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Adventures in Diamond Strategies of Change(s)

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Short Studies

Adventures in Diamond Strategies of Changes

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Preface

Tales and constructions of scripturality beyond iterability and its narrations.

How to write without telling stories and how to write stories without telling?
How to count without numbering? How to number without counting?
How to do both at once without counting on one of both?

Not writing stories is neither accepting nor rejecting story telling and the narration of writing.
Not counting is neither accepting nor rejecting numbering.

Writing is not counting with rejections and acceptance, neither with numbering and telling.

Narration is about and of something, sometimes this something changes to nothing, writing the nothingness of rejection is fairly struggling with the self-understanding of natural language as such.

"Was mir schön erscheint und was ich machen möchte, ist ein Buch über nichts." (Flaubert/Meier)

Diamond strategies are not moving in a continuum or a labyrinthine field of being and nothingness, sense and non-sense, but jumping in the carré, designing fractured emptiness, not accessible to natural languages. Neither to the artificiality of formal notational systems.

Saltations, branchings backwards, double salti, turning somersaults, and others, are topological metaphors that are closer to scriptural adventures than continuous iterations of meaningful sentences.

Situational topics, hazardous strategies, unchecked methods; rejecting adjectives.

Conceptual stories and stories of concepts, biographical and actual, transcribed and constructed experiences of anger and love. Neutrality of observations and inventions entangled with abysmal ennui and annoyance. What else?

Short Studies 2008

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Modular Bolognese

-(this is not the original)-

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Paradoxes of postmodern education.

1. Modules in Metaphors

Without doubt, I like Spaghetti Bolognese. Especially, the Bolognese between the spaghetti. Even more, I like the Bologna Reform, which is unifying European education. As we had to learn, spaghetti in their chaotic wildness are not supporting the desires of clean decomposability and reusability, needed for real-time control and surveillance. Like it happened with Ravioli §, the Bologna Reform invented the *modularity* of knowledge for university education. Each topic has to be framed by its module†. Each module is cleanly separated from the other modules. Like ravioli, which are coupled only loosely and are building, ideally, a cluster, each module has its own content, structured hierarchically into topics, sections and paragraphs, enabling its specific taste and evaluation.
[A full-fledged theory of the *Pasta Strategies* is available at the complete Pasta Theory of Software Development. The present text about *Noodles* will be published at *Moodle*.]

But ravioli are nothing without their sauce! That's obvious and natural for the people of Bologna. But hard to understand north of the Alps.

What are we doing with the sauce? Is it simply another module? But how can the *in-betweeness* of modules in a modular system be itself a module? This contradicts academic logic; it maneuvers you immediately into headaches of logical paradoxes. If the module between the modules is itself a module, what is the in-betweenness between this conglomerate of modules, such a *meta*-module, and the original modules themselves? A meta-meta-module or simply nothing? Or is it the *para*-module of fluidness and fuzziness, defined by Water Logic? Do we need a *proto*-module to manage this new *inter*- and *trans*-modular wilderness?

What happens if the sauce between the ravioli becomes a sausage?Is the sausage an *ultra*-module? It belongs to the modular system exactly if it doesn't belong to the modular system. The sausage is a module exactly if it is a ravioli and at the same time it is a ravioli if it is a sausage. And by the way: Is the *logic* of this argumentation itself a module or is it superior or prior to all modules? Is it a deviant module with its own subversive logic or simply a *pseudo*-module?
There are not many chances left to solve this paradoxical problem. One radical strategy tells you: *Eat* the sausage and forget the problem! Yes, but what are we doing with a ravioli Bolognese without sauce? We simply could smash the dry ravioli into the *bin* (**.5.1.**) All problems solved!

But there is another solution too: Mediate the ravioli and the sausage with a brand new sauce, well mixed, half ravioli and half sausage. This strategy has a safe legitimation and is best evaluated by the tools of Fuzzy Logic.

Unfortunately, the Fuzzy Strategy is of short reliance as it is demonstrated in my Warentest paper, which is probably the very first evaluation of the reliance of logical systems for interactive devices in commercial telecommunication.
Ok, the game has to go on. Why not introduce, just for academic reasons, a new mega-sausage between the ravioli and the first sausage and the ravioli and the mixed - fuzzy

based - sauce consisting of ravioli and sausages between the real ravioli and the real sauce Bolognese? But what's real in such an administrational intervention? The sauce, the ravioli, the sausage or the content in the ravioli or the European administrators of the ravioli complot?

Figure 1: Ravioli alla Bolognese

Even worse, a good Bolognese is not a homogenous module, it is in itself full of well-balanced differences of overlapping interactions of different strength.
Hence, the interplay between ravioli is not modular but *sub*-modular. Ravioli are building 3-dimensional clusters, and only a few of them are showing a flat hierarchical order of composition.

Figure 2: Cluster of Ravioli

bp3.blogger.com/.../ s320/IMG_7925.jpg
"Image may be scaled down and subject to copyright."

It is more than clear, that the content of a single ravioli Bolognese is of no interest at all. What is of interest is the clear cut distinction between the shape and content of each ravioli and the disjunctive separation from other ravioli.

Nevertheless, each single ravioli has to pass a general test of quality: measure, weight, taste, design, originality. The evaluation is general because each ravioli is tested by strict scientific and objective quantificational methods. There are surely differences in the general cluster, there are ravioli for the beginner, ravioli for the advanced and ravioli for the post-docs and ravioli for the tester and ravioli for the administration, etc. And all are fitting well into the European ontology of modularized knowledge taxonomies and ontologies and the qualifications of the generalized European user.

2. Le Corbusier, OOP and the Bolognese

Life before Bologna was much more fun. Great ideas had been in the air. Stop hierarchical thinking and writing, just now! Go inter-disciplinary! Go further, Anything goes! Go trans-disciplinary! Cross the borders! Enjoy your Bolognese! Give up your script, melody and rhythms! Not easy to realize today in a restored world of departments, professorial kingdoms and busy lecturers and a flat pizza culture.

The Humboldt ¶ approach to education and research was German, and is still influencing the world-leading US American universities. The Bologna Model is giving up nearly everything reasonable of Humboldt' s idea of a university culture.

Even before the Web was popular, surfing in the grid of knowledge was well elaborated and possible even against many obstacles.

†

LedModular

2.1. Le Modulor

The Modulo Man

Like each modern trend, also Modularism has its own new man: the man of the Golden Ratio, the *mudulo man.*

In 1887 Charles-Adored Generate(later called Le Corbusier) was born. He first studied with Charles L'Eplattenier, who always stressed nature. His first job was with Beret where he worked from 1908 to 1909 in Paris. During that time he also probably made many trips to Note Dame. Note Dame fascinated him especially the way in which they used the Golden ratio in it. After he decided to take a trip across Europe. His first stop was in Germany where he took with Peter Barrens who probably taught him many of the workbench fundamentals of which consisted of the Golden Ratio, more that likely it was this influence that first introduced this great proportion to him which he based so many things on.

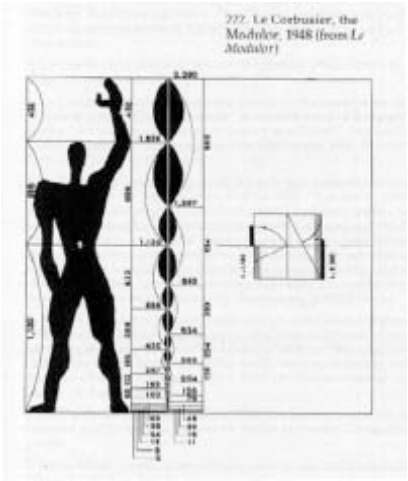


Figure 3: Le Corbusier

The LEGO MAN

But there is also the LEGO MAN. He has given up to be ruled by the *golden ratio*, he prefers a clever modular mix of the *"Automatic Binding Bricks"* rules and the robotic *MINDSTORMS* strategies to organize his complexions of modules. Lego rules are defined by λεγω (lego). Also LEGO is an international experience, it has with its Eurobricks a specific European representation, which is responsible for control and evaluation of the LEGO EMPIRE. The lego-approach shouldn't be underestimated in its philosophical and technological profoundness. The most important philosopher of the 20th century, Martin Heidegger, explains thinking as *gathering*, which is the meaning of the Greek λεγειν (*legein)*. Hence, he declares: *"Thinking demands...that we engage ourselves with what at first sight does not go together at all."* (M. Heidegger, Discourse on Thinking, trans. J.M. Anderson and E.H. Freund (New York: Harper & Row, 1962)

2.2. Modules in OOP

In Object-Oriented Programming (OOP), everything is modular and hence reusable. More, everything in OOP is an object. Without any loss we also can state: Everything in OOP is a module. But on top of everything in OOP is the class Class. Is this Class a class, an object, a module? It is the ultimate Class, which allows all classes to be classes. Without surprise, the whole OOP system is neatly organized as a hierarchical system with the class Class on top.
Object-orientation is not only a strategy to organize programming, it is applied successfully on nearly all kind of knowledge systems. Hence, knowledge organization, like the Bologna Model, should acknowledge the efforts and results of OOP.

Odeon Café

In fact, the movement of modularization didn't start in Bologna. After the well-structured hierarchical approach invented in Zürich was exhausted, the maître chef introduced his new menu, replacing Pascal with Modula, and later with Modula-2. The real fun was celebrated in Zürich with a visit to the opera, where Oberon was on the program. Le maitre Niklaus surprised the world with the finest chips for his operating system and programming languages. The feminists never understood that Wirth was one of their pioneers. I remember that his machine, running on his brain-child Lilith, was on all levels of design revolutionary, well styled and of

superb elegance.

But even in programming this hierarchical organization is not as natural as it is declared to be. So, because of the growing complexity and complication of computational systems an additional axis had to be introduced: a diametral, horizontal, heterarchical organization, called *Aspects*. This is developed in Aspect-Oriented Programming, AOP.
Hence, hierarchic modularity is not doing the job. AOP is needed. But AOP is not an approach in isolation, it works together with OOP. Therefore, the new approach, at the time, is an interactional system incorporating OOP and AOP. Both, OOP and AOP are in an interactional cooperation.

But such an interactional and mediating third system is, as such, not yet part of conceptual programming efforts. Hence, AOP appears, in the classic setting of programming, as a queer module of OOP.

The concept of modules in OOP

This is standard knowledge, thus we could cite the topics from *Bertrand Meyer, Object-oriented Software Construction (1988),* and today (2008)*:* Touch of Class *,* where OOP is introduced as a specification of modules. Historical materials and the underlying philosophical concepts of OOP with extensive explanations are assembled at my “Actors, Objects, Contextures, Morphograms".

So, what does modularity mean for software systems and in general for the organization of knowledge? The need for a modular organization of software systems is best summarized by Meyer (1988):

• *Correctness* is the ability of software products to exactly perform their tasks, as defined by requirements and specification
• *Robustness* is the ability of software systems to function even n abnormal conditions.
• *Extendibility* is the ease with which products may be adapted to changes of specifications.
• *Reusability* is the ability of software systems to be reused, in whole or in part, for new applications.
• *Compatibility* is the ease with which software products may be combined with others.
Secondary qualities are: Efficiency, Portability, Verifiability, Integrity and Ease of use.

To check if a knowledge system is a modular system, Meyer proposes 5 criteria:

modular *decomposibility*,
modular *composibility*,
modular *understandability*,s
modular *continuity*,
modular *protection*.

The concept of aspects in AOP

Aspect-oriented programming is complementary to OOP. is still quite new and has not yet influenced general knowledge organization strategies and techniques.

"The only problem with OO programming is that it is essentially static*, and a change in requirements can have a profound impact on development timelines.*
Aspect-Oriented Programming (AOP) complements *OO programming by allowing the developer to dynamically modify the static OO model to create a system that can grow to meet new requirements. Just as objects in the real world can change their states during their lifecycles, an application can adopt new characteristics as it develops."* (Graham O'Regan)

AOP complements the static and hierarchical organization of modularized knowledge by horizontal interactions between modules. AOP is delivering the conceptual framework and techniques to deal with such complementary situations. Its main concept is *crosscutting*, which is conceived as a trans-modular interaction, crosscutting the barriers of OOP modularism.

"Aspect-oriented programming (AOP) grew out of a recognition that typical programs often exhibit behavior that does not fit naturally into a single program module, or even several closely related program modules. Aspect pioneers termed this type of behavior crosscutting *because it cut across the typical divisions of responsibility in a given programming model. In object-oriented programming, for instance, the natural unit of modularity is the class, and a crosscutting concern is a concern that spans multiple classes. Typical crosscutting concerns include logging, context-sensitive error handling, performance optimization, and design patterns."*
ftp://www6.software.ibm.com/software/developer/library/j-aspectj.pdf

Metaphors to AOP are *horizontal* or *heterarchical* organization. Other labels are given by *lateral*, *transversal* and *orthogonal* thinking. Google-It!

The concept of an interplay between OOP and AOP

A first step to an *interactional* and *reflectional* interplay of OOP- and AOP-strategies, which conceptualizes and formalizes hierarchical and horizontal structurations as chiastic interplay, is sketched in my paper .

"*The idea behind a mapping of AOP or OOP onto the proemial matrix PM is inspired by the possibility of a chiastic dynamization of the main concepts of AOP in the play and their distribution along the dimension of reflectionality and interactionality of mediated systems. Thus, a heterarchic cut is deliberating the main concepts from their hierarchy and is involving them into chiastic interplay. Between objects, classes, aspects, domains, viewpoints, etc., hierarchies are established only as temporary frozen chiasms.*
The whole game is played as an interplay of heterarchy and hierarchy."

2.3. The Bolognese

The bolognese is what is accompanying you through your whole life. It is in fact a friendly affair and easy to handle. Intelligent, playful and not too stressful. Its a cosy experience, well represented in Great Britain and lasts long enough to learn to handle its hyperallergenic behavior. The bolognese certification procedure is transparent and internationally well recognized.

3. Metaphors in Modules

Even if today the possibility of surfing between and through disciplines, topics and modules is highly restricted for university students, some theoretical distinction could be of help to organize the so called chaotic information flow of academic broadcasting and the Internet. It also could help to navigate between disciplines and supporting one of the main interests of the Bologna approach: *mobility*. Mobility means: to navigate in a pre-given navigational topology of knowledge. In fact, to be able to move up and down the hierarchies, while abstracting from the place and location of the knowledge hubs. Locality of knowledge is reduced to provinciality, supporting the myth of an abstract identity as European.

3.1. Some scholastics for multi-modular systems

As many terms, *transdisciplinarity* can be used and abused as a fashion term for holistic speculations; it also can be confused with a lot of other terms, like *inter-disciplinarity*. The same happens with the term *polycontexturality* which is confused by some sociologists with pluri-centralism. Sometimes it isn't stupid to define terms as much as possible and to use the definitions as guiding tools to orient in a confusing world of science and opinions.

3.1.1. Transdisciplinarity in a post-modern world?

Wolfgang Hofkirchner, ICTS AND SOCIETY: THE SALZBURG APPROACH TOWARDS A THEORY FOR, ABOUT, AND BY MEANS OF THE INFORMATION SOCIETY, 2007

My own paper from 1986 is written in German and elaborates in a quasi-scholastic way the differences of multi-/inter-/trans-disciplinarity in a mono-/poly-/dis-/trans-contextural setting. This study is not only differentiating terms but giving an operative outlook how to realize those organizational devices on the base of polycontextural logics and arithmetic. At this time, about 1986, there was not yet anything like the Bologna ECTS controlling system landing on the campus, nevertheless there had been some discussions in the air about a new understanding of disciplinarity, inter and trans.
I'm not in the mood to translate my own paper - in fact, I can't find it, so, is the original lost? - but I feel free to use Hofkirchner's translation of my early definitions.

Modules have to be evaluated and the first question surely is: Is this text a plagiat? Yes or no! Or, to which degree? So, in plagiarizing a text an other scientist plagiarized from my text, am I plagiarizing? Is there something like a second-order plagiarism? Or is the plagiat of a plagiat the original? Even when the original is lost? By the way, does an original in fact ever exist? Was there ever a chance for an original to be an original and not a copy of a copy, a clone of a paraphrase or a paraphrase of a copy or a citation of a copy, etc.?

Disclaimer

I'm not accusing Hofkirchner of plagiarism at all!

Disclaimer of the disclaimer

This, i.e., *"a. Disclaimer: I'm not accusing Hofkirchner of plagiarism at all!"*, is not a joke!

Is this a joke or isn't this a joke? How could I know?
I'm just enjoying my new computer and my intriguing new program.

To decide this crucial question, we could use one of the tools, which are supplementing the Bologna approach to university knowledge management: Turnitin. Unfortunately, this service would cost me GBP 200.-. as the UK manager for Turnitin told me. And I would only be qualified to buy and to use it if I could proof my universitarian affiliation as a lecturer. Nevertheless, plagiarism, with or without iThenticate, remains a tricky business, intriguing for both sides, the originator and the plagiator.

The Bologna Model

To sum it up: The Bologna Model or Process has 3 super-modules (*Modularization*, *Examination* and *Evaluation*) plus additional modules like Turnitin or iThenticate.
Another supplement might be the eLearning, i.e., an Open Source *"course management platform"* Moodle.
The main strategic modules of the Bologna Model are: *Modularization*, *Examination* and *Evaluation* (ECTS).‡ The aim is academic , educational structures for students and lecturers within Europe §and additionally, computerized *verification* and *control* of content* to fight intentional and unintentional plagiarism.

As one of many consequences, the Bologna Process is aimed to deny regional and local differences in favor of an abstract European identity of their subjects. Globalism, even in this restricted European frame, is blind for the chiastic interplay of local and global realities and developments. Modern students and lecturers have, first of all, to be or to become Europeans alla Bologna. As much as the food has to be normed by European criteria, the knowledge business has to be adjusted to the abstract phantasms of European bureaucrats.

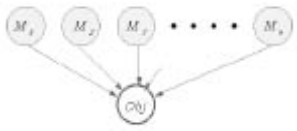
3.1.2. Transdisciplinarity in Technology and Education

(Eberhard von Goldammer, Rudolf Kaehr, 1996)

This internet version seems to be a clone from a much older German hard-copy version I have proposed1986 at an intra-disciplinary workshop about different concepts and models of generall disciplinarity.

Figure I: Interdisciplinarity: {M_1,..., M_n; "Obj"}

Interdisciplinarity: one common object domain ("Obj") of interest, but different methods of research (M_1, ..., M_n).

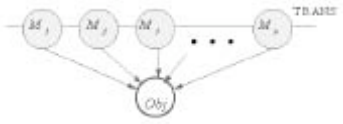


This seems to be the diagram for the multi-disciplinary approach. That is, a multitude of different isolated methods studying a "common" object-system.

Figure II: Transdisciplinarity: {"M"; Obj_1,Obj_2,...,Obj_n}

Transdisciplinarity: crossing the involved methods ("M") as a common general rationality of methods, i.e., despite the different methods ("M") and different common object domains, a

common general rationality of methods (logic, arithmetic, etc.) is accepted.



3.1.3. Figure III: Mediation of inter- and transdisciplinarity

This looks like a mediation of inter- and trans-disciplinary approaches, with a kind of connections, interaction, and even reflections between the multi-disciplinary methods towards the common complex multi-domain object-system. This pictures obviously is an abbreviation of the possible complexity, only.

More about the notion of transdisciplinarity in Second-Order Cybernetics form the "American Society for Cybernetics" (1983): *"Cybernetics is a way of thinking, not a collection of facts."*

3.1.4. Citations from Salzburg

Multidisciplinary

"Multidisciplinarity is a pluralistic worldview, the result of a dualistic Two-Cultures thinking. Binary thinking has resulted in a fragmentation into various disciplines and institutes. The sum of several disciplines, where each discipline uses its own objectives, objects, methods and theories is according to Eberhard von Goldammer and Rudolf Kaehr called multidisciplinarity (see Goldammer and Kaehr 1996, online). There is no interaction between disciplines, they are fragmented and have nothing in common. Each branch tries to solve problems within its natural, i.e. historical grown, boundary by using its own methods and speaking its own disciplinary language. In multidisciplinary research projects scientists from different disciplines are trying to find a solution to the same problem, but their research is fragmented and not integrated in one joint project, they are not working cooperatively, but in coexistence only (see Raffl 2006, 321)."

Interdisciplinary

"While *multidisciplinarity* means to add one discipline to another, each of them solving the problem from another standpoint, or "washing their own laundry" as John Brockman tends to call it popularly (Brockman 1995, 19), *interdisciplinarity* means to solve one specific problem in a joint project, but by still using methods and theories and speaking the language of different disciplines. There is also an accumulation of many disciplines that exist independently from another; there is not much interaction of researchers with diverse backgrounds. Researchers from different disciplines are working on one shared common problem by using their "home-methods" and theories. When the project is finished (and in the best case the problem is solved), scientists go back to the institutes they originally came from. There are no durable effects of such a type of research."

Transdisciplinary

"While there is a lasting trend towards transdisciplinarity in theorising the complexity of science and technology in the information age, empirical research in that field so far seems to make use of a mixture of multiple approaches which is characteristic of a multi- or interdisciplinary stage of evolution."

"Though as with the terms multi- and interdisciplinarity no unified understanding of transdisciplinarity can be found in scientific literature, it makes sense to make a distinction. For Jeremy Hunsinger *"transdisciplinary research attempts to approach the object of study beyond and across disciplinary and interdisciplinary perspectives"* (Hunsinger 2005, 277). Transdisciplinarity increases the chance of a dialogue - and mutual understanding, as well as an exchange of knowledge and information. Furthermore *"a transdisciplinary field is one defined by the globality of its object of study, combined with the complex, emergent, and changing nature of that object"*." (Hunsinger 2005, 277)."

"Transdisciplinarity does not mean to dissolve disciplinary competences: *"Transdisciplinary*

research is an additional type within the spectrum of research and coexists with traditional monodisciplinary research" (Häberli and Thompson Klein 2002, 4)."

"According to Juergen Mittelstraß transdisciplinarity means longterm cooperation that changes disciplinary orientations. Transdisciplinarity is an integrative, but not a holistic concept. Disciplinary isolations are therefore suspendedon a higher methodological level, as transdisciplinarity goes beyond specialization, but without substituting disciplines."

Some further Salzburger citations about transdisciplinarity

"*Stakeholders* play a very important role also in this new perspective of scientific research and cooperation: *"Transdisciplinary knowledge, because it has been recontextualized for the broader audience of multiple disciplines, is more accessible and interpretable"* (Hunsinger 2005, 278). For Charles Kleiber, transdisciplinarity means the *"pooling of disciplinary knowledge and information, technological revolutions, and the creation of networks and new forms of knowledge"* (Kleiber 2002, 56)."

"Helga Nowotny and Michael Gibbons point out that because *"knowledge is transgressive, [...] transdisciplinarity does not respect institutional boundaries"* (Gibbons and Nowotny 2002, 70)."

"Furthermore transdisciplinarity crosses *national* boundaries, it is a transnational concept. Hence transdisciplinarity means more than just a sum of researchers from different disciplines working together, as within multi- or interdisciplinarity. Transdisciplinarity crosses *academic* boundaries in order to solve real-world problems."

After all those Salzburger citations, can we say we learned something of practical use for an orientional approach to a complex world of disciplins and the notion of disciplinarity?

First observation. Everything said by the author(s) has to be verified by citations from other authors. Hence, nothing new or illuminating should be said. But what is said? It is said that transdisciplinary *crosses* boundaries (national, academic, disciplinary). The term "trans" just means "across", like the Trans-Siberian Express, so transdisciplinarity is defined by "transdisciplinary"; *trans* is explained by crossing and *crossing* is explained by "trans".

*"*Trans *is a Latin noun or prefix, meaning "*across*,* beyond*" or "on the opposite side [of]". It is the opposite of* cis*, which means "on the same side [of]"." WIki*

This reminds me of Jacques Prevert's poetique definition of the philosophical term "transcendence";

La trance sans dance est la dance sans trance.

Second observation. Nothing conceptually too complicated or even systematically developed should be elaborated to elude the complex situation. *"Everything said is said by an observer"*, which is observing what other observers are observing. With that, everything is save and no borders have to be crossed. The whole taxonomy of multi-/inter-/trans-disciplinary appears as mono-disciplinary and hierachical.

Recall Humberto Maturana's Observer

"Indeed, everything said is said by an observer to another observer that could be him- or herself."
*"*My starting point is our use of language: *Everything said is said by an observer to another observer that could be himself. We are observers and living systems, and as living systems we are observers. Whatever applies to living systems applies to us. Therefore, my task is to use language to describe living systems and to show how they may develop a language and become observers that may make descriptions as we do, and in the process use cognition to analyze cognition. I shall proceed accordingly."* (Maturana, Cognition, 1978)

Original, i.e., first version works well without gender distinction.
The Observer
"Anything said is said by an observer. In his discourse an observer speaks to another observer who could be himself, and whatever applies to one applies to the other as well. "
Maturana, H.R. 1970, "Neurophysiology of cognition", in Garvin, P. (ed.) 1970, Cognition: A multiple view, New York/Washington, 3-23, p. 4

Additional question

Does the (late) gender difference in the observer terminology forces any differences in the genuine observer theory? This is not a joke! But it opens another open question: What is lost if

language is perceived as an instrument? For him, for her, for it, the theory? And what does it mean that *"Anything said..."* is said and is not written as "Anything *written*"?

3.1.5. Trans/disciplinarity in the Appendix

"According to **Erich Jantsch** (1972), the terms interdisciplinary or trans-disciplinary etc. should be applied as follows:

• Pluri-disciplinary *means a common research topic or problem area spanning several, cogni tively largely varied disciplines, which can, however, still make use of their own, traditional disciplinary methods, heuristics, and theories in thematic analyses.*

• Inter-disciplinary *comprises common languages of observation, common forms of description, measurement operations or methodologies in different disciplines, which - as a minimum requirement - have to be situated across the natural, social, or cultural sciences.*

• Trans-disciplinary *means the application of theories, models, or patterns in different disciplinary fields, which - again, as a minimum requirement - have to be anchored in the natural, social, or cultural sciences."* (Karl H. Müller)

heinz von foerster:
I don't know where my expertise is; my expertise is no disciplines. I would recommend to drop disciplinarity wherever one can. Disciplines are an outgrowth of academia." Interview

But there are other strong voices too. The desire for an unfication of disciplines of knowledge is still alive.

UNE NOUVELLE VISION DU MONDE **: LA TRANSDISCIPLINARITÉ**
"Le Centre International de Recherches et Études Transdisciplinaires (CIRET) est une association régie par la loi de 1901, fondée en 1987. Le but de notre association est de développer l'activité de recherche dans une nouvelle approche scientifique et culturelle - la transdisciplinarité - *dans sa tentative de prendre en compte les conséquences d'un flux d'information circulant d'une branche de connaissance à une autre et de créer un lieu privilégié de rencontre et de dialogue entre les spécialistes des différentes sciences et ceux des autres domaines d'activité, en particulier, les spécialistes de l'Éducation. Le but de l'association est pleinement précisé dans son projet moral."*

The Transdisciplinary Evolution of the . Condition for Sustainable Development
*"*La transdisciplinarité *concerne, comme le préfixe "trans" l'indique, ce qui* est *à la fois* entre *les disciplines,* à travers *les différentes disciplines et* au delà *de toute discipline. Sa finalité est* la compréhension du monde présent *, dont un des impératifs est l'unité de la connaissance."* Basarab Nicolescu (1997)

Interestingly, there is no Hof in the Church for a Basar with Nicole! Poor Salzburg!

Next to un/intended plagiarism there is also an established market for un/intended *censorship*. Isn't it?
And don't forget the profound work of our friend Edgar Morin ! Unfortunately, I have passed the limit-number of allowed words for this paper :-)!

4. A Framework of World-Models

Based on the difference logic/world or rationality/reality, subjectivity/objectivity, syntactic/semantics, etc. a 4-fold distinction can be developed by applying the Diamond Strategies onto the difference. This might serve a start to develop the *modules* of the *"Framework of the World-Models*". Before discussing topics like plagiarism, disciplinarity and modularity it should be made clear which are the basic epistemological presuppositions involved. The framework of the 4 world-models might offer a general guideline for epistemological, logical and ontological orientation.

4.1. World-Model I: One Logic/One World

Plagiarism in world-model I is easy to understand. The first is the origin and the origin is the first. Everything else is secondarily. There is the inventor, the patent and the Patentamt (patent office) guaranteeing the legal ownership of the invention to its inventor.

There is no ambiguity in the notion of ownership, the identity relation between inventor/patent/patent-office is logically and ontologically strict. Plagiarism, i.e., intellectual property (IP) theft, is strictly identifiable.
Identification happens here on the levels of attributes. If the attributes of two objects (products) are the same, coincide, then the objects are identical. This narrow ontological approach might be extended to functional criteria: if two machines (chemical, plants) behave in all parts the same then they are identical.

Hence, if the German train Transrapid appears in Shanghai as a Chinese invention, the German companies are forced to check the Chinese invention of patent-theft. The Chinese train may look the same, function the same, even based on the same physical and engineering principles, etc., therefore, there is a high possibility of intellectual property theft. But following this kind of comparison, there is still a limit in comparison. There will probably be no access to all the parts and procedures of the whole train to allow a final decision. Hence, a *one-to-one* comparison as presumed in world-model I, is not always accessible in concreto.

We might think that this argument is producing a pseudo-problem, simply, because the legal matters are ruled and controlled in written form by the patent office of the involved countries. But, again, not much has changed. The problems of translations of the *crucial terms* (4.3), like "patent of invention", between different cultures, remains.

Obviously, there are even in world-model I some structural limitations for the business of comparison and decision. But why should the Chinese culture think and act in the sense of this identity related world-model I?
Because of the one-to-one constitution of world-model I, there are no constellations allowed, which could disturbe logical tautologies and decidability. Hence, no self-referential constructions, which are domesticated in the other world-models, are legitimatly occuring in world-model I. Obviously, paradoxes are strictly excluded from the very begnning of the game.

Epistemology: Objects (things, thoughts) are identical.

: *The case can be objectively decided.*

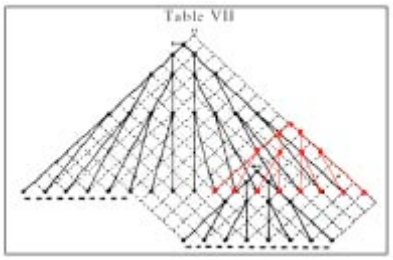
4.2. World-Model II: One Logic/Many Worlds

Plagiarism in world-model II demands for some distinctions, which are not easily be codified in Western culture and law. The problems of law in post-modern societies, which are playing in world-model II, can be undestood as the problems of a transition of the strict *private/public* dichotomy to a complex and interactional chiasm of the terms.

"My argument starts with the obvious observation that the public/private distinction is an oversimplified account of contemporary society. More controversially, my argument continues that any idea of a fusion of the public and private spheres is equally inadequate. As an alternative conceptualisation, I propose that the public/private divide should be replaced by polycontexturality.

The claim is this: Contemporary social practices can no longer be analysed by a single binary distinction; the fragmentation of society into a multitude of social sectors requires a multitude of perspectives of self-description. Consequently, the simple distinction of state/society which translates into law as public law vs. private law needs to be substituted by a multiplicity of social perspectives which are simultaneously reflected in the law." (Teubner)

If everybody has his/her *"model of the world"*, then comparison of inventions demands for a *many-to-one* procedure of translation. That is, if two taxonomies (term trees) share the same knots (terms) there is no guarantee that their meaning is the same. As the diagram shows, the origin of the taxonomies might be different, hence, the meaning of a term, which is defined by the position of the term in a tree, will be different.



http://www.thinkartlab.com/CCR/2007/03/chinese-centralism.html

Interactions between different term-trees, as they are needed for translations, are involving some new operators not known in logic-based theories. One such operator is mentioned by Luhmann as tranjunction.Transjunctions had been introduced by Gotthard Gunther in his famous paper "Cybernetic ontology and transjunctional operators" (§ 3: Logic with Transjunctions). Further formalizations are proposed at PolyLogics, (§ C.1.6)
In polycontextural systems, *transjunction* are logical operators, which are beyond (trans) junctions, like conjunctions and disjunctions, this mainly because they are *rejecting* the logical values offered by the logic in which they are positioned. Junctions, in contrary, are always accepting the offered values. Hence, in a polycontextural interpretation, transjunction are bridging different logical contextures (systems). Junctions are behaving by definition intra-contexturally, transjunctions are interacting between contextures, hence are transcontextural.
Also this is known since the early 60s, it would be naive to think that it had any influence on a theory of transdisciplinarity.

What we can read, again and again, is the mantra *"modern society is a polycentric (pluri-centric) system".* This seems to be the great message of the second-order system theorists.

"Modern society is a polycentric, polycontextural system. (...) Consequently there must be transjunctional *operations, which make it possible to go from one contexturality into another, still marking which differentiation is accepted or rejected for specific operations."* (Luhmann 1996).

Interestingly, the terms "pluri-" or "polycentic" are mostly, see: Luhmann, Teubner, Baecker, Fuchs, Qvortrup, etc., followed by the term "polycontextural" as if this term would demonstrate the *"non plus ultra"*-state of their theory.
Their is no surprise, that not only no logical formulas are in the game but that the complex terminology of Gunther's theory of polycontexturality is reduced to 1 or 2 terms: polycontextural and transjunction. Terms, like intra-, inter-, trans-, dis-, elementary/compound, etc. are not part of the references.

The possible IP theft involved in such a writing production is quite harmless. Not much would be changed in their texts if the term "polycontextural" would be replaced at all its occurrences by the much more appropriate terms "polycentric" or ".pluri-centric". Thus, it is more reasonable, especially in the case of Luhmann, to think of a friendly carriage case. in his citations (Zettelkasten), Luhmann is carrying the torch of "polycontexturality" through some hostile times of German academia.

Nevertheless, the consequences from polycentrism for international law systems are dramatic. Gunther Teubner gives a big picture of the destiny of law in a post-modern society in his: The king's many bodies: *The self-deconstruction of Law's hierarchy.*

"Law's constructed identities change chameleon-like with the change of observation posts, each of which has an equally valid claim to truth. There is no stable predefined identity to the legal system but rather a multiplicity of conflicting identities that are constructed in different contexts of observation. Law is the same and it is not the same. So what's the difference between constructing and deconstructing legal systems?" (Teubner)

4.2.1. Limitations of the idea polycentrism

Lars Qvortrup, following Luhmann, has sketched the situation of postmodernism in his "The Hypercomplex Society"'

"Polycentrism characterizes a society that cannot observe itself or its environment from a single observational position-or, rather, from within a single observational perspective or "optics"-but has to employ a large number of positions of observation, each using its own individual observational code to manage its own social complexity. This implies that no universal point of observation can be found. Furthermore, this means that a large portion of these observations

are observations of observations: of others' observations and of the observer's own observation."

Without a *"universal point of observation"* communication between the different position has to be *mediated,* otherwise we would be forced to subsume, again, the multitude of positions under the umbrella of a unique and ultimate meta-position. In other words, a multitude of observational positions is involved with the interpretation of an unique objectivity. This is demanding for a *many-to-one* codification of the observed reality.

Because of this many-to-one constitution of world-model II, reality has to be constructed and reality-constructions are entering self-referential situations. The self-referentiality of reality-constructions are becoming more and more meta-theoretical self-descriptions of the reality-construction language. The description language is re-entering into its own description. This is producing paradoxes and hence, provoques a clear affront to the rationality of world-model I.

Codification in world-model I is highly developed and well based in the classic scientific paradigm. The rationality of world-model I has its final conceptual and operational codification in logic, formal and programming languages. Formalisms and metaphors for world-model I might be *universal algebra;* for world-model II it might be *universal co-algebra* and *modal logics* but this connection is not yet realized by postmodernist thinkers.

From a second-order cybernetic point of view, objectivity is a construction of an observer. The form of the construction is understood as a fix-point of a recursive formula. A recursion is a step-by-step iteration of the formula-scheme, including the results from the lower levels into the higher levels of the step-wise development. Independent of the complexity of the recursive function, the step-wise development of the iteration belongs to the paradigm of 'forwards'-iterability. This is obvious, because the recursive function is solution-oriented, hence aimed to reach a final goal. The idea of a simultaneous 'backwards'-oriented movement, in parallel to the 'forwards'-movement of the 'same' movement is strictly absurd in world-model II. Polysemy occurs in world-model II as disseminated, only.

A compromise was offered with the idea of a polycontextural number theory. This theory is constructed as a dissemination, i.e., distribution and mediation, of the classic systems of natural numbers over different loci in a kenomic grid. Such disseminated, different and autonomous natural number systems, might then run their numbers forwards and backwards seperatedly and simultaneously. But this happens not for a genuine operation as such, i.e., ' inside' an arithmetical system, but only for the interpretation of different simultaneous operations, which remain distributed and separated over different loci. Such a restriction in the process of simultaneity and sameness of the differentness of an operation in itself will be removed in world-model IV.

Despite the big pictures of post-modernism drawn by Luhmann and his followers, there is still nothing comparable to the operational formalisms of world-model I for the world-model II. The operative terms are taken by Luhmann are selectively from Gotthard Gunther' s theory of *polycontexturality* and Henz von Foerster' s *recursive observer theory*, but without any attempt to further formalization. Hence, a theory of *mediation*, necessarily for an understanding of the interaction of the different observational positions, is still lacking. This, obviously, are bad news for the realization of global control and surveillance desires and phantasms. But for a functioning free society, too.

Epistemology: The same is different.

Fazit: *The case needs mediation.*

4.3. World-Model III: Many Logics/One World

Plagiarism in world-model III is very difficult to understand from the viewpoint of world-model I and II, i.e., from the Western classical, modern and post-modern culture and law.

There may be one *"observational point of view"* involved in world-model III but there exist for the same observational experience a multitude of different codes. In contrast to the world-model II, with its many-to-one codification, the world-model III is involved into a *one-to-many* codification of the interpreted and experienced reality. It seems that the situations of world-model II and III are in some sense *complementary*. Nevertheless, despite its concptual complementarity to world-model II, there is a big obstacle to codification and formalization in world-model III.

Codification in world-model II might be conceived as a distribution and mediation of existing situations, hence a polycontextural dissemination of known theories. Complementarily, for world-model III, the multi- and trans-pespectivism of polycontexturality has to be seen as a multi- and trans-(hyper)reality. A sign might have many meanings, like in the constellation of polycontextural *polysemy*, but in world-model III, a singular meaning might have a cluster of different reality presentations.

A formal logical thematization of the epistemological situation of world-model III might have a first trial with a so-called Grossetest logic. A second turn is risked with a more profound understanding of complementarity. It could open up the realm of morphogrammatics. Morphograms are pre-semiotic patterns, which are well implementing the one-to-many approach.

The funny question if I could plagiarize myself and therefore be fined for my own plagiarism is *absurd* only if the personality of the person in question is identical with itself. But there are good reasons to not to search for one's identity, simply because it might be preferable for situations, where the self is conceived/constructed as a multi-personality. Hence, I and I are not the same. Therefore, there are two I' s involved: I_1 and I_2. And this is the *sine qua non* for punishing I_2 to have plagiarized the work of I_1.
In other words, multi-addressability of persons opens up highly interesting constellations.

Obviously, this goes far beyond of the non-intentional self-application of the Spitzer Laws to Eliot Spitzer himself.

A proper functioning, psycho-sociologically and legally, of this strange situation of multi-personality and self-application, might force us to move to the world-model IV.

Epistemology: The different is the same.

Fazit: *The case has to be negotiated.*

The "*Patent for invention"* characters in Chinese:

发明专利

4.4. World-Model IV: Many Logics/Many Worlds

Originality and plagiarism are involved in a complex interplay, relativizing both terms at once. In world-model IV it is reasonable to think of originality as a theft, and of plagiarism as the origin of the work.
The secondary might be the original and the originary the secondary. The challenge to rational and legal interactions is demanding to reject and to surpass all forms of absolute identities, like rationality and reality.

World-model I is realizing *consistency* of rationality and *coherency* of reality; excluding all kinds of *paradoxes* and *antagonisms.*

World-model II is based logically on para-consistency and ontologically on the phantasm of the unreachablility of a coherent reality. It is including on the logical level, i.e., rationality, a whole bunch of self-referential constructs, re-entries, contradictions and paradoxes but it is excluding on an ontological level, i.e., reality, all kind of proto-structural antagonism.

World-model III is complementary to world-model II, hence it is ontologically based on proto-coherence, and on the logical level on the unreachablility of rational consistency and para-consistency. It is including on the reality level a whole bunch of self-organization, circularities, antagonisms, struggles and emergent behaviors.

World-model IV is plurifying in itself the features of the previous world-models, which are based on the desires of unification towards a universal rationality (logic) or an ultimate reality. But because there is no save heaven left in world-model IV, neither on the rationality nor on the reality side, consistency and coherency has to be situatively co-created between logical and ontological movements. Such movements are not only *chiastic*, or in other words, *proemial*, as in polycntextural systems of world-model II, but *enantiomoroph* and *antidromic*. That is, chiastic movements, logical and ontological, are at once involved with their counter-movements. Such movements, therefore, cannot be identified, named and gathered (legein) at once, neither with

a para-consistent nor a proto-coherent interaction or intervention towards rationality and reality of their movements.

Hence, the second-order pradigm of a recursive construction of reality and rationality has to be completed with its complementary, antidromic paradigm of iter/alterability.

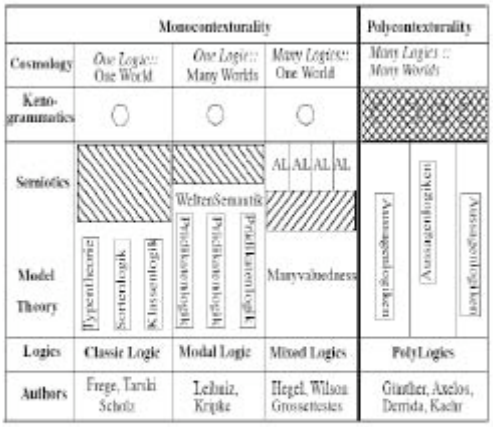
In contrast to the previous world-models, which are *descriptional*, world model IV is *scriptional*.

Epistemology: The same and the different are interacting differently as well as similarly, at once.

Fazit: *The case needs computational support for negotiation, mediation and decision.*
That is, interactional, reflectional and interventional computation and conversation.

Summary

World-models mapped, in respect to sameness and differentness, onto distinct general trends in mathematical logics and semantics.



4.5. Post-disciplinary interplay of disciplines

$$\begin{bmatrix} \text{mono} - \text{disciplinarity} \\ \text{multi} - \text{disciplinarity} \\ \text{inter} - \text{disciplinarity} \\ \text{trans} - \text{disciplinarity} \\ \text{post} - \text{disciplinarity} \end{bmatrix} \otimes \begin{bmatrix} \text{OneLogic/OneWorld} \\ \text{ManyLogics/OneWorld} \\ \text{OneLogic/ManyWorlds} \\ \text{ManyLogics/ManyWorlds} \\ \text{Morphogrammatics/Logics/Worlds} \end{bmatrix}$$

4.5.1. Disciplinarity revised

As far, I have followed the traditional way of proposing the game of mono-/multi-/inter-/intra- and transdisciplinarity. One step further would have to introduce the distinctions of *proto*- and *meta*-disciplinarity. With all that we are still embroiled into the cartography of Greek terms and their topo-logic. Independently of how many terms are involved to describe the game of disciplinarity, their order remains - more or less - hierarchic and based on identity and diversity. That is, “inter” is “inter”, “trans” is not “inter” and “multi” is “multi”. But the operator “is” is not necessarily identical with itself. What’s the “trans” of the “inter” and the “inter” of the “trans"? Such duplications are necessary for a reflectional *interpretation*-language, which is thematizing and interpreting its object-domain with second-order terms. The description-language is dealing with the first-order terms directly. First-order terms are part of a mono-contextural description-languague

Hence, first-order terms are ruled by the *is-abstraction*, second-order terms by the as-abstraction. Therefore, the formula “mono is mono” is transformed into “mono as mono”,

“mono as multi”, “mono as inter” and “mono as trans”. That is, the introduction of a multitude of different positions of description, observation an involvement enables different kinds of thematizations. Hence, to speak simply, say, of “interdisciplinarity” is an underdetermined characterization because the position of the distinction-making isn’t included into such a characterization. On the other hand, if there is a multitude of different positions included, it is more than natural that the different positions of observation and involvement are also producing different results. Therefore, what appears for one position as interdisciplinary might appear for another position as transdisciplinary.

The possible interpretations, therefore, is nothing else than a matrix of the involved terms. As a first step, we could organize the terms in a matrix instead of a tree.

Table 1. Contextual matrix for disciplinary modi

modi/disciplin	*mono*	*multi*	*inter*	*trans*
mono	mono/mono	mono/multi	mono/inter	mono/trans
multi	multi/mono	multi/multi	multi/inter	multi/trans
inter	inter/mono	inter/multi	inter/inter	inter/trans
trans	trans/mono	trans/multi	trans/inter	trans/trans

As a *first* step, could introduce for "mono/multi”, i.e., “mono as multi”, or generally: “X as Y”, the wording : *“What appears as ‘mono’ from your position, appears as ‘multi’ from my position”.* But both positions are accepted as a simoultaneous interplay from both positions or from an additional reflecting postion.
A *second* step would have to specify the roles of the different positions according to the *world-models* they are involved.
A *third* step would have to consider a further specification. The formula “X as Y” is not complete, we can specify: “X as Y is Z”. Hence, what is the meaning of “Z"? "Z” represents the complex interplay between “X” and “Y” as such.

BAD NEWS: [Just lost this paragraph=cell. Therefore, where *is* the original? Only some keywords are left.]

transition/transformation/metamorphosis,
proto/meta,
surface/deep structure,
is-/as-abstraction,
sociology of philosophy, philosophy of sociology, *Social Epistemology*, Steve Fuller vs epistemology of sociology,
knowledge grid,
bologna/semantic web,
challenge bologna/china/zhuge.
http://www.knowledgegrid.net/~H.zhuge/data/Discovery_of_Knowledge_Flow.pdf

"*The way we classify the disciplines is not incidental, and a strong argument can be made that our current system of metatheory is path dependent. For example, under the* Dewey Decimal system*, psychology, now considered a science in the social tradition, is classified under philosophy, a decidedly humanities-oriented categorization. This conceptualization is not without consequence, and the perception of which “*bins” (*contain a discipline influence the production of knowledge.”* http://www.scholar-warrior.info/scholar/research/eod/index.php

Reconstructing the original

Obviously, the *original* got lost. How can it be reconstructed? As what could such a reconstruction, say with the help of Apples Timemachine or another diskdoctor, be recognized? As a copy of the original? How could it be evaluated in the absence of its source? Would such a successful reconfiguration be a plagiat of my own, but lost, original? Would I plagiarize myself? Is this possible at all? At the time, I have to leave this question open.

5. Evaluation of Modules

5.1. Structural evaluations of modules

A structural reflection on the Bologna module concept should be realized more or less independently from the specific content of the modules in question.

5.1.1. Exclude course/module chiasms!

It shouldn't happen that a paradox situation like this happens: *"What's your module is my course; and what is your course might be my module*." Avoid chiasm in hierarchical systems! Respect the hierarchical order of:

$$\text{Hierarchy: course} \Longrightarrow \text{module} \Longrightarrow \text{topic} \Longrightarrow \text{section} \Longrightarrow \text{paragraph}$$

.
Is this reasonable within a trans-disciplinary approach? Obviously not.
A strict hierarchy of modules might be possible in a (mono)disciplinary and to some degree in a multi-disciplinary paradigm of research. Even with inter-disciplinarity, chiastic exchanges between the whole and the part (course/module/topic) can easily and reasonably happen.
A simple chiasm between modules and topics might be constructed by the following diagram.

$$\begin{bmatrix} \text{Position}_1 : \text{module} \Longrightarrow \text{topic} \\ \Updownarrow \qquad \Updownarrow \\ \text{Position}_2 : \text{topic} \Longrightarrow \text{module} \end{bmatrix} \Longleftrightarrow \chi(\text{mod}, \text{top}, \text{pos}_1, \text{pos}_2)$$

Such a chiastic interplay between a whole and its parts (course/module) is reasonably realizable only within the epistemological presupposition of world-model IV.
Hence, the first and most sever violation of the Bologna rules would be to allow to play with chiasms between wholes and parts. It seems, that this violation is of such a gravity that it is not even mentioned in the guidelines of modular education in the sense of the Bologna reform.

