering thinking processes. The eight diamonds are, in this respect, a draft for the teaching of orgiton theory as a compact synopsis. These elements or diamonds contain some basic concepts of orgiton theory, which are an open system in terms of structure and therefore need to be supplemented by the respective future practice. Ethics, for example, allows us to build higher order systems with the help of argumentation, to model, simulate and argue systems that allow us to build a specific system according to our basic argument, supplemented by further own argumentation. In this context, the basic argument and the methods of orgiton theory are a toolkit to build one's own ethics and, at the same time, to have a compass regarding the limits or to know for which limits to look. This may be used in management courses to apply ethical implications and simulation with computational tools to verify the aspects. Especially in future when interdisciplinary simulation applications are more widely used in scenario simulations than now. Here, those base principles can be used to draft decisions, which are then later on refined by computational modelling of socio-economic systems. Examples include, e.g., simulation of energy networks, CPS systems, Industry 4.0 systems, transportation and logistic networks, and many others.

B. Social Dynamics—Management and Engineering Applications

Concerning, e.g., the application of the social dynamics, this seems metaphorical at first. Here are two aspects to mention: (1) First, socio-economic systems for industrial engineers like production systems or business process models can be cybernetically modelled by orgitons to reduce the model to minimal configuration units or orgitons. These can then be built together into more complex systems in simulation tools. (2) Second, those now explicitly formulated given dynamic elements can be regarded as "pre-orgitons" of a new form of then explicitly mathematically formulated social dynamics, building the bridge to classical mechanical engineering dynamics, which can be the base of future generation computational simulation programs, based on these new elements of social dynamics. Applications will then be generally, as an application of language theory, the increasing cybernetisation of language, which then goes into the realm of, for example, strategies for artificial intelligence applications. In the sense of a meta-theory concept, new creative applications are thus possible depending on the area of application and can also be assessed at least to some extent in terms of meta-effects, i.e., interdisciplinarily. In management, especially in the decision sciences, there is a link by means of these tools directly to increasingly rational decisions. First, by a diamonds of orgiton theory heuristics with natural language arguing. Second, by Computational Engineering of sophisticated Industrial Engineering and Management use cases, like, e.g., management control or manufacturing scenarios.

VII. Conclusion and Outlook

In the following, we give some basic conclusions, relating by this to the defined diamonds of orgiton theory, and then giving the outlook that is just emerging into our new work now.

A. Conclusions

In this work, we have presented the eight diamonds of

orgiton theory, a theory that we have developed in the years before, which is a theory of everything and aims to provide an interdisciplinary framework, unifying very distant appearing disciplines with this uniting approach. As a selforganisational, systemic or graph-theoretical approach, this theory can help discover new and overall insights and make and shape lean computational implementations. According to Wittgenstein's diction and his language theory, the natural language suffices to explain everything, as the language is our border. In our theory, we have summed this up and condensed it into several results, demonstrating by this how knowledge can be gained with this language philosophical approach. By emergence-contraction §13, emergence §11, directionality §5 and orgitonisation §2, or orgitonal grammatisation §3 of language to use the diamonds directly. More complex systems, like the cybernetic ethics §17 and the social dynamics §19, are given in a first descriptive formulation.

B. Outlook for Our Research Work

We plan to formulate social dynamics as a thorough analogy of Newtonian and Einsteinian Mechanics in the form of *Social Mechanics*, ground-laying a new discipline, using the transformational approach of relativity to formulate and then think in the new, transformed theory, as already Lillian Lieber suggested for Einstein's theory of relativity [26]. Our deep feeling is that we are still trapped in the classical mechanics, in general thinking of natural language, and has this new form of relativistic thinking a deeper impact on us, especially with regard to social mechanics and dynamics. By this approach, it will be possible to translate social-system theory into the mathematical language, enabling computational approaches quite directly in the form of computer simulations of then formulated social orgitons or social-os.