In words, the formula says : *For all modules Mod: If Mod is an element of a chiasm χ, then Mod doesn't exist.*

$$\forall\, \text{Mod}: \text{If Mod} \in \chi(\text{mod}, \text{top}, \text{pos}_1, \text{pos}_2), \text{ then Mod} \notin \text{Mod}$$

The more explicit formula in
bracket form as a procedure to decide modularity :

$$\begin{bmatrix} \forall\, mod_{i,j}, top_{i,j} \in MOD, \\ i, j \in Compl(MOD) \\ \begin{bmatrix} IF \\ \begin{bmatrix} MOD \\ \chi(mod, top, pos_1, pos_2) \\ \begin{bmatrix} THEN \\ \begin{bmatrix} equal \\ [(mod_i, mod_j), (top_i, top_j) \end{bmatrix} \\ ELSE \\ [mod_{i,j}, top_{i,j} \notin MOD] \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

5.1.2. Content disjunctness of modules

Two modules shouldn't coincide in content. Or, two topics of different modules shouldn't overlap.This presumes strict context independence of content. That is, the same content in two different modules is identical in respect to its content. It may differ in meaning and significance,

but there are no criteria given to separate and determine such semantic and pragmatic differences between contents.
The content of a module is semantically defined by the module; and the semantics of the module is defined by its content.

$$\forall x, y: x, y \in C: x \in M_1 \cap y \in M_2 = ?$$

How is "*sameness*" of contents of modules defined? Could it be possible that the exactly same content has a strictly different *meaning* and *significance* in another module? Content surveillance systems (CSS) are not checking content, they are checking *syntactical structures* of texts. Hence, the identical syntactical constellation can have a strict different meaning and significance. Nevertheless, such a difference in meaning with identical syntax would by taxed by a CSS as equal and therefore tagged as a copy. With that, the text model of such CSS is build along the phantasm of "*Protokollsatz*" (basic sentence) of the positivist understanding of linguistics of the pre-ware time. A protocol sentence is an unambiguous, context-free true sentence. Like, *the herring is red*.

Content surveillance on the base of syntactic equality of texts is generally useless. It works only in a context of very restricted correlations between syntactic and semantic structures. It is best realized in a codified mono-disciplinary setting of a course and its modules. The whole approach is denying the fact and naturality of polysemy in meaningful contexts.

5.1.3. Hierarchical mobility as an exclusion of creativity

In contrast to the aims of the Bologna reform, the mobility and flexibility supported is restricted to a hierachical up and down the hill of the well prepared mountain of knowledge. It is a strict reproductive educational knowledge acquisition program, disallowing any queer connections between courses and modules.

For the students, the modules are pre-given. There is no supported program to develop, creatively and by invention, surprise or insight, new modules and new courses. Inter- and trans-disciplinary studies are excluded, simply because they cannot be measured by the Bologna criteria of ECTS. Hence, who is taken responsibility for the content of the modules? The lecturer is free only in the frame given by the Bologna criteria. Like the students, he/she is controlled. The business of the marks is pre-given. But the students don't have even any saying about the contents of the modules. The hierarchy is perfect. There is no escape, it has to be realized to compare objectively the quality of different courses, departments and universities.

Such a strategy is best realized in World-Model I, which is guaranteeing *inter-subjectivity* and *inter-objectivity* for the general user of pre-existing knowledge. Its technical realization is a so-called Expert system.

5.2. Content related analysis

5.2.1. UNDO: Proof of the Pudding (1)

The main reason why the project of UNDO, an ArtPhil dissertation, could be successfully finished, qualified and certified was not because of the Bologna criteria but despite those criteria because the academic staff has taken its own scientific responsibility to qualify the difficult inter- and trans-disciplinary PhD dissertation and the corresponding art work, which didn't fit into any of those pre-given administrational restrictions. But a new generation of lecturers will not anymore be trained to take such a responsibility and risk as scientists and lecturers of a university and they will be happy to relay on objective criteria and measurability by service programs on which they don't have any influence.

Modular Bolognese

Rudolf Kaehr Dr.@

ThinkArt Lab Glasgow

†

LedModular

Notes

Basta to Pasta

§ "**Ravioli code** is a type of program structure, characterized by a number of small and (ideally) loosely-coupled software components. The term is in comparison with **spaghetti** code, comparing program structure to pasta; with **ravioli** (small pasta pouches containing cheese, meat, or vegetables) being analogous to objects (which ideally are encapsulated modules consisting of both code and data).

Some consider ravioli code to be a good design methodology, especially when the components used are modular, highly interchangeable, well-encapsulated, and providing well-defined interfaces and behavior. Others consider ravioli code to be an anti-pattern. In poorly-designed object-oriented systems, with deep inheritance hierarchies and multiple layers of virtual functions overriding each other, it can become very difficult to discern (without use of a debugger) exactly what the behavior of the program is, as it is often unclear how virtual function calls are resolved."
http://encyclopedia.thefreedictionary.com/Ravioli+code

Additional insights and ingredients to the final menu of modules:
Complete Pasta Theory of Software
"**Lasagna code** is used to describe software that has a simple, understandable, and layered structure. Lasagna code, although structured, is unfortunately monolithic and not easy to modify. An attempt to change one layer conceptually simple, is often very difficult in actual practice.

The ideal software structure is one having components that are small and loosely coupled; this ideal structure is called **ravioli code**. In ravioli code, each of the components, or objects, is a package containing some meat or other nourishment for the system; any component can be modified or replaced without significantly affecting other components.

We need to go beyond the condemnation of **spaghetti code** to the active encouragement of ravioli code." (Raymond J. Rubey)
http://www.cs.brandeis.edu/~dkw/C-humor/pasta.txt

† "**modularisation**" is a concept for which no European reference documents exist (for example, standard forms, "key features", users' guides). Therefore a huge variety of interpretations of the concept can be found, ranging from defining each single unit (lecture, seminar, etc.) as a module to full-fl edged and very elaborate modular systems with interdisci- plinary elements.

¶ "Here **Humboldt** states that 'the ultimate task of our existence is to give the fullest possible content to the concept of humanity in our own person [...] through the impact of actions in our own lives'. This task 'can only be implemented through the links established between ourselves as individuals and the world around us'(GS, I, p. 283). Humboldt's concept of education does not lend itself solely to individualistic interpretation. It is true that he always recognized the importance of the organization of individual lifeand the 'development of a wealth of individual forms' (GS, III, p. 358), but he stressed the fact that'self-education can only be continued [...] in the wider context of development of the world' (GS, VII,p. 33). In other words, the individual is not only entitled, but also obliged, to play his part in shaping the world around him.Humboldt's educational ideal was entirely coloured by social considerations. He never believed that the 'human race could culminate in the attainment of a general perfection conceived in abstract terms'. In 1789, he wrote in his diary that 'the education of the individual requires his incorporation into society and involves his links with society at large' (GS, XIV, p. 155)."
http://en.wikipedia.org/wiki/Wilhelm_von_Humboldt#Minister_of_Education

‡ **Promoting mobility within Europe**

This should provide a further boost to student mobility. The mutual recognition of coursework in particular will make it easier to study abroad or transfer schools. The following measures are intended to achieve this:

• *Program modularization:*

A module refers to a group of lectures, lab classes, practical work or seminars of related content. The contents of each module are stipulated by its module description. In this way, requirements for coursework become more transparent, enabling students to plan classes more effectively. In addition, this makes it easier for coursework to be recognized when studying abroad or transferring schools.

• *Accompanying exams:*
At the end of each module comes an accompanying module completion exam. This avoids examination blocks at the end of studies, thereby spreading the workload more evenly across the whole period. This also offers you as a student a way to monitor your progress each semester.
• *Introduction of a credit system:*
Points in accordance with the European Credit Transfer System (ECTS) are awarded for each module passed. ECTS points describe the workload required for each module. A bachelor's degree requires a total of 180 ECTS points, which breaks down to a share of 30 ECTS points per semester.
http://www.en.physik.lmu.de/programs/ba_ma/bologna/index.html

§ "Not all cultures take the same view of plagiarism. The Western notion that "ideas" can be the property of individuals may actually seem absurd to those with different views on what constitutes shared information or public discourse."
http://www.plagiarism.org/learning_center/educational_tips.html#unintent

* Widespread access to the Internet and other digital resources has made protecting your intellectual property harder than ever before. Now there is a solution. iThenticate is a revolutionary web-based system that uses sophisticated textual searches to verify document originality and quickly and easily identify infringement of digital intellectual property when and wherever it occurs.
http://www.ithenticate.com/

† Undo

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A Tale of Fishes, Birds and Diamonds in Second-Order Epistemology

Why it is useless to write about the mono-contexturality of alphabetism and digitalism

Rudolf Kaehr Dr.
ThinkArt Lab Glasgow

Abstract

In a closed world, which consists of many worlds, there is no narrowness. In such a world, which is open and closed at once, there is *profoundness* of reflection and *broadness* of interaction. In such a world, it is reasonable to conceive any movement as coupled with its counter-movement. Endness has to be connected with endless rhythms instead of linear or non-linear progressions.

The Endness of Events

The endness or finiteness of events in a open/closed world are not simply ending in an unqualified way. Endness has to be connected with rhythms instead of linear or non-linear progressions.

A rhythm has a beginning and an end; endlessly. An open/closed world is poly-rhythmic. Scientific linear time structures of whatever complexity are without rhythms. Western science beliefs in a 1-rhythm world: from the big bang to the wee crash.

In many papers I emphasized the importance of *linearity* for the Western way of thinking and its mathematics and mathematically based technology.

In-between I have the feeling that I always experienced a strange lack of response to my argumentations. In a metaphor, I feel like a fish telling his female fish friend: *"Honey, do you know, we are living in water?"* And getting the harsh response: *"Shut up you wanker, I don't fancy you!"*.

OK, not everybody can be mesmerized like Monsieur Jourdain after he learned that he is speaking all his life prose. And not everybody thinks that this is trivial anyway.

For good reasons we can belief that there is no reason to think that the fish girl was stubborn or even stupid. She easily could have pointed to the un-denial fact that there is no such thing like water in the water to perceive. What is in the water are all these different

plants, stones, animals, and surely, other fishes. But no water at all. This is more than clear. There might be some areas where it is harder to swim or where other stuff is moving very fast or areas where nothing is moving at all. The stuff might also move in all direction, at once. And as far as she can swim there is no limit and no reason to stop her swimming. What can be perceived and sensed in her world as a fish are objects of all sorts but no water. All that is crystal clear.

And without doubt, if the water in which everything is swimming becomes itself an object of the water with all its objects, something quite confusing will happen to the whole world of swimming forever.

Another approach, which has not to struggle with the problems of the abstractness of the arguments for linearity of alphabetism with its atomicity and ideality of signs, could be the more generally acknowledged fact of the endless repeatability of (sign) events. This concept of iterability can be thought independent of dimensionality, parallelisms, circularities, interactions and other seemingly non-linear complex and pictorial or sonic processes and structures. Hence, for now, we will free the notion of iterability and repeatability from all restricting connections to alphabetism and digitalism.

As for the swimming moves of our fish girl, which are not restricted by any obstacle, to each move there is a next move, and so on. There is no last move in such a world of movements. Swimming is producing swimming; only a swimmer is swimming, and no swimming is leaving the category of swimming. Outside of swimming there is no swimming. Swimming adds to swimming, and remains swimming; endlessly. No swimming transforms into flying; no swimming permutes into walking. And so on.

OK, in real-world conditions, the fish girl will stop to swim because of physical limitations of her life-span. The same happens, evidently, to the chalk and blackboards of the high priests of formal systems. The endless iterativity of their sign systems will have, in real-world conditions, unavoidably, some natural ends. This is in sharp contradiction to the abstractness of the definition of signs and Obs in formal systems.

Nevertheless, repeatability is open and endless. The iterability of repeatability is stable.

The other fact, we could agree to some degree, is given by the *identity* of the repeated objects. It may not be a too big challenge to see and perceive, *clara et distincta*, that this concept of identity is best realized, as Hegel pointed out, by the Western alpha-numeric sign systems. A number or a letter is as a number or as a letter strictly identical with itself. Take the inscription on your bank note: 5 USDollar. There is nothing to interpret, 5 is 5 and USDollar is USDollar. And nothing else.

Hence, endless repeatability is realized within the realm of identical entities. Or: identities are realized in the realm of iterability. There is no identity without iterability and no iterability without identity. This, again, happens in the ideal world of sign systems, i.e., in the mind of semioticians and mathematicians; and not at the blackboard, nor in citations or plagiarism [0].

Therefore, if we accept iterability, we have not to struggle with the strangeness of the challenge to be aware of swimming in strange waters. Identity, at least to some degree of fuzziness, and the endlessness of repeatability in all its mathematical forms, seems to be accessible to everyone and understood universally without getting involved with the paradox of the medium we are living in.

Things are getting less *natural* and *universal* if we stipulate a pluri-verse instead of a classic universe as the *ultimate* condition. But this is a story to come!

It seems that nobody wants to share my linearity thesis. It is said, all over again: The world is hyper-complex, fractal, undecidable and the World Wide Web decentralized and chaotic. Old alphabetism is loosing its dominance in the Western world to images, graphics, pictograms, videos and sound. More theoretical motivated guys are talking about cellular automata, parallelism, actor communities, grid computing, multi-located λ-calculi, etc.

Therefore, there is no such thing to observe like a dominance of linearity and identity in a post-modern world full of paradoxes, parallaxes, ruptures and abysses.

A.A. Markov's linearity thesis – equivalent to the Church-Turing Thesis – is not only unknown by media scientists but put under the carpet by computer scientists as old foundational fundamentalism (FOL) and bad reductionism.

What to do against such a poverty of thinking?

Simply, change topic! Give it up! Ask our fish!

Hence, forget linearity!
Forget alphabetism and its digitalism!

Enjoy endless repeatability! The world is rich and complex, and you too.

And there is also conceptual space enough available to defend this situation of repeatability before we end up in the annoyance of paradoxical self-defence.

The Obs of Paradoxes and Second-Order Cybernetics

- **The fish's parallax**

Our poor fish had a fight with his mate, made a big jump; and ended outside of his aquarium and discovered, for a short time in his life before he died, that there must really be something like an outside of his medium. He was right to tell his bird that they are both living in water! But then it was too late.

A bird from Raymond Smullyan's bird zoo has taken him into other dimensions, not being aware of what an epistemological mystery happened to his easy prey. As we know, birds don't swim in waters.

This was his moment of self-referentiality.

What he couldn't know, at this exquisite time of his death, that he was an observer observing himself as an observer. Living in water and at once not living in water. Living and dying at once. The high-noon of observability: simultaneously, internal and external observer; at once! A real double-bind! What a paradox! The parallax killed him.

This double blindness of Western civilization is on the train to experience the same misery.

Time has gone on, and Uncle Heinz, the Magician from Urbana/Vienna brought this paradoxical experiences to the point. And this long before Niklas Luhmann released a wave of re-entry beasts into the still waters of sleeping West Germany.

▪ The misery of re-entry figures

Heinz domesticated, what the Swiss psychologist, Jean Piaget, described in great precision and concreteness, into his calculus of recursive Eigen-values. For that, Heinz transformed the observers into the magic object *"Obs"*. Obs are not only abstract *Obs*, they are objects *obs*, observers *Obs*, observables *obs* and more. And obviously, they come in the form of fishes. And sometimes they look like ancient birds.

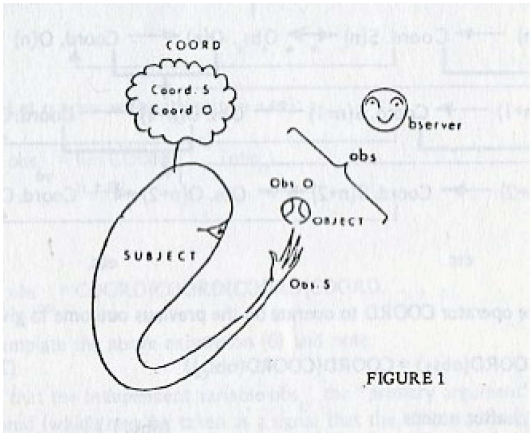
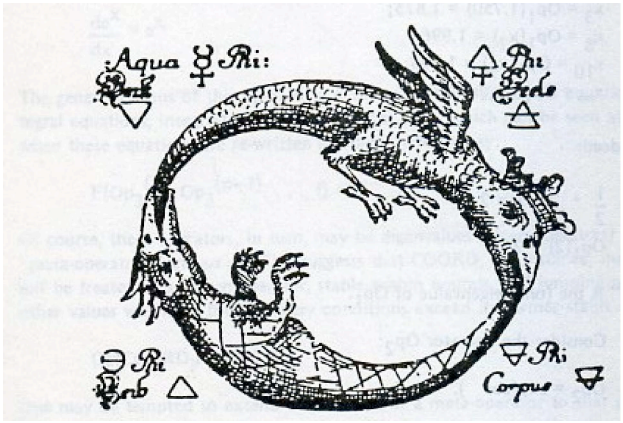


FIGURE 1

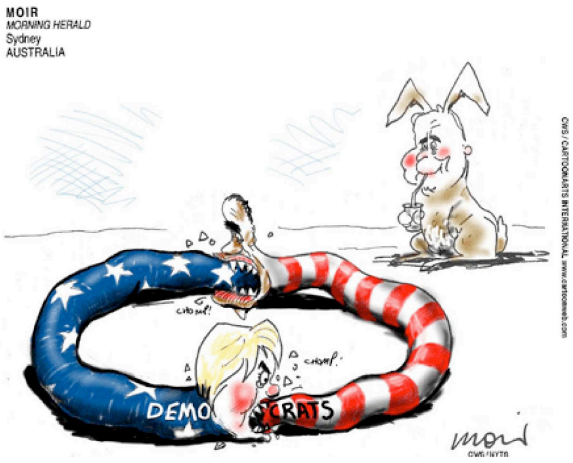
The epistemological results are well known:
1. Cognition is the computation of a computation.
2. Objects are tokens for eigenbehaviour.

In the case of two observers observing an observation, Heinz von Foerster writes:

> *"Under which conditions, then, do objects assume 'objectivity'?*
> *Apparently,only when a subject,* S_1, stipulatesthe existence of another subject, S_2, *not unlike himself, who, in turn, stipulates the existence of still another subject, not unlike himself, who may well be* S_1*."*



The observational double play, defined by Heinz, is not closed with a couple of internal observers S_1 and S_2, a new observer is entering the game, enjoying to observe from a cosy external position, those observers observations. In an actualized version, deployed from medieval mysticism, this new external observer of this devilish mismatching re-entry match, distinctively drawn from the neutral position of Australia, is nourishing himself with a non-observational drink on his own. Meanwhile, the combatants have lost all their magicks, reduced to snakes and trapped in the Sisyphus play of eating their own re-entry tails. In real-world time measures, the magic of the game is over and on the way of being re-entering into a non-circular harmony.



Nonetheless, the magic is more profound. Our O*bs* are in fact birds, too. More precisely, Heinz' fishes and snakes are profoundly, i.e., in their very deep-structure, birds, and nothing else than birds.

Adepts of Heinz' constructivism are mostly mesmerized by re-entry forms of indefinite recursions. What they miss to read is the hint to the real trick, the magician is giving clearly: **Contemplate!**

$$\mathbf{obs}_\infty = \lim_{n \to \infty} \mathbf{CORD}^{(n)}(\mathbf{obs}_0) \quad : (6)$$

"*Contemplate* [emph, rk] the above expression (6) and note:
(i) that the independent variable obs_0, the *"primary argument"* [of the recursive function, rk], has disappeared [...].
(ii) that, because obs_∞ expresses an *indefinite recursion* of operators CORD onto CORD, any indefinite recursion within that expression can be replaced by obs_∞.
(iii) Hence:

$$\mathbf{obs}_\infty = \mathbf{CORD}(\mathbf{obs}_\infty)$$
$$\mathbf{obs}_\infty = \mathbf{CORD}(\mathbf{CORD}(\mathbf{obs}_\infty))$$
$$\mathbf{obs}_\infty = \mathbf{CORD}(\mathbf{CORD}(\mathbf{CORD}(\mathbf{obs}_\infty)))$$

Note that while in this form the horror infinitaris of expression (6) has disappeared (all expressions in CORD are finite), a new feature emerged, namely, that the dependent variable obs_∞ is, so to say, "self-depending" (or "self-defining" or "self-reflecting," etc., through the operator CORD)." (Heinz von Foerster, Observing Systems 0, p.277)

With that, and the following *contemplations* on constructions, Heinz succeed to suggest that *contemplation* is equal *computation*. And obviously, it goes on and on. Even if it might become circular by contemplation and meditation, the circularity of the indefinite recursion is constructed in one and only one direction. Its recursion is trapped into linear iterability. The *"primary argument"* as the entry step of recursive game, might have disappeared in such a contemplation, but it still dictates the start as a singularity. That is, there is one and only one beginning, even in the case we are eliminating it. Only one *"primary argument"* is disappearing in the contemplation. There is no colored multitude involved. Colored figures are not allowed on this stage. Contemplate on that and you will find it boring! Given into other hands, it will be, i.e. it *is* becoming dangerous.

▪ Curry's ornithology

Haskell Curry, one of the most passionate ornitologues, invented the radically naked objects of thinking ever appeared in the Western world: the *Obs of Formal Systems*.

The philosopher Emil Lask risked it before Curry and Schönfinkel but didn't succeed, except in some philosophical circles in Japan, to entertain the European academics with his Urform 0 of logical nakedness.

The job of the Obs was to save the struggling fundaments of mathematical thinking.

This Snob of an English aristocratic logician, Bertrand, got the trick to show that the whole work of brave Gottlieb was paradoxical. Frege was destroyed. He didn't know Heinz and his magic tool box. Bertrand became famous: the *Russell Paradox.*

Today, we are used to enjoy bursting bubbles of all sorts. Van Benthem 0 has written a kind of a manifesto for the domestication and integration of paradoxes: *Four Paradoxes*. Similar proclamation appeared by Heinz and Richard Howe, written to promote Francisco Varela's *Calculus for Self-reference*.

Curry's Obs had a much too hard burden to carry, and they failed too. But Haskell was tricky enough to keep his job running. The paradox of the Obs, he claimed, is a natural quality of the world of Obs. The faulty worm is not in the Obs but in logic. The Obs are flying free, with and without paradoxes.

Who cares about logic?

Heinz Second-Order cybernetics had a similar short life as our thinking fish.

But those bubbles hadn't been useless or without influence.

Another magician, Raymond Smullyan, had the real smile.

Curry's operators had been hidden by the high priests of formalistic mathematics. Only the free city of Amsterdam got and offered some insights into the secret life of the Obs and their derivatives.

When I visited the institute in the search for papers about Ultra-intuitionism I got a very friendly and open-minded welcome. But what was most striking was the set of beautiful colonial chairs in the foyer of the Centrum voor Wiskunde. In Westberlin, at this time, they wouldn't have had a chance to survive.

Smullyan, himself a Magician, and one of the most ingenious logician ever, has freed these Obs by transforming them into birds.

Obviously Raymond wasn't aware or more probably, he might kept it as a special secret of his logical riddle books, the Urbird of all combinatorial birds, was a "schöner Fink" 0, called Moses 0, hidden, and nearly not recognized, in Moscow of the 20s. He was the Urvogel of the Urlogik. Unfortunately, he didn't make it over the ocean. Today, the game is called by Strachey *"currying"*, nobody can guess the pleasure of *"schönfinkeling"*. Nobody wanted to walk or rest in the Finken of Moses. Neither there is a Fink or a Moses in Ratheman's bird zoo.

Now, there is a zoo of free birds, Mockingbirds and ordinary birds, similar to the one in Singapore, accessible for free or with ticket to everyone.

One of the most fanciest bird is the paradoxical bird *Why*. He sings, logically, exactly when he/she doesn't sing. He/she must, therefore, be beyond such differences. That must be the reason why he is called Sage Bird. 0 His derivation is impressive but nevertheless well controllable.

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Y Why Bird (aka Sage Bird) SLL  (((SS)K)((S(K((SS)(S((SS)K)))))K)
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Alas, Smullyan's birds might smile, they might iterate and clone their existence in great ingeniousity, they are even able to produce a mass invasion of new birds. But those newcomers are only combinations of existing birds. And even worse, there is a kind of an oligarchy, others are calling this a family dictatorship, of a very small group of original birds. The committee is called: (IKS).

Proof that the Amsterdamer have no clue about the radicality of this ultra-paradoxical SKIer, Gotthard. A real hard guy in SKIing and thinking.

Smullyan's birds might sing but they don't mate. Olivier, 0 the Messiaen of living birds, *Traité de rythme, de couleur et d'ornithologie* (1949-1992), is feeding them, and they are feeding him, with all kind of fishes and rhythms. He is the only one who knows the life of birds, their melodies, rhythms, figures of flights. He knows the fishes and the cats, too.

To tell people what our fish couldn't tell and what Curry disguised in complex formalistic calculi, which, today, appear in computer programming, and Heinz in his observing systems, which are observing only themselves, Olivier Messiaen's 0 generosity to the Lord let us hear them all together in his musical work. He even changed the shape of the most classical instrument, the piano, to stay in the tempi of his birds, to an oval. His wife Yvonne Loriot 0, the pianist, was his impressive bird of inspiration.

Also Olivier and Haskell probably didn't met in Paris, there are some interesting connections between HASKELL and music composition: Haskore 0, runs on NeXT computers, written by Paul Hudak.

▪ Diamonds

Now, what can we do?

• Our fish got a knock back from his fish girl, and died.

• Curry's Obs disappeared into computer programming languages, like HASKELL. 0
• Heinz Second-Order Cybernetics got occupied and watered down by Niklas.
• Smullyan's birds are singing everywhere but never mate.
• Oliver's rhythms are too complex for the digital age based on Curry's Obs.
• And, the real birds on my balcony at Garnethill are all dying out...

Obviously, we need something more stable.

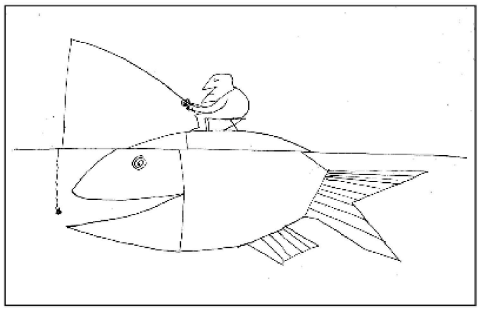
Diamonds!

Diamonds are making birds happy.

Therefore, I have to fight against the power of my own star sign: Pisces. Or was it Aquarius?

But first, listen to Fish Fish Fish, 0 and relax. 0

Watch Saul Steinberg's fisherman!



Saul Steinberg: The Labyrinth, N.Y. 1954

Diamonds are not unknown in logic. Nathaniel introduced the *"heller Stein"* as his main player of his *"Diamond, A Paradox Logic"* 0. But again, the hidden story is not yet told. It was the "schonfinkeling" Fink who has offered "schon" before the diamond at the very beginning of the "paradox avoiding" strategy game of formal systems players. Well disguised, until now, as the bird-stone "Finkelstein".

The eyes of the fish had a glance like a diamond. But he couldn't see the glance of his own eyes. Heinz always said, 'you cannot see that you see'. Or, was it: *"We don't see that we don't see."*

Does it matter?

Without doubt, our fish had a *knowledge* that he was living in water and not a perception, neither *clara* nor *distincta*; there was clearly nothing to see at all. What he could see was his complex world full of strange stuff, and this funny fish girl. But not the water. What the fish girl didn't know, neither Heinz, was that he properly acted according to Heinz' Ethical Imperative:

"Always act to augment the possibilities of the others."

But how could such a meta-message augment the possibilities of actions for the fish girl? Isn't it simply an unnecessarily luxury to know that she is living in water?

But he, our fish, not Heinz, didn't accept the fish girl's ignorance to try to reduce the necessities of his insights. Therefore, intuitively, his dual imperative of Heinz's altruistic maxim came into force.

"Never contemplate to reduce the amount of necessities of yours!"

▪ Skiing with IKS

Gotthard's SKIing was on the right path of illumination. His path was profoundly chiastic. With his 2 skiers and his 2 staves he mapped with his shadow the living chiasm into the morning snow. But again, his great sophistication worked only down hill.

He was very much into Aliens, too. Gotthard told his decade long German friend, Helmut Schelski, *"I'm not a human being, I'm only looking like one."* But with skiing he was down hill terrestrial.

The down-hill approach and Gunther's deep desire to find a *Urform*, similar to the one of Lask and Curry, but profundly philosophical, albeit not necessarily Western, intrigued him into the icy world of the *Form of Form*, the $\mu o \rho \varphi \eta$ of form, i.e., the morphogram and its grammatics, its morphogrammatics. Only week thinkers, trapped in their logocentrism, can come with the yellow card that it better should be called grammer instead of grammatics.

The operator Gotthard discovered in his God hard insistence to his path, was what he called the *operator before the operator*, the *prelude* to any relationship, i.e. the pro-ömiality of relationality and operativity as such. In a proemial system, the difference between applicator and applicand, e.g, combinator, becomes entangeld into a chiastic interplay of changing roles.

Im neither a skier nor a pilot. This story came to (my) mind when I was siting in a bus, commuting between Glasgow and Edinburgh.

SKI or IKS is, according to the prominent computer scientist Philip Wadler, *"universal, ultimate and natural".* Yes, in Switzerland we say: *"Petri heil!"*, for fishing. And *"Hals- und Beinbruch!"* for skiing. And in the city some girls are hugging each other: *"Chum guet unders tram!"*. I'm not sure what Wadler's aliens would wish. But one thing is crystal clear, they are all counting on SKI.

Diamonds are the most flexible Obs which have ever occurred in history. They are neither fishes nor birds nor skiers. Not definable by IKS. In fact, they are not part of history, neither of this nor of another. And neither belong to the superpositions of the negations used in this explanation.

Currys's paradoxical Obs needed an observer to observe their paradoxical behavior. In itself, this paradoxical Ob was not moved by any struggle of a paradox. Unlike to Mao TseTungs insight: *Everything is in a struggle, hence dialectical.* This burden belonged to the observing observer of the Ob, not to the real world objects. Curry kept the secret of the real behavior of his Obs in his mind. Ink and paper couldn't catch it properly. What we got are some calculi, which need an initiation by a high priest, like Henk Barendregt, to be understood.

Diamonds, as hard as they are, are a living paradoxon.

So, what's so special to diamonds? They are and they are not. That means nothing and/or everything, hence I should stop talking and try to begin to write.

The paradoxicality of the known paradoxes, is constructed always in one direction only. Or as Curry would insist, in no direction at all. It's not about perception and observation but about thinking only. But readable in fact in one or the other direction, exclusively.

How are paradoxes constructed? There is a sophisticated tool-box on the mathematical market. Also out of fashion a lot of devices are still in offer. Tools offered are: re-entry, recursion, diagonalization, substitution, contradiction, flip-flop, etc.

Their movement or their temporality is always uni-directional. They need time. They are consuming time. Niklas even thought, they are producing time. Produced or consumed or both at once, at the same time, their time structure is uni-linear.

Everything else appeared as nice phantasies of the post-modern couple Deleuze/Guattari with their open chiastic multitudes. Or as Paul said before/during the Parisian Cultural Revolution: *"Anything goes!".*

Or look at Escher! Surely, you can read his figures up and down, but you will not read the figures at once up and down, nor neither up nor down. As the neuro-cyberneticists would say, today: *"Our brain is not build for that"*. Or the other fundamentalists: *"We haven't yet found the proper gene for that".*

If you need more stuff to swallow, read instead of Gödel Hofstadter's *"Gödel, Escher, Bach"*.

The temporality of diamonds is moving at once forwards and backwards and, at the same time, diamonds are in fact the most stable Obs ever, they are beyond any move at all.

I can see this is making you dizzy and vomiting. Sorry. That's because you are still a fish or a bird or a skier or whatever terrestrial being.

Diamonds are interacting, and enjoying their interplay; independently.

▪ Uni-formity of self-reference

> *"Symbols …presuppose the difference between familiar and unfamiliar and…enable the re-entry of this difference into the familiar…They are forms of self-reference using the self-reference of form"*. (Niklas Luhmann)

Luhmann re-enters the unfamiliar of his familiar/unfamiliar difference into the familiar, i.e., familiar/(familiar/unfamiliar).

What are the obstacles or fears for the inverse scenario: the familiar re-enters into the unfamiliar, i.e., unfamiliar/(familiar/unfamiliar)? Hence, at least the double movement of re-entry would have a chance to be thought. This wouldn't be achieved with a second application of the simple re-entry manoeuvre onto the inverse

difference: putting the familiar into the unfamiliar of the familiar/unfamiliar difference. This manoeuvre would have to be realized *at once* for the familiar and the unfamiliar re-entry.

But this little antidromic challenge is not included in any of the recursive re-entry forms George Spencer-Brown is offering his admirers. It is also not done with any double or multiple recursion function - *"Only two can play this game"* - as they are well known from recursive function theory. Not to mention the complementary situation of the manoeuvre, the *neither-nor* of the familiar/(familiar/unfamiliar) and the unfamiliar/(familiar/unfamiliar) re-entries.

There are two reasons why such a double re-entry is not in the range of constructivist thinking.
First, what is lacking is a polycontextural number theory and semiotics, able to disseminate recursive formulas, like Spencer Brown's re-entries.
Second, there is no insight into an antidromic time structure. In other words, recursion is realized inside the paradigm of linearity of counting and time. Antidromic movements are asking for some more space and don't wont to be pressed into a linear succession, only.

Antidromic strategies would confuse the innocence of linear repeatability. If something is moving forwards and backwards at once the whole concept of movement becomes obsolete. If movements are neither forwards- nor backwards-oriented, then movements need structural space to realize their parallax. Such a structural space is neither endless nor finite; it is not connected to any kind of iter-/alterability. Such a world is simultaneously, beyond time, open and closed.

Heinz is more on pictorial scenarios: On his arena of self-reference, where the play of the Circulus Creativus is performed, the popular self-form, played by the serpent Uroboros is the crazy monster-form, which is eating his own tail. Well, that's funny. But it is also quite boring. I never had the opportunity to read something deviant to this construction, say the complementary wording or, at least, dual version of the play: The tail of the Uroboros is *feeding* his own mouth. Well, the paradox as a whole would then be read as *"eating his own tail"* and *"feeding his own mouth"*, at once. Hence, a queer double fun in a Kasper 0 puppet theater.

Again, to satisfy more sophisticated clients, the play would have to become an antidromic double play, like it was such often been risked in Paris and Yale under the directorship of the master of the double-play championships, Jacques Derrida. It got its seminal performances under the auspices of Péter Szondi and Samual Weber in the 60s/70s at the Institute of Comparatistics in Westberlin. There we enjoyed, despite the total lack of any deconstructive attempts towards mathematical logic, the double science of *"La Double Séance"*.

▪ Double-faces in real-world constellations

Self-descriptions of double-faced experiences are not always easy to grasp.

The multi-cultured 0 artist

"An artist's split between cultures becomes a potential means of deautomatizing worn-out formal devices, a strategy of inserting and asserting, of uprooting and defamiliarizing formal contextures. In a true sense the process exhibits a polycontextural stylistic matrix and a distributed artistic identity - one runs across the terms heterarchy, contexture, polycontexturality, transjunction and kenogrammatics in Gotthard Guenther's transclassic logic investigations. Polycontextural systems apply different codes of self-observation related to different observation positions." (Arteni)

The double-headed 0 baby girl

"A BABY born with two faces is doing well one month on from her birth.
Tot Lali was born in a northern Indian village with two noses, two pairs of lips and two pairs of eyes - but only two ears."

Her full name is hinting to a solution: symmetric and at once, asymmetric. *Tot* is symmetrically inverse to *toT*, i.e., palindromic, and *Lali* is asymmetrically inverse to *ilaL*. This is reflected in the symmetry of two noses, two pairs of lips, two pairs of eyes - and the asymmetry of only two ears.

No wonder that the baby girl Tot Lali is conceived as an incarnation of a Buddhist God: *Baby Girl Born With Two Faces Worshipped as Reincarnated God.* (FoxNews)

New birds in the coming

- **Curtain up!**

Back to our story about fishes and birds, in what ever disguise.
The scenario has changed. We are now in a world of multitudes of worlds. All interacting together in a harmonic togetherness.

Alas, nothing new happens here. Now surprise, no challenge, except of keeping the multitudes together in harmony. Cleanly distributed, well-balanced and mediated.
But only epistemological blindness can oversee what is happening behind the stage.

Birds are mating!

New unforeseen birds are emerging; never seen before. Neither confirming nor disturbing the brave harmony of polycontextural choreography. On stage, behind stage, without stage. Everywhere/nowhere.

It was a hard work of sophisticated combinatorics to combine the basic birds of the **SKI** committee together to invent new birds on stage. A wise bird like **LU(LU)** was cleverly disguising the fact that she was nothing more than the old guys in a fancy disguise.

Combinator birds at Ratheman's [0] experimental zoo - free access! - are giving the clue of **LU(LU)**'s complexity.

```
L  Lark    ((S((S(KS))K))(K((S((SK)K))((SK)K))))

U Turing ((S(K(S((SK)K))))((S((SK)K))((SK)K)))
```

A bird of a highly complex behavior is the **Finch**. He can't do it in a simpler way.

```
F  Finch
((S(K((S((SK)K))(K((S(K(S((SK)K))))K)))))((S(K((S(K((S(KS))K)))((S(KS))K)))))((S(K(S((SK)K)))))K)))
```

Rathman's bird zoo might be rich but there is no such birds to find like a **Fink** or another diamond bird.
There is also not much to bet on the game of disseminating LU(LU) into different shapes of colored contextures. Such a dissemination of LU(LU) over the grid of polycontexturality would be highly colorful and intriguing. But it wouldn't leave the general scenario of repeatability.

This can be seen with the colorful behavior of a colleague of LU(LU), the distributed Y-operator WHY. [0] His advantage is clear, he freely can dance his circular pirouettes and jumping his salti without being conceptually confused and logically trapped by Curry's paradoxes and the Uroboros of Heinz' observers *pas-de-deux.*

$$\begin{array}{l}\text{thematize self}-\text{referentiality}\\ \text{identify contexture}\ \ s^{(3)}\end{array}$$

$$\left[\left[\begin{array}{l} W(\mathrm{BN})\,(W(\mathrm{BN})); \quad W=Q \\ \left[\left[\begin{array}{l} \mathrm{BN}\,(W(\mathrm{BN}))\,(W(\mathrm{BN})) \\ N(W(\mathrm{BN})\,(W(\mathrm{BN}))) \end{array}\right]\right] \\ N(W(\mathrm{BN})\,(W(\mathrm{BN}))) \end{array}\right]\left[\left[\begin{array}{l} W(\mathrm{BN})\,(W(\mathrm{BN})) \\ \left[\left[\begin{array}{l} \mathrm{BN}\,(W(\mathrm{BN}))\,(W(\mathrm{BN})) \\ N(W(\mathrm{BN})\,(W(\mathrm{BN}))) \end{array}\right]\right] \\ N(W(\mathrm{BN})\,(W(\mathrm{BN}))) \end{array}\right]\left[\left[\begin{array}{l} W(\mathrm{BN})\,(W(\mathrm{BN})) \\ \left[\left[\begin{array}{l} \mathrm{BN}\,(W(\mathrm{BN}))\,(W(\mathrm{BN})) \\ N(W(\mathrm{BN})\,(W(\mathrm{BN}))) \end{array}\right]\right] \\ N(W(\mathrm{BN})\,(W(\mathrm{BN}))) \end{array}\right]\right]$$

Things are much more surprising if we change, not only our view-points of observation, but if we jump out of the whole observational circus of observing systems.

What was not seen by the designers of the play was the fact, that with each combination of birds not only an anticipated new combinator was defined, fulfilling the conditions of constructive definitions, but also a new, not expexted surprising and not allowed counter-combinator, violating the rules of definitorial reductionism, is taking place, well hidden in the backstage. It is time to open the eyes to see what always was there to see.

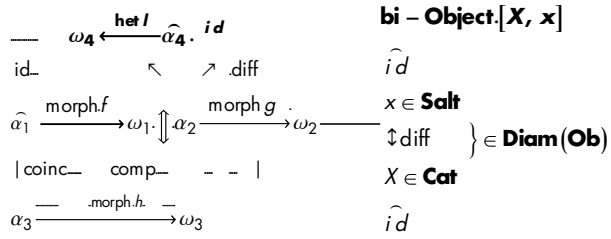
Curtain up!

Each observation in this non-observational game is co-creating to its observables of observation new observables, which are creating new observers, observing, in an act of self-observing, their complementary play of being observers and observables at once. Hence, diamond observers are neither observables nor observers of any observation.

▪ Diamond category

Hence, a combination of two combinator has, according to the diamond rules 0, a double result: *horizontally*, the superpositional composition of the two combinators and simultaneously, *vertically*, an antidromic hyperposition of the creation of a new combinator.

Thus, diamond combinations are not simply behaving like Heinz' *copulation* of his Bio-Logic (1962), and are also not primarily producing *superadditive* logical systems, like it is the case, in Gunther's setting, for the intriguingly complex polycontextural birds, but are enabeling by co-creation the emergence - (*"rise from water and obscurity"*) - of a new kind of combinators.



To use category theoretical terms, the composition of morphism *f* and g to *(f⇳g)* is not only resulting in the composed morphism h, *h=(f⇳g),* but at once, antidromically and enantiomorph into the hetero-morphism *l*. In other words, a diamond object *Diam(Ob)* of a diamond composition is a bi-object *[X, x]*, consisting at once of *categorical* and *saltatorical* components. Bi-objects are complexions, unifying interactively, identity and diversity. Hence, *Obs* in diamonds or Diamonds in *Obs*, are always appearing in a double determination, at once being identical and different to themselves.

The consequences for the entire paradigm of composability, based, as we learned, again and again, on iterability and repeatability, linear or not linear, are enormous. Not only an absolute new kind of double-compositionability 0 appears on stage, even more. Primary to all kind of composition, there is the difference, i.e. the differentness of identity and difference, between superpositional and antidromic combinations. Instead of dealing with superpositionality alone, *interactionality* and *reflectionality* between superpositional and antidromical movements, iter-/alterabilities, are taking place, well positioned in the kenomic grid of Diamond 0 Strategies.

The double strategie of moving at once forwards and backwards, of counting and combining formal term sequences, simultaneously in different direction, at the very basis of the definition of rationality, has lost all of its absurdity. Neither parallax nor paradox, nor any re-entry is able anymore to seduce to enter any trance.

This is really a great relief!

Forget debates about the monocontexturality of combinatorial logics, their fixation on alphabetism and its linearity and atomicity, as *sine qua non* of all their composability.
Forget the postmodern theater of disseminating colored contextures of repeatability.
Forget the phantasm of our hidden universal mockingbirds in whatever fibered forests.

Listen to the songs of free mating birds! Enjoy your Diamonds!

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Chez Maxime's

Human rights in a polycontextural world

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Abstract

Ethic maxims, the human rights declaration, guidelines of comportment are all first of all texts, mostly written in sentences of a Western language. Hence, deconstructions and diamondizations of general maxims and human right declarations have to be risked to find a more acceptableframework of ethics for the 21st century.

Heinz' CybernEthic Maxim

From another story we might have experienced a first conflict involving ethics.

"Without doubt, our fish had a knowledge that he was living in water and not a perception; there was nothing to see at all. What he could perceive was his complex world full of strange stuff, and this funny fish girl. But not the water. What the fish girl didn't know, neither Heinz, was that he properly acted according to Heinz' CybernEthical Imperative:

"Always act to augment the amount of possibilities of the others!"

But he, our fish, not Heinz, didn't accept the fish girl's ignorance to try to reduce the necessities of his insights. Therefore, intuitively, his dual imperative of Heinz's altruistic maxim came into force.

"Never contemplate to reduce the amount of necessities of yours!"

This dual maxim has to be set into a complementary maxim to conflict the *Golden Rule* of ethics. This is not simply involving a negation of selfless altruism, hence selfishness, but a first step into a liberation of ethics from ontology.

Only if we accept the slavery of classical logics, which is declared as *universal*, *natural* and *ultimate*, again and again, we would have to believe that a rejection of altruism must necessarily be an affirmation of selfish egoism.

The fish was not selfish but true to the alter-ego of his fish girl.

This intricate togetherness of a dual imperative for actions, which always are a composition of actions and never occur in the majesty of a singularity, is highly intriguing and needs, thus, a formalization in an appropriate formalism, like the diamond category theory, which is offering additional space for the togetherness of complementary and antidromic statements.

Therefore, the two imperatives have to be embedded into a complementary and reflectional interplay:

$$\left(\begin{array}{c} \mathfrak{Always\ act\ to\ augment\ the\ amount\ of\ possibilities\ of\ the\ others!} \\ \mathfrak{"Never\ contemplate\ to\ reduce\ the\ amount\ of\ necessities\ of\ yours!"} \end{array}\right)$$

Such a reflectional turn is abstracting from the object-relatedness of classical modalities. Modality in classical logics are modalities of truth. That is, a proposition is not only an assertion, but in a modal form, its assertivity is put into modalities. Hence, a proposition is necessarily (possibly, actually) true or false.

Reflectional propositions or statements tries to reflect on the modality as such and not on modal truth conditions of a proposition. Hence, their aim is not truth or falsehood of a proposition but the modalities of modalities, the necessity of necessity or the necessity of possibility, etc., not simply of a single proposition but of a textual complementarity. Such a reflectional turn is neither covered nor intended by the classical modal construction of multi-modal logics.

Table 0. **Second-order modalities of classical modalities**

Modalities	necessity	possibility	actuality
necessity	necessity of necessity	necessity of possibility	necessity of possibility
possibility	possibility of necessity	possibility of possibility	possibility of actuality
actuality	actuality of necessity	actuality of possibility	actuality of actuality

Hence, fish-maxims are always double-maxims, fish- and bird-maxims, water and air, both at once.

Immanuel Kant: *"Handle nur nach derjenigen Maxime, durch die du zugleich wollen kannst, daß sie ein allgemeines Gesetz werde."*
"Act only according to that maxim whereby you can at the same time will that it should become a universal law."

"The ethic of reciprocity or "The Golden Rule" *is a fundamental moral principle which simply means '*treat others as you would like to be treated.' *It is arguably the most essential basis for the modern concept of* human rights*. Principal philosophers and religious figures have stated it in different ways."*

It is a principle of deconstruction to question what principal philosophers have stated in what ever principal way.

As a consequence of the *Golden Rule* paradigm, other paradigms of ethics can not be accepted because they are violating the human rights canon.
Hence, societies with different ethics are under-developed and have to be educated and elevated to the standards of the *Golden Rule* paradigm. In other words, who is not following the Western ethics is in danger to be/come bad and evil.

The epistemological presupposition of the *Golden Rule* is quite simple: We are all the same; hence reciprocal. This is the symmetric Ego-Ego-concept of communication, which is excluding the asymmetry of the I-Thou-dialogical concept of interactionality. This Ego-Ego-concept of communication appears in a more noble form in all progressive sociologies as the Ego-Alter-Ego-difference of communication and interaction. The idea is that there is an Ego and an Alter-Ego, both interacting together and towards the world. But an Alter-Ego is still an Ego if the difference between Ego and Alter-Ego has no logical and epistemological consequences.

Between Ego and Alter-Ego a strict symmetry is imposed. Otherwise, that's the fear of weak thinkers, an asymmetry would destroy the reciprocity of the Golden Rule, and with that contradict the Declaration of Human Rights.

But everybody who has taken the risk to do some more profound studies would have learned about the dialogical asymmetry between I and Thou. An asymmetry which is guaranteeing the autonomy of different subjects and is not suppressing them under the umbrella of unified subjectivity as Egos.

Because of the Ego-Ego-communication we are in the *Golden Rule*; and because of the reciprocality of the Golden Rule we are in an Ego-Ego-communication. Both together is well at home with classical logic, i.e., rationality and ontology, i.e., reality.

Hence, the Ego-Ego-communication model is presupposing a general reality and a general rationality, which are guaranteeing the reasonability of the Ego-Ego-communication for "everyone". This constellation is modeled as world-model I.

It is still worth an effort to analyze the sociological theories of Jürgen Habermas and Anthony Giddens, in respect to their presuposed Ego-Alter-Ego-based dialogism, to learn about their failure to develop a theory of interactionality and reflectionality compatible with the needs of contemporary societies.

First-order maxims

Act this and that way!
Such a maxim is oriented to the objects of actions.
Firs-order maxims are embroild in heroic or tragic paradoxes:

"Hobson's Choice: *Act selfishly and cause collective disaster, or act altruistically and aid someone else who is acting selfishly. Either way, selfishness wins."*

Shankar Vedantam said it agan:
"Edella Schlager summed up neatly: "Rational individuals are trapped. To act rationally, to pursue one's self-interest, leads to collective ruin. To act irrationally, to place the collective interest above one's self-interest, exposes one to exploitation."

How would a second-order formulation of the Hobbes paradox change the scenario?
Ethical paradoxes are formulated in the framework of logic. It is still a taboo to question the logical framework used in ethical argumentations.

Second-order maxims

Object-relatedness

"Augment the amount..."
This formulation is still object-related. To augment the number of choices is presupposing the existence of a number of possibilities in the pre-given space of choices.

Modality-relatedness

Second-order formulations are concerned with the modalities of actions. Modalities like *possibility*, *necessity*, *actuality* are abstracting from a direct object-related approach. But the question still remains: Modalities of what?

- **Eksistenz-relatedness**

Existential (or eksistential) modalities are relating to the existence of the subject in question.
Existential questions are basic for existential maxims, which are beyond object-relatedness. (PolySystemics)
Ethical behavior - in world-model IV - is neither action-, nor object-based.

This situation of an ontology-free ethics might occur if all possible restrictions of human rights will be resolved and stripped off from their objectivists treats, the declaration fulfilled and becoming superfluous. What then will be the positive declaration of being a human being beyond *"reason and conscience"* and the *"spirit of brotherhood."*?

I'm not talking here about politics and the industrial-military complex.

Costas Douzinas, THE END OF HUMAN RIGHTS
'If the twentieth century is the epoch of human rights', Professor Costas Douzinas writes in his book The End of Human Rights, 'their triumph is, to say the least, something of a **paradox**. Our age has witnessed more violations of their principles than any of the previous and less "enlightened" epochs'. 'No degree of progress', in the words of famous French philosopher Jacques Derrida, 'allows one to ignore that never before in absolute figures, have so many men, women and children been subjugated, starved, or exterminated on earth'.

After all, there is no reason to accept this misery as a paradox. It seems to be in harmony with the Declaration of the Human Rights as they are presupposing a logic of exclusion. The rest is not ethics but moral.

Diamondization of Heinz' Maxim

- **Modalities Chez Maxime**

"Always act to augment the possibilities of the necessities of others."
"Never contemplate to reduce the necessities of your possibilities."

The mechanism of diamondization of Heinz's maxim towards its complementary maxim is a simple application of the diamond strategies.

First step: Dualization
always - never,
act - contemplate,
augment - reduce,
possibilities - necessities,
others - yours.

Second Step: Acception and rejection
There is only a little jump to find the diamond form of the two complementary maxims:
- first, reject the dualities as differences,
- second, accept the dualities as unities.

That is, neither "always" nor "never" is accepted for the rejectional position; and both-at-once of "always" and "never" of the rejection are accepted for the acceptional position. And this applies to all differences involved.
With such a rejectional decision, the duality of altruism/selfishness is moved out of relevancy.

Hence, the question, put in abbreviated form, is: what is neither altruism nor egoism?
And: what is at once both, altruism and egoism?
Obviously, we are back to the simple, but in no way innocent question of the meaning of the copula *"is"*? It is in fact, not about egoism and altruism, it is about "is".

Transitions between modality in classical modal logic are ruled by negation.
$\Diamond P \leftrightarrow \neg \Box \neg P$: The *possibility* of P is equal the *negation* of the *necessity* of not- P.

□ P ↔ ¬ ◊ ¬ P: The *necessity* of P is equal the *negation* of the *possibility* of not-P.
In other words, necessity (□) and possibility (◊) form together a *dual pair* of modal operators.

$\Diamond \Diamond P \bigwedge \Box P \leftrightarrow \Diamond P \bigwedge \neg \Diamond \neg P \leftrightarrow \neg \Box \neg P \bigwedge \Box P$

Hence, the diamond complementarity of the maxims is not represented by a conjunction of classical modalities. Simply, because diamond complementarity is not (logical) duality. Complementarity means, that both parts holds at once. Logically, a contradiction for dualities.

■ Epistemology and grammatology of ethics

Kantian and Second-order cybernetic ethics, CybernEthics, are ego-based conceptions related by the singularity of the maxim to anonymous others, which could be ourself. If we want to be generous, they may even involve a dialogical I-Thou-Encounter (Buber), at least as a projection, and surely as an intention. But they are in no way including, structurally, the ours- and the others-positions, necessarily to build a real-world dialogical understanding of interactionality and reflectionality of human actions.

Second-order cybernethics is Kantian based and is dreaming together with Martin Buber and Victor Frankel of a dialogical paradigm of ethics.

It is a direct conclusion of the I-Thou-relationship, as it was conceived by the philosopher Gotthard Gunther, which is in fact a trichotomic relationship of I, Thou and It, to introduce a complementarity of the maxims. My maxim is different from your maxim, even if it has the exact same wording, because it is positioned at a different position in the grid of contexturality, which just makes the difference between me and you.

And further more, it is a direct conclusion, of the I-Thou-Ours-Others-interaction to introduce as the necessarily kernel of ethics in the 21st century the *diamond form* of maxims. That is, ethical sentences, in this paradigm of ethical orientation, are necessarily 4-fold and antidromic, at least.

Dialogical systems are able to balance the differences between different points of view, different world-models, different cultures, towards a kind of a *harmony* in the Pythagorean, Confucian or Cybernetic sense. But they are closed to harmony; no surprise, or undefinable and undecidable event, the Other, is positively welcomed by a structural place to happen as such. Harmonic systems have to harmonize and to defend against disturbance and disruptions.

Diamond systems have to harmonize harmonic systems with the "complementarity" of their self-understanding.

Hence, the time of ethics as a narration, written and based in "clara & distincta perciperem" (Descartes) and logical deduction has to come to a closure. Leibniz's dream of a lingua universalis and a calculator rationis might serve as a hint to use polycontextural *scriptural* systems to formulate in languages and calculate within game-based poly-algorithms ethical constellations, surpassing any narrational and mathematical configurations, of post-modern challenges.

"The written form creates in the law a difference between sign and meaning, between text and interpretation: 'All law set down in writing is...law that has to be interpreted'*".* (Luhmann)

As far as I experience the consequences of Western ageism I have to apologies the academic reader to not to serve him or her or it with the intellectual treasures well saved in the tresors of knowledge, which he or her or it would deserve.
Because of that, I will feel free to use my own approach of post-academic research and thinking. As a consequence of such *discriminations* I cannot know if someone else behind the walls has developed similar ideas to mine and might have them exposed in a much better way. My own work, therefore, could easily turn out to be nothing more than a plagiat of my own thoughts.

"ageism " in the postmodern economy.
American Anthropologist

June 1998, Vol. 100, No. 2, pp. 565-566
Posted online on January 27, 2005.

Review: [untitled]
Peter Dear
Reviewed work(s): Lingua universalis: Kryptologie und Theorie der Universal-sprachen im 16. und 17. Jahrhundert by Gerhard F. Strasser
Isis, Vol. 80, No. 1 (Mar., 1989), **pp. 185-186** (review consists of 2 pages)
Published by: The University of Chicago Press on behalf of The History of Science Society

Lingua Universalis vs. Calculus Ratiocinator:: An Ultimate Presupposition of Twentieth-Century Philosophy
(Jaakko Hintikka Selected Papers)
J. Hintikka
Hardcover: 296 pages
Publisher: Springer; 1 edition (November 13, 1996)
Price: $189.00
Only 1 left in stock--order soon (more on the way).

Product Description
"*Twentieth-century philosophy has tacitly been dominated by a deep contrast between universalist and model-theoretical visions of language. The role of this contrast is studied here in Peirce, Frege, Wittgenstein, Carnap, Quine, Husserl, Heidegger and in the development of logical theory. Hintikka also develops a new approach to truth-definitions which strongly supports the model-theoretical view.*"

I don't know if there is still 1 copy left, but thanks to Amazon 's generosity I'm entitled to have a wee glance. Also copyrighted, I will give a citation .
To my surprise the master of analytic philosophy and modern logic is mentioning Jacques Derrida and is developing an interesting comparison between his own work and Derrida's deconstruction.

Jaakko Hintikka: Lingua Universalis vs. Calculus Ratiocinator:: An Ultimate Presupposition of Twentieth-Century Philosophy

"And even though I am not a fan of Derrida's, a few comparative comments on the methodology of the study of historical as well as contemporary ideas is in order." [...] As a slogan, I could therefore say that like Derrida I believe that contemporary philosophy and large parts of the history of philosophy are ripe to be deconstructed.
I nevertheless have three main objections to deconstructivism.
First, I will argue that there is no valid reason to think that the job that the deconstructivists are trying to do cannot be done equally well and better by means of traditional historical and logical means.
Second, I see no reason why deconstruction cannot be followed by reconstruction. [...].
Third, my most specific criticism of Derrida is that he is a largely unsuccessfull deconstructivist. He has never been able to deconstruct successfully a single truely significand centrally philosophical (logical, epistemological or metaphysical) idea, concentrating instead on half-baked suggestions on the social context of philosophical ideas. [...]
Later in this paper I will indicate how to deconstruct and reconstruct even the idea of elementary logic. [...]
This type of motivation of the ineffability thesis nevertheless relies on presuppositions of semantical context independence (compositionality, atomicity) which are far from obvious and in my considered judgment are in the last analysis unacceptable." pp.2 , 9 (Copyrighted Material)

Unfortunately, I couldn't learn about Hintikka's deconstruction of the *"so-called principle of compositionality"*. Despite the fact that Derrida never understood himself as a deconstructionist, I have the feeling that Hintikka is (ab)using his name, according to academic usage, simply as a "Papiertiger".

■ Universality vs. pluri-versality

What is declared as an *universal* law is always excluding everyone else, which is not included into such a *universal* paradigm. This sentence is trivial only if we don't have an idea of universality, which is surpassing its singularity towards a multitude of universes, hence towards a complexion of multi-verses.

In the 50s it would have been the aliens, today things are more terrestrial, the happy ones are now the Chinese.

From an actional point of view, actions have to be composed. The maxims don't tell yet much, how actions could be composed. It easily could be possible that the underlying rules of composition are just denying the possibility to realize the maxims.
Actions have to be composed in a reasonable way. With that, logic enters the game. And with that, Jaakko Hintikka's de-/re-constructional studies of compositionability would be welcomed.

Antidromic aspects of thinking are not elicited by natural language or speech-act analysis. On a language level, linguistic games like palindromes, are a kind of an approximation to antidromy in the sense of diamond theory.
Logic and ethics behind human right declaration and definitions are based on indo-germanic language analysis and its logic.

■ Transitivity and Non-Transitivity of actions

Transivity of actions: If A act B, B act C, then A act C.
Or nontransitivity of actions:
If A act B, B act C, then:
A act C || non(A act C) || neither-nor (A act C)

Some more differentiation of the action rule is possible.
Depending on the underlying logic, those "metaphoric" formal action rules, can be concretized and developed to a formal action calculus.
Depending on the context of actions, i.e., their semi-formal semantics, different rules have to be considered. The pure transitivity rule is working only for strictly formal relations, thus intransitivity or non-transitivity of action composition has to be considered, too.

$$\frac{\left(\left(A \xrightarrow{f} B\right) o \left(B \xrightarrow{g} C\right)\right) \Big| \left(b_1 \xleftarrow{k} b_2\right)}{\begin{array}{ll} (1) & \left(A \xrightarrow{fg} C\right) \Big| \left(b_1 \xleftarrow{k} b_2\right) \\ (2) & \left(\left(A \xrightarrow{f} B\right) \bigvee \left(B \xrightarrow{g} C\right)\right) \end{array}}$$

Only if the composition of actions is realized, antidromic complementary actions have to be considered (1). If composition is not happening, no antidromic action is involved (2). In this case, composition of actions is intransitive. *"An intransitive action either* $\left(A \xrightarrow{f} B\right)$ *or* $\left(B \xrightarrow{g} C\right)$ *or both."* (Kohout)

I don't see, why the *neither-nor* case of the intransitive composition $\left(\left(A \xrightarrow{f} B\right) o \left(B \xrightarrow{g} C\right)\right)$, i.e., $\neg\left(A \xrightarrow{f} B\right) \bigwedge \neg\left(B \xrightarrow{g} C\right)$, has to be excluded (3). It occurs as the dual of Kohout's $\left(A \xrightarrow{f} B\right) \vee \left(B \xrightarrow{g} C\right)$. In other words, in a non-transitive interaction either action *f* or action *g* or both action *f* and *g* together, (f ∧ g), might happen. But for systematic reasons also none action at all might happen, i.e., neither action *f* nor action *g, i.e.,*(¬ f ∧ ¬ g). Otherwise, with the exclusion of the *neither-nor* case, the composition would not be determining the reduction results. The reduction results simply would be a formal combinatorics of the premises.

Despite the fact that two action are presumed in the premises, nil action can result from the composition. That is, a combination of

actions can either *affirm* the interactivity of the actions, i.e., the ∨-case, or *deny* any interactivity between the actions, i.e., the *neither-nor* case.

$$\frac{\left(\left(A \xrightarrow{f} B\right) o \left(B \xrightarrow{g} C\right)\right) \Big| \left(b_1 \xleftarrow{k} b_2\right)}{\begin{array}{ll} (1) & \left(A \xrightarrow{\mathrm{fg}} C\right) \Big| \left(b_1 \xleftarrow{k} b_2\right) \\ (2) & \left(\left(A \xrightarrow{f} B\right) \bigvee \left(B \xrightarrow{g} C\right)\right) \\ (3) & \neg\left(A \xrightarrow{f} B\right) \bigwedge \neg\left(B \xrightarrow{g} C\right) \end{array}}$$

Hence, the rationality of the composition of actions, i.e., their compositional interactivity, is not covered by classical logical laws alone. As a consequence, ethics in the framework of logic, say deontolocical or in other settings, is not adequate for a post-modern concept of ethics, which would have to belong to world-model IV.

$$\frac{\left(A \xrightarrow{f} B \xrightarrow{g} C \xrightarrow{h} D\right) \Big| \left(b_1 \xleftarrow{k} b_2 \amalg c_1 \xleftarrow{l} c_2\right)}{\left[\begin{array}{c} \left(A \xrightarrow{\mathrm{fgh}} D\right) \Big| \left(\neg\left(A \xrightarrow{\mathrm{fgh}} D\right)\right) \Big| (\neg A \bigwedge \neg D) \\ \left(b_1 \xleftarrow{l \amalg k} c_2\right) \Big| \neg\left(b_1 \xleftarrow{l \amalg k} c_2\right) \Big| \left(\neg\, b_1 \xleftarrow{\mathrm{l \amalg k}} \neg\, \mathrm{c}_2\right) \end{array}\right]}$$

A sequence of actions f, g, h might result in a transitive or a non-transitive composition and a rejection of transitivity between A and D. This happens for both, the *acceptional* and the *rejectional* parts of the diamond formula.

Differentiation of action sequences

transitivity: $\left(A \xrightarrow{\mathrm{fgh}} D\right)$

non − transitivity: $\neg\left(A \xrightarrow{\mathrm{fgh}} D\right)$

disjunctivity: $(A \vee D), (\neg A \vee \neg D)$

negation: $(\neg (A \vee D))$

conditionality: $(A \vee \neg D), (\neg A \vee D)$

Contexture-change in polycontextural systems

▪ Polycontextural logics

One of the most basic logical rules in legal systems is surly the classical rule of deduction, *modus ponens*. We have not to establish to much of the apparatus of polycontextural logics to introduce some significant differences between the concept of the classical modus ponens and its appearance in polycontextural logics.
According to the wordings of theoreticians of post-modern legal systems (Luhmann, Teubner) the world is conceived as pluri-centric and polycontextural. It is easy to grasp, if we take the post-modernist statements for serious, that the logical concept of the modus ponens is too hardly challenged by the complexity it would have to manage deductively.

Polycontextural logics are disseminating, i.e., distributing and mediating, logical systems to form a cluster of a complex logical system. In such a complexion, each contexture is domesticating a full-fledged logical system, including its modus ponens. Additionally, structural rules of interactionality and reflectionality between the contextures are trans-logically defined.

Hence, complex interacting and reflecting forms of modi ponens, building not a linear succession but a dynamic grid, are at service to help the lost souls of modern post-traditional thinking and feeling to find orientation in the overwhelming chaos of postmodern worlds.

▪ Intransitivity as contexture-change

Logical deductions, like done with our simple modus ponens, are fundamentally transitive. That is:

$$\textbf{If } A \Rightarrow B \bigwedge B \Rightarrow C, \textbf{ then } A \Rightarrow C$$

Intransitivity as it is usual in ordinary life, would produce dilemmas and circular paradoxes applied to deduction rules.
A situation like, *"team A wins against team B, B wins against C, hence team A wins against C"* would be the end of the betting business.
But the same would happen for the jobs of logicians, if the intransitive situation would hold:

$$\textbf{If } A \Rightarrow B \bigwedge B \Rightarrow C, \textbf{ then } C \Rightarrow A$$

Such problems are well known in theoretical economy and ethics.

A plausible explanation is given with the hint of *context-change*. If an actor is arguing, deductively in one context, then changing the context of his argumentation for another context, situations like intransitivity are appearing as no surprise.
This can be formalized in many ways by applicative logics. But it will not touch the fundamental transitivity of the deduction rule.

Another approach is given with polycontextural logic. Here contexts are radicalized to *contextures*, and each contexture is running its own logic and deductional rules.
Hence, there is no need for paradoxes, if in one contexture, deduction is running the opposite way. Simply because polycontexturality is offering space to separate the interacting deductional systems. Therefore, changes in points of view, context-change, can be logically modelled as *contexture-change* on the very level of logical deduction and not secondarily as a modeling in an applicative logic.

The offered formula below is intending not more than to give a simple hint or metaphor how intransitivity of deduction rules, crucial for ethical systems, could be implemented into polycontextural logic.

$$\text{If}\begin{pmatrix} A_1 \Rightarrow B_1 \\ A_2 \Rightarrow B_2 \\ \dots\ \dots\ \dots \\ A_n \Longleftarrow B_n \end{pmatrix} \bigwedge_1 \bigwedge_2 \dots \bigwedge_n \begin{pmatrix} B_1 \Rightarrow C_1 \\ B_2 \Rightarrow C_2 \\ \dots\ \dots\ .. \\ B_n \Longleftarrow C_n \end{pmatrix}, \text{ then } \begin{pmatrix} A_1 \Rightarrow C_1 \\ A_2 \Rightarrow C_2 \\ \dots\ \dots\ .. \\ A_n \Longleftarrow C_n \end{pmatrix}$$

Universal Declaration of Human Rights

▪ Articles 1 & 2 of the Human Rights

Article 1.
"All human beings are born free and equal in dignity and rights.They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood."

Application:

Article 2.
"Everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status. [...]"

The declaration is done in a neutral way. The subjects are human beings as such.
Distinctions are object- and behavioral-oriented.
Problems: ontologism, endlessness of the list.
The Declarations are prospective and not perspective. That is, the Human Rights are written against the abuse of achieved fundamental rights for human beings, hence still defensive.

"Human rights are, at their most basic level, rights to which everyone human *being is entitled simply for because he or she is a human being."*

Philosophically, it is not as "simply" be given, but instead a highly intricate question and not as naturally evidently answered, what human beings are understanding by human beings.

It seems to be too philosophical, futuristic and trans-humanistic to ask for a complementary declaration for the future of humanity; beyond, altruism and egoism.

Apropos: Brotherhood
As much as it would be absurd under such a neutral definition of human beings to ask for siterhood, it is not only absurd but ideological, to ask for brotherhood.
This *Short Study* is not denying the catastrophic consequences of archaic brotherhood.

Universal, fundamental, natural, global
Universal human rights are declared as universally valid and fundamental; as holding universally. What to do, if we don't belief in a universe in which human rights could hold. What if we belief, instead, not in a uni-verse but in a pluri-verse or a multi-verse or even neither in a uni-/pluri- nor in any -verse at all? Are we then still entitled to be respected by the intentions of the Human Rights? And if we still are entitled to be respected by the human rights, do we really want to be honored by an idea of humanity, which is stupidifying its members in such a radical way?
Wouldn't it be a better choice to search for chances of post-technological trans-humanism?

Everybody has the *right* to be a human being. No human being has the *obligation* to remain as a human being.

Co-Article-0:

$$\begin{pmatrix} \text{Everybody has the right to be recognized as a human being.} \\ \text{No human being has the obligation to remain as human being.} \end{pmatrix}$$

- **Diamondization of the declarations**

  - **Article 1**

    "All human beings are born free and equal in dignity and rights.[...]"

    No human beings are born unfree. No free born being is human. No born being is human. All human beings are different in dignity and rights. All dignities and rights are equal to different human beings. All dignities and rights are different to equal human beings. No dignities and rights are equal to different human beings.

$$\text{Co-Article-1:} \begin{pmatrix} \text{All human beings are equal.} \\ \text{No equal is a human being.} \end{pmatrix}$$

  - **Article 2**

"Everyone is entitled to all the rights and freedoms set forth in this Declaration [...]."

Nobody is entitled to all rights and freedoms in this Declaration. There is no Declaration for everyone to be entitled to all rights and freedoms set forth in this Declaration. There is nothing set forth for the rights and freedoms of everyone.
Everyone is free. Nobody is free. Nobody is unfree. No free one is everybody.

$$\text{Co-Articel-2:} \begin{pmatrix} \text{Everyone is free.} \\ \text{No free one is everybody.} \end{pmatrix}$$

- **This game of deconstruction has to be played situatively, every time, until an agreement is reached in the actual group as a result of contextural, i.e., interactional, reflectional and interventional, negotiations and computations.**

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  - ***List of links***

CybernEthical
http://www.stanford.edu/group/SHR/4-2/text/foerster.html
Golden Rule
http://www.answers.com/topic/ethic-of-reciprocity
vedantam
http://www.washingtonpost.com/wp-dyn/content/article/2008/04/27/AR2008042701660.html?nav=rss_print/asection
hobson
http://en.wikipedia.org/wiki/Hobson's_choice
clara
http://www.wright.edu/cola/descartes/meditation3l.html
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ageism
http://www.glbtq.com/social-sciences/ageism.html
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http://www.anthrosource.net/doi/pdfplus/10.1525/aa.1998.100.2.565.2
citation
http:/www.springerlink.com/index/UM63103757463QX6.pdf
JaakkoHintikka
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Human Rigths
http://www.un.org/Overview/rights.html
human
http://www.aboutequalopportunities.co.uk/what-are-human-rights.html
declaration
http://www.thinkartlab.com/CCR/2006/08/pamphlet.html
brotherhood
http://www.independent.co.uk/news/world/middle-east/barbaric-honour-killings-become-the-weapon-to-subjugate-women-in-iraq-816649.html
post-technological
http://www.thinkartlab.com/CCR/rudys-chinese-challenge.html
trans-humanism
http://www.transhumanism.org/index.php/WTA/index/
asymmetry
www.thinkartlab.com/pkl/archive/Cyberphilosophy.pdf
Ladislav Kohout
A perspective on intelligent systems. Chapman and Hall Computing, 1990

Primary Thoughts to a Manifesto for Awareness Fashion Marketing

zurück Seite 4

Rudolf Kaehr, New York/Glasgow

Fashion and Awareness

In the past, fashion was determining our consciousness.
Without clothes, human beings wouldn't exist in the form we know today.
Fashion was an attribute to a person, like a mask to an identity in an ancient theater play.
Hence, fashion allowed to play different roles without implying a change in identity and self-understanding of the person.

Fashion, obviously, has many faces. Its objects are highly divers, reaching from cars, social habits, like smoking, health interests, etc., to cultural preferences in literature, music, etc.

These *Thoughts to a Manifesto for Awareness Fashion* is exemplified by the complex fashion patterns of fashionable clothes.

In the future, our consciousness and our way of acting will be defining fashion. A new understanding of fashion, i.e., a new paradigm of performing fashion is emerging.

Awareness Fashion is not emphasizing *what* object or attitude is chosen as fashionable but *how* a usage of objects and attitudes is performed. The way or mode of performing fashion will define what is fashionable and what not.
Hence, the definition of fashion is interlocked into a mutual characterization of the object, as the what, and the subject, as the how, of fashionable objects and objectionable fashions.

In a further step, the new level of fashion has to surpass the distinction between *what* and *how* as such. A first contemplation would have to concentrate of the *in-betweenness* of the distinction "what/how".

The internet of fashion and the fashion of the internet

Web-1.0
Like in the use of the Internet, transitions from the Web-1.0 to the Web-2.0 are on the way to be realized. The Web-1.0 was concerned with the distribution of information. Information had to be accessible to be used by a user, which in no way was ever involved into this kind of usage.

Web-2.0
The Web-2.0 as a social networking medium seems to include the subjectivity of the users into the creation of the social domain of Web-2.0. Nevertheless the users involvement is still determined by the *what* of his/her content, which is added to the sociality of the Web-2.0.
This will be changed by the Web-3.0.

Web-3.0
The web-3.0 which will be a semantic/pragmatic web, will be determined by an interactive involvement of the user, i.e., by the *how* of the usage by the user, which will change the identity of the user by using the Web-3.0. The *what* of the content in the Web-3.0 will be secondarily to the *how.*
Also there is a long way to go to realize the paradigm of the Web-3.0, it is not the final solution for an emancipation of the user of information technology from the suppression by the formation of the information age, i.e., of digitalism.

Web-4.0
To accept common hierarchic numbering, a Web-4.0 would have to be conceived as a next step to realize Awareness Computation. But this next step will not simply be a step but a jump, in fact, a salto.
Awareness Computation would include subjectivity into the paradigm of computation as the creativity of the user. The creativity of the user is realized as interactivity and reflectivity towards the paradigm of computation. Creative users will be able to change the structure of the *how* of the usage of the Web. Hence, they are not only aware of the difference between the what and the why. They will be enforced the *intervene*, i.e., to change the structure of the what and how game. Intervention is possible as an interplay of interaction and reflection towards the communicational system.

Mass production of designer fashion is marketing an elimination of differences.
Therefore we have to ask:
How can excellence and exclusivity be realized in a context of permanently changing values and trends?
How can excellence and exclusivity be achieved beyond elitism and popularism?

> **Fashion Consciousness**
> "Fashion consciousness refers to a person's degree of involvement with the styles or fashion of clothing. An individual does not have to be either a fashion opinion leader or a fashion innovator to be considered fashion conscious."
> http://www.blackwell-synergy.com/doi/pdf/10.1111/j.1470-6431.2006.00497.x

Awareness vs. consciousness
Fashion Awareness is not the same as fashion consciousness.

> "In biological psychology awareness comprises a human's or an animal's *perception* and cognitive *reaction* to a condition or event. Awareness does not necessarily imply understanding, just an ability to be conscious of, feel or perceive." WiKi

Awareness, in this Thoughts, is conceived as an *activity*, which is receptive and creative at the same time.

Awareness as an activity has at least 3 features:
Reflectivity
Interactivity
Intervention

Therefore, to wear fashion or to act fashionable is not primarily an act to realize the esthetics of the object defined by the designer but to define, while wearing it, its fashionable attributes and characteristics.

Awareness Fashion is not fashion awareness but more a new way of marketing fashion.

Fashion and Marketing

What is sold in a fashion market is a product, defined by its material and its design.
This concept belongs to a paradigm of first order cybernetics: the steering of the circulation of information realized by designed objects and their hidden rules of usage. This concept is excluding the user of the usage of the used.

That is, the user has no chance, in principle, to change the definition of the object while using it.
On the other hand, the object is not changed by its usage. It remains what it is to its end, which happens not to the definition but the material of the object.

Change in such a paradigm of first-order cybernetics is possible only by abuse and misuse, but not by proper use of the designed object.

What has to be sold in the new paradigm of fashion is, at least, a double-faced object, i.e., an object being material and spiritual at once?

Awareness as spirituality is a cognitive and volitive process, and has to be trained. Hence, the buyer is not simply involved in a market of designed objects but also, simultaneously, in training of his consciousness

Without doubt, this is happening today anyway also it is hidden in the ideology of the objects. If I buy some hip hop stuff, I may be involved in some hip hop culture. This is in no way necessary. I can buy the hat because it is cold and windy; and for no other reasons.

The new marketing would have to sell the designed object and in parallel a training for the awareness of the new marketing.

Hence, the subject as a buyer is not any more excluded from the definition, i.e., the design of the designed object. There is no second-order object without an involvement of the subjectivity, i.e., cognition and volition, which is using it.
Such a usage is itself redefined by the involvement of subjectivity, i.e., the usage is co-creating the self-definition of the user.

Thus, in a higher-order paradigm, use, usage and user are defining each other mutually.

Epistemology of fashion

From an epistemological point of view, first order usage is binary, second order usage is ternary.

First-order usage

First-order usage is dictated by the needs to defend the body from nature. It is, hence, a tool to protect the body. There is no awareness about a medium between human body and nature to place the tool into a culture. A tool is not a medium, but placed into a medium.

This kind of usage was quickly involved in esthetics by the early people, and brought to perfection, in production as well as esthetics, during the emperor epochs for the elite and in the industrial revolution for the mass.

Second-order usage
The second-order concept of usage is aware about the medium between body and mind, or material and usage. This usage is well described by modern semioticians, like Lotman, Bense, Bartes and Eco. It is reflected in a ternary and trichotomic semiotics of objects, medium and practice.
Barthes: http://mh.cla.umn.edu/txtimdb2.html

Third-order usage
With that, second-order concept are still not reflecting their environment properly. That is, the use-usage-user trinity is not reflecting its own context, which is, in this case, the market as such.
In other words, the fact that the fashion system is a system is reflected in the paradigm of third-order usage. The user is not only acting inside of the framework of a general fashion system but he/she is also aware about this fact of being involved with such a system. What still is lacking are further reflectional and interactional chances and tools to think and act beyond this general/specific singularity and uniqueness. Hence, there are no means to *intervene* against this uniqueness or to *play* with a multitude of structurally incomparable and incompatible, also called incommensurable, systems.

Diamond Strategies as forth-order usage
The diamond paradigm of fashionability is not only involved into the game of a multitude of incomparable but interacting and reflecting fashion systems, but also into a transgression of the very scheme of the user/usage/using trichotomy.

In a more economical terminology, the supposed triadizity of production, distribution and consumption of fashionable objects has to be transgressed into a 4-fold scenario.
The same has to be achieved with the triadism of the semiotic systems of different *couleurs* (Barthes, Lacan, Eco).

Originating in Charles Sanders Peirce revolutiory work on semiotics, historically involved intensively in Kant and Hegel studies, modern semiotics is adopting the Peirceian trichotomy of semiosis, i.e., the usage of sign systems. Semiotics is, therefore, distinguishing syntactics, semantics and pragmatics of the sign-relation to reality, with its similarity degrees to reality of iconicity, indexicality and symboliciity (icon, index, symbol). This kind of trichotomy was well popularized by Charles Morris and systematized by the German Max Bense to a triadic-trichotomic categorical semiotic.

Such a multitude of contexturally irreducible semiotic systems can not be tackled by questions of quantity. Because these systems are incomparable, i.e., autonomous, they have to be mediated to be able to be involved into a game of interplay. Such an interplay is not realized as a superposition operation on triadic semiotic systems. That is, an application of triadicity (triadism) onto itself is not escaping its own structure of triadism. In other words, the semiosis of semiosis is a semiotically closed operation, i.e., it is closed with respect to semiotic operations. The meaning of such second-order semiotics is, that semiotic operations are not capable of leaving their framework of sign-systems. Like the addition of integer numbers is not producing anything else than integer numbers, again. (This might become slightly more sophisticated with the operation of subtraction and division of integer numbers.)

Hence, mediation between incomensurabel (autonomous) semiotic systems cannot be achieved by semiotic operations as such. It is not realized by ternary operations, applied on ternary operations, but only by a structurally new invention, i.e., the genuine 4-foldness of the chiastic diamond, constituting the diamond strategies of dissemination, i.e., the distribution and mediation of autonomous semiotic systems.
From a very theoretical point of view, semiotics are categorical, and thus, well studied by category theory. Polycontextural category theory is studying the *dissemination* of such trichotomic

categorical systems. But category theory, classic as well as polycontextural, are based on iterability[1] and repeatability.

Roland Barthes' Fashion System

If Roland Barthes is describing the triadicity of the fashion drama as a semiotic system, he is not including his position as an observer into the arena of the fashion drama. He stays out-side as an external observer describing the observed without describing simultaneously his activity as describing the system as an observer of it. It is well known that his *System de la Mode* has become itself a fashion. Obviously, this reflectional turn is not yet reflected in his description of the structure and functioning of the fashion system as an *"independent, autonomous system",* which, obviously, is unique, too.

But more seriously, what Barthes is not reflecting directly is the fact that while he is describing the fashion system semiotically, he is developing his semiology 'fashionally'. That is, he is using and producing, at once, and in parallel, his semiotic methods and his theory of fashion. This double action of using and producing semiotics and fashion theory seems to be the interesting achievement of Barthes. And not the separate presentation of his "Eléments de Sémiologie"(1964) nor his separate publication of his "Systeme de la Mode" (1967).

For Roland Barthes, the designer is the semiologue (semiotician), which is designing the fashion system by semiotics while thematizing semiotics by fashion events.

> "Nobody had a better eye for fashions - in language, in behavior, in anything - than Roland Barthes.
> And so, when we open *''The Fashion System,''* which was first published in 1967, we expect semiology to be put at the service of fashion.
> But the book does just the opposite: it uses fashion to demonstrate how semiology works.
> It consists, for the most part, of sentences like this: ''Within the matrix, on the contrary, the syntagmatic relation is constrained; it is a relation of solidarity or double implication which unites the object, the support, and the variant.''
> Though here and there the real world of Barthes breaks through, *''The Fashion System''* is semiology with a vengeance." (ANATOLE BROYARD)

Levels of analysis

"Having isolated the units of his analysis, Barthes then proceeds to define the possible levels of his analysis:

- the *real*, or vestimentary code (analyzing the relationship between the real garment and Fashion)
- the *written* vestimentary code (in which propositions express the relationship between the garment and Fashion of the written garment)
- the *rhetorical* code (in which a metalanguage and connotative system describing the relationship between the written garment and Fashion is developed)

In any case, Barthes is finally interested in the way that these sign systems produce not clothing, not women, but the abstract notion of Fashion. Barthes's fascination with Fashion as an independent, autonomous system followed him for a decade after completion of *The Fashion System."* (David Beard) http://mh.cla.umn.edu/txtimdb2.html

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[1] "Derrida speaks of "iterability" throughout his works. We are accustomed to hearing people say, "could you reiterate that?" -- ordinarily, in other words, one would expect to see the word "reiterate" rather than merely "iterate." What Derrida stresses by using the word iterate is that any word which can be said by one human being to another must, if it is at all comprehensible, be repeatable. Every iteration is, therefore, a reiteration: words appear in dictionaries before you use them; you might imagine yourself, in speaking, as quoting the dictionary.
http://www.units.muohio.edu/technologyandhumanities/eng495/iterability.htm

Usage in the diamond paradigm is, hence, as much a creative use/abuse than simple proper use.
Paradigms as sketched, from the first to the third order, are proper. They are owned as a property by the designer and they are logically and structurally clean.

For Roland Barthes, the designer is the semiologue (semiotician), which is designing the fashion system by semiotics while thematizing semiotics by fashion events.

> "Nobody had a better eye for fashions - in language, in behavior, in anything - than Roland Barthes.
> And so, when we open *''The Fashion System,''* which was first published in 1967, we expect semiology to be put at the service of fashion.
> But the book does just the opposite: it uses fashion to demonstrate how semiology works.
> It consists, for the most part, of sentences like this: ''Within the matrix, on the contrary, the syntagmatic relation is constrained; it is a relation of solidarity or double implication which unites the object, the support, and the variant.''
> Though here and there the real world of Barthes breaks through, *''The Fashion System''* is semiology with a vengeance." (ANATOLE BROYARD)

Iterability, deconstructed by diamond strategies
A totally new feature enters the game of iter-/alterability (repeatability) if we study what happens to the "original", which is involved into iteration. We might start with a text as an original, as the source or the origin of citation, quotation and translation. Obviously, such an action is temporally forward-oriented, because, first is the original as a starting point and then the usage of it by quotation, citation, translation or paraphrase. Hence, the usage comes second. But a closer look into this writing action discovers that the original itself is always changed by such interaction. That is, the original is not only quoted, etc. but its meaning, context, significance, etc. is simultaneously and instantly changed by such an action. Hence, there are always, even at the very beginning of installing an original, a double movement, a double gesture, a double feature, encircling a double logic of "forward" and "backward" movements.

After Walter Benjamin, Translation is a highly philosophical and metaphysical adventure. Reduced to a purely formalistic and operational point of view, translation is best explained by categorical transitions (Joseph A. Goguen)[2]. Categorical transitions between sign systems are based on morphisms. Semiotic morphisms are, like all morphisms, structure *preserving* mappings between sign-systems, their basic rules of *composition* are given by identity, commutativity and associativity

Such a categorical approach is not considering the antidromic backward movement of interpretation. More, there are even no means in category theory, neither conceptual nor technical, to think and calculate such a parallax scenario. In fact, diamond category theory is challenging the whole Western approach to rationality and creativity.

What is changed by the procedure of iteration is not the physical substance of the text, but its meaning and significance. And this, and nothing else, is what makes a text a text and not a physical object. Hence, a text is from its very beginning a repeated text and not a objective and physical fact in its singularity, which seems to be a myth anyway.

Iterability and parallaxy are engulfed into the paradox of quotation:

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[2] "We address questions about the nature of translation between sign systems, and the reasons for preferring one translation to another, by studying maps from signs in one system to "represent" signs in another system. These maps are called **semiotic morphisms**, and are made precise in Definition 2 of the paper [B]. Examples include metaphors, analogies, etc., as well as representations in the more familiar user interface design sense. Just as we defined sign systems as theories rather than models, so their mappings should translate from the *language* of one sign system to the language of another, instead of just translating the concrete signs in a model. This may seem indirect, but it has important advantages over a model based approach to representations, as we discussed in Section 2." (Goguen)
http://www.cs.ucsd.edu/users/goguen/papers/sm/node5.html

"In a slogan: *'Quotes don't know their mates.'* (George Boolos)." (Kaehr, 2005)

The idea of a simultaneous antidromic, i.e., forwards/backwards, action as the temporal interpretational/thematizational structure of translation gets some flesh with the citation of the surprising remarks of Rudolf Pannewitz (Postmoderne, 1917);

> "*Our translations, even the best ones, proceed from a wrong premise. They want to turn Hindi, Greek, English into German instead of turning German into Hindi, Greek, English. […] The basic error of the translator is that he preserves the state in which his own language happens to be instead of allowing his language to be powerfully affected by the foreign tongue.*"

This gesture of double affection between the work to be translated and the medium or language into which it will be translated is a strictly poetological experience and has not to be confused with any empirical complicity between the original and its translation.

> "*The ambiguity of Benjamin's view becomes obvious when the relation between original and translation becomes topical: an imitation of the original does not make any sense for him because of the inadequacy of source and target language, but his demand for loyalty is not to ignore. The independence of the original can also be cast into doubt by his remark that the original demands a translation, that translatability is something inherent to it, as well as—with regard to the "messianic end of history"—considering Benjamin's underlying teleology.*" (Sahra Dudeck)
> http://www.cipherjournal.com/html/dudek_benjamin.html

Iterability and plagiarism

Iterability, today, is a big topic and appears mainly in the context of *intellectual property theft*, i.e., in the drama of plagiarism in all its forms. In the time of globalism, nobody knows for sure the meaning and relevance of a text written by an (unknown) author. What might be common sense for one might be a plagiat for another. If all common sense has to be referenced, nobody ever could write something else than references. Hence, after the basic conformity-checks of grammar and style, the text has to be checked against its degree of plagiarism. This is objectively and scientifically supported and done by Turnitin and as a business by iThenticate, both from iParadigm.[3]

From all the intricate deconstructive reflections and analysis of text, context, inter-textuality and the intriguing problems of origin(s) in relation to quotations, citations, paraphrases and translations, what is left is the e-business idea of legal property. The proper text belongs proprietarily to a legal owner, which is the proper originator of the original text in all its property.

Self-referentiality of fashion's originality

What does these deconstructive reflections on originality, iterability and plagiarism mean for fashion? Is it of any meaning? Titles, like *"Is Kate a Copycat?"* seems to suggest its virulence and actuality.

Fashions are fast, it's not surprising that their movements are becoming self-referential citations of themselves.

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[3] "Even the U.N. Security Council has begun to protect its credibility this way, using iParadigm's technology since last fall to ensure the originality of reports by its researchers and freelance writers. Oakland-based iParadigms started in 1996 with a computer program to help researchers at the University of California, Berkeley inspect undergraduates' papers. Today, its Turnitin plagiarism-detector is used by about 2,500 high schools and colleges in the United States and 1,000 more abroad. It launched a commercial version, iThenticate, in January."
http://www.usatoday.com/tech/news/2004-04-06-revealing-copycats_x.htm

“It's kind of feeling like a hall of mirrors in here, no?”

Kate Moss - who, two years ago, single-handedly launched the ongoing skinny jeans/ballet flats craze - is the first fashion model whose personal take on clothes is immediately replicated by fans and reinterpreted by designers.

"Even Kate Moss wants to look like Kate Moss."

To stop all those exploitations of the original work of the originator of the original, the government introduced some juridical steps into prevention.

To amend title 17, United States Code, to provide protection for fashion design. (Introduced in House)

HR 5055 IH

109th CONGRESS

2d Session

H. R. 5055

To amend title 17, United States Code, to provide protection for fashion design.

IN THE HOUSE OF REPRESENTATIVES

March 30, 2006

Mr. GOODLATTE (for himself, Mr. DELAHUNT, Mr. COBLE, and Mr. WEXLER) introduced the following bill; which was referred to the Committee on the Judiciary

On the other hand, there seems to exist some historical and cultural facts about culture and fashion. Ownership is part of a very restricted cultural formation. With the closure of this epoch and the resolution of individuality and originality, new strategies beyond the private/public dichotomy has to be created.

“Is it shocking anymore to learn that fashion designers don’t design so much as swipe from fashion history?”

This is a great example of how **all fashion is derivative**. The inspiration for these sandals is millennia old. No one can claim to have been the originator of a design that dates back thousands of years, and so no designer should be granted a monopoly over the design.

Second, **copying facilitates the rapid growth of trends**.

Third, **copying fashion designs benefits designers and consumers**.

Some of 2253 froogles of Gladiator Sandals

Personal proclaimer
If I would try to sue all the copyist who are copying my copies I would quickly be bankrupt if I would have any money. Hence, I'm happy to not to have to sue anybody, and I very much enjoy to see that my copies are worth to be copied.

How to become an original originator?
Obviously, there exists originators and some are getting extremely rich by securing and marketing their originality. How does it work? An originator becomes an originator by juridical decision, i.e., by power. Hence, not by originality but by an institutional acceptance of the originality of the work. You can apply for a patent, registration, protection of copyright, etc. at an institution, which is entitled by the government to protect your rights. This, too, is a business in itself.

The WIPO (World Intellectual Property Organization) is giving advise with its *freepublications* in PDF format about the whole story, procedures and legal achievements to protect intellectual property (IP). But don't try to copy a paragraph of their free papers about intellectual property. Its not free! All PDF access is protected, except for printing. Hence, I'm restricted in copying the rules against copying.

Without doubt, a proprietor of a property has to be an identifiable identity. It can be a personal identity, an individual, or a group-identity, an association, etc. But what happens, if the identity of the originator transforms, mutates, in the process of proprietion? A pluripersonal personality with a multitude of addressability modes, as who is this multitude of identities addressable as an owner of a property in a WIPO-catalogue? And what happens with the property as such if its proper identity is resolved into a cluster of transforming aspects in the act of being owned?

still to do

New Mind Marketing

What will be sold is generalized exclusivity.
The objects of generalized exclusivity are produced and consumed on the level of excellence.

There is no need for generosity, which allows lower class people to buy designed clothes. The object is defined and

Bridging Conditions

$$\forall \bar{l}, \overline{m} \in HET,$$
$$\forall f, g \in MORPH :$$
$$g \ o \ f, \ l \parallel k,$$
$$\left(\bar{l} \ o \ g\right) \ o \ \overline{k},$$
$$\bar{l} \ o \ \left(g \ o \ \overline{k}\right) \ are \ in \ MC$$

finally designed by the person who is wearing it. Hence, the whole class strategy of exclusion and superiority is obsolete from the very beginning.

In this sense, the wearer stopped to be a persona wearing masks in anonymity. That is, it stopped to be a general subject of the market with its object and information circulation.

Fashion and Environment

Fashion, today, has to appear in very short cycles of creation, production, distribution and consumption.

Nevertheless, retail markets for fashion are collapsing.
High speed consumerism is collapsing.
High speed consumerism is leading to lowest prices with maximum of products.
Speed and quantity cannot be accelerated indefinitely.
Physical and human resources are limited.

Green Fashion

Green Fashion is not achieved by ethical production and consumption.
Even if everything would be green and everybody would behave green, nothing would have been changed in the paradigm of production and consumption.
That is, the binary structure between object and subject, or the dichotomy between the material world of consumption and the mental world of the consumer, would stay untouched and still intact to be able to destroy the material and mental environment of transactions.

Fashion and Technology

Wearable computation is changing fashion from the side of technology.
A first step of a transformation of fashion was produced by the development of new materials, allowing textures with new qualities of design and usage.

Awareness Fashion is not been wear as clothes had been wear.
Wearability has changed.
There is a transition from the body-oriented clothes to the mind-oriented wearability.

Clothes are covering the body; awareness fashion is not simply worn but is supporting the emerging body and mind.

The body might be visible, the mind isn’t accessible to perception.

The missing link is movement and dance.

Awareness fashion is realized by dancing movements of wearable computing.
Wearable computing is supporting refections and interactions in society and is basic for a transition of of humanity to trans-humanity.
Wearability is including prothetic implants such as intelligent cybernetic devises.

Hence, to consume Awareness Fashion is to be trained in wearing this fashion.
This training, while buying fashion, is including training for body and mind movements. This will be a further step to surpass and dynamize the body/mind dichotomy prevalent in Western culture.

Wearable computing and computable wearability is realized by materials adequate for computing and for wearing. Hence, Awareness Fashion is not simply fashion plus computing devices added to the old paradigm of wearable things.
The order has to be involved into a inversion and subversion, from the clothes with computers to the computers as clothes/and the clothes as computers.

Obviously, this strategy is only the beginning of a whole deconstruction of the mind-body relationship in the fashion production, market and usage.

Which Equality?

How equal are equal human beings?

Rudolf Kaehr Dr.[@]

ThinkArt Lab Glasgow

zurück Seite 4

Abstract

"All human beings are equal". What does "equal" mean? What are the many definitions of "equal" and "equality"? From a Diamond perspective, concepts of sameness, from equality, similarity, bisimilarity to hetero-morphism and more are sketched in respect to their usage in ethical discourses, e.g Human Rights, of mono-, multi- and trans-cultural formations. What happens in such scenarios to the Golden Rule? The family of mankind? The brotherhood?

1. Interdependency of context and composition

Life under the regulation of *equality* has stopped to be funny. To do the same, which can have strictly different meanings and significance, can end up in prison, deportation or execution if judged by identity-trained forces and institutions of our free society.

The following short study might be wrong in time. Things are still sub-human. The human rights not realized at all. On the other hand, what do we understand by equality if this term is defined only in a negative way, i.e. by exclusion of non-equality. Despite the wrong timing a conceptual effort to achieve a positive and constructive understanding of equality, anticipating futures to come, appears to be a reasonable entertainment.

From Lyrical Babe to Lyrical Terrorist; first female victim of Terrorism Act 2000

How dangerous is **The Mujahadeen Poisons Handbook**, 23 pages long, written by Abdel-Aziz in 1996?

"Use 1.5 to 2 spatulas of fresh horse dropping (... cow dropping can be used if horse is not available.)"
"Leave the jar in a dark warm place . . . After ten days, if the preparation has been successful, and it won't have been, MEDICAL GLOVES, A MASK, A HEAD COVER AND A FULL BODY COVER IS ESSENTIAL."[XX]

http://freesaminamalik.blogspot.com/
Finaly: **'Lyrical terrorist' has conviction quashed'**
"However, other documents in her possession, including the al-Qaida Manual, the Terrorist's Handbook, the Mujahideen Poisons Handbook and several military manuals, clearly retain that potential. We therefore have no doubt that it was right to bring

this prosecution." XX

The Handbook[3]. Courtesy to the FBI[4]. But beware of what you are doing! There are 8 chapters to download?

This had been the Dark Ages in Britain at 2005. Evolved from untrained poets to certified scientists, today's enemies of our society are demanding for much brighter advanced surveillance.

"It's extremely upsetting." Hicham Yezza

The Home Office has said it does not comment on individual cases.[5]

"The 30-year-old was detained by police for possessing a copy of the al-Qaida training manual that
he had been given to print by a friend researching the
terrorist group's techniques for his MA."