The link to computer simulations might be quite useful in the future for a lot of applications. Besides purely physical applications, it will be preferable to have also applications for soft science discipline fields like law, philosophy, society, politics, and management, to mention only a few, to work effectively in a deep epistemological understanding of systems and system complexity as it emerges in necessary increasing real-time necessities of now and future society according to the acceleration of the societal gravitational field. For this, we need, what now is roughly called XAI or explainable artificial intelligence, but we think that the technology development goes further, towards even more general tools that we can use, as an immediate feedback process eco-system, that comprises then largely our environment, such that we cannot even easily distinguish it from our perception, as it will have become familiar to us by "deep" education and applications. These new tools can then be regarded as our then "natural" skin that protects us, like a shell, and that we can control ourselves completely like a part of our body now. This has an epistemological as well as a computational aspect, as we have explained in [30] and a systemic one of the ordering of systems [31], leading to higher order systems §5 and new properties §11–13 and directly to existence related cybernetic ethics §17 and by this to the diamonds of now and future humanity, which you are invited to discover and apply with us.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

We have done the work in equal distribution of efforts. Bernhard Heiden has primarily worked on the first four diamonds, and Bianca Tonino-Heiden has worked on the second four diamonds of the orgiton theory, which constitute a concentrated substrate of our in the same way equally authored philosophy dissertation thesis project "Philosophical Studies—Special Orgiton Theory". All authors have approved the final version.

References

[1] N. Luhmann, *The Society of the Society*, Suhrkamp Verlag, Frankfurt/Main, 1997. (in German)

[2] N. Luhmann, *Social Systems*, Suhrkamp Verlag AG, 2018. (in German)

[3] G. Wunsch, *Fundamentals of Process Theory: Structure and Behavior of Dynamic Systems in Technology and Science*, Teubner Verlag, Stuttgart, 2000. (in German)

[4] L. von Bertalanffy, *General System Theory*, George Braziller, New York, 2009.

[5] J. Götschl, "Self-organization: New foundations for a more uniform understanding of reality," *in Self-Organization—A System of Thought for Nature and Society*, M. Vec, M. T. Hütt, and A. Freund, Eds., Böhlau, Köln, 2006, pp. 35–65. (in German)

[6] J. Götschl, *On the Epistemology of Self-Organization: From Convergences to Correlations between Systems Sciences of Nature and Systems Sciences of Humankind*, H. Fabisch, K. Fabisch, and H.-P. Kapfhammer, Eds., Publishing Company Dr. Kovac, 2020, pp. 85–104. (in German)

[7] S. A. Kauffman, *The Origins of Order—Self-Organization and Selection in Evolution*, Oxford University Press, New York, 1993.

[8] W. R. Ashby, *An Introduction to Cybernetics*, Chapman & Hall Ltd, London, 1956.

[9] C. Pias, Ed., *Cybernetics: The Macy Conferences 1946-1953*, Diaphanes, Zürich, Berlin, 2004.

[10] P. Läuchli, *Algorithmic Graph Theory (Program Practice)*, Birkkäuser, 1991. (in German)

[11] S. Dasgupta, C. Papadimitriou, and U. Vazirani, *Algorithms*, Boston: The McGraw-Hill Companies, 2008.

[12] W. D. Wallis, *A Beginner's Guide to Graph Theory*, Springer Basel AG, 2007.

[13] L. Wittgenstein, *Philosophical Investigations*, Suhrkamp Verlag AG, 2019. (in German)

[14] L. Wittgenstein, *Tractatus Logico-Philosophicus—Logical Philosophical Treatise*, Suhrkamp, Frankfurt am Main, 2003. (in German)

[15] T. Bauernhansl, M. ten Hompel, and B. Vogel-Haeuser, *Industry 4.0 in Production, Automation and Logistics*, Springer Vieweg Verlag, Wiesbaden, 2014. (in German)

[16] J. Jamaludin and J. M. Rohani, "Cyber-Physical System (CPS): State of the Art," in *Proc. 2018 International Conference on Computing, Electronic and Electrical Engineering (ICE Cube)*, Nov. 12–13, 2018 2018, pp. 1–5, doi: 10.1109/ICECUBE.2018.8610996

[17] H. ElMaraghy, L. Monostori, G. Schuh, and W. ElMaraghy, "Evolution and future of manufacturing systems," *CIRP Annals*, vol. 70, no. 2, pp. 635–658, 2021, doi: 10.1016/j.cirp.2021.05.008

[18] B. Heiden, B. Tonino-Heiden, and M. Decleva, "Towards a wittgensteinean ladder for the Universal Virtual Classroom (UVC)," in *Proc. of Smart Living Forum 2019*, November 14, 2019, Villach, Austria, S. L. Lattacher and D. Krainer, Eds., Norderstedt, Germany: Books on Demand 2020, 2019, pp. 71–77.