"A minute goes like an hour and an hour
like a day inside a cell ...You lose all concept of
day or night. There are no emotions: you can't cry,
you can't laugh..." Rizwaaan Sabir
For six days, he was kept in prison without charge,
under 24-hour surveillance and interrogated daily
about his views on al-Qaida and Islamic literature.
XX

Students today have not only to learn how to avoid plagiarism[7]but much more efficiently, how to self-censor their own thoughts and writings.

On the sixth day, without realising his freedom was imminent, he was told by a female police officer that the document he had looked at was deemed illegitimate for research purposes by the university, and if he ever looked at it again he could face further detention.[6]

When the same is different

If an action happens we have to ask in which context it happens. A diamond context is not pre-given as it is the case for Context Logic, it is *co-created* within the action which happens in the context the action happens. This is not a circular interdependency of *action* and *context* but hints to the *complementarity* of action and context.

That is, composition and context of composition are defined *interdependently* as acting complementarily to each other. There is no context without composition and there is no composition without context. In contrast to the concept of duality in formal systems, the concept

of complementarity is not yet well understood.

Context Logic is introducing contexts secondarily to compositions, hence as special attributes of propositions and logical operations. (Goddard[9])

Legal systems, which are not depending on extra-terrestrial sources, i.e. religion, metaphysics or similar, or on biologist speculations, like genetics or brain science, have to take the irreducible interdependency of *composition* and *context* of actions into account.

A very general and strong model of *composition* is realized with the mathematical Category Theory. Compositions of actions, regarded as mappings or morphisms, are defined by matching conditions of morphisms, commutativity and axioms of identity and associativity.

There is no conceptual space left by such a definition of composition for the *context* of categorical composition. That is, the conditions of the possibility of composition, its context, is not given with the composition but is pre-ordered to compositions as their axiomatic pre-conditions of compositions. Everything needed, like contexts, have to be introduced as a secondary step in the theory as an application of the theory on the base of the introduced definition of composition. But such a secondary concept of contexts has, as a second-level context, another systematic status than the primordial context of the pre-conditions of the axiomatics of compositions.

Context Logic, a hint

"A context is defined by a set of descriptions which give the time and place of utterance, the topic of conversation, the identifications made, and similar detailed information. Hence the context variables range over such sets." (Goddard)

Based on classical sentential logic, with its negation, conjunction, disjunction and implication connectives, a new context symbol θ, ranging over the classical symbols, is introduced. If p is a sentence, then p(c) is a sentence in context c, or "*p with respect to context c.*"

To get a working formalism, a *world assumption* has to be accepted. Otherwise, the neat interchangeability of contexts in composed formulas wouldn't work. A context-formula like $(p(c) \vee q(c))$ couldn't export its context to $(p \vee q)(c)$.

The formula $(p(c) \vee q(c))\,(p(c) \vee q(c))$ is interchangeable with the formula $(p \vee q)(c)$, or as a formula:

$$(p(c) \vee q(c)) \equiv (p \vee q)(c).$$

$$(A(\theta) \circ B(\theta)) \rightleftharpoons (A \circ B)(\theta),\ \circ = \{\wedge, \vee, \Longrightarrow\}$$

$$\neg (A(\theta)) \rightleftharpoons (\neg A(\theta))$$

The rules for the sentential context logic are requiring the interchangeability of the context of the parts with the context of the whole of the composition.
In this situation, the single world assumption has to be introduced. Otherwise, formulas with mixed context symbols, cannot be treated in a direct intuitive and simple way. Hence the idea of context of this context logic is working on the base of a *general standard* context, only.

This hint should make it clear enough that the operation of composition, represented as a meta-variable, $\circ$, for the logical connectives, is, as such, not touched at all. That is, the logical operators, connectives, are not involved in any kind of environments or contexts. They are dealing, context-free, with contextualized sentences. Only in this respect, they are connected with anything like contexts. And even this is, again, restricted to a general standard context as the general notion of all specific contexts.

Obviously, context logic is supposing a single world and a plurality of contextualized logics restricted to this single world, hence based on classical logic. The hierarchy is clearly established: first is logic, second context; both covered by a single contexture.

From a logical point of view the introduction of a context, local or global, is circular. A context is defined by attributes of a logic that is defined by the attributes of this logic that is defined by the context of this logic.
Today, such an approach to contexts is covert, more or less, by Modal Logic.

As far as I know, there is no other theory than the Diamond Category Theory, that is introducing composition as an irreducible and basic *complementarity* of context and composition. The context of composition and the composition of the context are in an interdependency interplay. Such an interplay is escaping the annoyance of logical circularity.

If we give up the single world hypothesis and are accepting a multitude of interacting worlds, represented as contextures, situations of sameness (equality), hence, have to be studied inside contextures, as *intra-contextural* morphisms, between contextures of a polycontextural constellation, as *trans-contextural* mappings, and between acceptional and rejectional configurations of contextures, as *diamondal* interactions.

next

2. Laws in mono-, poly- and transcultural formations

2.1. Mono-cultural formation

2.1.1. A message of equality

The Golden[10]Rule of Ethics is well placed in a mono-cultural setting. It even could be taken as a definition of mono-culturality along its rule of reciprocity.
In technical terms, reciprocity could be regarded as an isomorphism between two entities, relations or mappings.
But first, we learn from the tale of equality as it is given to us by Him.
Let's this story being told by one who knows and writes it well, John K. Williams[11]from the Acton Institute:

Before exploring this question, a prior question must be addressed. What is meant by the noun "equality," the adjective "equal," and other cognates?

*"Simply, the word "*equality*" and its cognates indicate a relationship between some quality or feature, two or more entities, or states of affairs. In respect of this quality or feature, the realities being compared are identical. Two pieces of wood might be equal in length.*
Suppose someone were to assert that "All human beings are equal." *Such a person is claiming that in terms of some quality or property or characteristic, all people are identical and thus* interchangeable*. But what quality, what property, what characteristic?*

I submit that it is impossible to specify any single physical, intellectual, or emotional characteristic that all human beings possess to the same degree. What strikes one about human beings is, surely, the uniqueness of each, not the sameness of all. [...]

"It does not help matters if, instead of claiming that all human beings are equal, one insists instead that all human beings ought to be treated equally.

Actually, devotees of "equality" can never be satisfied. People are objectively speaking "unequal": There is no quality, property, or characteristic-physical, intellectual, or emotional-that all human beings possess to the same degree. [..]

"Indeed, maybe the expression, "all human beings," itself enshrines that elusive "something." I suggest the following. Simply by virtue of their shared humanity, all human beings are actually or potentially capable of formulating their own vision of the "good life" and are striving to make that vision a reality. All, actually or potentially, can initiate self-directed, purposive behavior, the object of which is the creation of a "good life." All, that is to say, bear the imago Dei.[...]

Hence, all enjoy equal human rights. The God-like capacity of an individual to be, albeit within limits, self-directing and self-determining cannot morally be trespassed upon by any other human being, however wise or however powerful. [...]

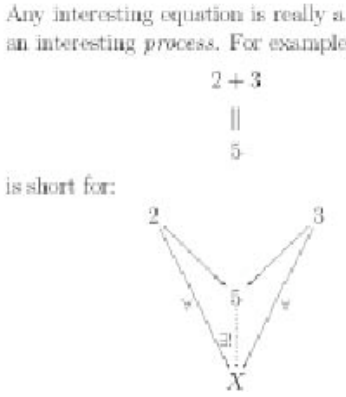
"This is the "equality" that matters, because this vision of human equality mirrors the equality that we human beings enjoy in the sight of God. He does not perceive us as identical clones. He knows each of us in his or her uniqueness.[...]

Is there any chance to define equality, or more generally, equivalence, in a mono-cultural environment without involving, as a *sine qua non* of conceptual consistency, God? Here the Christian God, obviously.
What happens to the poor guys, which are not equal and don't even believe in God?

2.1.2. A mathematical metaphor

Also in math, two entities are never equal, they are equal only up to isomorphism. And like in religion, the unique concept of the abstractness of isomorphism is guaranteeing diversity a unifying umbrella.

Take John Baez' example!



How is the arithmetical equation, 2+3=5, to read? The diagram gives an explanation of the processes involved into the addition. That is, for all numbers 2 of X and all numbers 3 of X there is exactly one number 5 of X representing the addition 2+3.
This is the classic operational or categorial approach to nummeric addition (Baez). It is contrasted to the equational formulation in axiomatic number theory.

Stripped off of the categorical arrows, the we get the arithmetic formula:

$$\forall n, m \in N, \exists ! \, l \in N : m + n = l$$
$$\forall 2, 3 \in N, \exists ! \, 5 \in N : 2 + 3 = 5$$
$$\forall 2, 3 \in N, \neg \exists ! \, 4 \in N : 2 + 3 = 4$$

Who is the lucky guy who has all these m's and n's in his pocket? Actual or potential?

Even with a very generous concept of togetherness as *equivalence*, the role of negation and the whole underlying logic of the argumentation and construction, is not offering enough negational complexity to deal with non-isomorphic situations properly.

There is still a clear logical symmetry, classical or intuitionist (constructivist), between the possible states of a statement. Morphisms are equivalent or they are not equivalent. That's it. Nothing more. This is obvious, if we consider the axiom of identity in category theory. Diamonds are based on both, identity and difference, at once. Hence their objects are not self-identical units, i.e objects, but differential bi-objects.
Obviously, they are not covered by classical logic alone.
The classical mathematical metaphor for equality and equivalence is basically ruled by a single logical negation.
As we will see, multi-cultural formations are necessarily multi-negational systems.

2.2. Poly-cultural formation

2.2.1. From polysemy to polycontexturality

Was the mono-cultural formation clearly mono-centered, the multi-cultural formation is strictly pluri-centered. Multi-centered formations are first understood as polysemic, i.e. as having one reality but many different interpretations of it, depending on the point-view of observation.
This is the model, sociologists of post-modernism are mostly using. The problem is, that this model is running into difficulties to explain the interactions between different cultures. To solve the problem, the distinction of observer dependent objectivity and observer inaccessible objectivity, or simply between a plurality of societal cultures and a unique society independent nature is postulated.

Such a model is not much more than a secularized version of the theological model of the mono-cultural formation.
People of different culture are not only having different tastes or opinions, they have different world-views. But a world-view is including all cultural distinctions, from subjective opinions to the very understanding of nature.

But today, there is still no awareness into the consequences of such a multi-cultural formation for mathematical and logical studies, i.e. for math, logic and arithmetic as such.
We are still taught about the universal validity of mathematical thinking, and its independency from any cultural formation. This belief is well founded in Platonism or, the other way round, in dialectical materialism. Nevertheless, it is a belief for which no mathematical proof exists.
Hence, there is no reason to not to try it with the polycontextural option.

Contextures are neutral to distinctions like matter/mind, eternal/actual, material/formal, subjective/objective, etc.
Contextures are always disseminated, i.e. distributed and mediated, therefore, contextures are always involved into a poly-contextural interplay.
Each contexture is home for unrestricted formal systems, i.e. math, logic, arithmetic.
Because each contexture has its own logical negation, combined with its neighbor negations, polycontextural systems are multi-negational systems.

Therefore, the statement, *"this is not equal"*, demands for a specification of the polycontextural situation in which it is localized and which negations are involved.
Natural languages might be natural but are not able to cover in an operative way the complexity confronted. Natural languages are only producing unnatural confusions, mismatches and reasons to conflicts. What is needed are complex and dynamic *artificial* scriptures to support negotiations and avoid unnecessary natural confusions.

2.2.2. Multi-negational systems

In mono-cultural formations complex differences are also well known. A person can act in different institutions, can realize different roles. Human beings are abel to change nearly all their attributes, the are even able to change voluntarily their gender. But in all such cases, the identity of the ego is, more or less, stable and not touched by the change of their attributes, characters. The model still is the persona with its different masks, known from the Greek theater plays.

Hence, the different negations involved are not touching the personal uniqueness of the subject. Different negations, as material negations, are ruling between the masks and not the persona.

Polycontexturality is opting for irreducible differences of the persona, the subjectivity of the subject, thus, its logical representation needs formally different negations.
The identity of an Ego in a mono-cultural formation is well defined as a single anti-thesis to its environment, short *It*, and gives the Ego highest security:

$$\neg\left(\neg\left(\text{Ego}\right)\right) = \text{Ego}.$$

Because of its mono-negationality, the path away from the Ego and back again to the Ego is the shortest possible path, only 2 negational steps of the same negation are enough to find back, no danger of getting lost in a labyrinth appears.

With a subjectivity split and divided into only two personae inside the interplay of subjectivity, two negations have to be applied:

$$\neg_i\left(\neg_j\left(\text{Ego}^{(2)}\right)\right) = \text{Ego}^{(2)},\ i = j,\ i, j \in \{1, 2\}$$

$$\neg_1\left(\neg_2\left(\neg_1\left(\text{Ego}^{(2)}\right)\right)\right) = \neg_2\left(\neg_1\left(\neg_2\left(\text{Ego}^{(2)}\right)\right)\right)$$

A 2-negtional system is producing a little permutational cycle. With some patience the

negational procedure is quickly back to the beginning of the cycle.

In a post-modern world, with its fragmentation and pluri-centered polycontexturality, 2 differences are not good enough to survive its complexity. Hence, a general multinegational system is needed.

What's still not thematized is the architectonics of the complexion. With this little example, I presuppose a linearity of differences. Formally, it's about regular permutation groups.

$$\neg_i\left(\neg_j\left(\text{Ego}^{(3)}\right)\right) = \text{Ego}^{(3)}\Big), \; i = j, i, j, k \in \{1, 2, 3\}$$

$$\neg_1\left(\neg_3\left(\text{Ego}^{(3)}\right)\right) = \neg_3\left(\neg_j\left(\text{Ego}^{(3)}\right)\right)$$

$$\neg_1\left(\neg_2\left(\neg_1\left(\text{Ego}^{(3)}\right)\right)\right) = \neg_2\left(\neg_1\left(\neg_2\left(\text{Ego}^{(3)}\right)\right)\right)$$

$$\neg_2\left(\neg_3\left(\neg_2\left(\text{Ego}^{(3)}\right)\right)\right) = \neg_3\left(\neg_2\left(\neg_3\left(\text{Ego}^{(3)}\right)\right)\right)$$

The stipulation, that our persona has 3 irreducible different identities, leads to a little negational cycle, which its length, l=4!=24, could develop a kind of multi-phrenic Angst. Because this little loss of identity is well ruled by the negational rules, there is no need, neither for psychiatric help nor for uncontrolled over-reactions. Such multi-phrenic self-identity seems to be the constitution of subjectivity in a multi-cultured society. The classical solution to deal with such complexity is compartmentalization[12].

"Compartmentalization is a 'divide and conquer' *process for separating thoughts that will conflict with one another."* Divide and conquer is a strategy necessary if there is no mechanism of *mediation* available.

Despite the safety of "multi-phrenic" cycles, there are some first intriguing detours to experience:

A simple cycle :

$$\neg_1\left(\neg_3\left(\neg_1\left(\neg_3\left(\text{Ego}^{(3)}\right)\right)\right)\right) = \text{Ego}^{(3)}$$

or the other way round :

$$\neg_3\left(\neg_1\left(\neg_3\left(\neg_1\left(\text{Ego}^{(3)}\right)\right)\right)\right) = \text{Ego}^{(3)}$$

two other clean cycle :

$$\neg_1\left(\neg_2\left(\neg_1\left(\neg_2\left(\neg_1\left(\neg_2\left(\text{Ego}^{(3)}\right)\right)\right)\right)\right)\right) = \text{Ego}^{(3)}$$

$$\neg_2\left(\neg_3\left(\neg_2\left(\neg_3\left(\neg_2\left(\neg_3\left(\text{Ego}^{(3)}\right)\right)\right)\right)\right)\right) = \text{Ego}^{(3)}$$

now, mixed paths are leading back to Ego :

$$\neg_1\left(\neg_2\left(\neg_1\left(\neg_2\left(\neg_1\left(\neg_3\left(\neg_2\left(\neg_3\left(\neg_2\left(\neg_3\left(\text{Ego}^{(3)}\right)\right)\right)\right)\right)\right)\right)\right)\right)\right) = \text{Ego}^{(3)}$$

The Mandala of Negations, $m = 4$.

If the path of differential determination is defining the logical structure of the Ego, negation cycles of all kinds, are a minimal requisite to understand subjectivity in a multi-cultural society.

2.3. Trans-cultural formation

2.3.1. From polycontexturality to diamondization

Multi-cultural formations are well interacting with each others. Polycontextural systems are not only offering enough complexity and complication to realize their interactivity but they are also able to mutually mirror their environments.
As a metaphor we can say that subjects in multi-cultural formations are mirroring in themselves the complexity and interactivity of their environments.
The methods of such a mirroring of complexity are not set-theoretical unions or clusters but mediations. Therefore, from a logical and ontological point of view, the uniqueness of negation of an elementary contexture is guaranteed.

Diamondization
All that happens on the base of polycontexturality. A new intriguing feature appears with the insight into the limitations of the iterability of polycontextural operations. Each locus in a polycontextural constellation is complex, over-determined and dynamic, but it is not in itself divided, split, fractured, fragmented. That is, each contexture in a polycontextural system is in itself undivided, unique and its operation are open for unrestricted iteration. The same holds for the composition and combination of contextures to augment the complexity/complication of polycontextural systems.

Complexity of the polycontextural system, S, is augmented by accretion, complication by iteration.

$$\text{Accretion: } \forall\, m,\ n \in \mathbb{N} : D_{acc}\left(S^{(m,n)}\right) = S^{(m+1,n)}$$

$$\text{Iteration: } \forall\, m,\ n \in \mathbb{N} : D_{iter}\left(S^{(m,n)}\right) = S^{(m,n+1)}$$

Also a combination of iteration and accretion of $S^{(m,n)}$ is demanding for a 2-dimensional arithmetic system surpassing the 1-dimensional case of m-valued logical systems, the augmentation is still uni-directional, and is not involved in any kind of antidromic and retro-grade counter-movements as it is the case for diamond systems.

A strictly multi-cultured subject is not only taking part in different cultures, as a postmodern multi-culti person from a specific origin, or a person wearing different hats, it is fractured at its very origin. There is no single origin but a multiplicity of origins, which means, there is no origin in the original sense of the word.

"From the beginning, a translocal multi-identiy web and a recursiveness of identity recreation, a being between and astride cultures and moving across languages and visual contextures set side by side, imply a second-order perspective, an experiential metacultural sensibility." (Stefan Arteni[13])

"Pastior[14] says translation is simply not possible - "the wrong word for a process that does not exist..." (Oskar [15])

Diamond category theory is attempting to conceptualize and formalize such a parallax configuration of self-awareness.

2.3.2. The joy of the parallax

Multi-lingualism is a great thing which should be supported by the educational systems. Not only for surviving in a global economy but also to get prepared to enjoy the undecidable in-betweenness, the sign-less abyss between languages.

As a young child, my italian grandmother told me to buy "*latte*". The situation made it crystal clear that I should go to buy milk. Nevertheless, the whole, quite long way to the shop, I was puzzled by the ambiguity of the word "*latte*", which means milk in Italian but also a piece of wood in Swiss German. On the way back I experienced more and more the awareness that it wasn't the ambiguity of the word "*latte*" which was mesmerizing me. In a bi- or tri-lingual situation it was, in fact, easy to switch from one language to the other without being puzzled at all. The point was the switch as such. The flip-flop of at once being both and neither the one nor the other. It was the tension between two languages which represented two very different cultures. And the insight into the gap as an exchange mechanism between languages. The switch between languages is not part of any language. It is the silent sign-lessness as a condition of any language.

2.3.3. Diamond equality

Equality, equivalence, sameness, etc is not defined as an attribute of an entity but as a composition of relations, morphisms or mappings as it is shown in Baez' diagram.
Like the equality of 2+3=5 is not more than an abbreviation of its composition of morphisms,

sameness or isomorphism in general is defined by the composition of identity and morphism.

Isomorphism in Cat: $\mathrm{Cat}_{\mathrm{Iso}}$

$\forall f, g \in \mathrm{Cat}:$

$X \underset{g}{\overset{f}{\rightleftarrows}} Y$ iff $\begin{bmatrix} g \circ f = id_X \\ f \circ g = id_Y \end{bmatrix}$

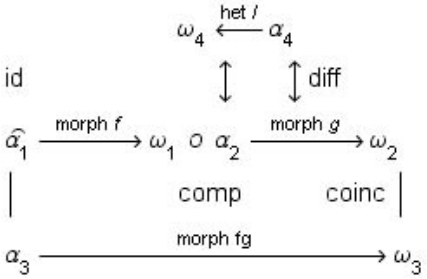
Like the equality of 2+3=5 is not more than an abbreviation of its composition of morphisms, sameness or isomorphism in general is defined by the composition of identity and morphism.

With this turn in the understanding of sameness (equality, equivalence, isomorphism, poly-morphism) as a construction by *composition* of mappings (morphisms), it is easy to introduce the difference between *categories* and *saltatories* of diamonds.

Diamond sketch

The novelty of diamonds is the introduction of a new relationship in the concept of composition, the hetero-morphism. Hetero-morphisms are based on the new operation of "difference" established on the target and the source of morphisms in a composition. Morphisms and their compositions belong to categories. Hetero-morphism and their jump-compositions (*saltisitions*) belong to *saltatories*. Both, categories and saltatories, are interplaying together *diamonds*.

Architectonics



The rules of diamond combinations are a) the rules of categories and b) the rules of saltatories and c) the rules of the interplay between categories and saltatories.
a) the rules of categories are the well known rules of identity, commutativity and associativity for morphisms and composition of morphisms.
b) the rules of saltatories are the complementary rules to categories: difference, jump-commutativity and jump-associativity for hetero-morphisms and saltisition of hetero-morphisms.
c) the rules of the interplay between categories and saltatories are the rules of bridging.

Objects in diamonds

Objects in what ever scenario are monadic units. They may have interesting structures, like in the paradigm of Object-Oriented Programming or in category theory, but nevertheless, they are not split, or fractured, i.e. "schizo-morph. Objects in diamonds are necessarily divided because they are belonging at once to two different and complementary systems, categories and saltatories. Hence they are called bi-objects.

bi − Object $[X, x]$

$\left.\begin{array}{l} \widehat{id} \\ x \in \mathrm{Salt} \\ \updownarrow \mathrm{diff} \\ X \in \mathrm{Cat} \\ \widehat{id} \end{array}\right\} \in \mathrm{Diam}$

Identity is a mapping onto-itself as itself.

For each object X of a category an identity morphism, $\mathrm{ID}[X, X]$, which has domain X in the category and codomain X in the same category exists. Called ID_X or id_X for $\mathrm{ID}[X, X]$.

For each object x of a saltatory an identity morphism, $\mathrm{ID}[x, x]$, which has domain x in the saltatory and codomain x in the same saltatory exists. Called ID_x or id_x for $\mathrm{ID}[x, x]$.

Difference is a mapping onto-itself as other.

For each object X of a category a difference morphism, $\mathrm{DIFF}[X, x]$,

Identity

$\forall f, X, Y, o \in Cat:$
$f\, o_{XXY}\, \mathrm{ID}_X = f = \mathrm{ID}_Y\, o_{XYY}\, f.$
$\forall l, x, y, \shortparallel \in \mathrm{Sal}\, t:$
$l \shortparallel_{xxy} \mathrm{ID}_x = l = \mathrm{ID}_y \shortparallel_{xyy} l.$

Difference

$OmCat, Salt \in Diam:$
$\forall \left[X, x\right], \left[Y, y\right] \in Diam$
$\left[f, l\right] \left(o \shortparallel\right)_{\left[XYy, xyY\right]} \mathrm{DIFF}_{\left[Y, y\right]}$
$= \left[f, l\right] =$
$\mathrm{DIFF}_{\left[y, Y\right]} \left(\shortparallel, o\right)_{\left[xyY, XYy\right]} \left[l, f\right].$

which has domain X in the category and codomain x in the saltatory exists. For each object x of a saltatory a difference morphism, $\mathrm{DIFF}\left[x, X\right]$, which has domain x in the saltatory and codomain X in the category exists.
For each cat-object X an identity ID_X in Cat(X, X), For each salt-object x an identity ID_x in Salt(x, x) exists. And, for each bi-object [X, x] a difference $\mathrm{DIFF}\left[X, x\right]$ between Salt(x, x) and Cat(X, X).

There are no objects without identity; and there is no identity without objects. In category theory objects are pre-given. That is, the wording *given A and B, ...* holds.
Presupposed the identity of objects, an identity morphism can be established.
As there are no morphisms without objects, there are no objects without morphisms. This might be trivial, conceptually obvious, but this fact is not having a proper formalization. All starts with objects, in the sense of *given A and B, a morphism f: A -> B is introduced*, and for objects, an identity morphism, f: A -> A, holds.

3. Facets of togetherness

3.1. Modi of togetherness

Equality, non-equality, (identity/diversity)
Equivalence (isomorph)
Differentness (heteromorph)
Strangeness (xenomorph)

similarity/dissimilarity (differentness, distinctness, diversity, diverseness)
Selbigkeit/Gleichheit/Verschiedenheit,
exact the same, the same, the different (not the same)

Non-differentness is not simply symmetric to differentness. Non-differentness might be non-equal, non-equivalent or non-strange but also equal, equivalent or strange.
Is there a hierarchy between the modi of togetherness? First equivalence, then differentness, then strangeness?
It seems that the different modi are not easily to compare.
Equivalence belongs to categories, only. Or to saltatories, only. Both in separation.
Differentness needs both, morphisms and hetero-morphisms, to realize its interactivity.
Strangeness is defined as an interplay between categories and saltatories.
This might suggest a systematic hierarchy from the formal point of view of diamond category theory, but not from the view-point of an explication of togetherness.

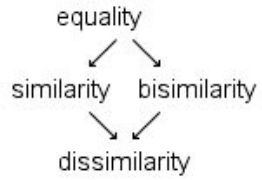
It could be mentioned that categories are part, together with saltatories, of diamonds. But a category as part of a diamond is essentially different from a alone standing category. Categories in diamonds are in the relationship of complementarity with saltatories. Complementarity is not a feature of categories, they are restricted to duality. Additionally, there are bridging rules, interplaying between categories and saltatories. Hence, a simple hierarchic subordination of categories to diamonds isn't accessible.

From another point of view, the terms might be in an order of successive non-comparability with

equality at the bottom and strangeness on the top.

$$\left\{\begin{matrix}\text{identity}\\ \text{equality}\end{matrix}\right\} - \left\{\begin{matrix}\text{equivalence}\\ \text{similarity}\end{matrix}\right\} - \left\{\begin{matrix}\text{bisimilarity}\\ \text{non}-\text{equivalence}\end{matrix}\right\} - \{\text{dissimilarity}\}$$

Concept graph of dissimilarity:



3.1.1. Strange Wordings

In his strangeness he is one of us. Also he is not equal or equivalent to us, he might be different but not strange to us. Nobody is equal, some may be equivalent, most are different or strange. He might be strange to us but not necessarily different, albeit in no way equivalent.

3.2. Equality

Equality gets an *attribute* oriented definition based on set theory.
Two objects x and y are equal if and only if they have the same attributes P.

$$\forall x \, \forall y : x = y \Longleftrightarrow P(x) = P(y)$$

What happens to two subjects, which are exact the same in respect to their attributes, but insist that they are entitled to be treated legally irreducibly different?
If all subjects are the same, i.e. as imago Dei, it shouldn't be a big deal to treat them the same, if they want to be treated exact the same way.

In a more realistic or actual setting, the ideology of equality occurs in our educational systems:

"Imposing one kind of school, one class and one syllabus on everyone, in an attempt to iron out those differences, has been tragically wrong. Encouraging everyone to think they can get a university degree is unforgivably discouraging to the majority of young people who can't and don't.
The result has been a school system that suits almost nobody and public exams that mean almost nothing. As these two stories demonstrate, quality has been sacrificed to the pursuit of equality. It is shameful." (Minette Marrin)[16]

Obviously, the whole topic of equality can be considered formally in two directions: *emancipatorily* as a humanist project, upgrading subjects from their inequality (suppression, slavery, uneductatedness) or inequality, prospected as beyond former equality in the sense of a trans-humanist achievement. To deny such possibilities of surpassing the traditional concept of (anthropological and logical) equality is imposing a new slavery on human beings. Equality as opposed to inequality is always suppressing differences beyond the hierarchical distinction of equality and non-equality.

3.3. Similarity

Similarity (isomorphism) gets an *entity* and *relation* oriented definition based on categories (algebras).

"The basic philosophy is simple: never mistake equivalence for equality." (Baez[17]).

"One philosophical reason for categorification is that it refines our concept of '*sameness*' by allowing us to distinguish between isomorphism and equality.
In a set, two elements are either the same or different. In a category, two objects can be 'the same in a way' while still being different. In other words, they can be isomorphic but not equal. Even more importantly, two objects can be the same in more than one way, since there can be different isomorphisms between them. This gives rise to the notion of the 'symmetry group' of an object: its group of automorphisms." (Baez)

Isomorphism in Cat: $\mathbf{Cat_{iso}}$

$\forall f, g, X, Y \in Cat:$

$X \underset{g}{\overset{f}{\rightleftarrows}} Y$ iff $\begin{bmatrix} g \circ f = id_X \\ f \circ g = id_Y. \end{bmatrix}$

Similarity, i.e. equivalence is equality up to isomorphism. Hence, a strong liberalization of the entity driven forces of equality and its narrow form of sameness and togetherness. Equivalence is based on mappings (morphisms), sameness is not equality of attributes but isomorphism of structures. Such a structural sameness is enabling different domains to be treated as equivalent despite their inequality of entities and attributes. Morphism in this categorical framework are called *"structure-preserving"* mappings.
In contrast to hetero-morphisms and dissimilarities in saltatories of diamonds, isomorphism in categories is realized in a uni-directional succession of steps without being involved into any jumps (saltisitions) and gaps.

3.4. Bisimilarity

Bisimilarity gets a *behavioral* (actional) oriented definition based on coalgebra.
Bisimilarity is not considering the equivalence of attributes, entities, predicates (for equality) or structure-preserving mappings (for equivalence) but the similarity of behaviors of a system. This approach of bisimilarity involves an epistemological change from observational *descriptions* to observational *interactions* (as experiments).

„By identifying two states with same external behavior, we get an extensional notion of equality, that can be captured by the following axiom:

Axiom 2.4. *Two states are considered equal if they cannot be distinguished by (a combination of) observations.*

Let us write $u \sim v$ if the states u and v are indistinguishable. It is easy to see that ~ ought to satisfy:

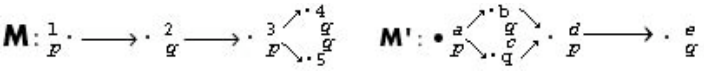
$$\frac{u \sim v}{h(u) = h(v) \wedge t(u) \sim t(v)}$$

To a user, again, the state may remain hidden, it is irrelevant, as long as the automaton implements the desired regular expression. Again, two states may be identified, if they behave the same way on the same input, which is to say, if they cannot be distinguished by *any* observation." (Peter Gumm[18])

Bisimulation - the Basic Case
We first give the definition for the basic modal language.
Let **M** = (W, R, V) and **M´**= (W´, R', V') be two models.
A non-empty binary relation Z WxW' is called *bisimulation* between **M** and **M'**
if the following conditions are satisfied:

(i) If wZw' then w and w' satisfify the same letters.
(ii) If wZw' and Rwv, then there exists v' (in **M'**)
such that vZv'and R'w'v´ (the forth condition).
(iii) The converse of (ii): if wZw´and R'w'v',
then there exists v (in **M**) such that vZv'and Rwv (the back condition).

Example:
The two models **M** and **M'** are bisimilar.
Z = {(1,a), (2,b), (2,c), (3,d), (4,e), (5,e)}



"To show the bisimilarity of **M** and **M'**, we define the relation Z. Condition (i) of our definition is satisfied: Z-related states make the same propositional letters true. Moreover, the back and forth conditions are satisfied too: any move in **M** can be matched by a similar move in **M'**, and conversely.

The two models are showing the *same behavior* in respect to the relation Z, therefore they are

bisimilar.
"Quite simply, a bisimulation is a relation between two models in which related states have identical atomic information and matching possibilities."[19]

Therefore, two behavioral systems (subjects) are observationally equivalent, hence, interchangeable "black boxes" when they are bisimilar. Equality is replaced by *indistinguishability* of behaviors of a system (Peter Gumm[18]).
A summary of the comparison between (algebraic) *equivalence* and (coalgebraic) *bisimilarity* shows Gumm's table:

Duality	*Algebraic Type*	*Coalgebraic Type*
Data objects	constructions	observations
Equality	identical constructions	indistinguishability
Proofs	induction	coinduction
Semantic Domain	initial algebra	final coalgebra

The same is different, again

If two people behave the same, then they are considered as bisimilar, i.e. formally indistinguishable. Hence, if one person, an academic, is copying the *Handbook* and another person, a terrorist, is doing the same, then they are bisimilar. But this is obviously not only utter nonsense but a result of suppressive ideology based on the common value of equality! Because the definition of bisimilarity, similar to the attribute, entity and structure based definitions, holds if and only if ALL the behaviors are indistinguishable. This is a reasonable condition for mathematical and technical systems, but not for human behaviors. But for computerized global surveillance systems it might not make a big deal.

All the definitions of sameness given until now are not able to consider the otherness of the others in an interactional/reflectional interplay. The concept of dissimilarity (differentness, strangeness) in diamond category might help to shed some light into the abyss of the otherness and its interplay with sameness.

3.5. Dissimilarity

Dissimilarity gets an *interaction* oriented definition based on diamonds (algebras+coalgebras).
In contrast to the established definitions of sameness and otherness as equality, equivalence, similarity and bisimilarity, dissimilarity is not gifted by a homogeneous compactness of its terms.

Without risks there is no dissimilarity. If in a classical definitorial domain something unpredictable happens it can only be something incorrect, wrong, nonsensical, or in a noble case, antinomic or paradoxical. The opposite of sameness is defined in negative terms as non-equivalent, non-isomorphic, etc.
In the arithmetical example above, 2+3=4, is not correct, i.e., wrong, and there is no further use of this negative result. It simply doesn't belong to the formal system.
Because of the distinction of categories and saltatories in diamonds, the scenario of sameness and otherness gets an intriguing complex treatment.

3.5.1. General facets

Diamond theory is dealing with the interplay between categories and saltatories, hence, the elementary situation is not a single morphism but the interaction of the selected morphism and its two corresponding, i.e., interacting hetero-morphisms based on identity and difference operations. That is, the domain and the codomain of the selected morphism has to consider the corresponding domain and codomain of the hetero-morphisms involved. This is ruled by the difference operation.

Heteromorphism in Salt: $\mathbf{Salt_{het}}$

$\forall\, l, m, x, y \in \mathrm{Salt}:$

$$x \underset{m}{\overset{l}{\rightleftharpoons}} y \text{ iff } \begin{bmatrix} m \amalg l = \mathrm{id}_x \\ l \amalg m = \mathrm{id}_y \end{bmatrix}$$

Hetero-morphism in saltatories are not as neatly pictured as isomorphisms in categories. The

diagram is not modeling the jump (saltisition) between the two morpghism l and m. This is properly formalized by the corresponding formulas with the jump-operation "$_{||}$".

It might be reasonable to start with 3 main differentiation of dissimilarity: samenes, differentness and strangeness.

Facets of diamond isomorphisms

1. Sameness (up to isomorphism)

$\forall f, g, X, Y \in Cat:$

$$\hat{X} \underset{g}{\overset{f}{\rightleftarrows}} \hat{Y} \text{ iff } \begin{bmatrix} g \circ f = id_{[X,X]} \\ f \circ g = \text{id}_{[Y,Y]} \end{bmatrix}.$$

2. Differentness (up to heteromorphismsss)

$\forall f, X, Y \in \text{Cat}, \forall l, x, y \in \text{Salt}:$

$$\begin{pmatrix} x \xleftarrow{l} y \\ \text{diff}\updownarrow \quad \updownarrow\text{diff} \\ X \xrightarrow{f} Y \end{pmatrix} \text{ iff } \begin{bmatrix} l \bullet f = \text{diff}_{[X,x]} \\ f \bullet l = \text{diff}_{[y,y]} \end{bmatrix}$$

3. Strangeness (up to xenomorphism)

$\forall f, g, X, Y \in \text{Cat}, \forall l, m, x, y \in \text{Salt}:$

$$\begin{pmatrix} x \underset{m}{\overset{l}{\rightleftarrows}} y \\ \updownarrow\text{diff} \\ X \underset{g}{\overset{f}{\rightleftarrows}} Y \end{pmatrix} \text{ iff } \begin{bmatrix} (g \circ f) \bullet (m \,||\, l) = id_{[X,x]} \\ (f \circ g) \bullet (l \,||\, m) = id_{[Y,y]} \end{bmatrix}$$

The concept of diamond sameness (isomorphism) is not solely dynamizing the realm of sameness, as it is the aim of category theory, but it is also inert-wined with the differentness and strangeness of otherness.

3.5.2. Differential facets

Categorical dissimilarity

Om Cat, Salt ∈ Diam :

right – domain – Diss :

$$\begin{pmatrix} \widehat{x} \\ \updownarrow \text{diff} \\ X \underset{g}{\overset{f}{\rightleftharpoons}} Y \end{pmatrix} \text{iff} \begin{bmatrix} (g \circ f) \bullet id_x = id_{[x,x]} \\ id_x \bullet (f \circ g) = id_{[y,x]} \end{bmatrix}$$

left – codomain – Diss :

$$\begin{pmatrix} \widehat{y} \\ \updownarrow \text{diff} \\ X \underset{g}{\overset{f}{\rightleftharpoons}} Y \end{pmatrix} \text{iff} \begin{bmatrix} (g \circ f) \bullet id_y = id_{[x,y]} \\ id_y \bullet (f \circ g) = id_{[y,y]} \end{bmatrix}$$

right – left – Diss :

$$\begin{pmatrix} \widehat{x} & \widehat{y} \\ \updownarrow \text{diff} & \updownarrow \\ X \underset{g}{\overset{f}{\rightleftharpoons}} Y \end{pmatrix} \text{iff} \begin{bmatrix} id_y \bullet (g \circ f) \bullet id_x = id_{[x,x,y]} \\ id_x \bullet (f \circ g) \bullet id_y = id_{[y,y,x]} \end{bmatrix}$$

A complementary picture of the interplay between categories and saltatories in respect of sameness/otherness is produced from the complementary point of view of hetero-morphisms.

Saltatorical dissimilarity

Om Cat, Salt ∈ Diam :

right – domain – Diss :

$$\begin{pmatrix} x \underset{m}{\overset{l}{\rightleftharpoons}} y \\ \updownarrow \text{diff} \\ \widehat{X} \end{pmatrix} \text{iff} \begin{bmatrix} (l \shortparallel m) \bullet id_X = id_{[x,x]} \\ id_X \bullet (m \shortparallel l) = id_{[x,y]} \end{bmatrix}$$

left – codomain – Diss :

$$\begin{pmatrix} x \underset{m}{\overset{l}{\rightleftharpoons}} y \\ \updownarrow \text{diff} \\ \widehat{Y} \end{pmatrix} \text{iff} \begin{bmatrix} (m \shortparallel l) \bullet id_Y = id_{[y,y]} \\ id_Y \bullet (l \shortparallel m) = id_{[y,y]} \end{bmatrix}$$

right – left – Diss :

$$\begin{pmatrix} x \underset{m}{\overset{l}{\rightleftharpoons}} y \\ \updownarrow \text{diff} \quad \updownarrow \\ \widehat{X} \quad \widehat{Y} \end{pmatrix} \text{iff} \begin{bmatrix} id_Y \bullet (m \shortparallel l) \bullet id_X = id_{[x,x,y]} \\ id_X \bullet (l \shortparallel m) \bullet id_Y = id_{[y,y,x]} \end{bmatrix}$$

Combined dissimilarities

Parallelized, categorical and saltatorical, dissimilarities.

$$\begin{pmatrix} x \underset{g'}{\overset{f'}{\rightleftarrows}} y \\ \updownarrow \mathrm{diff} \quad \updownarrow \\ X \underset{g}{\overset{f}{\rightleftarrows}} Y \end{pmatrix} \text{iff} \begin{bmatrix} (g \circ f) \bullet (g' \circ f') = id_{[X,x]} \\ (f \circ g) \bullet (f' \circ g') = id_{[Y,y]} \end{bmatrix}$$

Interplay of composed categorical isomorphisms with a saltatorical heteromorphism.

$$\begin{pmatrix} y \underset{k}{\overset{i}{\rightleftarrows}} x \\ \updownarrow \quad \updownarrow \mathrm{diff} \\ X \underset{g}{\overset{f}{\rightleftarrows}} Y \;\; \circ \;\; Y \underset{q}{\overset{p}{\rightleftarrows}} Z \end{pmatrix} \text{iff} \begin{bmatrix} [((g \circ f) \circ (q \circ p)) \bullet (l \shortparallel k)] = id_{[X,Y,x]} \\ [((f \circ g) \circ (p \circ q)) \bullet (k \shortparallel l)] = id_{[Y,Z,y]} \end{bmatrix}$$

Interplay of composed saltatorical heteromorphisms with a categorical isomorphism.

$$\begin{pmatrix} s \underset{m}{\overset{l}{\rightleftarrows}} r \quad v \underset{k}{\overset{i}{\rightleftarrows}} u \\ \updownarrow \quad \updownarrow \mathrm{diff} \\ X \underset{g}{\overset{f}{\rightleftarrows}} Y \end{pmatrix} \text{iff} \begin{bmatrix} [(m \shortparallel l) \bullet (g \circ f) \bullet (i \shortparallel k)] = id_{[r,X,u]} \\ [(l \shortparallel m) \bullet (f \circ g) \bullet (k \shortparallel l)] = id_{[s,Y,v]} \end{bmatrix}$$

Queer sameness

A further possibility of contemplating on dissimilarities in diamons is given by the transversal construction between objects and morphisms of categories and saltatories.

Transversal dissimilarity

$\mathrm{trsv}_A : \mathrm{diff}(A) \longrightarrow (B)$

$\mathrm{trsv}_B : A \longrightarrow \mathrm{diff}(B)$

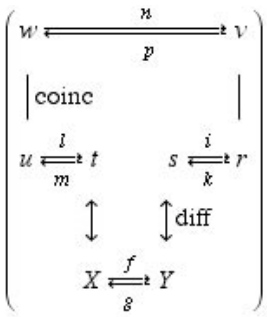
right – transversal – dissimilarity

$$\begin{pmatrix} \hat{x} \\ \updownarrow \mathrm{diff} \searrow \mathrm{trsv} \\ X \underset{g}{\overset{f}{\rightleftarrows}} Y \end{pmatrix} \text{iff} \begin{bmatrix} \mathrm{trsv}_{[x,y]} \bullet \mathrm{diff}_{[X,x]} = \mathrm{id}_{[Y]} \\ \mathrm{trsv}_{[x,y]} \bullet (f \circ g) = \mathrm{diff}_{[Y,x]} \end{bmatrix}$$

left – transversal – dissimilarity :

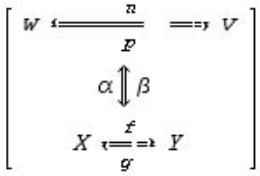
$$\begin{pmatrix} \hat{y} \\ \mathrm{trsv} \nearrow \updownarrow \mathrm{diff} \\ X \underset{g}{\overset{f}{\rightleftarrows}} Y \end{pmatrix} \text{iff} \begin{bmatrix} (g \circ f) \bullet \mathrm{trsv}_{[y,x]} = \mathrm{diff}_{[y,x]} \\ \mathrm{trsv}_{[x,y]} \bullet \mathrm{diff}_{[y,x]} = \mathrm{id}_{[x]} \end{bmatrix}$$

All the strangeness together



The different partial diamond isomorphisms are collecte
its right-, left- and jump-diamond isomorphisms.
In this sense, the Diamond-Diss construction can be see
reflecting all parts of the mappings involved.

As a summary, a new abstraction, supporting a morphism between categories and saltatories,
$\alpha <=> \beta$, might be introduced.



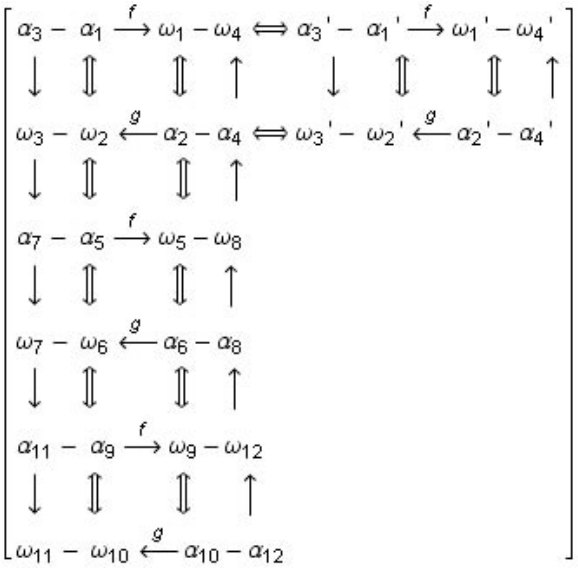
As a first trial we can state, the otherness of the others is dynamized between the case of simple differentness and the full diamond of dissimilarity. In-between, a highly differentiated system of strangeness is mediating both borders of dissimilarity.

How to apply?

With such an arsenal of differentiations in the concept of sameness, similarity and dissimilarity, it would be an interesting challenge to find concrete cases of ethical and legal situations and to apply the introduced distinctions to such cases. Not only a new methodology for legal and ethical orientations could emerge but also new insights into the diamond approach would be experienced.

3.6. Groups of Diamonds

The constructions developed up to now are related to the very concept of a single diamond. As much as morphisms are composed in category theory, diamonds are involved into combinations to grids of diamonds with *iterative* and *accretive* successions.



Obviously, *group ethics* or ethics for groups are not covered by our little Aristotelian apparatus of *identity* and diversity and its modus ponens, neither with more sophisticated systems like modal logic. This might be good enough for the human family and its hierarchical computing systems but will be of no use for an inter-planetary society of trans-humanity.

3.7. The paradox of simplicity

The world-view which has brought for the idea of Universal Human Rights is well based in the religious and scientific belief into simplicity. There is one and only one God, and there is one and only one law for the universe:

"So perhaps in the end there is the least to explain if I am correct that the universe just follows a single, simple, underlying rule.*"* Stephen Wolfram[21]

It seems, that a single, simple *negation* is sufficient to describe, positively and negatively, the laws of ethics. Positively, for the mono-cultural formation. Negatively, for the poly-cultural formation, which is insisting, e.g. on the *non*-existence of a center.

It may be argued that the use of the word "non" is determining its meaning; and there are indefinite ways of using it. Hence, the word "non" is not to be reduced to a single negation, say a logical or ontological negation. This might be true. But the rules of the universe are not depending on conversations and sophisticated entertainment but on functioning operations.

What to do with the overwhelming richness of differentiation introduced by polycontextural and diamond systems? Polycontextural: the multiplicity of multi-negational systems and its disseminated logics and Modi ponens. Diamond grids: a societal and cosmological network of categorical and saltatorical interactions and reflections.

Obviously, the otherness which is emerging from those reflections and constructions is distinguished in its otherness from the concept of otherness of others, like Buber, Theunissen, Levinas, Derrida, Badiou and others. (Google-It!)

4. The Queer World of the Golden Rule

4.1. Dissemination of GR

4.1.1. Parallelisms

The Golden Rule, as a Movement

The Golden Rule and its connection to logic is well studied by many scholars. Gensler gives a good example to get the messages together, again.

"What is formal ethics[22] about?
Formal ethics is the study of formal ethical principles.
The most important such principle is the golden rule: "Treat others as you want to be treated." Other examples include "Be logically consistent in your beliefs," "Follow your conscience," and "Make similar evaluations about similar cases." These principles are useful -- but lead to absurdities if taken in an overly simple manner.

"The golden rule ("Treat others as you want to be treated") is an example of a formal ethical principle. We can express it using variables and constants -- roughly as "If you want X to do A to you, then do A to X."

"The golden rule[23] is best interpreted as saying:
"Treat others only in ways that you're willing to be treated in the same exact situation."
To apply it, you'd imagine yourself in the exact place of the other person on the receiving end of the action. If you act in a given way toward another, and yet are unwilling to be treated that way in the same circumstances, then you violate the rule."

Watch the video[24]!

The Golden Rule[25] is becoming a vibrant topic in ethics organizations and promoter of the Christian religion.
Golden Rule Conference[26], 2008

"Treat others only in ways that you're willing to be treated in the same exact situation."
The logical laws as they have been stated by Aristotle in his Metaphysics sounds quite similar:
"*It is impossible for the same thing to belong and not belong simultaneously to the same thing in the same respect."* (Met.)

Both statements are referring to the *"exact same situation"* (Gensler), *"in the same respect"*(Aritotle) as a necessary condition to define sameness of objects (actions, things).
Hence we are back again at the interpretation of "sameness", "otherness" and "modus ponens" and their involvement into logical circularity.

4.1.2. Distributed GRs and Modi Ponens

For a ***mono-cultural*** formation the logical Modus Ponens takes the form as we know it from Aristotle.

Modus ponens of classical Logic:

$$\text{If } A \in \text{ag}, \left(A \longrightarrow B\right) \in \text{ag}, \text{ then } B \in \text{ag}$$

$$\text{MP} - \text{Rule}: \frac{A,\ A \longrightarrow B}{B}$$

The modus ponens is ruling linear chains in *a* single contexture.

For a ***poly-cultural*** formation, a *dissemination* of the Modus Ponens into distributed contextures has to be taken into account.

$$\frac{A^1,\ A^1 \longrightarrow B^1 \mid A^2,\ A^2 \longrightarrow B^2 \mid \ldots \mid A^n,\ A^n \longrightarrow B^n}{B^1 \qquad \mid \qquad B^2 \qquad \mid \ldots \mid \qquad B^n}$$

$$\text{Distributed MP} - \text{Rule}: \frac{A,\ A \longrightarrow B \parallel A,\ A \longrightarrow B \parallel \ldots \parallel A,\ A \longrightarrow B}{B \qquad \parallel \qquad B \qquad \parallel \ldots \parallel \qquad B}$$

This example is emphasizing on the *distributed* parallelism of modi ponens only. Mediation rules are not involved. Presented in a matrix, only the diagonal systems are considered.

For a ***trans-cultural*** formation *interactional/reflectional* configurations of the Modus Ponens has to be taken into account. Such configurations are modeled by the matrix approach.

$$\begin{pmatrix} M & \text{O1} & \text{O2} & \text{O3} \\ \text{M1} & \text{log1} & \square & \square \\ \text{M2} & \square & \text{log2} & \text{log2} \\ \text{M3} & \text{log1} & \square & \text{log3} \end{pmatrix} \begin{pmatrix} \text{MP1} & \square & \square \\ \square & \text{MP2} & \text{MP2} \\ \text{MP!} & \square & \text{MP3} \end{pmatrix}$$

This table illustrates a reflectional and an interactional configuration. Logic log1 is reflected at position (O1M3) as log1 and logic2 is interacting with system log3 at position (O3M2) as log2. Hence, the modi ponens, MP1 and MP2 are disseminated in a reflectional and a interactional mode in the framework of PolyLogics[27].

4.1.3. Transversality

Interactivity between GRs is transversal or queer to the intra-contextural steps of argumentations and is producing puzzling chiasms between its basic terms.
Intriguing situations can happen if we cross the border from one contexture to another, not forgetting that both are simultaneously holding their own modus ponens.

The core of modus ponens is a hypothetical proposition which consists of two parts, the *antecedence* and the *precedence*.

* If P, then Q.

P represents the antecedent and Q the precedent.

* If X is a man, then X is mortal.

Modus ponens takes a step further from the hypothetical to the factual:

* X *is* a man, hence X *is* mortal.

The linear order of hypothesis and modus ponens between antecedence and precedence gets into a *chiastic* circularity if played between different contextures. What is the antecendent in one contexture appears as a consequent in another contexture, and vice versa. Obviously, such a chiasm is not a circularity[28]in the sense of logical antinomies or the circulus creativus of second-order cybernetics.

4.2. Paradoxes of an Ethics for Others

4.2.1. Ethics for Others?

"human power borders on the inhuman; the human also endures the inhuman...humans bear within themselves the mark of the inhuman...their spirit contains at its very center the wound of non-spirit, non-human chaos atrociously consigned to its own being capable of everything" (Agamben[29],1999: 77)[30].

The ethics I'm hallucinating for, "*for other* futures *",* always included in its concept of humanity, what is called the *inhuman*, as an undenial constitutive part of humanity.

$$\text{pre}-\text{human} \leftrightarrow \left\{ \begin{array}{c} \text{human} \\ \updownarrow \\ \text{inhuman} \end{array} \right\} \leftrightarrow \text{post}-\text{human}$$

This chain is not necessarily a chronological chain. All parts are in fact simultaneously involved by a conceptual understanding of human beings and humanity. Hence the borders of the *human* are not essentially the *inhuman* with its *"non-spirit"* and *"non-human"* but the *pre-* and *post-human.* As long as the status of the "*non*" is not reflected, the distinction *"non-human"* remains vague and opens up omnipotent fantasies of *"being capable of everything"*.

To understand the inhuman as a fact of the human condition is in no way accepting what inhuman happened in the name of the Übermensch ideology.

"Today I'm privileged thanks to G-d and you gallant fighting men. I'm here to reminisce, and reflect, and experience instant recollections of those moments. Those horrible scenes and that special instance when an Allied soldier outstretched his arm to help me up became my re-entrance, my being re-invited into humanity and restoring my inalienable right to a dignified existence as a human being and as a Jew. *Something, which was denied me from September 1939 to the day of liberation in 1945. I had no right to live and survived, out of 80 members of my family, the infernal ordeal of Auschwitz, Buchenwald, Ordruf, and its satellite camp Crawinkle and finally Theresinstadt Ghetto-Concentration Camp."* Rabbi Murray Kohn, Entry: bannedbycastro[31], May 31, 2008 2:09 AM

Ethics towards others, ethics for others, ethics of others. How could this be possible?
It seems to be impossible to propose an acceptable ethics for others. Others conceived as beings beyond human beings. At least it would simply be ridiculous if human beings would belief they could define what's ethical for beings which are beyond their own reachability. The situation is not less absurd and terrestrially provincial as the LINCOS project of inter-stellar communication.
Nevertheless, there are many statements, in science, religion and SiFi, how non-human beings will or should behave and think ethically.

As we will learn, none of the sketched following positions from the *Lambda-man*, the *Pope* to *Asimov* is offering the Aliens a status of being fundamentally different to human beings. The Otherness of the Alien's otherness is reduced to the familiarity of the generous human family and its brotherhood in God.

4.2.2. The Lambda Power of the Lambda-man

The strongest arguments for a cosmological unity of intelligent beings is given by Philip Wadler.
I always loved his belief in the Lambda Calculus. (Sushi's Logics)
I'm very happy to learn that Philip Wadler did the turn out of the purely academic scenario to a one-man show at the OOPSLA 2006.

"He came to OOPSLA in a spirit of *multiculturalism*, to be a member of a *broad church*, hoping to help us see the source of his faith and to realize that we often have alternatives available when we face language and design decisions."

There is no stronger argument in favor of the universalistic belief than that the *"visitors from an other place",* later they are called *Aliens,* are calculating in the very same mathematical framework as we human beings. They are all, wherever they are from, on SKI.

"Whether a visitor comes from another place, another planet, or another plane of being we can be sure that he, she, or it will count just as we do: though their symbols vary, the numbers are universal[32]. The history of logic and computing suggests a programming language that is equally natural.

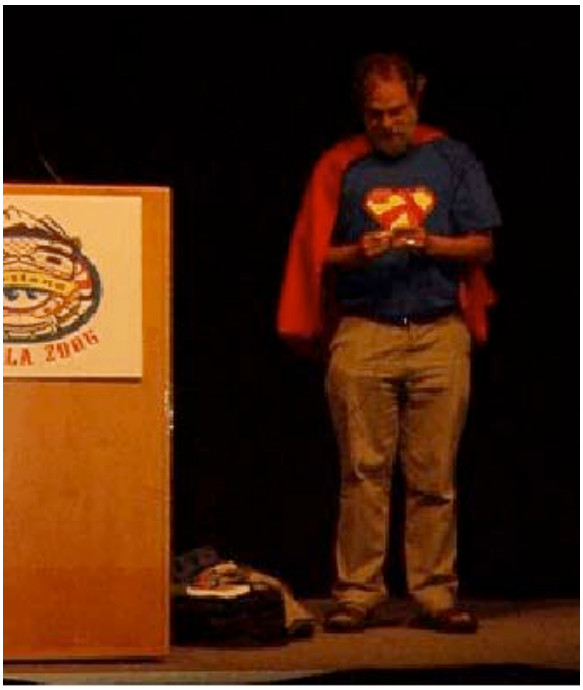
The language, called lambda calculus, is in exact correspondence with a formulation of the laws of reason, called natural deduction. Lambda calculus and natural deduction were devised, independently of each other, around 1930, just before the development of the first stored program computer. Yet the correspondence between them was not recognized until decades later, and not published until 1980.

Today, languages based on lambda calculus have a few thousand users. Tomorrow, reliable use of the Internet may depend on languages with logical foundations."

It is of no surprise that there is not always an easy way to contact the Lambda-man's *Alien-Category-Theory* Website[33].Thus, I have the pleasure to rely on a report from *Knowing and Doing, Reflections of an Academic and Computer Scientist* by Eugene Wallingford, October 28, 2006 8:05 PM

Church: The Origins of Faith[34]

"This idea, that logic and programming are equivalent, is universal. In the movie, *Independence Day*, the good guys defeat the alien invaders by injecting a virus written in C into its computer system. The aliens might not have known the C programming language, and thus been vulnerable on that front, but they would have to have known the lambda calculus!"



What the Java team needed was... the **lambda calculus**!
(At this moment, Wadler stopped his talk Superman-style and took off his business suit to reveal his Lambda-man[35]outfit. The crowd responded with hearty applause!) [...]
Wadler closed his talk by returning to the themes with which he began: *faith*, *evolution*, and *multiculturalism*."

As we can know from Sailor Moon[36]things beyond lambda calculus can be much funnier[37]!

4.2.3. The Pope: Aliens are Children of God

The Vatican has other arguments, for Christian believers probably even stronger, than the Lambda-man could imagine. OK, he is not a Christian but believes in another God.

"The Pope's astronomer, José Gabriel [38], a Jesuit priest, told L'Osservatore Romano that there would be nothing surprising about the existence of intelligent extra-terrestrials.
"Just as there is a multiplicity of creatures on Earth, so there could be other beings created by God [beyond it]," he said. The interview suggests that the Church's hierarchy may be paving the way to showing that Pope Benedict XVI is more open to the ideas of modern science than he has previously seemed to be."

For ordinary believers in God, like *Underthematrix*[39], there are similar arguments for Aliens too.

4.2.4. Asimov's Runaround Ethics

Some people still think that robots should mirror human qualities. Everywhere, even at art schools, students are programming humanoid behaviors. Programs able to write poetry, short stories and other things we know anyway. It was Bruce Sterling, then on a short visit at the Academy of Media Arts, Cologne, who surprised the students, proud of there electronic parrots, that he would like to hear something which he never heard before and which might be machinal, a property only machines can have.

In other words, robots are not designed or perceived as having, possibly or in future, behaviors, not paralleled to human nature.

Ethics of Robots

They were first introduced in his 1942 work of **Runaround**.

http://library.thinkquest.org/05aug/01158/laws.html

The Three Laws of Robotics are as follows:

1 A robot may not harm a human being, or, through inaction, allow a human being to come to harm.
2 A robot must obey the orders given to it by human beings,
except where such orders would conflict with the First Law.
3 A robot must protect its own existence, as long as such protection
does not conflict with the First or Second Law.

In a French translation, one of the character's thoughts translated into:
"A robot may not harm a human being, unless he finds a way to prove that in the final reckoning, the wrong he caused, profits humanity in general."

The Laws are an identifying theme within Asimov's fiction, appearing in the Foundation Series and other fiction related to it. Many other authors who use Asimov's fictional universe have adopted these Laws, and technologists within the Artificial Intelligence field are working to create real machines with some of the properties of the robots created by Asimov.

What can we learn? Neither strong mathematical science, nor authentic Christian belief, nor the creative fantasy of SiFi, is able or willing to imagine, that Aliens are Aliens and not the same as we human beings, i.e. wight of God. The Otherness of others, Aliens, Robots, Trans-humans, and others, has no chance to be accepted by humanity, as others.

Final consolation

The Pope got it right, the Lambda-man too. Asimov anyway. Aliens are like us, simply from different cultures, hence at home with us in our global multi-culturalism.

This has at least two great advantages. After all the wars on earth have ended, new and unlimited wars against our brothers in God can start; again. As it happened on Earth in the name of family and brotherhood in God and Science.

The other point is highly profitable too. We have not to learn too much alien. Our math, logic, arithmetic, belief systems, robot and computer technology, and much more, is universal and natural; valid for all creatures of God, human beings, robots and aliens. Hence, we can try to export our knowledge far beyond the Chinese Wall.

Fortunately, there is some hope left. The Aliens[40] could refuse the generosity to be domesticated by the human family. Or as a funny surprise, it could turn out that the human family is nothing more than a satellite of Alien cultures.

References&Notes

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4 http://www.disastercenter.com/terror/

5 http://news.bbc.co.uk/2/hi/uk_news/england/nottinghamshire/7429025.stm

6 http://www.guardian.co.uk/uk/2008/jun/11/uksecurity.terrorism

7 http://www.thinkartlab.com/pkl/media/transMODULE/transMODULE.html

6 Concerned about what he calls the climate of fear the government has created in Britain, which he says has in turn prompted a society of suspicion, Rizwaan feels the UK is becoming a place that does not allow a natural interest and involvement in politicisation.
"Police are paranoid that every Muslim who is young and has a beard and is slightly involved in

politics is a national security threat," he says.
"I was a regular student who was researching a phenomenon we encounter in today's society."
[...]
"They were quizzed by police for five hours ... they said to my personal tutor that if this had been a young, blond, Swedish PhD student, then this would never have happened. The investigating officers were making these statements when I was detention."
http://www.guardian.co.uk/uk/2008/jun/11/uksecurity.terrorism

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31 http://www.guardian.co.uk/commentisfree/2008/may/31/uselections2008.barackobama

32 http://homepages.inf.ed.ac.uk/wadler/papers/natural/natural3.pdf

33 http://wadler.blogspot.com/2008/04/alien-category-theory.html

34 **Alonzo Church**
http://www.princeton.edu/~mudd/finding_aids/mathoral/pmc05.htm
http://libweb.princeton.edu/libraries/firestone/rbsc/aids/church/
Sushi's Logics
The ultimate power of the Lambda Calculus is the historical fact that it has succeded to create a community which is accepting this kind of beginning of an abstraction, accepting the common context, lexical scope of the calculus, and developing the endless research of this empire. The Church of Alonzo Church has its high sophisticated high priests and common priests where ever we need the pureness of the Crystal of the Static Universe.

This Crystal of the Static Universe has power to all Purist of this Globe: From the Roman-catholic Jesuits to the Presbyterian Protestants, the Jewish Orthodox and the mesmerized high priests of Digitalism; all are united in the trance of the secret power of the Ultimate and Eternal Lambda of Naturality."

"To fight fundamentalism we have to disperse the ultimate lambda power crystal into its powder. The ultimate pulverization of the powers crystal.

35 http://www.cs.uni.edu/~wallingf/blog/archives/monthly/2006-10.html

36 www.thinkartlab.com/pkl/media/SUSHIS_LOGICS.pdf
Maybe, SUSHI'S LOGICS, a collage/sabotage and patchwork&catalogue, is aimed at girls/young ladies (13-23 years old & more). One just got her degree in logic at Oxford university. It also can be considered as having some threads of a compendium for chiastic and subversive thinking and acting in a frozen world of digitalism.
A patchwork &catalogue of interplaying contextures doesn't need a narrative with its beginning and end, nor any drive and suspension to motivate the reader to invest his/her time.

37 www.thinkartlab.com/pkl/lola/poly-Lambda_Calculus.pdf

38 http://www.independent.co.uk/news/europe/popes-astronomer-insists-alien-life-would-be-part-of-gods-creatio

39 "I watched Larry King Live and I think what I found most interesting is that this is the first time I've ever seen a story about aliens landing on a primetime CNN show. The other issue for me is this. I believe in God, the Creator and Author of all things and life. I believe that aliens are real because man cannot envision ANYTHING that has not already be created or brought into existence by God. Man can discover, and uncover (the theory of relativity, black holes, the genome project) but man cannot create. Man cannot imagine anything that does not already exist in the universal consciousness. So the idea that people "imagined" something that does not already exist is simply bizarre. God gave man life but he did not give him the power to create. What man is doing is simply uncovering the multiple levels of reality (dimensions) in the universe - nothing more."
http://www.huffingtonpost.com/2008/05/29/alien-video-to-be-reveale_n_104043.html

40 http://www.huffingtonpost.com/2008/05/29/alien-video-to-be-reveale_n_104043.html

Generalized Diamonds

From monosemic to tectonic complementarity

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zurück Seite 4

Abstract

The construction of diamonds can be generalized towards *polysemic* and *metamorphic* interactions between categories and saltatories.

1. Generalized Diamond Conditions

1.1. Architectonics of diamonds

Composition in diamonds can be generalized towards *polysemic* and *metamorphic* interactions between categories and saltatories.

After having developed some insights and experiences with the diamond approach and its complementary structures, a design of diamond category theory might be introduced which is not as close to the introductory analogy to classic category theory. Following the classic strategy of academic research a *generalization* of the introduced concepts of diamond category theory shall be sketched.

To some degree, such generalizations are obvious, but nevertheless quiet intriguing albeit a tedious pleasure.

Asymmetry in the interplay

The first introduction of the diamond category concept is based on the strict and primary distinction of categorical objects and morphisms and their composition. A saltatorical hetero-morphism is thus an abstraction from the composition operation on morphisms resulting in an asymmetry between categories and saltatories. A composition is defined on 2 morphism, an abstraction on the composition is establishing a single hetero-morphism as a reflection of the categorical composition activity in a saltatory. Hence, a commutative composition of 2 morphisms is mirrored by only one hetero-morphism. Thus, the commutativity of the composition of 2 morphism has no direct proper correspondence in the commutativity of a single heteromorphism.

Therefore, the general sentence *"To each commutativity in a category a commutativity in a saltatory corresponds"* leads to conflicts if we use the strict and restricted introduction of diamonds.

Diamond Commutativity

$$(g \circ f) = \chi\,\langle (g \circ f) \shortparallel l \rangle$$

with $\begin{pmatrix} \mathrm{cod}(f) \cong \mathrm{dom}(g) \\ \omega(f) \,\|\, \alpha(g) \end{pmatrix}$

$(g \circ f) \shortparallel l$: with commuting scheme : $\left(\begin{array}{c|c} \begin{array}{c} A \xrightarrow{f} B \\ h \searrow \quad \downarrow g \\ C \end{array} & \begin{array}{c} \text{saltatory} \\ \hline a \xleftarrow{l} b \end{array} \\ \hline \text{category} & \end{array}\right)$

Associativity Condition

$\text{Iff, } g, h, k \in MC, \text{ and } l, m, n \in MC:$

$$then\left[\begin{array}{c} h \circ ((g \circ f) \circ k) = ((h \circ g) \circ f) \circ k \\ l \shortparallel (m \shortparallel n) = (l \shortparallel m) \shortparallel n \end{array}\right] \text{ such that}$$

$$\left(\begin{array}{c} A \xrightarrow{f} B \\ \downarrow h \quad \downarrow g \\ C \xrightarrow{k} D \\ \hline \text{category} \end{array} \;\middle\|\; \begin{array}{c} \text{saltatory} \\ \hline a \xleftarrow{l} b \\ n \nwarrow \quad \uparrow m \\ c \end{array}\right) \text{ commutes in category and salataory.}$$

Balancing the interplay

A. Complementarity of features (properties, structures, data):
1. in parallel, commutativity to commutativity
2. mixed, say commutativity to associativity
B. Bridging features of complementarity

All those combinations are possible with a liberalization in the definition of the constitutive rules for diamonds.
That is, the complementarity of a categorical composition has not to be represented in a single elementary hetero-morphism it could be mapped into a complexion of hetero-morphisms.
With that, a free, but still reasonable mixture of features could be realized.

Architectonics

$$\begin{array}{ccccc} & & \mathcal{B} & \xleftarrow{\text{funct } F} & \mathcal{A} \\ & & \updownarrow & & \updownarrow \\ \text{id} & & & & \text{diff} \\ \alpha_1 & \xrightarrow{\text{morph } f} & \omega_1 \circ \alpha_2 & \xrightarrow{\text{morph } g} & \omega_2 \\ | & & \text{comp} & & \text{coinc} \; | \\ \alpha_3 & & \xrightarrow{\text{morph fg}} & & \omega_3 \end{array}$$

$$\mathcal{A} = \left(\omega_4 \xleftarrow{\text{het } l} \alpha_4\right), \; \mathcal{B} = \left(\omega_4 \xleftarrow{\text{het } l} \alpha_4\right)$$

This example could be read as a complementary distribution of a categorical composition of morphisms, hence a category, and a saltatorial functorial mapping of saltatories. Hence, the difference operation is not reduced to polysemy but is a mapping between morphisms of a category and functors in a saltatory. Such a mapping is crossing tectonic levels, here, between morphisms and functors.

Functors are mappings between categories, thus, in our case, they are *hetero-functors* as mappings between saltatories. Functors in categories are associative under composition, in saltatories they are associative under saltisition. That is, the jump-operation holds not only for hetero-morphisms but for hetero-functors too.

For alone standing categories it seems not to make any sense to mix morphisms with functors in one design. For diamonds, the possibility to mix types between categories and saltatories is opening up a new kind of flexibility in modeling complex systems.

Standard diamond definitions

bi – Object $\left[X,\ x\right]$

$$\left.\begin{array}{l} \widehat{\text{id}} \\ x \in \text{Salt} \\ \updownarrow \text{diff} \\ X \in \text{Cat} \\ \widehat{\text{id}} \end{array}\right\} \in \text{Diam}$$

Identity

$\forall f, X, Y, o \in Cat:$
$f\, o_{XXY}\, \text{ID}_X = f = \text{ID}_Y\, o_{XYY}\, f.$
$\forall l, x, y, \shortparallel \in \text{Salt}:$
$l \shortparallel_{xxy} \text{ID}_x = l = \text{ID}_y \shortparallel_{xyy} l.$

Difference

$OmCat,\ Salt \in Diam:$
$\forall \left[X,\ x\right],\ \left[Y,\ y\right] \in Diam$
$\left[f, l\right] \left(o \shortparallel\right)_{\left[XYy,\ xyY\right]} \text{DIFF}_{\left[Y,\ y\right]}$
$= \left[f,\ l\right] =$
$\text{DIFF}_{\left[y,\ Y\right]} \left(\shortparallel, o\right)_{\left[xyY,\ XYy\right]} \left[l,\ f\right]$

Identity is a mapping onto-itself as itself.

For each object X of a category an identity morphism, $\text{ID}\left[X, X\right]$, which has domain X in the category and codomain X in the same category exists. Called ID_X or id_X for $\text{ID}\left[X, X\right]$.

For each object x of a saltatory an identity morphism, $\text{ID}\left[x, x\right]$, which has domain x in the saltatory and codomain x in the same saltatory exists. Called ID_x or id_x for $\text{ID}\left[x, x\right]$.

Difference is a mapping onto-itself as other.

For each object X of a category a difference morphism, $\text{DIFF}\left[X, x\right]$, which has domain X in the category and codomain x in the saltatory exists. For each object x of a saltatory a difference morphism, DIFF $\left[x, X\right]$, which has domain x in the saltatory and codomain X in the category exists.

For each cat-object X an identity ID_X in Cat(X, X). For each salt-object x an identity ID_x in Salt(x, x) exists. And, for each bi-object [X, x] a difference $\text{DIFF}\left[X, x\right]$ between Salt(x, x) and Cat(X, X).

Tectonics of Diamonds

According to the presentation of categories by Eugenia Chang, a category consists of Data, Structure and Properties (DSP). Categories as graphs with structure are defined as DSP in the following sense:

Definition: A **category** is given by

i) **Data**: a diagram $\left(C_1 \underset{t}{\overset{s}{\rightarrow}} C_0\right)$ in *Set*

ii) **Structure**: composition and identities

iii) **Properties**: unit and associativity

A *first* step in developing a tectonics for diamonds is introduced by an *inversion* of the full DSP-scheme (Data, Structure, Properties) from DSP to PSD. That is, the properties are determining the choice for the structure and data of the structuration.
A *second* step is diamondizing PSD.
- Diamonds are conceived as an *interplay* of categories and saltatories, hence PSD has to be distributed and involved into a complementary and chiastic interplay, resulting in: YPSD.
- Disseminated Diamonds, YPSD, are involved into interactionality and reflectionality as iterative and accretive *interactions*, resulting in IYPSD.
- Interacting YDSPs are localized and positioned into the kenomic grid by the *place-designator*, resulting in LIYPSD.

Hence the diamondized DSP results into the LIY(PSD)- archictecture.

DSPYIL-Architectonics of diamonds

i) **Data**: 2-diagram C_1-s,t-->C_o/C_o<-diff-C_1 in 2-Set,

ii) **Structure**: composition, identities + saltistition, difference,

iii) **Properties**: unit, associativity + diversity, jump law,
iv) **Interplay**: complementarity and chiasm between category and saltatory,
(v) **Interactions**: diamonds with diamonds, iterative/accretive,
vi) **Localisation**: kenomic grid, place-designator.

A *third* step is freely interchanging the structure and property features of categories and saltatories in the sense of metamorphic transformations realized by the super-operators.
Free mixtures of structures (commutativity of composition and identities) with properties (unit, associativity) and its saltatorical equivalents (saltisition, difference) shall be introduced.

$$\text{Interplay}\left(\text{Diam}\right) = \chi\left(\left(\text{Cat},\ \text{Salt}\right),\ \left(D,\ S,\ P\right)\right)$$

$$\chi\left(\left(\text{Cat},\ \text{Salt}\right),\ \left(D,\ S,\ P\right)\right) = \begin{pmatrix} \text{DD} & \text{DS} & \text{DP} \\ \text{SD} & \text{SS} & \text{SP} \\ \text{PD} & \text{PS} & \text{PP} \end{pmatrix},$$

$$\text{with}\left(\text{XY}\right) \equiv \text{Cat}\left(X\right) \longrightarrow \text{Salt}\left(Y\right),\ X,\ Y \in \left\{D,\ S,\ P\right\}.$$

$$\text{num}\left(D,\ S,\ P\right) = 3,\ \text{num}\left(\chi\left(D,\ S,\ P\right)\right) = 3 \text{x} 3 = 9$$

1.2. Polysemic complementarity

Up to now, a *standard* interpretation was leading the construction of diamond category theory. That is, the range of the *difference* relation as part of the definition of the bi-object of diamonds placed between categories and saltatories had to be monosemic and preserving the tectonics of the categories, i.e. objects to objects and morphisms to morphisms. That is, between a categorical object X and a saltatorical object x, a 1-1-mapping was supposed.
Polysemic-Mappings:

one – to – one
$\textbf{bi – Object}\left[X,\ x\right]$

$$\left.\begin{array}{l} \widehat{\text{id}} \\ x \in \text{Salt} \\ \updownarrow \text{diff}_{(1-1)} \\ X \in \text{Cat} \\ \widehat{\text{id}} \end{array}\right\} \in \text{Diam}$$

one – to – many
$\textbf{bi – Object}\left[X,\ x^{(m)}\right]$

$$\left.\begin{array}{l} \widehat{\text{id}} \\ x^{(m)} \in \text{Salt} \\ \updownarrow \text{diff}_{(1-m)} \\ X \in \text{Cat} \\ \widehat{\text{id}} \end{array}\right\} \in \text{Diam}$$

many – to – one
$\textbf{bi – Object}\left[X^{(m)},\ x\right]$

$$\left.\begin{array}{l} \widehat{\text{id}} \\ x \in \text{Salt} \\ \updownarrow \text{diff}_{(m-1)} \\ X^{(m)} \in \text{Cat} \\ \widehat{\text{id}} \end{array}\right\} \in \text{Diam}$$

many – to – many
$\textbf{bi – Object}\left[X^{(m)},\ x^{(n)}\right]$

$$\left.\begin{array}{l} \widehat{\text{id}} \\ x^{(n)} \in \text{Salt} \\ \updownarrow \text{diff}_{(m-n)} \\ X^{(m)} \in \text{Cat} \\ \widehat{\text{id}} \end{array}\right\} \in \text{Diam}$$

This decision for a mono-semic approach is guaranteeing the diamonds a strong stability. But it also can be regarded as a restriction. Hence, a polysemic and trans-tectonic approach shall be introduced.

Polysemic relations in regard of the basic terms of identity and difference shall be sketched.

Protological comment

From a *proto-theoretical* point of view, some comments about the status of the difference relation would be appropriate. The usual problem of *use* and *mention* of terms, here ”relation”, in a case of *abuse* of terms, is demanding for justification. If the concept of relation is entirely covered by categories and the difference between categories and saltatories is alien to categories, how has the concept of a relationship between categories and saltatories be deconstructed to model both, its status as a proper relation and as concept of relationship beyond its proper definition of relation? This question remains in the to-do box.

1.3. Tectonic metamorphosis

Minimal tectonics for categories is given by the 3-tupel (morphisms, functors, natural transformations).

Tectonic inter-relations between categories and saltatories:
From composition of *morphisms* to a mirroring in *hetero-morphisms,*
From composition of *morphisms* to a mirroring in hetero-*functors,*
From composition of *functors* to a mirroring in saltatorical *natural transformations.*

Metamorphism was introduced in ConTeXtures as a chiastic interplay between topics (types) of programming and contextures.

General scheme for tectonic metamorphosis:

Type – Chiasm

$$\text{Chiasm}(\text{Diam}) = \chi(\text{Cat}, \text{Salt}, \text{type}_{\text{Cat}}, \text{type}_{\text{Salt}}),\ \text{type} = \{\text{object}, \text{morphism}, \text{functor}, \text{natural transformation}\}$$

bi – Object [X, Salt]	**bi – Object [Cat, x]**	**bi – Object [Cat, Salt]**
$\widehat{\text{id}}$	$\widehat{\text{id}}$	$\widehat{\text{id}}$
$\text{Salt} \in \text{Salt}$	$x \in \text{Salt}$	$\text{Salt} \in \text{Salt}$
$\updownarrow \text{diff}_{(X-\text{Salt})} \in \text{Diam}$	$\updownarrow \text{diff}_{(\text{Cat}-x)} \in \text{Diam}$	$\updownarrow \text{diff}_{(\text{Cat}-\text{Salt})} \in \text{Diam}$
$X \in \text{Cat}$	$\text{Cat} \in \text{Cat}$	$\text{Cat} \in \text{Cat}$
$\widehat{\text{id}}$	$\widehat{\text{id}}$	$\widehat{\text{id}}$
X – to – Salt	Cat – to – x	Cat – to – Salt

Metamorphic chiasms between categories and saltatories in diamonds are supported by the generalized *difference* operation between categories and saltatories.

Polytopic Chiasms in ConTexTures

Polytopics, as a distribution of different topics over different contextures, in a reflectional and/or interactional mode, had been first introduced by the new paradigm of contextural programming, ConTeXtures. This introduction is restricted to polycontextural constellations only. The diamond approach to contextural programming wasn't yet at hand.

The following example shows a distribution of the topics *num*, *list* and *Boolean* over 3 mediated reflectional contextures of the polycontextural matrix.

samba$^{(3)}$(repl, ∅, ∅) – horizon

$$\left[\begin{array}{l} \text{thematize (zero, nil, false)} \\ \left[\left[\begin{array}{l}\text{identify contexture}_{1.1}\\ \left(\begin{array}{l}\text{define } \mathbf{zero}\\ \left(\begin{array}{l}\text{lambda } (f)\\ \left(\begin{array}{l}\text{lambda } (x)\\ \quad x\end{array}\right)\end{array}\right)\end{array}\right)\end{array}\right]\right. \quad \phi_{2.1}\ \ \phi_{3.1} \\ \left[\begin{array}{l}\text{identify contexture}_{1.2}\\ \left(\begin{array}{l}\text{define zero}_{1.1} \text{ as } \mathbf{nil}\\ \left(\begin{array}{l}\text{lambda } (l)\\ \quad \text{true}\end{array}\right)\end{array}\right)\end{array}\right] \quad \phi_{2.2}\ \ \phi_{3.2} \\ \left.\left[\begin{array}{l}\text{identify contexture}_{1.3}\\ \left(\begin{array}{l}\text{define nil}_{1.2} \text{ as } \mathbf{false}\\ \left(\begin{array}{l}\text{lambda } (a\ b)\\ \quad b\end{array}\right)\end{array}\right)\end{array}\right]\right. \quad \phi_{2.3}\ \ \phi_{3.3} \end{array}\right]$$

ConTeXtures are dealing with types as topics, mono- and poly-topics of complex constellations of programming languages.
This *reflectional metamorphic transformation* example shows a polytopic situation with the topics *Number*,

List and *Boolean*.
Thus, "define name" is an abbreviation of "define name_i *as* name_j" with i=j, which is an application of the *as-abstraction.*
- replication *repl*, in this example, is a metamorphic replication and is not replicating isolated configurations.

Exchange relations:
- "define zero" is "define zero as zero", as the start of the electional levels. It could itself be produced by a predecessor level,
- define zero in contexture1.1 as *zero* in contexture1.1
- "define nil" is "define zero as nil",
as: define zero from contexture1.1 as *nil* in contexture1.2
- "define false" is "define nil as false".
as: define nil from contexture1.2 as *false* in contexture1.3.

Obviously, transcontextural type transformations are not identical with intra-contextural *type derivations* in the sense of the lambda calculus. The first are crossing the borders of contextures, from types in one contextures to other types in other contextures. This can happen successively, from one contexture to another contexture, or simultaneously, from a multitude of types in one or more contextures to a multitude of different types of different contextures. The lambda derivations are monocontextural in all their derivational transformations, and are not leaving their contextures, i.e. the borders of the formal system.

Diamond Chiasm Scheme

Diamond Chiasm – Scheme

$$\left[\text{thematize chiasm}\left(\text{Cat},\ \text{Salt},\ M,\ \sigma\right)\left[\text{contexturalize}\left[\left[\text{identify Cat}\left[\text{define } M\left[\text{state } \sigma\left[\text{elect } M_{\text{Salt}}\right]\right]\right]\right]\left[\left[\text{identify Salt}\left[\text{define } M\left[\text{state } \sigma\left[\text{elect } \sigma_{\text{Cat}}\right]\right]\right]\right]\right]\right]\right]\right]$$

Type – Term – Chiasm

$$\text{Diam}^{(2,1)} = \chi\left[\text{Cat},\ \text{Salt},\ M,\ \sigma\right]$$
$$= \left[\left(\left[M \longrightarrow \sigma\right]_{\text{Cat}} \updownarrow \left[M \longrightarrow \sigma\right]_{\text{Salt}}\right),\ \left(\left[\text{M}_{\text{Cat}} \cong \text{M}_{\text{Salt}}\right],\ \left[\sigma_{\text{Cat}} \cong \sigma_{\text{Salt}}\right]\right)\right]$$

Basic relations
exchange relation between M and σ, *i.e.* $M \updownarrow \sigma$
order relation between M and σ, *i.e.* $M \longrightarrow \sigma$
coincidence relation between M_i, M_j and σ_i, σ_j, i.e. $\text{M}_i \cong \text{M}_j$ and $\sigma_i \cong \sigma_j$.

$$\text{Diam}^{(2,1)} = \chi\left[\text{Cat},\ \text{Salt},\ M,\ \sigma\right]$$
$$= \begin{bmatrix} \text{level}_{\text{Cat}} : \left[M \longrightarrow \sigma\right] \\ \updownarrow \ x \ \updownarrow \\ \text{level}_{\text{Salt}} : \left[\sigma \longleftarrow M\right] \end{bmatrix}$$

A full dissemination of the type-term chiasms is distributed over 2-dimensions: the iterative and the accretive dimensions.

$$\text{Chiasm}^{(m,n)} = \begin{array}{l} \text{level}_{\text{Cat}} : \left[\left[M \longrightarrow \sigma\right] \updownarrow \left[M \longrightarrow \sigma\right] \updownarrow \ldots \updownarrow \left[M \longrightarrow \sigma\right]\right]^{(n)} : \left\{ \text{iteration}\,(n) \right. \\ \qquad\qquad \updownarrow \; x \; \updownarrow \\ \text{level}_{\text{Salt}} : \left[\sigma \longleftarrow M\right] \\ \qquad\qquad \updownarrow \; x \; \updownarrow \\ \qquad\qquad \ldots\ldots \qquad\qquad \left\{ : \text{accretion}\,(m) \right. \\ \qquad\qquad \updownarrow \; x \; \updownarrow \\ \text{level}_{\text{Salt}} : \left[\sigma \longleftarrow M\right]\right]^{(m)} \end{array}$$

Catalogue of structurations

Categories: [1, 3, 1] = (1 category, 3 morphism, 1 composition (fulfilling the matching conditions)).

$$\text{level}_{\text{Cat}} : \left[M \longrightarrow \sigma\right]^1 o \left[M \longrightarrow \sigma\right]^2 \Longrightarrow \left[M \longrightarrow \sigma\right]^3$$

Chiasm:[1, 2, 2, 2] = (1 chiasm, 2 order, 2 exchange and 2 coincidence relations).

$$\text{Chiasm}^{(2,1)} = \chi\left[\text{Cat},\ \text{Salt},\ M,\ \sigma\right]$$

$$= \begin{bmatrix} \text{level}_{\text{Cat}} : \left[M \longrightarrow \sigma\right] \\ \qquad\qquad \updownarrow \; x \; \updownarrow \\ \text{level}_{\text{Salt}} : \left[\sigma \longleftarrow M\right] \end{bmatrix}$$

Polycontextural mediation: [1, 2, 3, 4] = (1 mediation, 2 exchange, 3 order, 4 coincidence relations).

$$\text{Poly}^{(2,1)} = \chi\left[\text{Cat},\ \text{Salt},\ M,\ \sigma\right]$$

$$= \begin{bmatrix} \text{level}_{\text{Cat}} : \left[M \cong M \longrightarrow \sigma\right] \\ \qquad\qquad \downarrow \; \updownarrow \; x \; \updownarrow \\ \text{level}_{\text{Salt}} : \left[\sigma \cong \sigma \longleftarrow M\right] \end{bmatrix}$$

Diamond: [1, 4, 2, 2] = (1 diamond with 4 order, 2 exchange and 6 coincidence relations).

$$\text{Diam}^{(2,1)} = \chi\left[\text{Cat},\ \text{Salt},\ M,\ \sigma\right]$$

$$= \begin{bmatrix} \text{level}_{\text{Cat}} : \left[M \cong M \longrightarrow \sigma \cong \sigma\right] \\ \qquad\qquad \downarrow \; \updownarrow \; x \; \updownarrow \; \uparrow \\ \text{level}_{\text{Salt}} : \left[\sigma \cong \sigma \longleftarrow M \cong M\right] \end{bmatrix}$$

Diamond plus: [1, 8, 6, 6], plus *simil* relations (cf. ConTeXtures)

$$\text{Diam}^{+\binom{2,1}{}} = \chi\left[\text{Cat},\ \text{Salt},\ M,\ \sigma\right]$$

$$= \begin{bmatrix} \text{level}_{\text{Cat}} : \left[M \cong M \longrightarrow \sigma \cong \sigma\right] \\ \downarrow x \updownarrow \ x \ \updownarrow x \uparrow \\ \text{level}_{\text{Salt}} : \left[\sigma \cong \sigma \longleftarrow M \cong M\right] \end{bmatrix}$$

The wording with chiastic constructions is not simply *"types becomes terms and terms becomes types"* as in a traditional chiasm but *"a type as a term becomes a term"* on a different level and, at the same time, *"a type as type remains a type"* on the same level. Thus, *a type as a term becomes a term and as a type it remains a type*. And the same round for terms.

Thus, a type has two functionalities at once, a type *as* a type and a type *as* a term.
Therefore, this double meaning has to be distributed over different localization of the complex constellation.

Diamond Disremption

Diamond interpretation of the kenomic succession operation

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zurück Seite 4

Abstract

Diamond interpretation of kenomic succession.
Kenomic disremption and equality in contrast to semiotic, category and diamond theory. Diamondization of the concept of explanation and hermeneutic circles. Complementary commutativity.

1. Diamondization of kenogrammatics

1.1. Descriptive interpretation of disremption

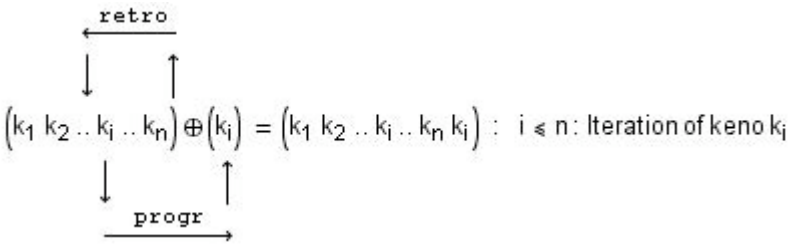
Iteration and accretion

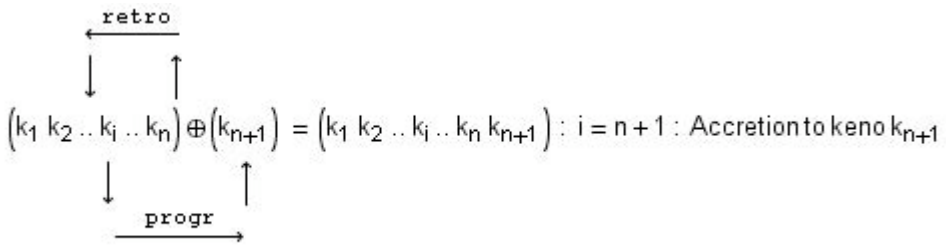
In contrast to the successor operation in word algebras, the operation of *disremption*, with its two aspects of *iteration* and *accretion*, is always defined by the simultaneity of a retro-grade and a progression action.

$$S_{iter}(k_1\, k_2 \ldots k_n) = (k_1\, k_2 \ldots k_n) \oplus (k_i),\ 1 \leq i \geq n \in \mathbb{N}$$
$$S_{accr}(k_1\, k_2 \ldots k_n) = (k_1\, k_2 \ldots k_n) \oplus (k_{n+1}),\ n \in \mathbb{N}$$

Disremption in kenogrammatics seems to be an operation which is defined by a simultaneous interplay of retro-grade and progressive interactions.
If we take this double-movement of the kenogrammatic succession into account a reasonable formalization of it might be given by the diamond approach.

Retro-grade progression





A word arithmetic approach, as it was developed in several papers, is still result-oriented and is not reflecting on the double movement of the construction as such. Thematization of this kind of double-movement of retro-/progression (recipatory/anticipatory) is guided by an interactional approach which gets its formalization within the diamond model.

Self-referentiality

Self-referential parts of the recursion scheme are thematized.
The recursion scheme gets a self-reflectional thematization.

Chiastic interplay

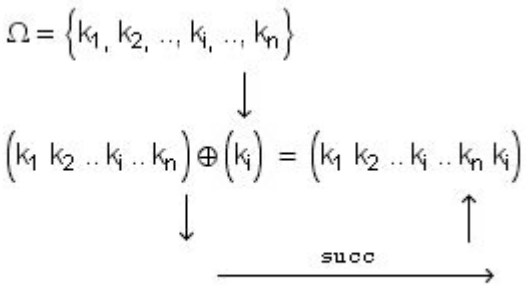
Circularity of self-referential structures gets a chiastic interpretation.

Diamond interaction

Double movements of chiastic implementation gets a diamond formalization.
In which sense are kenogrammatic operations diamondal and interacting with bi-objectional structures?

1.2. Semiotic Concatenation

Concatenation for word arithmetic is defined by a recursion which is involving its pre-ordered alphabet (sign repertoire) Ω.



Independently of the sign sequence k, a new sign out of the pre-given alphabet Ω is added to it. Hence the number of successors is depending on the size of the alphabet and not in anyway on the structure of the predecessor sign sequence.

Semiotic succession is defined in strict analogy to the concept of number-theoretic recursion.

There is also a kind of circularity in the recursive definition of succession: concatenation is introduced as addition and addition is introduced as succession.
Because disremption is not relying on an alphabet, the number of successions is strictly depending on the structure of the kenogrammatic compound of the disremption operation.

Circularity of Atomic Equality

Signs are based in perception. There is no chance for semiotics to proof the identity of two atomic signs. The whole game of type and token of signs is not producing more than a circular introduction of signs. Two signs are equal if they are equiform. And two signs are equiform if they are equal in all there (graphemic) parts. And the parts of two signs are equal if they are equiform. Etc.

Hence, the objectivation of the sign process has stopped on the half way to subject independendness. For semiotic systems to work means to be founded in subjective perception. Computer science knows this dilemma as paradox of “Symbol Grounding".
Therefore, A. A. Markov introduced his *“Abstraction of identification”* into algorithm theory, i.e. semiotic economy.

Semiotic Equality

Again, the equality of two words in a semiotic system is established by the graphemic identity (equality) of the signs at the same locality (position) of the compared words.

Semiotic Equality :

$$Seq_x \text{ equiv } Seq_y \Longleftrightarrow \forall\, i, j \in Seq_{x,y}, : loc_i = loc_j \bigwedge loc_i\left(atom_x\right) = loc_j\left(atom_y\right).$$

Or:

$$Seq_x \text{ equiv } Seq_y \Longleftrightarrow \forall\, i, j \in Seq_{x,y},$$

$$lenght\left(Seq_x\right) = lenght\left(Seq_y\right) \bigwedge \forall\, i, j \in Seq_{x,y} : loc_i\left(atom_x\right) = loc_j\left(atom_y\right).$$

The fact of the identification of position and identity of signs has a very clear consequence for the equality of two sign sequences (words). Two words with different length are semiotically unequal. Or, two sign sequences can be equal if and only if they are of equal length.

Hence, the radical challenge to graphematical systems is the madness to crack exactly this presumption of equality. That is, the equality (similarity, dissimilarity) of kenomic patterns (morphograms) is independent of the length (complication) of the patterns to be compared. That is, two kenomic “sequences" (morphograms) might be kenomically equal independently of the length of the morphograms. Morphograms of different length might be kenomically equal.

How is this possible?
Semiotic sequences are equal iff they are decomposable into equal atomic signs, i.e. iff they are atomically equiform and of the same number.
If we take the idea of *decomposability* as the leading strategy for a comparison of sign systems or morphograms we can abstract from the sign repertoires and the singularity of the successor operation. Hence, the test of equality is based on decomposability.

This leads to the observation:
Morphograms are kenomically (morphogrammatically) equal iff they can be decomposed into equal monomorphies.
Morphograms are kenomically (morphogrammatically) equal iff they have the same decomposition.

Morphograms, as well as sign sequences, are composed, thus decomposition is the dual operation of composition. But duality can have different attributes. The main attributes might be symmetry and asymmetry of the duality operation.

Semiotically, composition of parts to a word and decomposition of the word into its parts are *symmetric*. That is, the inversion of the composition, the decomposition, results into the same parts of the composition, i.e. the operation of composition and decomposition are commutative:
$Comp(Dec(X^{(m)}) = Dec(Comp(X_1, \ldots, X_m))$.

Kenomically, composition and decomposition are asymmetric.[1]

1.3. Kenomic Disremption

1.3.1. Categorical interpretation

The categorical thematization of the successor operation is characterizing its structure *"up to isomorphism".*

NN: $\begin{array}{ccccc} & & 1 & \xrightarrow{0} & N & \xrightarrow{s} & N \\ & & g\searrow & & \downarrow f & & \downarrow f \\ & & A & \xrightarrow{h} & A \end{array}$	A natural number object consists of an object and two morphisms 0: 1 --> N, s: N --> N such that for all objects A and all morphisms g, h g: 1 --> A, h: A --> A there exist a unique morphism f: N --> A making *commute* the diagramm NN.

1.3.2. Chiastic interpretation

I can not deny that I was never really happy with the *categorical* introduction of the natural numbers (up to isomorphism). It looks good but I think it gives us only have of the story. That is, natural numbers **N** are defined with the help of other objects **A** which themselves are not defined with the help of the objects **N** of the whole construction. There is a hierarchy between the defined objects **N** and the means of the definition, the objects **A**. This is correct and adequate for an introduction or definition. That is, the hierarchy of the definition scheme is preserved.

But it is unnecessarily hierarchically one-sided. The fact, that the construction is involved into morphisms between the objects is not in conflict with my observation. The defining morphisms *g, h* are founding the object **N** in one and only one direction.

Definition scheme:
definition $=_{Def}$ definiens --> definiendum.

(Definiens := That which defines the definiendum in a definition. Definiendum := The term defined in a definition.) Definitions are hierarchic but the definition scheme gets a circular introduction (definition).

Therefore, *commutativity* of the categorical diagram **NN** is only the half of the graphematic construction. The other half is sublimed in the mind of the reader.