[19] R. C. Hilborn, *Chaos and Nonlinear Dynamics—An Introduction for Scientists and Engineers*, Oxford University Press, New York, 1994.

[20] B. Heiden and B. Tonino-Heiden, "System Ordering process based on Uni-, Bi- and multidirectionality—Theory and first examples," in *Proc. 2021 International Conference on Business Intelligence and Information Technology (BIIT2021)*, 2021, doi: 10.1007/978-3-030-92632-8_55

[21] B. Heiden, V. Alieksieiev, M. Volk, and B. Tonino-Heiden, "Framing Artificial Intelligence (AI) Additive Manufacturing (AM)," *Procedia Computer Science*, vol. 186, pp. 387–394, 2021, doi: 10.1016/j.procs.2021.04.161

[22] B. Tonino-Heiden, B. Heiden, and V. Alieksieiev, "Artificial life investigations about a Universal Osmotic Paradigm (UOP)," in

Intelligent Computing. Lecture Notes in Networks and Systems, K. Arai, Ed., vol. 285, Springer, Cham., 2021, pp. 595–605. doi: 10.1007/978-3-030-80129-8_42

[23] B. Heiden and B. Tonino-Heiden, "Emergence and Solidification Fluidisation," in *LNNS 296*, K. Arai, Ed., Springer Nature Switzerland AG, 2021, pp. 845-855, doi: 10.1007/978-3-030-82199-9_57

[24] B. Heiden, B. Tonino-Heiden, V. Alieksieiev, and E. Hartlieb, "Digitisation Model Innovation System," in *Proc. 2021 10th International Conference on Industrial Technology and Management (ICITM)*, University of Cambridge, Cambridge, United Kingdom, M. O'Dell, Ed., March 26–28, 2021, doi: 10.1109/ICITM52822.2021.00030

[25] G. Spencer-Brown, *Laws of Form*, Bohmeier, Joh., 2008.

[26] L. R. Lieber, *The Einstein Theory of Relativity 2008—A Trip to the Fourth Dimension*, Paul Dry Books, 2008.

[27] K. R. Popper, *The Open Society and Its Enemies*, 2 vols., Mohr Siebeck, Tübingen, 1992. (in German)

[28] B. Heiden and B. Tonino-Heiden, " Key to Artificial Intelligence (AI)," in *Intelligent Systems and Applications. IntelliSys 2020. Advances in Intelligent Systems and Computing*, K. Arai, S. Kapoor, R. Bhatia, Eds., vol. 1252, Springer, Cham., 2021. doi: 10.1007/978-3-030-55190-2_49

[29] B. Heiden, B. Tonino-Heiden, V. Alieksieiev, E. Hartlieb, and D. Foro-Szasz, "Lambda Computatrix (LC)—Towards a computational enhanced understanding of production and management," in *Proc. of Sixth International Congress on Information and Communication Technology: ICICT 2021*, X.-S. Yang, S. Sherratt, N. Dey, and A. Joshi, Eds., vol. 236, Springer Nature Singapore Pte Ltd., 2021, pp. 37–46, doi: 10.1007/978-981-16-2380-6_4

[30] B. Heiden, B. Tonino-Heiden, and V. Alieksieiev, "Ladder of trust," in *Proc. of the Future Technologies Conference (FTC) 2021*, vol. 3, 2021, pp. 804–813. doi: 10.1007/978-3-030-89912-7_61

[31] B. Tonino-Heiden, B. Heiden, and V. Alieksieiev, "Safety rings principle and energy and information networks coupling," in *Proc. Conference on Artificial Intelligence and Sustainable Computing ICSISCET 2021*, M. Pandit, M. K. Gaur, P. S. Rana, and A. Tiwari, Eds., Springer Nature Singapore Pte Ltd., 2022, pp. 535–544. doi: 10.1007/978-981-19-1653-3_40