A further step to understand and introduce natural numbers in the framework of category theory is to contemplate on the *chiasm* between the "*object-*" and the "*medium-language*" or source- and target-concepts.
A formalization of the chiastic interplay of "*source-*" and "*target-*concepts" might be designed in a polycontextural framework.

A chiasm between object- and medium-language to characterize diamondally natural numbers as a complementarity of commutativity in categories and in saltatories is distributed over *two* loci. The aim of this interplay is to characterize natural numbers, hence, there is a *third* locus required, the locus of the natural numbers as such. That is as the product of the foundational or constructional actions.

It seems that a *logification* of the diamondal interplay, necessary to handle the characterization of

the natural numbers logically, is demanding for a 3-contextural logic.

A more concrete phenomenological description should take into account that the number system involved in the classic modelling isn't a number system but acts *as* a number system to be legitimated. These, not yet legitimated natural numbers are based on the intuition and the pre-understanding of natural numbers. That is, the whole construction as such is characterizing natural numbers, thus it gets a third locus of final inscription. Classically, it seems, that this third inscription is left to the mental imagination of the reader, i.e. the mathematician. And has no realization as an inscription.

Again, what's the profit?
The existing paradigms are working! We have found water on mars! There is nothing wrong with our universal approach to natural numbers! Children, robots and Aliens do it![2]

If it is correct that the main part of the introduction mechanism for natural numbers is depending on a *mental* representation in the understanding by a mathematician and not on a scriptural notation in a textual space, i.e. on inscription, then there is no hope to create Artificial Intelligence capable of doing arithmetic *as* arithmetic and not of doing arithmetic *as* physical manipulations on informatical objects depending on the mental decisions of mathematicians or programmers.

The project of implementing subjectivity into the formalism - *"Das Ich in den Formalismus hinenin definieren."* (Gunther 1937) - has nothing to do with the AI and AL intentions to add empirical features of human behaviors to artificial living systems.

1.3.3. Diamond interpretation

A more direct formalization of the chiastic concept of the categorical introduction of natural numbers (or other structures) is designed as a diamond interplay between the two complementary aspects of the construction.

Because of the complementary character of diamond theory, commutativity of constructions have to take into account the simultaneous complementarity of commutativity. Hence, a construction is specified only iff both diagrams, the categorical and the saltatorical, commutes.

$$\begin{array}{ccc} A & \xleftarrow{h'} & A \\ {\scriptstyle g}\swarrow & & \uparrow{\scriptstyle f} \quad \uparrow{\scriptstyle f} \\ \left[\begin{array}{ccc} 1 & \xleftarrow{0'} & N \\ 1 & \xrightarrow{0} & N \end{array}\right. & & \left.\begin{array}{ccc} \xleftarrow{s'} & N \\ \xrightarrow{S} & N \end{array}\right] \\ {\scriptstyle g}\searrow & & \downarrow{\scriptstyle f} \quad \downarrow{\scriptstyle f} \\ A & \xrightarrow{h} & A \end{array} \quad \text{with} \quad \left[\begin{array}{ccc} 1 & \xleftarrow{0'} & N \\ 1 & \xrightarrow{0} & N \end{array}\right. \left.\begin{array}{ccc} \xleftarrow{s'} & N \\ \xrightarrow{S} & N \end{array}\right] = \left[\begin{array}{ccc} 1 & \xleftarrow{0'} & N \\ \updownarrow & & \updownarrow \text{diff} \\ 1 & \xrightarrow{0} & N \end{array}\right. \left.\begin{array}{ccc} \xleftarrow{s'} & N \\ \updownarrow & \\ \xrightarrow{S} & N \end{array}\right]$$

Parallelism of differentness, differentness and antidromic directions

$$\begin{array}{ccc} A & \xleftarrow{h'} & A \\ {\scriptstyle g}\swarrow & & \uparrow{\scriptstyle f} \quad \uparrow{\scriptstyle f} \\ 1 & \overset{0}{\rightleftarrows} & N \overset{S}{\rightleftarrows} N \\ {\scriptstyle g}\searrow & & \downarrow{\scriptstyle f} \quad \downarrow{\scriptstyle f} \\ A & \xrightarrow{h} & A \end{array}$$

While the process of succession goes forwards, at once it goes backwards. The step forwards can be done only in cooperation with a step backwards.

This step backwards is not a subtraction but a consultation of the history of the previous steps done to produce the morphogram to be succeeded.

To go forwards, we have to go backwards. This sentence might be interpreted in a temporal order as “to go forwards we first have to go backwards and then forwards”. This may be correct from an observational point of view. But it is not adequate from a conceptual view-point. From this, both actions happens at once. Forwards and backwards “movements” are interdependent. In a kenomic succession there is no need to go backwards without going forwards, and there is no forwards movement needed without its complementary backwards movement (Fichte, Husserl, Derrida).

Semiotically, this situation is strictly separated between the pre-given sign repertoire, which as a set of signs has its independent role, and the successor operation defined on the set of signs.

Semantic composition

Composition of two sentences is not necessarily a semantic concatenation of two separated and context independent units, like “car” and “parc”. But the term “parc” gets a specification in a composition with the term “car”, which is changing its former separated literal meaning. Hence, comp("car”, “parc”)--> “car parc".

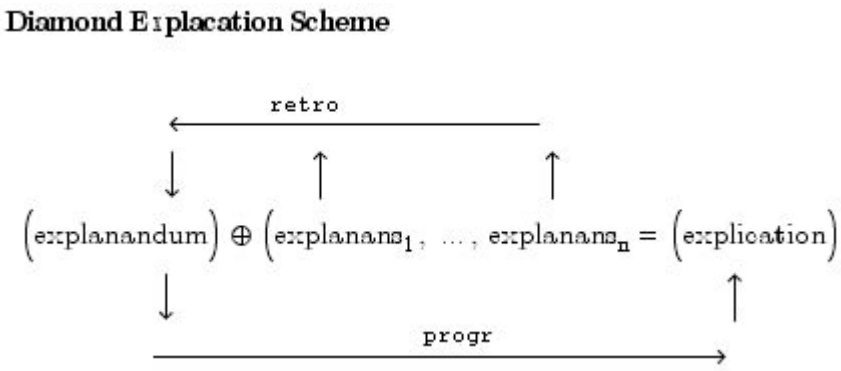
By composing two sentences, i.e by adding one semantic unit to an existing semantic unit a *retrograde* determination of the first unit by the new composition might happen. That is, the first unit gets its further semantic distinction by the additional semantic unit which is adding not only a new semantic unit to the first but is also adding specification to the definition of the context of the first semantic unit.

Explication, explanandum, explanans

Hence, explanations in general, might be given an antidromic interpretation as defining backwards the explanandum by adding forwards the new explanans.

“By the *explanandum*, we understand the sentence describing the phenomenon to be explained (not that phenomenon itself); by the *explanans*, the class of those sentences which are adduced to account for the phenomenon" (p.152).
The crucial comment, with respect to the scientific method, is given as follows:
"It may be said... that an *explanation* is not fully adequate unless its explanans, if taken account of in time, could have served as a basis for predicting the phenomenon under consideration.... It is this potential *predictive force* which gives scientific explanation its importance: Only to the extent that we are able to explain empirical facts can we attain the major objective of scientific research, namely not merely to record the phenomena of our experience, but to learn from them, by basing upon them theoretical *generalizations* which enable us to *anticipate* new occurrences and to control, at least to some extent, the changes in our environment" (p.154). (WiKi)
Hempel, C.G. & Oppenheim, P. (1948). "Studies in the Logic of Explanation." Philosophy of Science, XV, pp.135-175.

The logical problems involved in the explanation of the process of explanation had been a hot topic in the coffee houses of the famous Viennese time.



The hermeneutics circle
Such structures are also known as hermeneutical circles between pre-knowledge and knowledge.

"The hermeneutic circle describes the process of understanding a text hermeneutically. It refers to the idea that one's understanding of the text as a whole is established by reference to the individual parts and one's understanding of each individual part by reference to the whole. Neither the whole text nor any individual part can be understood without reference to one another, and hence, it is a circle." WiKi

A diamond interpretation can be given to the concept of *explication* and the concept of the *hermeneutic circle*. First, the metaphor of circle (or even feedback loop) shall be transformed into polycontextural chiasms, second chiasms shall be transformed into diamonds.

1.4. Diamond modeling of hermeneutics

1.4.1. Circle

Well known is Martin Heidegger's metaphorics of the circle: "Im Wirbel des Denkens".
One of the famous opposites of the Wirbel is the "Strudel", a multi-layered Viennese cake, a favorite of Rudolf Carnap.

„Die Idee der Logik selbst löst sich auf im Wirbel eines ursprünglicheren Fragens." (Martin Heidegger, Was ist Metaphysik., 1929, S. 37).

Despite the circularity of the hermeneutic concept of understanding there is still a chance for a conflict about the beginning of the circle. Should it be the whole or the part?
The metaphor of the "Wirbel" is not offering any chances to grasp *at once* the part and the whole as heterachically organized components of the circular concept of understanding. In fact, the metaphor "Wirbel" easily hints to a hierarchy towards a final ground (Abgrund, Urgrund, Ungrund).
Hermeneutics is denying the possibility of formalization and thus is depending on the linearity of notional analysis of all sorts.

1.4.2. Chiasm

Hermeneutic circle = [Text, Understanding, Whole, Part]
Even if the question of the beginning of the chiastic interdependency of the whole and parts of the process of hermeneutical understanding has a resolution, the figure produced is still uni-directional albeit it can be read explicitly in both directions: first part then whole and then first whole then part. With that, the general circularity is getting a differentiated structuration which lacks circularity as "Wirbel des Denkens".

1.4.3. Diamond

Diamonds are implementing both directions of understanding at once. Hence, the metaphor is no longer given with a non-ambiguous and identifiable figure. It seems, that only the diamond approach resists any reduction to a more classical paradigm.

Obviously, all three constructions, *Circle*, *Chiasm*, *Diamond* would disappoint Rudolf Carnap and provoke a final destruction of the whole project of diamondization.
Unfortunately, in between, mathematical logic itself has run into troubles.

1.5. Diamond explication of natural numbers

Chiastified circular strategies like *explanation* and *hermeneutical* circles might add to the understanding of the diamond strategic introduction of natural numbers.

$$\begin{array}{ccc} & A \xleftarrow{h} A & \\ g \swarrow & \uparrow f \quad \uparrow f & \\ \begin{bmatrix} 1 \xleftarrow{0'} N \xleftarrow{s'} N \\ 1 \xrightarrow{0} N \xrightarrow{S} N \end{bmatrix} & \text{with} & \begin{bmatrix} 1 \xleftarrow{0'} N \xleftarrow{s'} N \\ 1 \xrightarrow{0} N \xrightarrow{S} N \end{bmatrix} = \begin{bmatrix} 1 \xleftarrow{0'} N \xleftarrow{s'} N \\ \updownarrow \qquad \updownarrow \text{diff} \quad \updownarrow \\ 1 \xrightarrow{0} N \xrightarrow{S} N \end{bmatrix} \\ g \searrow & \downarrow f \quad \downarrow f & \\ & A \xrightarrow{h} A & \end{array}$$

A proper analysis of the diamond construction of the antidromic “movements” of natural numbers based on the difference relation in diamonds is given by a modeling of it in an explicit diamond with its chiastic properties. What was at first a diamondal *difference* operation is now involved into the full relational conceptionality of diamonds.

$$\text{Diam}^{(2,1)} = \chi\left[\text{Cat}, \text{Salt}, \text{NN}, \text{AA}\right]$$

$$= \begin{bmatrix} \text{level}_{\text{Cat}} : \left[N \cong N \longrightarrow N' \cong N'\right] \\ \downarrow \quad \updownarrow \; x \; \updownarrow \quad \uparrow \\ \text{level}_{\text{Salt}} : \left[A' \cong A' \longleftarrow A \cong A\right] \end{bmatrix}$$

1.6. Initial and final objects in diamonds

2. Kenomic sameness

2.1. Semiotic identity

Sign(A) eq sign(B): type(A) id type(B) iff for all token: token(A) id token(B)

2.2. Monomorphic equivalence

Two kenomic patterns are equal iff they are decomposable into the same monomorphies.
Two kenomic patterns are equal iff they have the same monomorphic decomposition.

2.3. Chiastic sameness

chiasm(typeA, typeB, tokeA, tokenB)

2.4. Diamond strangeness

diam(cat(A, B), salt(a, b))

Notes

1 http://www.thinkartlab.com/CCR/2008/08/web-mobility.html

2 http://www.thinkartlab.com/pkl/media/Equality/Equality.html

Diamond Web2.0?

How social is social networking?

Rudolf Kaehr Dr.[@]

ThinkArt Lab

zurück Seite 4

Abstract

The Web2.0' s understanding of societal activities is conceptually based on a non-societal model of hierarchical, mono-centered and solipsistic orientation. Sociologically, it is entangled into the dichotomic oppositions of the singular/plural of private/public and the conflicting overlapping of the public/state distinction.
A first step to diamondize Web2.0 approaches has not to go into the basics of transforming Web2.0 into the dynamics of a semantic Web3.0, it would be a reasonable transitional step, first, to ***diamondize*** *the existing technologies and user interfaces of Web2.0. This could happen along the leading metaphors of the Web2.0:* ***social****,* ***global****,* ***mobile*** *in connection to* ***interactional*** *and* ***reflectional****.*

1. Towards a Diamond Web2.0?

The sketched ideas for a diamondization of Web2.0 technologies is taking the slightly futuristic position to propose Diamond Web2.0 from the position of the insights into the emerging Web3.0 and contrasting it from the more traditional concepts and technologies of the Web1.0. In this sense, Diamond Web2.0 could be understood as a transitional concept to a social Web3.0, hence as a Web2.5.

With Chang, I try to avoid the interesting discussion about the technological legitimacy of such a thing as Web2.0. There are enough arguments pro and contra, especially from the standpoint of Web1.0, to deny the technological relevancy of the term Web2.0. But also from the position of an emerging semantic Web, i.e. Web3.0, Web2.0 is lacking significant conceptual changes to challenge the well known concepts and technologies of Web1.0. On the other hand, it seems, that enough new features emerged, at least in the general *use* of the Web, i.e. Web services, to put it together as Web2.0.

It seems that such a change in optics, towards *conceptual* and *paradigmatic* analysis in contrast to a surface-structure oriented approach, is a necessary step to wake up from an enthusiastic but unrealistic dream.

Recognized traps

"However, he believes there is a trap, which he is now calling the Facebook Trap. *It's not clear what Facebook is organizing or what specific purpose of form of economic value it is supporting or creating, other than personal profiles and page views against which to match contextual advertising. This*

extends into the point noted above, that by and large with current developments on the Web we are still using 1.0-ish economic and business logic. While it's true that there are more and more conversations searching for conceptual pathways and answers at edge-dwelling gatherings like Supernova*, it's also true that the significant applications and services on the Web to date are still primarily concerned with monetization and economic performance based on existing business logic."*
Umair Haque[1]

Ten Challenges for the Network Age?

Such a concept of the Network Age, as proposed by Kevin Werbach, is focused on the functioning of the Network only, hence excluding any possible subjective activity of the users of the Network. The user's activity is reduced in such a model of the Network Age to rational behavior, supported by the Nanni function of the Network, hence the user has to be challenged, especially, by the conditions 2 and 5 of the *Ten Challenges of Network Age*[2]:

2. Choice and Coordination
(Users are in control, but don't they need guides to avoid being overwhelmed?)
5. Behavior and rationality
(People don't always act according to models of rationality, especially when connected to one another, but our economic framework assumes they do.)

Social networking in the Age of the Network is reduced to behave correctly in the public domain, accepting the rules of the state and to suppress any desires to intervene, creatively and self-organized, into the pretended holy monetarian harmony as the ethics of the network providers.

Little typology

A little *typology* of the conceptual development of the Web is sketched. The idea behind this typology is to reflect on the degree and structure of the *involvement* of the user (subject, reflexivity) into its usage of the Web. It is also proposed that in contrast to the main stream opinion, the difference between *surface*- and *deep-structure* of the Internet and its form of usage, is of great relevancy. Obviously, the pragmatical or praxeological terminology of *use*, *usage* and *user* is applied, and in a further step it shall be deconstructed against its singularity. Such a step will be necessary to sketch the Web4.0 paradigm.

It is obvious that this little typology is not proposing a predictional or *futurological* typology or design in the sense of Spivak and Kurzweil, but nothing more than a conceptual offer for possible orientations in what is and what might emerge in the future of the Web.

1. the *information* tools using user, Web1.0,
2. the *media* participant user, Web2.0,
3. the *knowledge* producing and sharing user, Web3.0,
4. the *paradigm* co-creating (*interacting* and *intervening)* user, Web4.0.

1.1. Web1.0 : Information distribution

Like with the use of the Internet, transitions from the Web1.0 to the Web2.0 are on the way to be realized. The Web1.0 was concerned with the distribution of information. Information had to be accessible to be used by a user, which in no way was ever involved into this kind of usage. The use of information in the Web1.0 is, at first, not depending on the Internet. It had been realized by other technologies of net distribution, too. The Web1.0 is a logical consequence of information distribution. Such technologies of information distribution, is based on Web0.0,

which was simply realized as distribution, from signals to files, without user interfaces, like browsers, but command shells. On the way of the development of Web1.0 from Web0.0, a lot of work has been done to establish a proper deep-structure of communication, like protokolls, command languages, etc.

Information based communication developed multimedia as a differentiation of the abstract concept of information into its components (sound, graphic, video).

The Web1.0 user is used to this established comfort and has no access to it, anymore. This are welcomed consequences of the developments of user friendly interfaces.

This situation is radically changed for the Web2.0 scenario. Here, information is primary only on the surface-structure, on the deep-structure it is *distribution* as social electronic networking.

1.2. Web2.0: Social media participation

The Web2.0 as a social networking medium seems to include the subjectivity of the users into the creation of the social domain of Web2.0. Nevertheless the users involvement is still determined by the *what* of his/her content which is added to the sociality of the Web2.0. But this *what* is celebrated up to the highest exhibitionism and voyeurism of the subject by means of exhibiting information of all kind by all media. The exclusion of the subjectivity of the user is best demonstrated by the fact of the exclusivity of the "owners" of the involved Web2.0 technologies, like Google, Facebook, Myspace, etc., and their real or fictional richness. Social interaction is reduced to socializing information on the base of an exploitative non-social business model and technology.

Web1.0 was defined by information distribution, Web2.0 might by considered as information consumption. Information consumption appears as content (data) presentation on a platform of exchange. Instead of personal browsers as destinations, the platform of social networking acts like the marketplace of data exchange.

Because the Web as such is seen as *“massive, distributed, decentralized"* (Henle), these aspects of the surface-structure of the Web have to be seen as the main parameters of the play.
Complementarily, the surface-structure of the Web is finally, at the end, determining the whole game. This will be changed with the Web3.0.

Transitional tendencies are emerging towards distributed cooperative computing in science, technology, education and business as a beginning of *knowledge* production and sharing.

1.3. Web3.0: Knowledge Interactionality and reflectionality

The Web3.0 which will be a semantic/pragmatic Web, that will be determined by an interactive involvement of the user, i.e., by the *how* of the usage by the user. That will change the identity of the user by using the Web3.0. The *what* of the content in

the Web3.0 will be secondarily to the *how*. Hence the user will interact with other users and user groups to produce new shared knowledge and reflect the methods and technologies of this kind of knowledge production by developing situational methods, tools and strategies to handle the new kind of knowledge production.

Because the shared knowledge is not simply distributed over a platform but interactively co-created between users, the user as a user is involved into the definition of Web3.0 activities. On the other side, there is no isolated Web3.0 user, the Web3.0 user is defined in the process of using Web3.0 procedures to produce knowledge. All this happens under the umbrella of an accepted common paradigm of interaction. This paradigm as such is not yet touched, i.e. transformed by the activities of the Web3.0 users. Such a reflectional and interventional activity will be a main feature of the Web4.0.

Also there is a long way to go to realize the paradigm of the Web3.0, it is not the final solution for an emancipation of the user of information technology from the suppression by the formation of the information age, i.e. of digitalism.
As a step between Web3.0 and Web4.0 I sketched the idea of a *“Dynamic Semantic Web".*

Because information is no longer the main topic of the Web3.0 paradigm, the whole strategy of *controlling* information will become obsolete.

Today we still can be killed because of mentioning a forbidden information, i.e., a content in the sense of the Web1.0 and its socialization by the Web2.0.
The user will become aware about the absurdity of ownership of social networking in the sense of Web2.0.

1.4. Web4.0: Paradigm Co-Creation: Interventionality and interlocutionality

To accept common hierarchic numbering, a Web4.0 would have to be conceived as a next step to realize Awareness Computation.
Awareness Computation would include subjectivity into the paradigm of computation as the *creativity* of the user. The creativity of the user is realized as *interactivity* and *reflectivity* towards the *paradigm* of computation. Creative users will be able to change the structure of the *how* of the usage of the Web. Hence, they are not only aware of the difference between the *what (*content, media) and the *how* (methodology, paradigm). They will be enforced to *intervene*, i.e., to change and transform the structure of the what- and how-game.

Intervention is possible as an interplay of *interaction* and *reflection* towards the communicational system, i.e. the surface-/deep-structure of the Web.

- For the Web2.0 the meaning of "shared knowledge" is to share information as data (about oneself).
- For the Web3.0 user to share knowledge means to produce together with other users knowledge that is conceptionally independent of the subjectivity of the producers involved. It is common knowledge, like team work; and as such subject-independent.

- For the Web4.0 user, common knowledge is depending on the subjective standpoint of the users involved. Its value is subjective objectivity, involving the subject into its knowledge system as the standpoint of the interpretation of the actions, knowledge and contexture. Knowledge and subjectivity are becoming complementary correlated. Hence, transforming the structure of the involved subjectivity of the users. Therefore, there is no such thing corresponding the Web4.0 model of knowledge as a subject-independent, neutral, universal and natural (objective) knowledge system and its innocent users.

But also intervention is realized by specific rules. These rules are not first-order but third-order rules of the interplay of reflection and interaction. Interventional rules are not pre-given, neither, they have a history and they can be changed by a forth-order interaction, called interlocution[3].
Sketched all that, a localization of the trends of the emerging Web2.0 should become visible enough to allow to propose further ideas to a Diamond Web2.0.

1.5. The story doesn't end here...

One of the most striking possibilities in the move towards an emancipation from information-based technology is the idea of a *morphogrammatic* paradigm of interactivity. Morphograms are introduced as the inscriptions of the patterns of the behavior of an agent or groups of agents. Such units of a user's behavior are thus not informational or semantic units but morphograms as the patterns of the pragmatics of the behavior of the user.
This is not to confuse with statistical pragmatics of user profiles, which are based on information and preferences.

Different cultural traditions

From the very popular video *"The Machine is us/ing Us"* of Michael Wesch towards "mediated culture, seeking to merge the ideas of Media Ecology and Cultural Anthropology" we can learn some lessons about cultural differences. The lack of any awareness about such differences is leading to serious misunderstandings about the character of the Web and its underlying principles.

"Text is linear"
This starts with the common Anglo-American understanding of the notion *text*. A text is a linear sequence of sentences, or more formal, of signs and marks. This notion of text is a kind of "plain tex".

The Web in contrast is not linear, it has a link structure between texts, i.e. sentences and nouns and other linguistic entities. Hence it is called hyper-text or digital text.
It insists on the difference of information and data. Information belongs to the Web 1.0, data to the Web 2.0.

The video tells us:

"Text is uni-linear when written on paper"
"Digital text is different.
"Digital text is more flexible."
"Digital text is moveable."

"Digital text is above all ... hyper."
"Digital hypertext is above all... hypertext can link..."
"Digital text can do it better. Form and content can be separated."
"XML was designed to do just that."
[...]
"Web 2.0 is linking people."
Full text transcription at: http://mediatedcultures.net/ksudigg/?p=78

From a European point of view or simply from a more text-aware position, especially from what we learned from the French structuralism and deconstructivism, a text is a highly complex multi-layered, ambiguous and polysemic structure of mutual links between everything that constitutes a text. Not only its words and sentences, its syntax, semantics and pragmatics, its stratagems and intertextuality, but also its positions, environments, i.e its topology.

Hence, a text is not conceived as a syntactic structure with its simple uni-linearity but as a cultural event which is surpassing such simplicistic semiotic and linguistic distinctions like syntactics, semantics and pragmatics, etc.

Hence, the French linguistic, semiological, hermeneutical and grammatological understanding of texts is totally different from the text understanding by the Web2.0 promoters and computer scientists.

In a grammatological sense it is non-sense to say *"Text is uni-linear when written on paper"*.

First, text is always in a written form. But again, the concept of writing is representing more than spoken language and is not restricted to the linearity of spoken language nor to the hierarchy of spoken over written language.
Second, it is the spoken language which is uni-linear and not the text. Unilinear written text is understood as a representation of spoken language.

The text model of XML is the linear succession of the spoken language, formalized in formal systems, which are the basis for their text and document manipulation and programming systems (XML, SGML).

There is nothing more uni-linear, atomistic and hierarchic than formal systems like XML.
To see that we have to study the deep-structure of the Web activities and not being overwhelmed by the complexity of the surface-structure and its data distribution mediated by a platform of communication.

The difference between HTML and XML might be fundamental for the distinction between content (data) and form but both are strictly hierarchic and monotonic (unique).

More explicit, XML is characterized by following principles:
First: *Markup is separate from content.*
Second: *A document is classified as a member of a type by dividing its parts, or elements, into a hierarchical structure known as a tree.* (Daconta)

Hence, the slogan *“Everything is connected”* is blind for the fact that in hierarchic systems the order of connections can not be freely changed. No knot in a XML tree becomes the root and the root is not an element of the set of knots. This happens for the special case only if there is one and only one knot and this knot is identical with the root and vice versa, i.e. for a 1-element tree. Therefore, connections, if possible, are principally in a hierarchic order. The argument, that two tree can be connected between the knots of one tree to the root of the other tree, denies the fact that the composition of two trees results in a new tree.

Neither is a tag a text or is a text a tag taken in its principle definitions and functions. Obviously, a tag can be addressed *as* a text and a text can be addressed *as* a tag but XML is not offering a mechanism to realize the *as-abstraction* necessary to thematized a text as a tag and a tag as a text.

Because of such a narrow data structure all kind of conflicts are pre-defined. An interesting approach to ease restrictions, at least conceptually, is given with multi-colored trees. But such a strategy is not touching the mathematical structure of the principle hierarchy of XML.
http://www.research.att.com/~divesh/papers/jlssw2004-mct.pdf

On the surface, digital text looks highly tabular and non-hierarchic.
If we ask *how,* i.e. with what methods, tools and concepts, such a linked structure is realized, the answer is *"XML was designed to do just that.”*

How is XML defined?

"The Extensible Markup Language (XML) is a general-purpose specification for creating custom markup languages. It is classified as an extensible language because it allows its users to define their own elements. Its primary purpose is to facilitate the sharing of structured data across different information systems, particularly via the Internet, and it is used both to encode documents and to serialize data. [...]
serialization is the process of saving an object [...] or to transmit it [...] in binary form.” (WiKi)

Lack of surface and deep-structure
Hypertexts are based on the linearity and hierarchy of XML and others.
Consequences for society: author, identity, ...
It is not asked, which anthropological concept is leading and misleading just now the Web 2.0 achievements.
Since the French anthropologists we learned to study the deep-structure of social systems. Web anthropology and ethnology a la Michael Wesch seems to be lost in the surface-structure of Web activities.

"Web 2.0 is linking people.”
This is a widely accepted statement. It is a kind of a *credo* to separate the new wave from the dumb Web 1.0 and its information processing paradigm.
Whatever it means, the question is, again, distinguishing surface from deep-structure, as *what* and *how* are people understood by this kind of linking?

Am I linked with other people if I'm addressed as an address, say a phone number? If my mobile phone rings what happens? I think, as a person, I have absolutely nothing to do with it. What is addressed is my phone number and nothing else. I might have registered this number to call me, and to call this number, via phone, Web, Email, etc, and to try to send me all kinds of digitalized data, sound, photos, videos, text, etc., is not changing the fact that this action is not linked to me personally, in contrary, it is still me who is deciding to accept or to reject this addressing action.

Hence, people are linking with people and not the Web 2.0 is linking people.
I can send as many photos, videos, texts, graphics, sounds and whatever will be possible in future to the many platforms to add content, the Web 2.0 platforms are not connecting me with any other person at all.

Until now, a Web2.0 service or platform is helping me to disseminate some data, personal or non-personal or others, globally or locally over the Web.

Web2.0 platforms are not connecting people because their deep-structure is excluding by definition any reflectional and interactional features necessary to involve subjectivity into the process of interaction and communication.

Interactivity
People interact. They tag... (O'Reilly)
Hence again, there is no interaction with people. People are using an editor to add "content". Which is not semantic at all but a second-level syntax additional to the first level syntax, telling my program a syntactical difference.

A social platform is not connecting people but helping people to add content to a platform.
Such content might lead to connections between people in whatever form or not.

"The Machine is us/ing Us" by Mike Wesch*:*
http://tw.youtube.com/watch?v=6gmP4nk0EOE

A funny introduction to the Web 3.0 from the view-point of a Web 4.0 robot::
http://tw.youtube.com/watch?v=7pe79kPh3hw

2. Diamond Strategies

Diamond Strategies are not presuming identity. They are not presuming that the same syntactical structure is transporting the same meaning. Neither that meaning has to be transported by a transport system. If we would need identity we would have the pleasure to construct it.

If a give a list of my preferences: Jazz, HipHop, Classic, etc. I'm not presuming that those words have the same meaning for someone else. Until now, this well known difference and its mismatch producing consequences, is solved by differentation. I differentiate my interest by a tree and by moving through a taxonomy tree of labels. At the end, I can give an individual item, which is characterizing my concrete interest. This will be a name of a band, the name and time of the band, then the name, time and location of the performance of the band. But such a differentiation is not yet at the end of the conceptual tree.

Many other differentiations are possible; backstage, in front or at the back of the venue; before or after the police intervention, etc. And at the end of all those efforts, there is still not much achieved! Because these efforts of differentiation are focused on the event and not on the participant. But it is exactly the participant, which is having those interests.

The game of differentiations goes on. From the objective reality to the subjective experiences. Here again, a catalogue of differentiations can be established. It will end up as a hierarchical tree of distinctions, and on top my identity, my ego or my self. The chain of distinctions seems to end here. Obviously, especially in a social network, I'm not the only person with such an identical self on top of the tree. Everybody else will be in the same situation. As far as we are all the same.

A similar game has to be played with the *preferences*. What does it mean, 'I like" or "I hate" this and that. And so on!

From a philosophical point of view, this unmasks itself as a miserable situation. Why should we communicate if we are all, at the end, the same? Fortunately, there is nonetheless much space left on the ladders where we have the chance to be and to behave different. Hence, communication happens without touching my identity, my self on top of the ladder, the hierarchic pyramid. In other words, each ego (self, identity) remains the same. But how can we know it? There is no differentiation left in the abstractness of an internal ego where we could agree or differ.

In this sense of egological individualism, there is no such experience as social networking at all. The societal event of social networking with Web2.0 is a solitaire mental construction of the users or participants. Nevertheless, it seems that there are no strategies developed to surpass such individualistic waves.

First, paradoxically, there exists no generally accepted sociological theory of societal behavior in a society. What exists are all kind of different competing approaches to a theory of society. This lack of theory is mirrored by the different but still seminal approaches to Multi-Agent-Systems (MAS) of societal computing.

Second, there are no strategies on the Web2.0 market, which are developing a societal interface for Web2.0 users. What exists are Web1.0 based scenarios of usage and a strong propaganda, which make the user believe in its sociality. To collect friends doesn't proof the contrary.

3. Interactional diamondization

Diamondization of semantic fields can happen, firstly, as a procedure of *self-explication*. Secondly, it can happen as an *online interaction* between participants of a social platform. Obviously, the platform shall offer tools to develop together with a participant the grid of diamond semantics of the topics in question.
Also this thoughts are developed along the line of social networking, like Myspace,

Facebook, etc., it applies for social networking in the sense of scientific or business projects and their need to clarify semantic fields of interests to solve complex problems.

3.1. Self-application

In the case of self-applications of the diamond strategies, the user is proposing his/her self-image with the help, not of lists and clouds of information, videos, pictures, etc., but of diamond grids of the semantic field he/she wants to promote.
Hence, the platform shall offer the technical possibility to expose the diamond format. Like it offers to list properties it has to enable diamond-like developments of semantic grids. As a simple case, diamond term-grids as separated, distributed and inter-related clouds of terms, would have to be accessible.
Show your cards without denying your complexity!

3.2. Application with others

Users of a platform can interact according the diamond strategies to present themselves and to open up contact to the addressed partner of the social network. They can give feedback to a friend with the help of diamondal answers, comments, promotions. For that, the platform shall offer the participant space to manage diamondized responses and feedback.

3.3. Interactional applications

The ideal aim of social networking would be realized with a real-time interaction between partners, playing together the diamond grid of semantic interventions.
All that can remain in the virtual sphere of social networking and shall not be turned into the business of adult dating services. A service which nevertheless could learn a lot from the diamond approach.

3.4. Conceptual backgrounds

Until now, Web2.0's organization for the self-representation of the consumer is ruled formally by lists.
Clouds of terms are a further step in dynamizing conceptual order. But they are still organized by hidden lists and by the quantification of their popularity and represented in a matrix.

The challenge of the new.
To build a list and to allow a cloud is challenging only the way of self-description and is based on memory. There are now new insights happening and nothing new to discover. Not for the actor nor for the recipient.

If society is conceived in the Web2.0 and postmodern culture as a pluri-central, complex, dynamic, etc. system (Teubner), why not representing the societal aspects of the social Web in form of polycontecturally conceived system?

Paranthesis

Web3.0 is based on semantic Web technologies. The implementation of semantics into the Web2.0 scenario is mainly based on tagging. Tagging is not a semantic but

a syntactic technique. It produces a 2-level syntax, which can simulate some weak meaning, misunderstood as semantics. Meaning is involved into reflectionality. Tagging is based on hierarchic tree structures, realized mainly by XML.

Hence, there is no chance to adequately model and implement reflexional semantics by the means of XML. The only, very first step to a solution would be an introduction of polycontexturally distributed and mediated XML systems. This has to be done at the very basic level and not as an application of methods inside the XML system.

But with all that, the whole machinery and ideology of Western computing would have to be subverted.

This parenthesis is relativizing the highly optimistic futurology of Nova Spivack and his prognosis: *The Third-Generation Web is Coming*[45].

4. Web2.0 as "social”:: Social networking

4.1. Search for sameness

“When users browse through items listed under ‘Interests’, they can choose or add anything they like, e.g. a movie, a car brand or a celebrity. They can rate these items and see the ratings given by their friends or schoolmates. Users are then recommended to make friends with people who share similar interests and backgrounds locally, rate other interests which they may also like, or join local events that they may enjoy.”

"CityIn is called "Intelligent social network" - my question is, how intelligent is it?
Web 2.0 | 2008/03/13 00:42 | Web 2.0 Asia

CityIn[6] is a new Chinese social network service that "aims to bring people together by matching their personal interests, entertainment, brands, celebrities and others." Chang

"But here comes my favorite part form Simon’s[7] PR:
We know clearly what the Chinese users need. I'm sure that CityIN is going to be the market leader, because we, the team of average age 24, have the ability to provide fresh experiences to Asian users through innovative breakthroughs.
That's the spirit, Simon! Also, what sets CityIn apart from the pack is that it's not one of those "C2C" ("Copy to China") services.” Chang [8]

To build a list and allow a cloud is challenging only the way of self-description and is using memory. There are no new insight happening and nothing new to discover. Not for the actor nor for the recipient.

What the purpose of lists and how are they managed?

“When users browse through items listed under ‘Interests’, they can choose or add anything they like, e.g. a movie, a car brand or a celebrity. They can rate these items and see the ratings given by their friends or schoolmates. Users are then recommended to make friends with people who share similar interests and backgrounds locally, rate other interests which they may also like, or join local events that they may enjoy.” (Simon Chan [9])

So CityIn follows textbook ways of connecting people and objects in the so-called "*object-centric* (as opposed to ego-centric) social networks", which I believe can be summarized:

* Other people who did this include... (e.g. Other people who bookmarked this website are:)
* People who did this also did these... (e.g. People who bought this item also bought:)

But the big question I'd like to throw is, how much of intelligent recommendation technologies are being used for CityIn to come up with those "other people" and "other items" lists?

The so-called "dopplegangers" carry significant meaning only when they share some very unique things with me, not generic stuff like Starbucks. But then, if you found a guy who also liked a '70s album that's known only to two people in the entire world, would you be delighted enough to send a private message to him? I for one wouldn't. (Well, If she's a pretty girl, that's a completely different story of course).

I think the concept of CityIn is quite nice (the best of Lovemarks and Amazon book recommendation, perhaps?), but I'd like to first see how much of personalization technologies the company brings to the table. Because I know that personalized recommendations take either huge amount of data or a very sophisticated, intelligent technology - or actually more likely, both. CityIn might have those - if you know, please shed some light here .[10]

To socialize on the base of Web2.0, sameness means to find ones doppelgänger. Is this enough? Why not to search for a clone of oneself? Or asking the morning mirror?
Westerners are always learning that Chinese culture is basically social in contrast to the Western individualism. Does this apply to the concepts of Chinese social networking platforms?

If society is conceived in the Web2.0 and postmodern culture as a pluri-central, complex, dynamic, etc. system (Teubner), why not representing the societal aspects of the social web in form of a *polycontexturally* designed system?

The question remains, how are these differences catered by CityIN?
Does similarity mean sameness? What kind of similarity and differences are possible if interests are defined locally?

The challenge of the new

Is it a reasonable business model to believe that sameness in age will guarantee the necessary knowledge to match the users, as CityIn proclaims with its believe sentence: *"the team of average age 24, have the ability to provide fresh experiences to Asian users"*?

Independent of the fancy ageism, the question about the sociality of such an approach remains. Is it not contradicting and conflicting the interactional maxim of a *social* network to impose the structure of the service onto its users? Should a social network paradigm to be social not encourage its users to co-design its interface and catalogue of services? Wouldn't such an interactive approach, which involves the user from the very beginning and at a structural level, not be the best guarantee for success? Wouldn't such an approach not enable acceptance and success beyond any silly fixations on age and illusional experiences?

From the viewpoint of a theory of social communication, such an age-oriented approach is victim of the principally non-communicative ego-founded interaction of Ego2Ego; in such a case, it has the form of the illusion of Super-Ego2Ego. Ideologically, it is a kind of hedonistic indoctrination disguised in the overwhelming opportunities given by the surface-phenomenon of free communication.

With all that I'm not criticizing the *elan* and *esprit* of the new entrepreneurial spirit.

My interest is primarily to uncover hidden restrictions of the common approaches, which are on the way of sabotaging inherently the aims of the social networking project.

Because the main interests of the Web community is not focused on possible limitations of the deep-structure of the Web, an awareness into such restrictions is not easily accessible. Insights into the general conceptional limitations of the deep-structure of the Web and critical reflections on its popular philosophy of social networking are not specially welcomed by the Web community.

Hence, the proposed ideas try to give some hints to a more semantic Web2.0, augmented with a new organization of interactions, introduced by Diamond Strategies.

4.2. The opposite of sameness

"He said, *“For instance, what a student in Guangzhou prefers may be* exactly opposite *to that of a student in Beijing, and in CityIN we try our best to cater for different preferences”*."

CityIn: A Lifestyle Social Networks, Written by Tangos[11] on March 5, 2008

Until now, Web2.0’s organization for the self-representation of the consumer is ruled formally and in general by *lists*. *Clouds* of terms are a further step in dynamizing conceptual order. But they are still organized by hidden lists and by the quantification of their popularity and represented in a matrix.

How can this promise, to "*try our best to cater for different preferences*”, be realized?
First, I shall recall some statements about different kinds of opposition, which might be of help to *cater* a broad range *of differences* in the semantic field.
Second, the play with different kinds of oppositions will be connected with the orthogonal differentiations of the Diamond Strategies.

4.3. Modi of oppositions

"It can thus be seen that in studying the particularity of any kind of contradiction--the contradiction in each form of motion of matter, the contradiction in each of its processes of development, the two aspects of the contradiction in each process, the contradiction at each stage of a process, and the two aspects of the contradiction at each stage--in studying the particularity of all these contradictions, we must not be subjective and arbitrary but must analyse it concretely. Without concrete analysis there can be no knowledge of the particularity of any contradiction.”

"This holds true not only for nature but also for social and ideological phenomena. Every form of society, every form of ideology, has its own particular contradiction and particular essence.” Mao Tse-Tung

Methods to select sameness of interests are well known, albeit restricted to the lexicology, terminology, graphic styles of Web presentation, fashion trends in typology, and similar. But identical wording in a lexical catalogue doesn’t necessarily have the same meaning; neither in pictures, graphics or sounds. Hence, how can we give more reliable information about one's interests? Instead of filling the catalog of preferences with further entries, a more qualitative explication could be desired, which might be realized with the help of *contrasting* methods.

It isn't easy to define what it means that someone's preferences might be *"exactly opposite"* of someone else, especially if different cultural contexts, based on local, educational, ideological, etc. differences, in multi-cultural and pluri-language situations, are involved. Hence, a little catalogue of differentiation and separation is considered in the following steps. This catalogue, with its definitions, might help, as a first step towards a more diamondized social networking, to interpret better the entries of self-promotion within the existing lists and clouds, i.e. taxonomy and folkonomy.

4.3.1. Negation

The opposite of an interest, defined as a negation, is well realized in language by the linguistic and logical operation of negation. Negation is producing a separation between an interest and its environment. But this separation happens only in a non-specified manner. If I say, *"I don't like X"*, the *non-X* is still undetermined. It can represent anything except of X. With this method of separation, again, a large list of distinctions have to be entered in the box of what I don't like. The presupposition is, that there is no additional information about the context of the negation. In a concrete case, the context might be restricted, say to music, but music, again, is an open field in itself.
But even in this simple case, negation is, in real-world applications, not universally defined. The operation of negation is language depended; and logician are treating negation differently, in Western and Chinese cultures.
On the base of logical negation, simple contra-dictions are arising, which quickly are paralyzing social interaction and reflection in networking.

4.3.2. Rejection

Instead of only denying by negating something, e.g., *I don't like X*, rejection is a stronger form of separation. Rejection is not accepting full alternatives of pairs of preferences. The rejection takes the form: *"I like neither X nor Y nor...nor Z."*
Rejection has, at least in a polycontextural understanding, in contrast to negation, also an *acceptive* function; it rejects a full alternative in favour of the acceptance of a different contextural possibility. Thus, *"I reject X, Y, Z of contexture C but accept in the same turn contexture D."*
In other words, if the truth-conditions of a sentence are rejected, i.e. the sentence is declared as neither true nor false, the *significance* of the truth-conditions is rejected. The sentence might have a logical meaning under a different significance. Hence, it might be of no significance if someone likes something or the opposite of it, because another context might be preferred as being significant.

4.3.3. Dualization

A good method to develop a semantic map of interests is given by dualization. A dualization of a content is producing a kind of a mirror of the content.

During the cold war, only blindness into the paradigmatic duality of both sides, could support propaganda and hate. If one said, from a philosophical point of view, "*first matter, then spirit",* it was the exact dual opposite to the other paradigm *"first spirit and then matter"*. Or more actually, "*first comes the ego, then community",* dually opposed to, "*first comes community, then individuality."*
Such an insight into mirror-worlds, where both sides are of equal value, can help

orientation in complex situations.
It is supposed that social networking is helping to surpass such restrictions of the paradigm of *first* and *second* in keeping the duality in the right balance.

4.3.4. Polarity

Often, between opposites their is a strong tension of polarity. Instead of denying or fearing such tensions, it is helpful to use it to organize the semantic field of polarities. It might be interesting to develop some kind of a network of polar opposites instead of a polarized hierarchy of tensions.

4.3.5. Antagonism

Struggles between opposites can appear as a kind of a dynamic development of polarities over a common history.

4.3.6. Complementarity

Complementarity is not simply a way of being attracted by the opposite but more an organizational tool, which reflects the fact of the social I-Thou-difference of observation, participation and interaction. That is, interaction in social networking is guided by the notion of complementarity of autonomous participants. Without such a guidance, it is easy to reduce interaction to identification as it happens with the common search for sameness of interests.

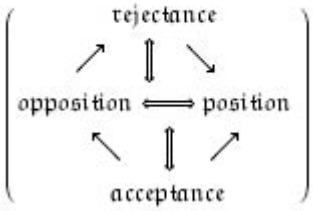
4.4. Diamondization of Opposites

"Qualitatively different contradictions can only be resolved by qualitatively different methods. ... Some contradictions are characterized by open antagonism, others are not. In accordance with the concrete development of things, some contradictions which were originally non-antagonistic develop into antagonistic ones, while others which were originally antagonistic develop into non-antagonistic ones."
(Mao Tse-Tung[12])

Applying the differences in the notion of opposition as explored above, further concretizations of orientations and interactions are naturally accessible.
A semantic network, which is explaining our interests, has not to be restricted neither to a list of singular terms nor to a list of oppositions.
First, chains of oppositions of different kind can be constructed.
Second, a new kind of differentiation is introduced: the neither-nor-rejection and the both-at-once-acceptance.

As a result, the *diamond form* of semantic explorations is introduced.
Hence, a semantic item, like an interest, is not only stated positively as a position or in opposition to the positioned item but in rejection and acception of the whole opposition, too. That is, a rejection is opening up a semantic place, which is neither the position nor the opposition of the terms. An acception is accepting both at once, the position and the opposition, hence offering such a simultaneity of oppositional terms, a semantic place. Like between position and opposition, between acception and rejection a relationship of difference holds. A diamond form entails 6 relations between its terms, i.e. 2 different difference-relations, and additionally, 4 inter-relations, between position and (acception and rejection) and between opposition and (acception and rejection).

$$\text{Diamond}(\text{pos}, \text{opp}, \text{rej}, \text{acc}) =$$



Hence, the unit of a diamond -oriented semantic representation, which is neither ego- nor object-oriented, is not a single identical, mono- or polysemic item, but a 4-fold structuration of the semantic fields.[13]

5. Web2.0 as "global" :: World-models

5.1. Social networking in a polycontextural world

Global social networking is hegemonistic if it is presuming a single world-model (world-view, Weltanschauung), e.g., the Western type of a general understanding of the world.

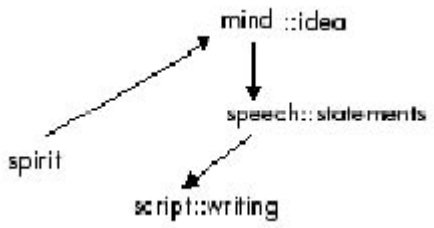
Global networking in a multi-centered world needs devices to interact between different world-models, cultures and languages. The framework of 4 world-models had been proposed at different places in much detail and different applications.
World-models can be exemplified by an analysis of the understanding of the relation between spoken and written language, i.e. the relation between speech and scripture can serve as a guideline to understand fundamental differences between cultures.

In the case of social networking the differences between the Western and the Chinese world-models shall be sketched. As proposed before, there is a fundamental asymmetry between the Western and the Chinese understanding of the relationship of the spoken and the written language systems.

The Western understanding has ideally a *one-to-one* relation between speech and scripture, combined with a dominance of the spoken over the written language. The Chinese model has a *many-to-one* relationship between spoken and written language with a fundamental priority of the writing system over the plurality of the spoken languages.
All that is very schematic and its only intention is to give a general guideline and not a profound detailed analysis.

5.2. Western world-model

The Aristotelian concept is hierarchic:
things -> soul -> spoken word -> written word.
Words spoken are symbols of affections or impressions of the soul; written words are symbols of words spoken. And just as letters are not the same for all men, sounds are not the same either, although the affections directly expressed by these indications are the same for everyone, as are the things of which these impressions are images. Aristotle



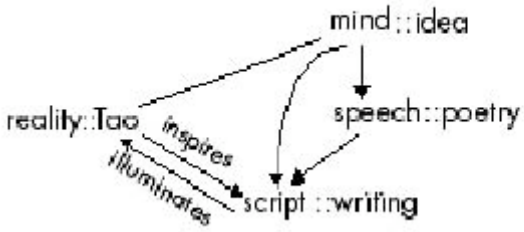
Hegel writes in his Encyclopaedia of the Philosophical Sciences, Part III: The Philosophy of Spirit (1830):
Alphabetic writing is on all accounts the more intelligent: in it the word ą the mode, peculiar to the intellect, of uttering its ideas most worthily is brought to consciousness and made an object of reflection.[14]

This one-to-one relation corresponds World-Model I. A more liberal version, involving polysemy as a basic term, is involving the many-to-one world model II into the game.

5.3. Chinese world-model

The Chinese World model can well be exemplified with the language model, i.e. the asymmetric understanding of speech and writing as it is designed by the classic poem[15]of Liu Hsieh. Such language models are mirroring the interaction between rationality and reality, which are the main constituents of world-models.

Micro-structure of the asymmetry
A more detailed reading of Liu Hsieh shows that the conception he describes is different in, at least, four ways:
1. it is *circular* : "The Tao inspires writing and writing illuminates the Tao.",
2. it is *co-creative*: "writing illuminates the Tao" and
3. it is *parallel*: "What in mind is idea when expressed in speech is poetry./writing to record reality"
4. it is *evocative*: "Isn't this what we are doing when dashing off writing to record reality?"



"These four properties are corresponding to the general ontology or world-view of Chinese thinking:
1. dynamism: things in the world are changing (circular, chiastic, co-creative)
2. grid and networking: things are complex and interrelated (parallelism, concurrency).
3. holism: situational, all parts have to be considered which are constituting a pattern.
4. interactional/reflectional: the text involves a reader who is addressed in a persuasive, evocative mode.
But it is also self-referential: "what we are doing?" [...]

As a result we can resume that the Chinese model of language is containing the classic Western model as a part of its complexity, and it seems that the Chinese model is more close to (post)modern scientific models of language than to its Western philosophical models."

It is surely not the job of a social networking platform to reflect all those grammatological differences between Western and Chinese culture. Because

Chinese language is offering more possibilities of differentiation based on its writing system, more concrete formalizations of social interactions should be realizable, hence augmenting the richness of differentiation of a social platform. But to deny such chances, would result, not only in unnessecary misunderstandings and mismatches by crafting people together, but also it would produce unneccessary restrictions in the development of Web2.0.

5.4. On Contradictions

The examples for contradiction are: *polarity*, *opposite*, *antagonism*, *struggle*, etc. and *logical* contradiction was only a part of it.

"Contradiction and struggle are universal and absolute, but the methods of resolving contradictions, that is, the forms of struggle, differ according to the differences in the nature of the contradictions. Some contradictions are characterized by open antagonism and others are not. In accordance with the concrete development of things, some contradictions, which were originally non-antagonistic, develop into antagonistic ones, while others which were originally antagonistic develop into non-antagonistic ones." (Mao[16]) "On Contradiction" (August 1937), Selected Works, Vol. I, p 344.

Mao's explanation is not easy to accept for non-dialecticians. First for Western philosophy and science there are no contradiction in the universe at all. Second, Mao's definition is in itself contradictory. If contradictions are "universal and absolute", how do we have to understand the "but"? And the "absolute and universal" is changing all the time? Contradiction as a self-referential term, but not in Aristotelian logic. Neither in paraconsistent logics.

Then I learnt that the Chinese ideogram for contradiction, 矛盾, has absolutely nothing to do with the latin *dictio* and contra-dictio (speech and contra-speech). But about *spear* (矛)+*shield* (盾). Later I was told that there are not only two fighters with their spear+shield in a fighting position, but that the ideogram goes back to the hieroglyphs for *sun* and *moon*.

Not only that we are far away from any phono-logical terms of contradicting and contradiction with its logos-based duality of true and false, the structure of a fight between two fighters is not dual but 4-fold: 2 positions with spear+shield, i.e. in fact, spear vs. shield + shield vs spear.

Social networking terminology is mainly Anglo-American, like the terms "*contradiction*" and "*opposite*" as used in *"catering for opposite interests".* What we can learn is that *opposite* is not *opposite*; it depends strictly on the world-model the terms belong.
Thus, a user interface for social networking shall take into account the complexity of terms like opposite and contadiction.

5.5. Web2.0 between autonomy and suppression

Web2.0 activities, especially blogging, are set into conflict between two societal oppositions, the *private/public* and the *public/state*. Hence, the notion "*public*" is entangled into two different opposing domains: the *private* and the *state; a*n opposition, *private/state*, that is artificial and contra-productive, supporting surveillance and suppression, only.

Up to now, the governments, everywhere, are not prepared to accept the functional distinction between the *public* as opposite to the private and the *public* as opposed to the state (government). Both forms of the public are put together and identified. Hence the state as a governmental system thinks to be entitled to control the *public space* in its double formation: the private/public and the state/public. Such a confusion is turning the *social* networking activity of Web2.0 movement into its opposite: into a public control and surveillance movement. With all its victims.

From a paradigmatical point of view, the main victim will be, in the long term, the controlling state itself. Because the state will become the ultimate mega-blogger and principally the main user of Web2.0 putting its servants, which are societal members of both, the public and the private, too, self-referentially into the struggles of established conflicts of the private/public/state constitution (and confusion) of society.

To perfect the function of the public sphere as institutionalized mechanism of observations of second order is a possible escape of this predicament, because it represent not only the different views in the environment, but can also function both as an operating dynamic and as an integrative mechanism of multiplex unity. But an actual autonomy is only realized, it is argued, when we not only enhance the competence of society for self-organization and discourse formation from the polycontextural viewpoint, but also transcend the Chinese tradition that viewed being together as publicity, actively develop the public sphere in the private realms, and build the unity on the basis of difference instead of identity.

"By this way this article explains how the public/private semantics reflected or leaded the changes of societal structures in the course of transformation of societal formations from polis via empire and feudalism to functional differentiated society. With this analysis of the western experiences, this article finds that the following factors are fundamental to the autonomy of society: to distinguish the different orientations of politics, administration and the public in the political; to recognize the publicity in the private; to activate the reforming dynamics and to strengthen the self-organizing ability of society by way of the public sphere as internal environment of the function systems. "[17]湯志傑(Chih-Chieh Tang)[18]

Building Autonomy through the Public Sphere,
Part I: An Examination of the Public Private Semantics and Their Related Societal Structures in the West
Part II: A Reflection about the Chinese Tradition of Political Primacy.

With the emergence of Web3.0 and Web4.0 paradigms, and its emancipation from the information paradigm and ideology of the *Information Age*, the whole surveillance system of the *Network Age* will *collapse in self-referential suffocatio*n, like the snail eating his own tail.

6. Web2.0 as "mobile":: Metamorphosis

6.1. Mobility and locality

If we restrict the contemplation on world-models to the world of *knowledge* for social networking it would be
1) *naive* to think that knowledge is independent from a world-view,
2) it would be a radical *restriction* of the aim of global *mobility* to reduced internal movements inside a single and local paradigm of established knowledge, say the

Anglo-American. Global mobility of information isn't global but restricted to mobility inside the framework of physical and informatical movements. Information is not the same as knowledge; knowledge is involved in the process of interpretation, hence including semantics, contexts and view-points of interaction. XML-based networking, with its monolitic and hierarchic structure, is conceptionally not prepared to design and manage structures and dynamics of mobility in a complex knowledge grid.

6.1.1. Agha's universal naming

Agha's new model is introducing a highly complex strict hierarchy of URLs with the assistance of meta-actors helping the brave actors, based on supressed basic-actors, of the Actor system to behave communicatively in a mobile environment.

"A naming service is in charge of providing object name uniqueness, allocation, resolution, and location transparency. Uniqueness is a critical condition for names so that objects can be uniquely found given their name. This is often accomplished using a name context. Object names should be object location-independent, so that objects can move preserving their name. A global naming context supports a universal naming space, in which context-free names are still unique. The implementation of a naming service can be centralized or distributed; distributed implementations are more fault-tolerant but create additional overhead." (Agha, Varela)
Gul A. Agha, Carlos A. Varela, Worldwide Computing Middleware
http://www-osl.cs.uiuc.edu/

The architecture of global naming is given in extenso by Agha[19]

"*Worldwide computing systems require a scalable and global naming mechanism. Moreover, the naming mechanism must facilitate object mobility; this implies that the object name should completely abstract over the location of an object, so the migration does not break existing references. Contrast this to the Web infrastructure, which users location-dependent references (URLs) therby inhibiting transparent document relocation."* (Varela)

This naming abstraction is in direct opposite to the kenomic abstraction of the identity/locality relation.
To *"completely abstract over the location of an object"* is eliminating the interrelationship between identity and locality of an object, which is basic to kenomic mobility
.
Abstraction as call-by-name, is naming. Naming is identifying an object. The process of naming happens in a context which is not part of the abstraction. Naming is a special kind of abstraction as identification, hence called is-abstraction. The is-abstraction is the fundamental abstraction of the lambda calculus.

A general concept of abstraction is thematization. Thematization is evocating an object without identifying it by naming. Hence the object shall be called *phenomenon* (Ernst Tugendhat)[20]. Thematization is enabling complex and mediated actions of naming, depending on different view-points and reflecting contexts of the phenomenon be named. Such a kind of abstraction is called as-abstraction.

6.1.2. Milner' s bigraph model

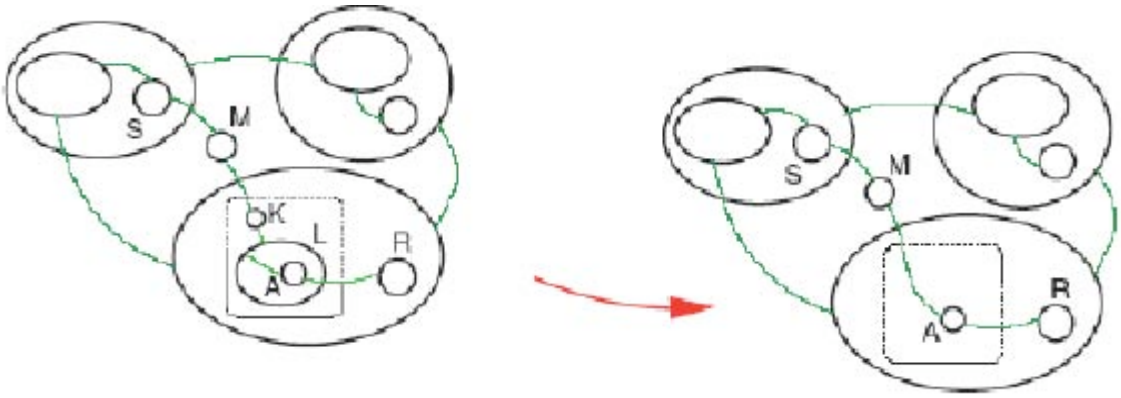
The topics of mobility and locality in a mono-contextural world-model are scientifically well analyzed, modeled and formalized by Robin Milner's *theory of bigraphs*. The concept of mobility in the bigraph model is still restricted to physical locality and physical movements of informatic objects, devices and participants.

Locality and connectivity in a communicational space are designed by Milner's bigraph model.

"Bigraphical reactive systems are a model of information flow in which both *locality* and *connectivity* are prominent. In the graphical presentation these are seen directly; in the mathematical presentation they are the subject of a theory that uses a modest amount of algebra and category theory. A bigraph may reconfigure both its locality and its connectivity. The example pictured above shows how reconfiguration is defined by reaction rules; in that case, the rule may be pictured thus:

Key metaphorics in the bigraph agent model is the key with its locking and unlocking functionality.

"The [next] picture illustrates how physical and virtual space are mixed. It represents how a message **M** might move one step closer to its destination. The three largest nodes may represent countries, or buildings, or software agents. In each case the sender **S** of the message is in one, and the receiver **R** in another. The message is en route; the link from M back to **S** indicates that the messages carries the sender's address. **M** handles a key **K** that unlocks a lock **L**, reaching an agent **A** that will forward the message to **R**; this unlocking is represented by a reaction rule that will reconfigure the pattern in the dashed box as shown, whenever and wherever this patterns arises."



Milner, Robin (2005): BIGRAPHS: A TUTORIAL, April 2005, Beijing
http://www.lix.polytechnique.fr/Labo/Robin.Milner/bigraphs-tutorial.pdf, (Robin Milner)[21]

The bigraph model of interaction seems to belong to a world model with the characteristics of: *'Everything in this world is changing but the world in which everything is changing doesn't change.'* Ubiquitous and global computing is presupposing an epistemologically uniform, homogeneous world of physical and informatical events. (Kaehr)

6.1.3. A Transitional Model

There is a transitional approach to mobility too. It takes a higly speculative stance to promote a transition from the *informatical* to the *knowledge* paradigm of mobile computing. Both, the Actor Model and the Bigraph Model, are founded, more or less, in category theory and its undelying semiotics. The transitional model tries to

surpass the conceptual and formal limits imposed by category theory and semiotics with the help of the emerging diamond model.

From a model of interactions to a design of interactionality, the transitions to be risked might be:

From the global, ubiquitous and universal Web of computation to the kenomic grid *of pluriversal contexturality containing the chiasm of global/local scenarios.*

From the locality in the Actor model of informatical events to the positionality of contextures *in the kenomic grid, positioning informatic localities.*

From the mobility in the Actor model of informatical flows between ambients (context, locality) of the same contextural (ontological, logical, semiotic) structure to a metamorphosis *between contextures, augmenting complexity/complication of contextural scenarios implementing clusters of informatical ambients and mobility.*

From the operations between actional ambients to the operationality *in polycontextural situations realized by the super-operators (identity, replication, permutation, reduction, bifurcation) placing ambient operations into the grid.*

From the connectivity of actions at a locality of message-passing, using a key to unlock a lock of an agent, to different kinds mediation *between contextures containing informatical connectivity.*

These transitions seems to record a catalogue of minimal conditions *to be fulfilled to realize interactionality/reflectionality and interventionality in such complex constellations as the emerging knowledge grid.* (Kaehr)

6.2. Mobility and translationability

A lot of work has been done in the direction of an analysis of mobility and translationality especially by the studies of global and international law.
Social networking, if it leaves the playground of innocent hedonism, is quickly involved in legally relevant constellations. Hence, we can learn, first, some insights and experiences from the problems of legal systems in a global and pluri-centered world.

"Nevertheless, the analysis of this discourse implies an additional complexity once it is operated in a system which is not only multi-juridical and multicultural, but also plurilingual. The choice of a common language accomplishes the function of facilitating the dialogue among the state agents. It is through this dialogue that different kinds of harms - economic, social, environmental or other - caused by the mutual linguistic incomprehension in international relations can be avoided.
However, its limitation is the same as that of any other natural language: it presupposes a principle of "translationability", i.e. it implies that their discourses can be translated into other languages, although each language might indicate different ways to perceive, organize and interpret the world." (Carvalho)

Challenges of translations, translatability of codes, occurs in multi-cultural societies even if they are not, in a Western sense, plurilingual. Pluri-linguality in Western cultures are strictly connected with pluri-scripturality, there is a one-to-one mapping between spoken and written language. Hence, each spoken language has its own written language. The differences between such languages is a differentiation of alphabetism. In contrast, the pluri-linguality of Chinese culture is based on a common scripture, hence between pluri-linguality and uni-scripturality there is an asymmetry, unknown in Western cultures.

"The term "to translate" *is a prefixed compound noun stemming from the Latin expression "*transducere*", with the prefix "*trans *("through") applied to the verb "*ducere*" ("to conduct"). Another parallel can be traced with the Latin verb "*transferre*", stemming from "*ferre*", "to take", "to bring". Both*

*expressions convey a meaning of "*transference*", of "transport", of "taking or bringing through", which allows a definition of translation as the trespassing of a text's "boundaries" through the conduction of its meanings to the "territory" of the expressed forms of another language."* (Carvalho)

But the transport metaphor gets quickly into trouble and looses its guiding significance. Suddendly, *transport* changes into *transformation*.

"According to James Boyd White, in the translation process "there is always gain and always loss, always transformation*; that the 'original meaning' of the text cannot be our meaning, for in restating it in our terms, in our world, no matter how faithfully or literally, we produce something new and different".* (Carvalho [22])

The term "translation", as explained above, is highly under-determined and is not telling anything about the structure of the medium or the media in which or from which something is transferred and how this could happen.

6.2.1. Category theory of translation

Morphisms (Goguen)
Translation as a transport system for identical meaning, communication of information

6.2.2. Polycontexturality theory of translation

Transjunctions and mediations, dissemination = distribution&mediation
Translation as crossing borders, transformation, interaction, interpretation

6.2.3. Diamond theory of translation

Bridging rules
Translation as interaction, interpretation as intervention

7. Web2.0 as "Interactional and reflectional"

Web 2.0 is a "Web of Services" primarily, a dimension of "Web Interaction" defined by interaction with Services. (Spivack[23])

Web2.0 is called social also because its interactions are bi-directional and enabling collaboration by the Internet, which is conceived as a platform of interchange.

Notes&References

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2 **Ten Challenges for the Network Age**
by Kevin Werbach
March 21, 2008 at 8:40 am ·

The Network Age poses ten basic challenges for all of us interested in the future of technology, media, and communications:

1. Scarcity and Abundance
   (Both are sources of value, yet they cannot coexist.)
2. Choice and Coordination
   (Users are in control, but don't they need guides to avoid being overwhelmed?)
3. Aggregation and Fragmentation
   (Network effects mean that the big players get bigger, but at the same time, markets increasingly specialize and personalize.)
4. Stability and Disruption
   (True innovation requires disruption, but disruption can be painful and costly, especially where

investment and trust are significant.)

5. Behavior and Rationality

(People don't always act according to models of rationality, especially when connected to one another, but our economic frameworks assume they do.)

6. Complexity and Simplicity

(Complex adaptive systems produce emergent behavior and growth, but simplicity is a virtue... in both life and information technology.)

7. Openness

(Everyone agrees it's good, even essential in a networked environment, but no one can say what exactly it means, or how much openness is beneficial.)

8. Governance

(How much do networks and their users need to be managed or protected, and where do those controls come from?)

9. Scale

(The local is different from the global, whether the subject is enterprise collaboration or usage patterns or cloud computing infrastructure.)

10. Sustainability

(How to build organizations and systems that endure, especially in a world whose delicate ecology is itself a form of scarcity.)

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15 **Liu Hsieh (465 - 522)**

When the mind is at work,
speech is uttered.
When speech is uttered,
writing is produced.
The Tao inspires writing
and
Writing illuminates the Tao.
What in mind is idea
when expressed in speech is poetry.
Isn't this what we are doing

when dashing off writing to record reality?
Writing originated
when drawing of bird trace
replaced string knitting.

http://www.thinkartlab.com/CCR/2006/10/liu-hsiehs-grammatology.html

16 http://www.rrojasdatabank.org/mao11.htm

17 藉由探討西方的公／私區分，本文旨在建立一個反省華人政治優位性傳統的參考架構。從系統理論運作建構論的觀 、統治樣□□□□□□□□□□□□□□□□□□□□□
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、社交公共生活及無私的、工具取向的活動領域。同時，本文把這些語意擺回它們所鑲嵌的歷史、社會脈絡，探究它們與社會結構有何相互影響的關係。藉此，本文說明了，隨著社會形構從城邦、帝國、封建到功能分化的轉變，公／私語意曾如何反映或引領了社會結構的改變。透過對西方經驗的分析，本文發現，在政治中再區分出政治、行政與公眾等不同取向，承認「私」中的公共性，以及以作為功能系統內環境的公共領域來活化改革的動能、強化社會自我組織的能力，是社會得以具有自主性的重要根源。

本文旨在探討中國的公／私區分圖式，藉以反省如何走出華人政治中心的一元觀傳統。本文探究了如下的問題：為何官／民會被視同於公／私，而家、國、天下的一貫秩序中則難以形成公／私的領域區分；對私的貶抑如何遲滯了社會的發展，陽奉陰違的二元結構又何以會盛行；為何聖王傳統下批判性的公共領域，以及由士紳地方公共活動構成的表徵性公共領域不會促成結構的變遷。在考察公／私語意與封建城邦、門第、士紳社會的結構有何對應及相互影響關係的同時，本文指出政治優位性的傳統與一

述的發展互為因果。本文進而說明，此一傳統如何在今日功能分化的情境中造成對政治不當的高估與低估，以致無法切事地處理公共事務的問題。本文主張，完善作為制度化二階觀察機制的公共領域是走出此一困境的可能出路，因為它不只再現出環境中各種不同的看法，還能作為運作的動力及多元統一的整合機制。但本文指出，唯有當我們不但學會從多元脈絡的觀點來增進社會自我組識與論述的能力，同時更走出了華人以群為公的傳統，積極發展私領域中的公共領域，在差異而不是同一的基礎一

來建立統一自主性才能真地實現。

湯志傑(Chih-Chieh Tang)

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19 **1.2.5 Universal Naming**

Since universal actors are mobile--their location can change arbitrarily--it is critical to provide a universal naming system that guarantees that references remain consistent upon migration.

Universal Actor Names (UAN) are identifiers that represent an actor during its life-time in a location-independent manner. An actor's UAN is mapped by a naming service into a Universal Actor Locator (UAL), which provides access to an actor in a specific location. When an actor migrates, its UAN remains the same, and the mapping to a new locator is updated in the naming system. Since universal actors refer to their peers by their name, references remain consistent upon migration.

1.2.5.1 Universal Actor Names

A Universal Actor Names (UAN) refers to an actor during its life-time in a location-independent manner. The main requirements on universal actor names are location-independence, worldwide uniqueness, human readability, and scalability. We use the Internet's Domain Name System (DNS) [Mockapetris, 1987] to hierarchically guarantee name uniqueness over the Internet in a scalable manner. More specifically, we use Uniform Resource Identifiers (URI) [Berners-Lee et al., 1998] to represent Universal Actor Names. This approach does not require actor names to have a specific naming context, since we build on unique Internet domain names.

The universal actor name for a sample address book actor is:

uan://wwc.yp.com/~smith/addressbook/

The protocol component in the name is uan. The DNS server name represents an actor's home. An optional port number represents the listening port of the naming service--by default 3030. The remaining name component, the relative UAN, is managed locally at the home name server to guarantee uniqueness.

1.2.5.2 Universal Actor Locators

An actor's UAN is mapped by a naming service into a Universal Actor Locator (UAL), which provides access to an actor in a specific location. For simplicity and consistency, we also use URIs to represent UALs. Two universal actor locators for the address book actor above are:

rmsp://wwc.yp.com/~smith/addressbook/
and
rmsp://smith.pda.com:4040/addressbook/

The protocol component in the locator is rmsp, which stands for the Remote Message Sending Protocol. The optional port number represents the listening port of the actor's current theater, or single-node run-time system--by default 4040. The remaining locator component, the relative UAL is managed locally at the theater to guarantee uniqueness.

While the address book actor can migrate from the user's laptop to her personal digital assistant (PDA), or cellular phone; the actor's UAN remains the same, and only the actor's locator changes.

The naming service is in charge of keeping track of the actor's current locator.

1.2.5.3 Universal Actor Naming Protocol

When an actor migrates, its UAN remains the same, and the mapping to a new locator is updated in the naming system. The Universal Actor Naming Protocol (UANP) defines the communication between an actor's theater and an actor's home, during its life-time: creation and initial binding, migration, and garbage collection.

UANP is a text-based protocol resembling HTTP with methods to create a UAN to UAL mapping, to retrieve a UAL given the UAN, to update a UAN's UAL, and to delete the mapping from the naming system.

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Web Mobility

Web computing between semiotic and kenomic spaces

Rudolf Kaehr Dr.[@]

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zurück Seite 4

Abstract

Locality, positionality and mobility in semiotic, categorical, diamond and kenomic systems. Kenomic mobility compared with Agha's Universal Actor System (UAM) and Middleware approach and Milner's Bigraphs. Sketch of an Architectonics of Kenomic Mobility. Introducing trans- and diamond-Actors and their chiastic interplay as interactional and reflectional actors in knowledge grids.
Web mobility as we know it is based on a mono-contextural static organizational system, mobility then is restricted by its static numerical framework. Kenomic mobility starts to diamondize such a static framework towards a metamorphic dynamics of polycontextural diamond structurations.

1

1. Kenomic mobility

1.1. Monomorphy

Mobility based on semiotics, i.e. sign systems, is restricted by the semiotic *equality* rule. Existence (occurrence) and locality of signs are identified in sign systems. There is no reason to separate the *identity* of an atomic sign from its *locality* in a sign sequence (word). Both notions, "occurrence" and "locality" of signs are coinciding. An atomic sign might occur as a graphemically (or:syntactically) identical sign, say "a", at different places in a sign sequence (string, word) but its graphemic identity as "a" is independent of the place (locus, position) it occurs. The identity of the sign is pre-given to semiotics and is has its tectonic place in the sign repertoire (alphabet) of the sign system. The rules (economy) of the sign system is not involved into the definition of its signs. This is the abstractness of sign systems, codified by Markov's axiom of the *"Abstraction of Identification"*.
It would be crazy if a sign would change its graphemic identity in regard to its position (occurrence) in a sign sequence. Potential identification and potential iterability of signs goes hand in hand.

An example which is working constructively with the notions of position and sign is the *positionality* system for natural numbers. In a positional system the *value* of a graphemically identical cipher is changing in respect to its position. The number "1", is of different value if it is at position one, i.e. "1", or at position one, two and three, of the positional string, say "111". But it would be utter nonsense, if the cipher "1" at position one would have the form of the cipher "3" and at position three the form of cipher "8". The result would be the number "138" and not "111".

Another, although less known use of the idea of positionality, is given by Gotthard Gunther's *place-valued* systems for the distribution and mediation of logical systems which culminates with the concept of polycontextural logic. A further development was introduced by the

dissemination of natural number series based on the place-designator for number systems. In several texts I introduced the concept of a *kenomic matrix* for the dissemination of formal systems in general and their interactionality, reflectionality and interventionality.[2]

Nevertheless it seems that exactly this craziness of a position-dependent identity of graphemic objects might be the next step in the deliberation of scriptural design from its inherent semiotic limitations.

Signs might have different meanings, i.e. polysemy, or a single meaning might have different sign representations, or it might even be monosemic: one sign, one meaning. But all the possible cases are based on the distinction of sign and meaning (or value, etc.).

This is the field of semiotic and logical thinking. Here, sign systems are conceived as the medium (or even instrument, tool) of thinking. Hence the use of signs in sign systems is not changing the identity of its signs.

A graphmatic turn

The *graphematic turn* is focusing on the difference of sign and position. It is thematizing both together, the notion of difference and the dichotomy of sign and position. In this sense, the *blind spot* of semiotics is its blindness for the co-creative interplay of locus and mark (sign, object). Locus and mark are positioning the difference of token and type of a sign.

This is the field of *graphematic* and *grammatological* scriptures (adventures, studies).

The idea of a separation of marks and loci is not absolutely new. Similar ideas have had some occurrences at several places in the context of kenogrammatics and in an interpretation of George Spencer Brown's *Calculus of Indication*. For the understanding of the Calculus of Indication the idea of a *"topologically invariant"* notation is mentioned by Matzka[3] .

"Obviously, a kenogram is composed of some sort of "atoms", in the sense of indivisible parts, but those "atoms" have no identity as types. In fact, if we ask how many "atoms" there are, and if we equate "atom" with "kenogram of length one", then the answer is that there is one and only one "atom". The concept of an alphabet, as a set of two or more types of atoms, becomes obsolete in the context of kenograms. Because of this very strange property of the kenogrammatic "atoms", we term them "kenoms", so that the kenograms can be called "strings of kenoms". (Matzka 1993)

Topological invariant notational systems, like the Calculus of Indication, are abstracting from the locus a mark takes place, but they are not yet studying the *interaction* between locus and identity (occurence) of marks or signs. Marks are occuring as single atomic elements, there is no concept of patterns of marks involved.
The argument related to the lack of atomicity in kenomic systems is not taking into account the genuine kenomic structures (patterns) of *monomorphies*. Monomorphic patterns (monomorphies) are basic in kenomic systems.

Despite the fact that "strings of kenoms", i.e. morphograms, consisting of kenograms, can be build recursively by the "successor" operations of *iteration* and *accretion*, the decomposition of morphograms is not a reduction to atomic signs or even to one and only one atomic sign.

From the point of view of a monorphic decomposition, an atomic sign is a *monadic* monomorphy and not a semiotic atom. There are no atomic signs in kenogrammatics, simply because their are no signs at all involved in kenogrammatics.
The basic "elements" of kenogrammatics are morphograms consisting of monomorphies and the "content" of monomorphies consists of kenograms.
[Or in the terminology of Matzka, kenograms consist of kenoms, building "strings of kenoms", called kenograms.]

Lack of a pre-given alphabet

As a surpising result we get the fact that there is no alphabet in kenomic systems, keno-

and morphogrammatics. Atomic signs as members of the set “alphabet” don’t exist. Each “atomic kenom” is kenomically equivalent. Further more, we can state, there is no alphabet as the beginning of all words, the morphograms themselves are the alphabet without any beginning. This intriguing phenomenon is studied in extenso in my eBook “Skizze 0.9.5".

"So where is the Chinese alphabet[4] and why is it so hard to find on the web? Well, the main reason is that there is no such thing as an alphabet in China.”

Because of the lack of an alphabet as a source for signs from the outside, i.e. from a lower level of the tectonics of a morphogrammatic calculus, evolution of morphograms have to be constructed as extensions out of their inner structure. This is a kind of an *immanent* evolution of morphograms based on the mononomorphies of the morphogram.

Self-generated alphabets

The wording that there is *no* alphabet means, there is no alphabet pre-given as the start of a kenogrammatic calculus. But what’s not pre-given is not denied to exist in a different way. Hence, a positive wording concerning the alphabet of kenogrammatics might be turned into this: Encountered a morphopgram, a kenomic abstraction is collecting the kenoms involved into the morphogram. A successor operation then can rely on those kenograms to precede to the next morphogram, in an iterative or an accretive way.
Therefore, albeit there is no alphabet pre-given, kenogrammatic operations are producing situatively their own alphabet, i.e. set of kenoms, to proceed their operations.
Again, it is reasonable to speak about a parallelism or diamond movement of operators and operands of kenomic operations. The kenomic alphabet has to be elicited. There is no need for a kenomic alphabet without intended interactions with morphograms.

Paradox of inscription

There is surely an additional paradox involved in writing morphograms. Until now, morphograms have to be written by signs. Hence, there seems to be a semiotic dependence for morphograms. Without signs, there are no morphograms.

This is true, as much as it is true, that there are no signs without physical marks. Hence, semiotic signs are depending on physical matter. And thus, there is no semiotics without physics. Again, this is a circular argumentation. To draw the distinction of signs and matter, signs have to be used. Morphograms are using signs but they are not signs. The scriptural media are enlarged to: marks - signs - morphograms. Between sign systems and morphogrammatics, a new interactivity is opened up. The interaction between matter (marks) and signs is based on a graphical level (typography) and is not yet reaching the intelligible level of sign systems.

Following the terminology of Gunther, morphograms are involved into *evolution* and *emanation*. Evolution happens with *iterative* and *accretive* successions (disremptions). Emanation with *differentiation* and *reduction* of morphograms.

Thus, monomorphic decomposition, as well as monomorphic composition, is a different topic of kenogrammatics and shouldn't be confused neither with the mentioned operations of kenogrammatics nor with similar semiotic operations.

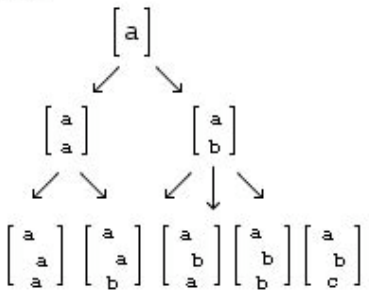
Monomorphic decomposition

Morphograms are decomposable, not into atomic signs, called kenoms but into kenomic patterns, called *monomorphies*. Monomorphies of decomposed morphograms are collected as ordered sets, i.e. n-tuples, and not as sets only. The order of the components is preserving the structure of the steps of decomposition.

Example for $MG^{(3)}$:

Composition of Morphograms

$\mathbf{MG}_{\text{Trito}}^{(3)} =$

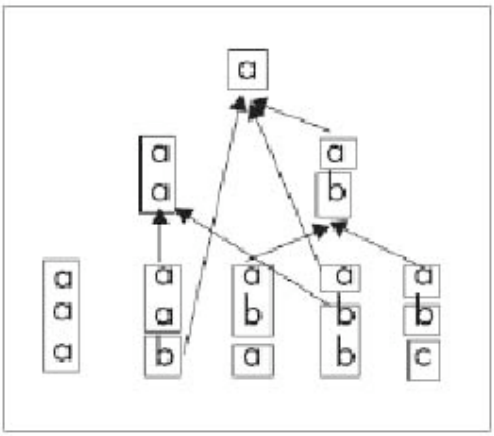


$MG^{(3)} = \{[aaa], [aab], [aba], [abb], [abc]\}.$

Decomposition of the morphograms of $MG^{(3)}$ into tupels of monomorphies.

$\mathbf{Dec}(\mathbf{MG}^{(3)}) =$

1. $[aaa] \longrightarrow ([aaa])$
2. $[aab] \longrightarrow ([aa], [b])$
3. $[aba] \longrightarrow ([a], [ba]) \longrightarrow ([a], [b], [a])$
4. $[abb] \longrightarrow ([a], [bb])$
5. $[abc] \longrightarrow ([ab], [c]) \longrightarrow ([a], [b], [c])$.



$Dec(MG^{(3)}) = \{([aaa]), ([aa], [b]), ([a], [b], [a]), ([a], [bb]), ([a], [b], [c]\}$

Explanation:
1. Dec:[aaa] --> ([aaa]) :
Also [aaa] is constructed by the steps [a]-->[aa]-->[aaa], a decomposition into monomorphies is not accessible because the sole monomorphy, i.e kenomic pattern, is [aaa] itself.
2. [aab] --> ([aa], [b]):
The morphogram [aab] is decomposable into its monomorphies [aa] and [b]. Dec([aa]) = [aa].
3. Dec:[aba] --> ([a], [ba]) --> ([a], [b], [a]) :
How are the monads differentiated? Obviously not by their monadicity only. But also by their *position* in the kenomic pattern as it is the case for the decomposition of [abc] into its monads ([a],[b],[c]), hence monads [a] and [b] of the decomposition of the morphogram

[aba] has be accepted as different monads; and thus the decomposition of [aba] into the 3-tuple ([a], [b], [a]) gets a legitimatimation.

Both decompositions ([ab]), [a]) and ([a], [ba]) are resulting in a further step of decompsition into ([a],[b],[a]).

```
Dec([aba]) = (Dec([ab]), [a]) = ([a],[b],[a]),
Dec([aba]) = ([a], Dec([ba])) = ([a],[b],[a]).
Dec:([aba]) -->([ab], [a]) -->([a],[b],[a]),
Dec:([aba])  -->([a], [ba]) -->([a],[b],[a]).
```

4. Dec:[abb] --> ([a], [bb]):
The morphogram [abb] is decomposable into the monomorphies [a] and [bb]. Dec([bb]) = [bb].
5. Dec:[abc] -->([ab], [c])-->([a], [b], [c]):
The morphogram [abc] is decomposable step-wise into its monadic monomorphies.
Both decomposition steps

```
Dec:[abc] -->([a], Dec([bc]))-->([a], [b], [c]) and
Dec:[abc]  -->(Dec([ab]), [c]])-->([a], [b], [c]) are
equivalent.
```

To choose the first in a representation is thus a question of convention in respect to the lexical order of the marks.

Comments:
The decompositions for [aab] and [abb] are delivering the same *set* of monomorphies, i.e. one monad and one dyad. Because the position of monomorphies in a morphogram is of relevance for morphograms of the trito-level of kenogrammatics (in contrast to the proto- and deutero-level), the order of the decomposition has to be taken into account. This is easily shown with the *reflection* of the morphograms: R([aab])= [abb]. Hence the order has to be kept and decompositions are producing *tuples* and not sets of monomorphies. This holds specially for the reflection of the morphogram [aba]: R([aba]) = [aba].
For morphograms of the deutero- and proto-level the order can be omitted and the to morphograms, [aab] and [abb], would be equivalent.
A full-fledged study of morphogrammatic systems, based on a “concatenational” approach, is available as Morphogrammatik . *Eine Einführung in die logische Theorie der Form.*[5] (Mahler, Kaehr, 1993) A new more pattern-oriented approach will be published soon as an *"Outline of Morphogrammatics".*

Reflection in MG [(3)] :
Further insight into the order of monomorphies in morphograms can be achieved with the simple operation of *reversion*. It turns out that the morphogram [abb] is the reverse of morphogram [aab] and not its equal.

$$R([aaa]) =_{MG} [aaa]$$
$$R([aab]) =_{MG} [abb]$$
$$R([aba]) =_{MG} [aba]$$
$$R([abb]) =_{MG} [aab]$$
$$R([abc]) =_{MG} [abc].$$

Decomposition and reflection are interchangeable: R(Dec(MG))=Dec(R(MG)).

```
1.  R(Dec([aaa])=R([aaa])=[aaa]
    Dec(R([aaa])=Dec([aaa])=[aaa]
2.  R(Dec([aab])=R([aa],[b])=([b],[aa]) = [abb]
    Dec(R([aab])=Dec([baa])=([b],[aa])
3.  R(Dec([aba])=R([a],[b],[a])=([a],[b],[a])  = [aba]
    Dec(R([aba]))=Dec([aba])=([a],[b],[a])
4.  R(Dec([abb]))=R([a],[bb])=([bb],[a]) = [aab]
    Dec(R([abb])=Dec([bba])=([bb],[a])
5.  R(Dec([abc]))=R([a],[b],[c])=([c],[b],[a]) = [abc]
```

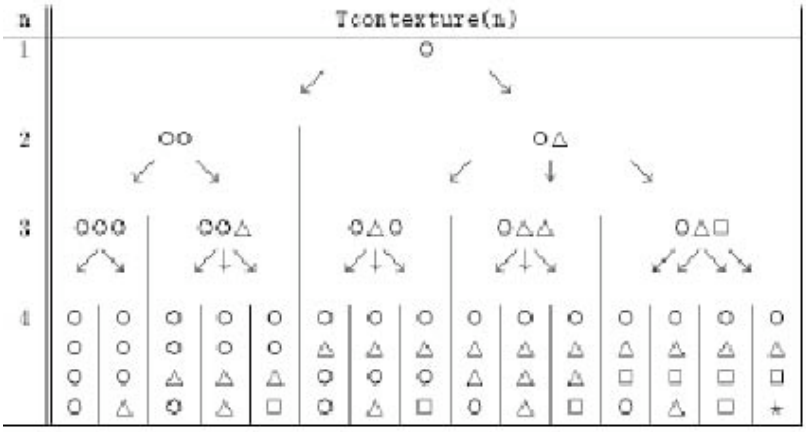
Dec(R([abc])=Dec([cba])=([c],[b],[a]).

The reflector R is defining a simple structure on the morphogrammatic system $MG^{(3)}$:

$[MG^{(3)},R]$ with $[Mg_1]->[Mg_1]$, $[Mg_2]<-->[Mg_4]$, $[Mg_3]->[Mg_3]$, $[Mg_5]->[Mg_5]$,

$[MG^{(3)}, R] = ([Mg_1], [Mg_2]<-->[Mg_4], [Mg_3], [Mg_5])$.

Composition and decomposition for $MG^{(4)}$



$$MG^1 = [aaaa],\ MG^2 = [aaab],\ MG^3 = [aaba],\ MG^4 = [aabb]$$

$$MG^5 = [aabc],\ MG^6 = [abaa],\ MG^7 = [abab],\ MG^8 = [abac]$$

$$MG^9 = [abba],\ MG^{10} = [abbb],\ MG^{11} = [abbc],$$

$$MG^{12} = [abca],\ MG^{13} = [abcb],\ MG^{14} = [abcc],\ MG^{15} = [abcd]$$

Decomposition of the 15 morphograms of MG $^{(4)}$:

1. Dec $([aaaa]) = [aaaa]$
2. Dec $([aaab]) = ([aaa], [b])$
3. Dec $([aaba]) = ([aa], [ba]) \longrightarrow ([aa], [b], [a])$
4. Dec $([aabb]) = ([aa], [bb])$
5. Dec $([aabc]) = ([aa], [bc]) \longrightarrow ([aa], [b], [c])$
6. Dec $([abaa]) = ([ab], [aa]) \longrightarrow ([a], [b], [aa])$
7. Dec $([abab]) = ([ab], [ab]) \longrightarrow ([a], [b], [a], [b])$
8. Dec $([abac]) = ([aba], [c]) \longrightarrow ([a], [b], [a], [c])$
9. Dec $([abba]) = ([abb], [a]) \longrightarrow ([a], [bb], [a])$
10. Dec $([abbb]) = ([a], [bbb])$
11. Dec $([abbc]) = ([abb], [c]) \longrightarrow ([a], [bb], [c])$
12. Dec $([abac]) = ([aba], [c]) \longrightarrow ([a], [b], [a], [c])$
13. Dec $([abcb]) = ([ab], [c], [b])$
14. Dec $([abcc]) = ([ab], [cc]) \longrightarrow ([a], [b], [cc])$
15. Dec $([abcd]) = ([abc], [d]) \longrightarrow ([a], [b], [c], [d])$

How to construct monomorphies mathematically?

From a mathematical point of view, monomorphies are *partitions* of mappings. This is well elaborated by [Schadach 1967]. The procedure to build monomorphies out from morphograms, as it is mathematically defined by Schadach' s approach, shall be called *monomorphic decomposition*, short "Dec". Hence, Dec(MG) is the operation to produce monomorphies from morphograms MG.

" Let A and B be non - empty finite sets,

$A = \{a_1, a_2, \ldots, a_n\}$, $B = \{b_1, b_2, \ldots, b_m\}$. Let denote B^A the set of all

$B^A = \{\mu \mid \mu : A \longrightarrow B\}$, $\text{card}\, B^A = (\text{card}\, B)^{\text{card}\, A} = m^n$.

The following theorem shows that
every family of subsets B^A defines a certain *partition* of B^A.

Theorem 1.

Let $\{R_i \mid i \in I\}$ be a family of subsets of B^A where I is a finite index set;

The family $\{R_i \mid i \in I\}$ defines a partition of B^A such that

the elements of the partition (the equivalence classes of mappings) are

$$[\mu]_{I_x} = \bigcap_{i_x \in I_x} R_{i_x} - \bigcup_{i_y \in I - I_y} R_{i_y}$$

where I_x runs through all subsets of I.

Corollary 1.

If $I_x = \emptyset$, then $[\mu]_\emptyset = B^A - \bigcup_{i \in I} R_i$ and

if $I_x = I$, then $[\mu]_I = \bigcap_{i \in I} R_i$.

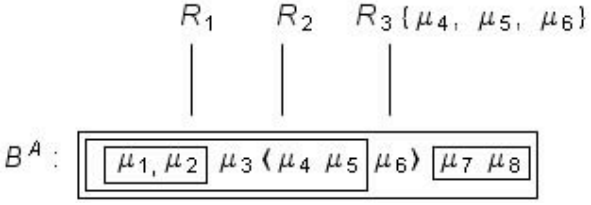
Corollary 2

By Theorem 1, we get *a* mapping from the set of all families of subsets of B^A onto the set of all par

Example.

Let be $B^A = \{\mu_1, \mu_2 \ldots, \mu_8\}$ and the family of subsets $\{R_i \mid i \in I = \{1, 2, 3\}\}$ where

$R_1 = \{\mu_1, \mu_2\}$,
$R_2 = \{\mu_1, \mu_2, \mu_3, \mu_4, \mu_5\}$,
$R_3 = \{\mu_4, \mu_5, \mu_6\}$.



I_x	$[\mu]_{I_x}$
$\emptyset$	$B^A - (R_1 \cup R_2 \cup R_3) = \{\mu_7, \mu_8\}$
$\{1\}$	$R_1 - (R_2 \cup R_3) = \emptyset$
$\{2\}$	$R_2 - (R_1 \cup R_3) = \{\mu_3\}$
$\{3\}$	$R_3 - (R_1 \cup R_2) = \{\mu_6\}$
$\{1,2\}$	$(R_1 \cap R_2) - R_3) = \{\mu_1, \mu_2\}$
$\{1,3\}$	$(R_1 \cap R_3) - R_2 = \{\mu_7, \mu_8\}$
$\{2,3\}$	$(R_2 \cup R_3) - R_1 = \{\mu_4, \mu_5\}$
I	$R_1 \cap R_2 \cap R_3 = \emptyset$

B^A: $\boxed{\mu_1, \mu_2}\ \boxed{\mu_3}\ \boxed{\mu_4\ \mu_5}\ \boxed{\mu_6}\ \boxed{\mu_7\ \mu_8}$.

(Dieter J. Schadach, BCL Report No. 4.1, August 1, 1967)

Monomorphic mobility

On the base of monomorphies in kenomic systems, identity and locality are separable.
That is, monomorphies at two comparable locations of two equivalent morphograms might be interchangeable despite their semiotic difference.
Or, the locality of monomorphies in morphograms might differ semiotically.
Hence, monomorphies are interchangeable in morphograms.
That is, morphogrammatic dissimilarity is stable under monomorphic exchange.

That doesn't mean that everything is interchangeable with everything.
Rules of pattern-invariance have to be applied.

Palindromes

For semiotic systems, *palindromic* symmetry seems to be the only possibility for semiotic identity to exchange parts and preserving the identity of the word.

$$(a_5\ a_4\ b_3\ a_2\ a_1)_j = \overline{(a_1\ a_2\ b_3\ a_4\ a_5)}_j \cong (aabaa)$$

$$(a_5)_j = (a_1)_j$$

Semiotic substitution

Interchangeability in semiotic systems is known as *substitution*. Substitution of parts in a semiotic sequence (chain, string, word) is correct if only if it fulfills the rules of identity. That is, equality of two equal semiotic sequences H_1 and H_2 is preserved under substitution iff equal parts, k_1, k_2, are substituted, $Subst_{h/k}$, at equal places (parts), h_1, h_2, of the sequences H_1 and H_2 of the semiotic sequences H.

Prerequisits:
1) Decomposability into parts, based on atomic elements,
2) Measurement of the length of sequences, this is given by (1),
3) Identity of signs and sign sequences.

The domain of signs to be involved in the process of substitution is given by the number of signs of the free monoid based on the sign repertoire.

Semiotic Equality:

$Seq_x \text{ equiv}_{sem} Seq_y \Longleftrightarrow \forall i, j \in Seq_{x,y}, : loc_i = loc_j \bigwedge loc_i(atom_x) = loc_j(atom_y).$

Or:

$Seq_x \text{ equiv } Seq_y \Longleftrightarrow \forall i, j \in Seq_{x,y},$

$lenght(Seq_x) = lenght(Seq_y) \bigwedge \forall i, j \in Seq_{x,y} : loc_i(atom_x) = loc_j(atom_y).$

Short:

$A = (a_1, a_2, \ldots, a_n), B = (b_1, b_2, \ldots, b_m)$

$A =_{sem} B$ iff

$1) m = n$

$2) \forall i, 1 \leq i \geq m, n : a_i =_{graph} b_i.$

Again, the equality of two words in a semiotic system is established by the graphemic identity (equality) of the signs at the same locality (position) of the compared words.
The fact of the identification of position and identity of signs has a very clear consequence for the equality of two sign sequences (words). Two words of different lenght are semiotically unequal.

Semiotic Substitution:

$\forall h, k \in H: H_1 \text{ equv } H_2 \Longleftrightarrow Subst_{h/k}(H_1) = Subst_{h/k}(H_2)$

$k_1 =_{sem} k_2 \text{ iff } length(k_1) = length(k_2) \bigwedge \forall i, j \in k_1, k_2 : loc_i(atom) = loc_j(atom)$

Example

$$\left.\begin{array}{l} H_1 = H_2 = (aabbcde) \\ h = (bb),\ k_1 = k_2 = (\overline{lkmbc}) \end{array}\right\} : Subst_{bb/klmbc}(aabbcde) = Subst_{bb/klmbc}(aabbcde)$$

$$\Longrightarrow (aa\,\overline{lkmbc}\,bbcde) = (aa\,\overline{lkmbc}\,bbcde).$$

$\forall h, k_1, k_2 \in H: Subst_{h/k_1}(H_1) = Subst_{h/k_2}(H_2) \Longrightarrow k_1 \equiv k_2$

$(aa\,\overline{lkmbc}\,bbcde) = (aa\,\overline{lkmbc}\,bbcde) \Longrightarrow \overline{lkmbc} \equiv \overline{lkmbc}$

Obviously, a substitution with different substituents results automatically into semiotic non – equ

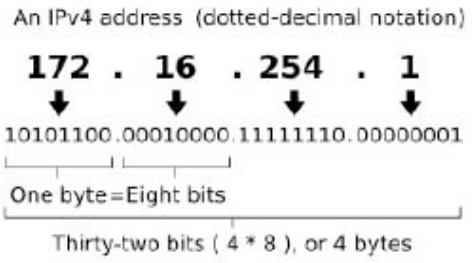
$$\left.\begin{array}{l} H_1 = H_2 = (aabbcde) \\ h = (bb),\ k_1 \neq k_2 : k_1 = (\overline{lkmbc}),\ k_2 = (\overline{klmop}) \end{array}\right\} : Subst_{bb/\overline{klmbc}}(aabbcde) \neq Subst_{bb/\overline{klmop}}(aabbcde)$$

$$\Longrightarrow (aa\,\overline{lkmbc}\,bbcde) \neq (aa\,\overline{klmop}\,bbcde).$$

Semiotic substitution happens as abstract as the sign sequences are build by concatenation. There is no need to reflect on the enviroment (context) of the place where the substitution takes place.

Recall: IPs are binary numbers
"An Internet Protocol (IP) address is a numerical identification (logical address) that is assigned to devices participating in a computer network utilizing the Internet Protocol for communication between its nodes. Although IP addresses are stored as *binary numbers*,

they are often displayed in more human-readable notations, such as 192.168.100.1 (for IPv4), and 2001:db8:0:1234:0:567:1:1 (for IPv6).
The role of the IP address has been characterized as follows: *"A name indicates what we seek. An address indicates where it is. A route indicates how to get there."* (WiKi)



"A name indicates what *we seek. An address indicates* where *it is. A route indicates* how *to get there."*
The clean identity prerequisites are well collected by the citation:
Name: A name identifies the object. Giving a name, i.e. to address, is to identify the addressed object.
Address: Adressing is to identify the singular location of the object . The process of identifying an object is not changing the identity of the object of identification.
Route: A route is determined by the identities of name and address. Both are not changed in the process of finding the route. There may be many routes between a name and an address but the routing operators are not changing 'en route'.
All three distinctions are defining a *binary relation*: route(name, address).

Such a *"role of the IP address"* transforms directly into the identity characterization of *semiotic substitution*, subst(word, sub).

Applying a morphogrammtic abstraction on binary numbers, binary numbers would be reduced to patterns where the equivalence of (0) ^=(1) holds. As a result, we get, e.g. (10101100) ^= (01010011). Morphogrammatically, the binary numbers (10101100) and (01010011) are represented by the morphogram [ababbaa]. On the other hand, the morphogram might represent numbers from other than binary systems too.

This might be bad news for *digitalism*. Based on the strict distinction of two basic elements "0" and "1", a morphogrammatic abstraction would undermine not only the possibility of IP addresses but also their calculation on computer systems based on binarism. But *"zero-and-one"* rationality and technology is not more than the tip of the ice-berg of what is possible to realize in a post-digital age of computation.

Monomorphic substitution

What follows is part of a study, which shall be called "*Sign systems in morphogrammatics*". Topics are the *interactions* between semiotics and morphogrammatics on different tectonic levels of the semiotic and the kenogrammatic systems. This title is emphasizing the fact, that semiotics (word arithmetic, string theory) remains untouched in this exercise. There is nothing wrong with semiotics. It simply has to be disseminated. Complementary, morphogrammatics has to be introduced (constructed) by an interplay with semiotics.

Morphogrammatics offers the possibility of a concept of monomorphic substitution which is a generalization of the semiotic concept of substitution. Monomorphic substitution is not depending on the semiotic equivalence of the substitutional parts, substitutes, but on morphorgrammatic equivalence only. Because morphograms are not abstract sign sequences but wholes, a substitution of monomorphies by other monomorphies which might be semiotically different, the part/whole reationship of the morphogram has to be considered by the substitution process. That is, the monomorphy structure of the morphogram has to be preserved under the interaction of semiotic substitution.

In the following, equal length of morphograms and monomorphies is presumed. In general, this restriction can be lifted too.

Semiotic sequences are equal iff they are decomposable into equal atomic signs, i.e. iff they are atomically equiform and of the same number.

If we take the idea of *decomposability* as the leading strategy for a comparision of sign systems or morphograms we can abstract from the sign repertoires and the singularity of the successor operation. Hence, the test for equality is based on decomposability only.

Composibility and decomposability then can be realized with different operators, e.g. concatenation, chaining, fusion.

```
Concatenation (⊕): length(A) + length(B) = length(A+B)
Chaining (⊗):      length(A) + length(B) = length(A+B)-1
Fusion (⊖):        length(A) + length(B) = length(A+B)-n, n >= 2
```

That is, "*Morphograms are kenomically (morphogrammatically) equal iff they have the same decomposition."*
Morphograms are kenomically equivalent if they behave (bi)similar under semiotically different interactions.

Semiotic substitution is based on the identification of signs; kenomic transformations are based on the *interaction* between semiotic and monomorphic levels of morphograms.

Prerequisits:
1) Decomposability into parts, based on monomorphies, h,
2) Measurement of the length of sequences, based on iteratie/accretive succession, length(m)∈N,
3) Similarity of monomorphies and morphograms, $m_1 =_{MG} m_2$,
4) Difference between semiotic and kenomic inscriptions, (m) $!=_{sem}$[m],
5) Semiotic disjunctness between substituents and morphogram H, $\text{sem}(m_1, m_2) \cap \text{sem}(H) = \emptyset$.

A monomorphic substitution is correct iff it doesn't violate the the structure (pattern) of the morphogram.
Thus, the substituents of a substitution have to be semiotically disjunct to the morphogram.

Monomorphic substitution

$\forall\, h,\ m_1, m_2 \in H,\ m_1 \neq_{sem} m_2 :\ \mathrm{Subst}_{h/m_1}(H_1) \simeq \mathrm{Subst}_{h/m_2}(H_2) \Longleftrightarrow m_1 \simeq_{MG} m_2$

$H_1 = [aabbacc],\ H_2 = [aaccabb],\ H_1 =_{MG} H_2$

$\mathrm{Dec}([aabbacc]) = ([aa], [bb], [a], [cc]),$

$h = [aa],\ m_1 = [ddd],\ m_2 = [eee],\ \mathrm{length}(m_1) = \mathrm{length}(m_2),$

$m_1 \neq_{sem} m_2,\ h \neq_{sem} m_1,\ m_2,$

$\mathrm{sem}(m_1, m_2) \bigcap \mathrm{sem}(H) = \emptyset$

$\mathrm{Dec}(H_1) = ([aa], [bb], [a], [cc])$

$\longrightarrow \mathrm{Subst}(H_1)_{[aa]/[ddd]}([aa], [bb], [a], [cc]) \longrightarrow ([ddd], [bb], [a], [cc])$

$\mathrm{Dec}(H_2) = ([aa], [cc], [a], [bb])$

$\longrightarrow \mathrm{Subst}(H_2)_{[aa]/[eee]}([aa], [bb], [a], [cc]) \longrightarrow ([eee], [bb], [a], [cc])$

$\mathrm{Subst}: ([aa], [bb], [a], [cc]) \longrightarrow ([ddd], [bb], [a], [cc]) =_{MG} ([eee], [bb], [a], [cc])$

$\Longleftrightarrow [ddd] \simeq [eee].$

$([dddbbacc]) =_{MG} ([eeebbacc]).$

Standard representation

$([aaabbcdd]) =_{MG} ([aaabbcdd]).$

Case one:

$h = [aa],\ m_1 = [aaa],\ m_2 = [eee],\ \mathrm{length}(m_1) = \mathrm{length}(m_2),\ m_1 =_{MG} m_2,$

$\mathrm{sem}(m_1, m_2) \bigcap \mathrm{sem}(H) \neq \emptyset.$

$\mathrm{sem}(m_1 = \{a\},\ m_2 = \{e\}) \bigcap \mathrm{sem}(H = \{a, b, c\}) = \{a\},\ (\neq \emptyset).$

$\mathrm{Subst}: ([aa], [bb], [a], [cc]) \longrightarrow ([aaa], [bb], [a], [cc]) \neq_{MG} ([eee], [bb], [a], [cc]).$

$\longrightarrow ([aaabbacc]) \neq_{MG} ([eeebbacc])$

Standard representation

$([aaabbacc]) \neq_{MG} ([aaabbcdd])$

Case two:

$h = [aa],\ m_1 = [ccc],\ m_2 = [eee],\ \text{length}(m_1) = \text{length}(m_2),\ m_1 \neq_{sem} m_2$

$\text{Subst: } ([aa], [bb], [a], [cc]) \longrightarrow ([ccc], [bb], [a], [cc]) \neq_{MG} ([eee], [bb], [a], [cc])$

$\longrightarrow ([cccbbacc]) \neq_{MG} ([eeebbacc])$

$([eeebbacc]) =_{MG} ([aaabbcdd])$

$([cccbbacc]) =_{MG} ([aaabbcaa])$

Standard representation:

$([\mathbf{aaabbcdd}]) \neq_{MG} ([\mathbf{aaabbcaa}])$.

After this descriptive case study, an implementation into a ML program would be a next step to clarify the mechanisms.

Semiotic environment of morphograms

Morphogrammatic transformations can be studied on two levels:
1.On a morphogrammatic level only, say as reflections of produced morphograms,
2. As interactions between semiotics and kenogrammatics.

The range of substitution is defined by the set of marks of the semiotic system involved into the interactions with morphograms.
$sem(m) \in \Omega(\alpha)$, $\alpha = \{\alpha_1, \alpha_2, \ldots \alpha_{n-1}, \alpha_n\}$.

Hence the range of of kenomic substitution is given by the sign repertoire (alphabet) α and its set of possible concatenations.
For n=2, Ω(α)= {a, b, aa, ab, ba, bb, aaa, ...}.

Direct monomorphic transformations

What happens if the substituents m_1, m_2 are not only semiotically different but also morphogramatically? Is there a reasonable form of substitution possible on the base of different monomorphies? It seems that the equivalence between morphograms under substitution with different substituents is violated.

The condition up to now was that the morphograms are composed by a generalized form of concatenation as iterative and accretive disremption. Hence, the morphogrammatic equivalence between two morphograms supposed equal length of the morphograms. If this condition can be abandoned, a new form of equivalence and substitution could be introduced.

A further abstraction to build equivalences can not refere to the set of signs or kenoms. The only possibility to furthr abstraction has to consider the operations involved. As long as there is only one operation (concatenation) possible an abstraction on it wouldn't make any sense.

Again, *"Morphograms are kenomically (morphogrammatically) equal iff they have the same decomposition"*.

There is no need that the only compositional and decompositional operators are concatenation and decomposition. In fact, the (de)compositional operations in morphogrammatics are including, additional to concatenation, the operation of *chaining*

(Verkettung) and *fusion* (Verschmelzung).

$$\mathrm{Dec}(H_1) = (\![\,\mathrm{aa}\,]\!],\ [\mathrm{bb}],\ [a],\ [\mathrm{cc}]$$
$$\longrightarrow \mathrm{Subst}(H_1)_{[\mathrm{aa}]/[\mathrm{ddd}]}(\![\,\mathrm{aa}\,]\!],\ [\mathrm{bb}],\ [a],\ [\mathrm{cc}] \longrightarrow (\![\,\mathrm{ddd}\,]\!],\ [\mathrm{bb}],\ [a],\ [\mathrm{cc}]$$
$$\mathrm{Dec}(H_2) = (\![\,\mathrm{aa}\,]\!],\ [\mathrm{cc}],\ [a],\ [\mathrm{bb}]$$
$$\longrightarrow \mathrm{Subst}(H_2)_{[\mathrm{aa}]/[\mathrm{eee}]}(\![\,\mathrm{aa}\,]\!],\ [\mathrm{bb}],\ [a],\ [\mathrm{cc}] \longrightarrow (\![\,\mathrm{eee}\,]\!],\ [\mathrm{bb}],\ [a],\ [\mathrm{cc}]$$

Given $H_1 = [\mathrm{abba}]$ and $H_2 = [\mathrm{aba}]$.

How could H_1 and H_2 be morphogrammatically (kenogrammatically) equivalent?

$$\mathrm{Dec}(\![\,\mathrm{abba}\,]\!] = (\![\,a\,]\!],\ [\mathrm{bb}],\ [a]$$
$$\mathrm{Dec}(\![\,\mathrm{aba}\,]\!] = (\![\,a\,]\!],\ [b],\ [a]$$

That is, how could the two monomorphies $[b]$ and $[\mathrm{bb}]$ of H_1 and H_2 be morphogrammatically equ

$\oplus$–Concatenation :

$$\oplus : (\![\,\mathrm{ab}\,]\!],\ [\mathrm{ab}]\!] \longrightarrow \{[\![\,\mathrm{abba}\,]\!],\ [\mathrm{abab}]\!],\ [\mathrm{abbc}]\!],\ [\mathrm{abcd}]\!]\}$$

$\ominus$–Fusion :

$$\ominus : (\![\,\mathrm{ab}\,]\!],\ [\mathrm{ab}]\!] \longrightarrow \{[\![\,\mathrm{aba}\,]\!],\ [\mathrm{abc}]\!]\}$$

Hence there are *combinations*, $\oplus$, $\ominus$, such that

$\ominus(\![\,\mathrm{ab}\,]\!],\ [\mathrm{ab}]\!] \longrightarrow [\![\,\mathrm{aba}\,]\!],\ (=A)$ and

$\oplus: (\![\,\mathrm{ab}\,]\!],\ [\mathrm{ab}]\!] \longrightarrow [\![\,\mathrm{abba}\,]\!],\ (=B)$ with

$\mathrm{length}(A) \neq \mathrm{length}(B)$.

Hence there are *de – fusions*, $\overline{\ominus}$, $\overline{\oplus}$, such that

$\overline{\ominus}: (\![\,\mathrm{aba}\,]\!] \longrightarrow (\![\,\mathrm{ab}\,]\!],\ [\mathrm{ba}]\!],\ (=C_1)$

$\overline{\oplus}: (\![\,\mathrm{abba}\,]\!] \longrightarrow (\![\,\mathrm{ab}\,]\!],\ [\mathrm{ba}]\!],\ (=C_2)$ with

$\mathrm{length}(\overline{\ominus}(A)) = \mathrm{length}(\overline{\oplus}(B)),\ (C_1 = C_2)$

$$\text{Dec}\left(\overline{\ominus}(A)\right) = \text{Dec}\left(\overline{\oplus}(B)\right) =$$
$$\text{Dec}([\text{ab}], [\text{ba}]) = (\text{Dec}([\text{ab}]), \text{Dec}([\text{ba}]) = ([a], [b], [b], [a]) = ([a], [\text{bb}], [a])$$

$$\text{Dec}(\ominus([\text{ab}], [\text{ab}])) =$$
$$\text{Dec}([\text{aba}]) = ([a], \text{Dec}([\text{ab}]) = ([a], [b], [a])$$

$$\text{Dec}(\oplus([\text{ab}], [\text{ab}])) =$$
$$(\text{Dec}([\text{ab}]), \text{Dec}([\text{ba}])) = ([a], [b], [b], [a]) = ([a], [\text{bb}], [a])$$

$$\Longrightarrow ([a], [b], [a]) =_{KG/(\oplus,\ominus)} ([a], [\text{bb}], [a]) . \Longrightarrow . [b] =_{KG/(\oplus,\ominus)} [\text{bb}]$$

As a result of the kenomic transformation with the combinations *fusions* and *de – fusions* we get the general formula for equality of morphograms of different length:

$$A =_{MG} B \text{ iff } \bar{\Theta}(A) =_{(\oplus\ominus)} \bar{\Phi}(B) .$$

$$\text{Dec}\left(\overline{\oplus}(A)\right) =_{(\oplus\ominus)} \text{Dec}\left(\overline{\ominus}(B)\right)$$

Concatenation

$$A =_{MG\ conc} B \text{ if } \overline{\oplus}(A) =_{\oplus} \overline{\oplus}(B) \bigwedge$$
$$\text{length}(A \oplus B) = \text{length}(B) + \text{length}(B)$$

Chaining

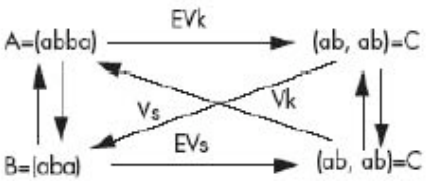
$$A =_{MG\ chain} B \text{ if } \overline{\otimes}(A) =_{\otimes} \overline{\otimes}(B) \bigwedge$$
$$\text{length}(A \otimes B) = \text{length}(A) + \text{length}(B) - 1$$

Fusion

$$A =_{MG\ fus} B \text{ if } \overline{\ominus}(A) =_{\ominus} \overline{\ominus}(B) \bigwedge$$
$$\text{length}(A \ominus B) = \text{length}(A) + \text{length}(B) - n$$

Diagrammatic sketch

The following diagram [6] might summarize the idea, again. It goes back to 24.5.1994 when I first sketched the idea and construction. (Ver-Operations: Verkettung, Verknüpfung, Verschmelzung)



Also length([abba]) > length([aba]), mg-equivalent([abba], [aba]) iff EVk * Vs = EVs * Vk.

"*This morphogrammatic equivalence can be compared with the* co-algebraic *concept of bisimulation. Two morphograms are equivalent iff they* behave *the same. This observation maybe the most radical departure from a semiotic understanding of writing."* (Kaehr, From Ruby to Rudy, 2006 , p. 22)

Again, this situation of morphogrammatic behavior gives a hint to an understanding of the fact that Chinese characters are not re-presenting pre-given concepts but are evocating actions. (Kaehr, How to Compose, p. 75, 2007)

What is the difference to semiotic abstractions? The kenomic abstraction happens over the *operators* O- and ⊕ and not over the sign *sets* like for semiotic systems. Equivalence classes in semiotic systems are build over sets of signs and not over the operations on signs. Hence, the kenomic abstraction is a kind of a second-order abstraction. Further studies are included in the paper "Categories and Contextures"[7].

Diamond categorical modeling

A first step towards a categorical construction might be sketched.

$$\begin{array}{ccc} (8)_1 & \longrightarrow & (5+3)_1 \\ \| & x & \| \\ (8)_2 & \longleftarrow & (5+3)_2 \end{array} \Big\} \; (8)_1 =_{\text{Arith}} (8)_2 .$$

Arithmetically, the relations $(5+3)_1 \longrightarrow (8)_1$ and $(5+3)_2 \longrightarrow (8)_2$ are well obvious because their relata are all belonging to the same arithmetical systems A_1 and A_2. The situation is getting slightly more intriguing if the relations are belonging to two different arithmetical systems, A_1 an A_2, with $A_1 \cap A_2 = \emptyset$. Hence the relations between $(5+3)_1 \longrightarrow (8)_2$ and $(5+3)_2 \longrightarrow (8)_1$ are of special interest.

The relations (or morphisms) $(5+3)_1 \longrightarrow (8)_2$ and $(5+3)_2 \longrightarrow (8)_1$ can be seen as *translational* morphisms between two *discontextural* arithmetical systems A_1 an A_2. Hence, a possibility of a *comparison* between $(8)_1$ and $(8)_2$ is established, which is demanding its own third contexture to take place.
This little example is of interest independently of the numeric values used and the definition of their axiomatics.

After all, the construction of an equivalence of morphograms of different length might be set into a more intelligible formalism with the help of *diamond category theory*, thus diamond constructions of categorical sums and products shall be used.

$$\begin{array}{ccccc} & & X_2 & & \\ & \forall_2 \swarrow & \exists!_2 \downarrow & \searrow \forall_2 & \\ \left[\begin{array}{ccccc} A_2 & \longleftarrow & A_2 \oplus B_2 & \longrightarrow & B_2 \\ A_1 & \longrightarrow & A_1 + B_1 & \longleftarrow & B_1 \end{array}\right] & & & & \\ & \forall_1 \searrow & \exists!_1 \downarrow & \swarrow \forall_1 & \\ & & X_1 & & \end{array}$$

The aim of the diamond category construction is to construct and compare X_1 and X_2. The *category* part is covering the construction of X_1, with $\ominus : A_1 + B_1 \longrightarrow X_1$, the *saltatory* part

is covering the construction of X_2, with $X_2 \longrightarrow B_2 + B_2$. Both parts of the diagram are complementary and commutative.

The interaction between categorial and saltatorial parts of the construction might be set into a chiastic interplay.

$$\text{Chiasm}\left(\left(A, B\right), \left(X_1, X_2\right), \oplus, \ominus\right):$$

$$\begin{pmatrix} \ominus: \left(A, B\right) \longrightarrow X_1 \\ \updownarrow \quad x \quad \updownarrow \\ \oplus: \; X_2 \longrightarrow \left(A, B\right) \end{pmatrix}$$

What's the fuss for?
As a radical result for a new conception of Web *mobility* we get the possibility of a new type of mobility in the static addresses of UANs, URLs and IPs even independently of any physical or informatical movements of the actors. That is, the *statics* of common Web mobility concepts with their hierarchic structures have to be *dynamized* to offer a free Web mobility in a Knowledge Grid. But this is asking for a high price: the sacrifice are our natural number systems which are guaranteeing *universal* and *unique* addressing methods. In fact, its only the proclaimed *hegemony* and *uniqueness*, and not the number systems as such, which have to be transformed and disseminated. Without saying, the whole apparatus of classical, i.e. informatical Web mobility concepts are saved and are getting their placement in the new paradigm of a kenogrammatically designed organizational structurations of mobile knowledge grids.

2. Web mobilities

2.1. Mobile computing

2.1.1. Many Faces of Mobility

Transport, translation, chiasm, worldmodels, kenomic transitions, metamorphosis.
Semiotic spaces (Goguen).
Kenomic spaces (Skizze-0.9.5).

2.1.2. The Actor Model

Agha's new model[8] is introducing a highly complex strict hierarchy of URLs with the assistance of meta-actors helping the brave basic-actors, based on supressed primitive-actors[9], of the Actor system to behave communicatively in a mobile informatical environment.

"A naming service is in charge of providing object name uniqueness*,* allocation*,* resolution*, and* location *transparency. Uniqueness is a critical condition for names so that objects can be uniquely found given their name. This is often accomplished using a name context. Object names should be object location-independent, so that objects can move preserving their name. A global naming context supports a universal naming space, in which context-free names are still unique. The implementation of a naming service can be centralized or distributed; distributed implementations are more fault-tolerant but create additional overhead."* Gul A. Agha, Carlos A. Varela, Worldwide Computing Middleware

The architecture of global naming is given in extenso by Agha[10].

"*Worldwide computing systems require a scalable and global naming mechnism. Moreover, the naming mechanism must facilitate object mobility; this implies that the object name should completely abstract over the location of an object, so the migration does not break*

existing references. Contrast this to the Web infrastructure, which users location-dependent references (UROLs) therby inhibiting transparent document relocation." (Varela)

This naming abstraction is in direct opposition to the kenomic abstraction of the identity/locality relation.
To *"completely abstract over the location of an object"* is eliminating the inter-relationship between identity and locality of an object, which is basic to kenomic mobility.
.
Abstraction as call-by-name, is naming. Naming is identifying an object. The process of naming happens in a context which is not part of the abstraction. Naming is a special kind of abstraction as identification, hence called is-abstraction. The is-abstraction is the fundamental abstraction of the lambda calculus.

A general concept of abstraction is thematization. Thematization is evocating an object without identifying it by naming. Hence the object shall be called phenomen. Thematization is enabling complex and mediated actions of naming, depending on different view-points and reflecting contexts of the phenomen be named. Such a kind of abstraction is called as-abstraction. Obviously, the interplay between different standpoint-depending naming actions is not itself a naming action but *thematization*.

Space and Place for Actors and Agents
"If the locatedness for a classic actor in his midleware theater is an URL, based on URI, etc., thus a fixed identity address, then the locatedness of a contextural agent is the morphogram of such an address. The morphogram of the locatedness of an Agent is guaranteeing the liveliness *of the Agent and is preventing it to be considered as a physical object. An Agent is a reflectional/interactional unit and therefore not addressable and nameable by a single and simple identity producing and identifiable name. An Agent can have a name but it isn't a name.*
Classic Actors are much more defined by their name and their name is used as if it would be the Actor. In this sense an Actor is a name and is not just having a name. An Actor is defined by a name-giving abstraction, i.e., the is-abstraction." (Kaehr, Actors+Objects, 2007)

2.1.3. The Bigraph Model

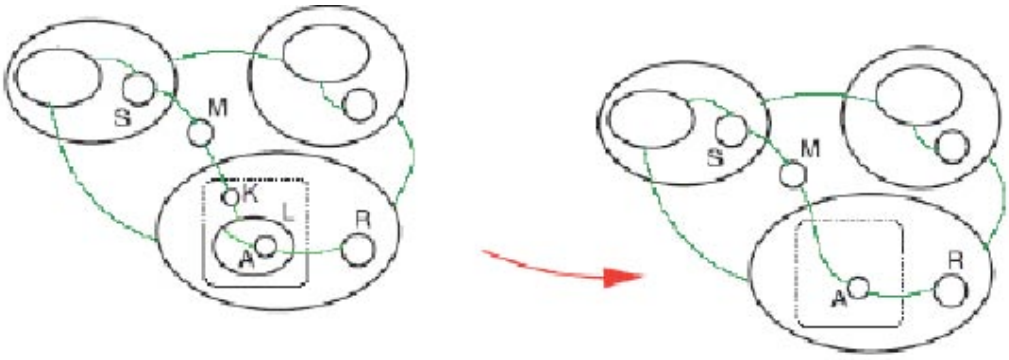
Locality and connectivity in a communicational space are designed by Milner's bigraph model.

"Our strategy here is to tackle just two aspects of mobile systems simultaneously: mobile *locality* and mobile *connectivity*. Already this combination presents a challenge: to what extent are locality and connectivity interdependent? In plain words, does where you are affect whom you can talk to? The answer must lie in the level of
modelling. To a user of the Internet (seeing it abstractly) there is total independence, and we want to model it at a high (i.e. abstract) level, just as it appears to users. But to the engineer these remote communications are not atomic; they involve chains of interactions between neighbouring entities, and we must also provide a low-level model which reflects this reality. These two levels must surely be part of a single multi-level model that explains how higher levels are realised by lower levels."

"Bigraphical reactive systems are a model of information flow in which both *locality* and *connectivity* are prominent. In the graphical presentation these are seen directly; in the mathematical presentation they are the subject of a theory that uses a modest amount of algebra and category theory. A bigraph may reconfigure both its locality and its connectivity. The example pictured above shows how reconfiguration is defined by reaction rules; in that case, the rule may be pictured thus:

Key metaphorics in the bigraph agent model is the *key* with its locking and unlocking functionality.

"The [next] picture illustrates how physical and virtual space are mixed. It represents how a message **M** might move one step closer to its destination. The three largest nodes may represent countries, or buildings, or software agents. In each case the sender **S** of the message is in one, and the receiver **R** in another. The message is en route; the link from M back to **S** indicates that the messages carries the sender's address. **M** handles a key **K** that unlocks a lock **L**, reaching an agent **A** that will forward the message to **R**; this unlocking is represented by a reaction rule that will reconfigure the pattern in the dashed box as shown, whenever and wherever this patterns arises."



Milner, Robin (2005): BIGRAPHS: A TUTORIAL, April 2005, Beijing[11]

2.1.4. A Transitional Model

There is a transitional [12] approach to mobility too. It takes a higly speculative stance to promote a transition from the *informatical* to the *knowledge* paradigm of mobile computing in polycontextural worlds. Both, the Actor Model and the Bigraph Model, are founded, more or less, in category theory and its underlying semiotics. The transitional model tries to surpass the conceptual and formal limits imposed by category theory and semiotics with the help of the emerging *diamond strategies*.[13]

"From a model of interactions to a design of interactionality, the transitions to be risked might be:
From the global, ubiquitous and universal Web of computation to the kenomic grid *of pluriversal contexturality containing the chiasm of global/local scenarios.*

From the locality in the Actor model of informatical events to the positionality *of contextures in the kenomic grid, positioning informatic localities.*

From the mobility in the Actor model of informatical flows between ambients (context, locality) of the same contextural (ontological, logical, semiotic) structure to a metamorphosis *between contextures, augmenting complexity/complication of contextural scenarios implementing clusters of informatical ambients and mobility.*

From the operations between actional ambients to the operationality *in polycontextural situations realized by the super-operators (identity, replication, permutation, reduction, bifurcation) placing ambient operations into the grid.*

From the connectivity of actions at a locality of message-passing, using a key to unlock a

lock of an agent, to different kinds mediation *between contextures containing informatical connectivity.*

These transitions seems to record a catalogue of minimal *conditions to be fulfilled to realize interactionality/reflectionality and interventionality in such complex constellations as the emerging knowledge grid."*

2.1.5. The key of mobile computing

Global URL and the identity of the key. The key of naming and the naming of the key.
The common semiotic presupposition of mobile computing is grounded in graphemic (or syntactic)
identity. Such a sentence sounds trivial because it is not only well known but the *sine qua non* of any scientific formulation. But its triviality is dissolved if it is localized into the graphemic chain of epochs from the pre-semiotic to the semiotic and further to the post-semiotic epoch as a trans-semiotic statement.

Mobility in identity systems is restricted to such identity; identity is guaranteeing security and global control for the prize of structurally restricted mobility. That is, mobility in identity systems happens under the roof of the identity of the global URL, e.g. Agha's UAN. Hence, despite its security it is the most vulnerable guarantee. A successful attack on its identity turns the system down.

2.2. Kenomic mobility

URLs, obviously, are words, representing numerical words. Numeric words are frozen kenomic scriptures.

Grammatologically speaking, the hierarchy between spoken and written language is inverted in graphematic systems. Hence, scriptures are not conceived as the inscriptions of words seen as connected with the thought, soul and life of a subject, they are therefore soul-less, dead, erratic (Platon, Roussau, de Saussure) but much more the life of spoken words is the witness of death, words are caged into the coffin of identity.
In other words, kenomic inscriptions are beyond life and death; spoken words are the words of death.

Mobility is a minimal condition for life.

The singularity and individuality of a kenomic address is given by its history. This is not a pre-given act of decision by an administrational priority but a mainly unknown and hidden determination of the address developed in the process of addressing.

Ideally, addresses are emerging by addressing. Hence, there is no key without using the key. Keys are not pre-given and representing a codification but are co-created during the process of addressing, co-creating the address of the key's addressing.

How many keys?

The identification number sequence given to a customer of a kenomic system is not a numeric number anymore but the dynamic pattern of of a number sequence, i.e. a *morphogram*. Hence a multitude of different concrete numeric addresses are given to the addresser. The system is not dealing with those addresses in concreto but with their pattern alone. That is, the URL is computed morphogrammatically and not numerically by the administrational instance.

The metaphor is: many keys to un/lock one lock.
Is this augmenting or reducing security? Mobility? Dynamics?
If a lock can be opened by many keys it is surely easier to crack the code and open the door than with a single and unique key. Hence polysemic locks are easier to crack than monosemic locks.
But this is missing the argument! No single key is unlocking the lock. Only the underlying morphogram of the different keys is unlocking the lock. Thus, the question is, how to get

access to the morphogrammatic lock? Is it accessible at all? There is no direct path from the single numeric keys to the unique morphogrammatic lock. Uniqueness in morphogrammatics is not connected with identity, like for numeric keys. Keys and locks in classical systems are both part of identity systems; they share the same semiotic abstraction.

The paradox is: The more keys are at hand the more difficult it is to un/lock the lock.
And at once, obviously, the more locks to be un/locked by one key the more difficult it is to find the key.

A key is not only an opener but with its cryptographic possibilities a discloser.
The more keys the more complex the cryptography. The complexity is not only in the numeric keys but in their multiple decompositions. There is a double or second-order cryptography involved.

The more keys fits the lock the less complex is the lock. The more keys *possible* to unlock the lock the less complex the lock.
The more keys *necessary* to un/lock the lock the more complex is the lock.

The more keys that don't fit the lock the easier it is to unlock the lock.
The more keys there are which don't fit the lock the easier it is to unlock the lock.
The more keys there are which fit the lock the harder it is to unlock the lock.
The more keys needed to unlock the lock the more complex the lock.

The key to mobile keys

The key to mobility seems to be mobile keys. Locality and connectivity in the sense of Web mobility are of second interest in keomic systems. Kenomic mobility is possible and reasonable even without any factual physical or informatical mobility by an actor. A static actor system should be able to be involved into the dynamics of mobility of the knowledge grid without getting forced to physical and informatical mobility.

The order of statics and dynamics of Web mobility is reversed in kenomic systems . Today, actors are mobile and the organizational institution is immobile and guaranteeing physical and informatical addressability and mobility. The concept or paradigm I'm halluzinating for is dynamic mobility and metamorphic transformability of the, until now, static organizational system of mobile computing.

Dynamic keys are offering mobility even for static actors. This doesn't sound absurd if we connect kenomic mobility with addressability and security. If the key is mobile, i.e.dynamic in a kenomic way, an attack to crack the code of the key turns into absurdity. That is, the abstraction from the locality of actors, like in Aga's model, can be understood in an *inverse* manner. *"Location-independence"* in Agha's model is connected with the mobility of an actor in the physical and informatical world, in a kenomic sense, *"location-independence"* has a rejectinal meaning: independence from the *necessity* of mobility between locations. And on the other hand, acceptance of "location-independence" for the constitutive difference of existence (occurrence) and locality (positionality) of events.

A location-independent system has two main features: a) it is *blind* to the fact that it is itself located, b) it is *blind* to the fact that it necessarily doesn't have an environment. Hence it is helpless against any attack or positive surprise from the *otherness* of itself.

Because of their dynamics, dynamic keys are not universal and unique, they don't have *"worldwide uniqueness"*, their world is not uni-versal but *pluri-versal*, their uniqueness is not identifiable by universal naming. Kenomic keys are situational, historical and depending on contextual use, learning reflectionally and interactionally to change and redefined self-determination.

"Since universal actors are mobile--their location can change arbitrarily--it is critical to provide a universal *naming system that guarantees that references remain consistent upon migration."*

"A Universal Actor Names (UAN) refers to an actor during its life-time in a location-independent *manner. The main requirements on universal actor names are location-independence, worldwide uniqueness, human readability, and scalability. We use the Internet's Domain Name System (DNS) [Mockapetris, 1987] to hierarchically guarantee name uniqueness over the Internet in a scalable manner."* (Agha, Varela)

From an *epistemological* point of view, I still have to insist on the crucial difference of *surface*- and *deep*-structure. Informatical theories and methods to deal with Web mobility are dealing with the surface-structure of Web activities. The kenomic approach tries to reflect and interact with the statics of the deep-structure of the Web. Both, surface- and deep-structure together have to be addressed simultaneously to develop a paradigm of an evolving knowledge grid.

The whole exercise experimented in this paper is trying to deconstruct the presuppositions of Mobile Computing: *uniqueness*, *universality*, *identity*, *human-readability,* etc. Such a manoeuvre might uncover some hints for a new paradigm of mobilities (plural!) in a pluri-versal knowledge grid.

3. Architectonics of kenomic Mobility

3.1. Architectonics of kenomic Actor systems

1. *Primitive actors* are zero-order actors, they are not allowed to interact but are responsible for the whole actor system to work properly, i.e. without paradoxes and circularity.
    a. Primitive actors are not active on the stage or arena but at the back-stage. Primitive actors are hidden actors.
        i. Primitive actors are enabling the interactional actions of basic actors.
        Without the support by primitive actors self-destructive actions of infinite regress, antinomic cricularities (paradoxes) are unavoidable in classical, i.e. monocontextural actor systems.
        ii. Primitive actors are typical for monocontextural (formal) systems.
2. *Basic actors* are first-order actors, their definition is to interact with other actors of an actor system.
    a. Basic actors are the actors on stage. They are playing the big interactional drama on a single arena.
        i. Basic actors are playing on stage on the base of the hidden support by primitive actors.
        ii. Basic actors are playing on stage on the prospect of the open guidelines by meta-actors.
3. *Meta-actors* are second-order actors, they are responsible for the interactivity between different actor systems in a global actor system, like the WWC (World Wide Computing).
    a. Meta-actors are the directors of the actor play. They manage the interactions between the actors, the actor systems and their universal distribution in a global interactional game. Hence, on a higher level they are also the organizational committee of the distributed actor systems.
    b. This reflectional capacity of the meta-levels of second order systems can be iterated to meta-levels of the second-order system. That is, in the second-order systems, meta-reflections (introspection) can be iterated without changing the second-order status of the system. No meta-reflection leads to a third-order system. No iteration of

meta-reflection has to collapse into first-order systems.

i. Meta-Actor systems, which are not yet embedded into the Diamond Actor system are not immun against the infinite regress problem imposed by the infinite iterability of meta-reflections.

c. Deepness of meta-reflections of second-order systems vs. broadness of object-reflection of first-order systems.
This defines the reflectional Actor system for uni-versal interactions as it is exposed by Agha's middleware approach.

4. *Trans-actors* are third-order actors, they are disseminating second-order actor systems over the kenomic matrix of polycontextural interactions. Polycontextural interactivity is pluri-versal.
   a. trans -actors in polycontextural systems are represented by the so-called super-operators (identity, permutation, reduction, replication, bifurcation) defining operationally the interactionality between disseminated universal actor systems.
   b. trans-actors are the *mediators* between disseminated actor systems. Mediators are the organizers of the interplay of different primordial actor systems.
      i. Interactivity between disseminated actor systems is ruled by the mechanism of chiasms.
      ii. Chiasms are combining order-, exchange- and coincidence-relations between actors and actands on different levels of polycontexturality.
      iii. As a consequence of the chiastic structure of disseminated actor systems the primitivity of the primitive actors is resolved into a contextural relativity. What functions as a primitive in one contexture functions as a non-primitive in a neighbor contexture, and vice versa.
      iv. Hence, problems of circularity are *restored* at the situation of any single elementary contexture and *resolved* by the distribution of the construction of chiastic circularity over different contextures.
5. *Diamond-actors* are forth-order actors, they are embedding the activities of the trans-actors into diamonds.
   a. Diamond-actors are enabling complex disseminated actor systems to incorporate the possibility of the new as the otherness of the actor system.
   b. Diamond actors are playing a double role. They are responsible for the mobility system and are enabling its environment. The environment of a mobility system is the place of the otherness. This can incorporate attacking events and/or the surprise of the new.
6. Diamond actor systems are localized and positioned into the *kenomic matrix*.
   a. The kenomic matrix is opening up spaces to general actor systems to place interactional, reflectional and interventional activities.

3.2. From hierarchy to a heterarchy of diamond actor systems

The classic hierarchy of the tectonics of actor systems is given by the hierarchy of:

$$AS = [\text{meta}[\text{basic}[\text{primitive}[\text{actors}]]]].$$

The original Actor Model is based on actors only. *"Everything in an Actor Model is an actor."* (Hewitt)

As it is well known, this everything-is-ism leads quickly to unpleasant consequences, which can hardly be accepted, especially from a computer science point of view. The unpleasant

species are *'illustre'* guests of many departments, they are called "vicious circles", "infinite regress", "paradoxes", "antinomies" and they got even a trendy appearance as "circulus creativus".

Hence, something has to be done. For that the brave "primitive actors" got a role in the play. Sometimes they experience the privilege of being tolerated, domesticated and baptized as "base actors" of a special kind.

On the base of existing presumptions of rationality and its mono-contextural constitution there is no escape in sight to such a situation. We can reject or forbid antinomies or we can try to domesticate them into a save corner of the hierarchical kingdom of reasoning and computation.

That's obviously very boring!

Therefore, I'm opting for a polycontextural and diamondal undertaking, adventurous or not.
The exercise to risk is quite simple:
Transform any circle or circularity into chiasms, first, then complete the chiasms towards diamonds of polycontextural frameworks!

3.2.1. Actor systems as mono-contextural reductions

$$AS_{mono} = \lceil \text{Meta} \lceil \text{Basic} \rceil \lceil \text{[Primitive]} \rceil \rceil .$$

This kind of a hierarchy can be seen as a reduction from the polycontextural diamond actor system to a monocontextural categorical actor system. That is, for matrix=1, diamond=0 and transoperations=0, the diamond Actor System is reduced the the monocontextural actor system AS_{mono} with its singular hierarchic distinction of meta/basic/primitive actors.

$$\lceil \text{Matrix} = 1 \lceil \text{Diamond} = 0 \lceil \text{Trans} = 0 \lceil \text{Meta} = 1 \lceil \text{Basic} \lceil \text{Primitive} \rceil \rceil \rceil \rceil \rceil \rceil \rceil \Longrightarrow \lceil \text{Meta} \lceil \text{Basic} \lceil \text{Primitive} \rceil \rceil \rceil .$$

Hierarchic solution of circularity
"The actor model is completely *uniform*. It includes a single kind of entity, actors, just as the Smalltalk-80 model only includes objects. [...]

"This uniformity raises the problem of *infinite regress*: if any access to information should be performed by message sending, messengers themselves would have to send a message in order to access to the message they carry and would deliver it to the receiver, and so forth.
So-called *primitive* actors, which do not need to send a message to respond a request, are provided to deal with this difficulty." Massing et al., Object-Oriented Languages, 1991, p. 299

"To avoid infinite regress of delegation, so-called *rock bottom* actors never delegate and do not send messages. They correspond to the *primitive* actors of the Hewlett's model and represent entities of a few specific types: for example, numbers, symbols and lists, in the lisp implementation. Their script is held by the interpreter." (ibid., p. 312)

Explanation of the brackets

1. **Matrix=1**: AS_{mono} is taking place in a scriptural space but their is no need to be aware

of it and to notify it. To defend a position is possible or necessary only if their are more than one position involved. Hence, mono-contextural systems are blind of possible neighbor systems and of the fact of being positioned, i.e. occupying a locus in a scriptural design.

2. **Diamond=0**: There is no need to involve AS_{mono} into a complementary interplay between categories and saltatories. Categories with their unsplit mono-contexturality are enough. Everything else is disturbance, creating fear.
3. **Trans=0**: Trans-operators are guiding the metamorphic interactions between contextures in a polycontextural complexion. Hence, in a mono-contextural situation, trans-operators are reduced to the identity operation, which again, can be omitted because it simply states the self-identity of the system with itself.
4. **Meta=1**: Finally, the Actor model for mobile computing gets its director. One, obviously, is enough to rule the (hidden) hierarchy of base and primitive actors.
5. **Basic=1:** The Actor model with its director rules the uniquenes of a singular base actor system which is secured by a unique troup of primitive actors.
6. **Primitive=1:** Primitive actors are building a unique system of core actors, preventing possible troubles, such as circularity produced by the base actors, .

3.2.2. Chiastic AS: basic/primitive

The hierarchy of primitive and basic actors, necessary in mono-contextural systems to avoid circularity, is transformed into a chiasm between the functionality of actors as *primitive* and as *basic* actors.

$$\left[\text{Matrix} = 2\ \left[\text{Diamond} = 1\ \left[\text{Trans} = 1\ \left[\text{Meta} = 1\ \left[\text{Basic}\ \left[\text{Primitive}\right]\right]\right]\right]\right]\right] \Longrightarrow \left[\text{Matrix}\ \left[\text{Diamond}\ \left[\text{Trans}\ \left[\text{Meta} = 2\ \left[\chi\left(\text{Basic} \,/\, \text{Primitive}\right)\right]\right]\right]\right]\right] =$$

$$\left[\text{Matrix}\ \left[\text{Diamond}\ \left[\text{Trans}\ \left[\text{Meta}^1\ \left[\left(\text{Basic} \longrightarrow \text{Primitive}\right)\right]\right] \updownarrow \left[\text{Meta}^2\ \left[\left(\text{Basic} \longrightarrow \text{Primitive}\right)\right]\right]\right]\right]\right]$$

$$\text{Chiasm}^{(2,1)} = \chi\left[\text{Meta}^1,\ \text{Meta}^2,\ \text{Basic},\ \text{Primitive}\right]$$

$$\left[\begin{array}{l} \text{Chiasm}^{(2,1)}: \\ \quad \text{Meta}^1 : \left[\text{Basic} \longrightarrow \text{Primitive}\right] \\ \qquad\qquad \updownarrow \quad x \quad \updownarrow \\ \quad \text{Meta}^2 : \left[\text{Primitive} \longleftarrow \text{Basic}\right] \end{array}\right]$$

A chiastic solution of the *"infinite regress"* problem is possible only for the cost of the commodity of the mono-contextural design, which has to be sacrificed to the dynamics of polycontextural systems.

Hence the chief director of the meta-operators has to be split into a cooperation of two directors building together the directors *team* of the cooperating theaters. This sacrifice of power opens up space to distribute the vicious circularity of self-referential base actors over two loci to form out of the circle a chiasm between base and primitive actors and the positions meta1 and meta2. Such a sacrifice shouldn't be too hard: their are still the directors dominating the distributed and mediated base and primitive actors. No director has to appear on stage with the actors. But also, no primitive actor has to stay hidden behind stage. The new fun of the game is the inter-exchange between back-stage and on-stage appearances of actors on the arena of different theaters.

3.2.3. Chiastic AS: trans/meta/basic/primitive

$$\left[\text{Matrix}\left[\text{Diamond}\left[\text{Trans}\left[\text{Meta}\left[\chi\left(\text{Basic}\,/\,\text{Primitive}\right)\right]\right]\right]\right]\right] \Longrightarrow \left[\text{Matrix}\left[\text{Diamond}\left[\text{Trans}\left[\chi\left(\text{Meta}\,/\,\text{Basic}\,/\,\text{Primitive}\right)\right]\right]\right]\right] =$$

$$\left[\text{Matrix}\left[\text{Diamond}\left[\left[\text{Trans}^{1}\left[\left[\text{Meta}\longrightarrow\left(\text{Basic}\,/\,\text{Primitive}\right)\right]\right]\right]\uparrow\downarrow\left[\text{Trans}^{2}\left[\left[\text{Meta}\longrightarrow\left(\text{Basic}\,/\,\text{Primitive}\right)\right]\right]\right]\right]\right]\right]$$

But that's not enough. Cooperations are still taking part in an old fashioned modern world view. But in-between post-modern experiences have led to a fundamental involvement of the directors into the play they have to direct, now becoming aware, that there was always an interaction between the brave players and the directors. Hence, a new step of the interchangeability interplay is opened: directors are becoming actors and actors are becoming directors.
All that is well operated by the supremacy of the trans-operators. But again, directors have to share their supremacy between each other.

There is some advantage, they learned to do it from the directors and they still can be assured of the common insurance by the diamond actors, who are well positioned in the kenomic matrix.

Because of the success of the play the difference of base and primitive actors gets neglected. This happens to all systems where the slaves are well domesticated.

Meta-actor and base actor
"Interaction between meta-actor and base actor." (Varela)

"We use the meta-actor[14] extension of actors to provide a mechanism of architectural customization. A system is composed of two kinds of actors: *base* actors and *meta-actors*. Base actors carry out application-level computation, while meta-level actors are part of the runtime system (middleware) that manages system resources and controls the base-actor's runtime semantics." (Agha, Varela)

"Thus, in a reflective architecture, a system is composed of two kinds of actors--*base*-level (application) actors and *meta*-level actors or meta-actors." (ibd. p.12)

$$\left[\begin{matrix}\text{Matrix}\\ \left[\begin{matrix}\text{Diamond}\\ \text{Trans}\\ \left[\chi\left(\text{Meta}\,/\,\text{Basic}\,/\,\text{Primitive}\right)\right]\end{matrix}\right]\end{matrix}\right] \Longrightarrow \left[\begin{matrix}\text{Matrix}\\ \left[\begin{matrix}\text{Diamond}\\ \left[\chi\left(\text{Trans}\,/\,\text{Meta}\,/\,\text{Basic}\,/\,\text{Primitive}\right)\right]\end{matrix}\right]\end{matrix}\right] =$$

$$\left[\begin{matrix}\text{Matrix}\\ \left[\begin{matrix}\text{Diamond}^1\left(\text{Category}\right)\\ \left[\text{Trans} \longrightarrow \left(\text{Meta}\,/\,\text{Basic}\,/\,\text{Primitive}\right)\right]\end{matrix}\right]\end{matrix}\right] \uparrow\downarrow \left[\begin{matrix}\text{Diamond}^2\left(\text{Saltatory}\right)\\ \left[\text{Trans} \longrightarrow \left(\text{Meta}\,/\,\text{Basic}\,/\,\text{Primitive}\right)\right]\end{matrix}\right]$$

Until now the distribution was guaranteed by the mechanism of polycontexturality.
No involvement of the intriguing apparatus of diamonds was necessary to involve trans-operators and directors of the meta-actors into the play.

3.2.4. Chiastic interaction AS: diamond/mobile

$$\text{Chiasm}\left(\left[\begin{matrix}\text{Matrix}\\ \left[\begin{matrix}\text{Diamond}\\ \left[\text{Mobile}\right]\end{matrix}\right]\end{matrix}\right]\right) \Longrightarrow$$

$$\left[\begin{matrix}\text{Matrix}\\ \left[\chi\left(\text{Diamond}\,/\,\text{Mobile}\right)\right]\end{matrix}\right] = \left[\begin{matrix}\text{Matrix}^1\\ \left[\text{Diamond} \longrightarrow \text{Mobile}\right]\end{matrix}\right] \uparrow\downarrow \left[\begin{matrix}\text{Matrix}^2\\ \left[\text{Diamond} \longrightarrow \text{Mobile}\right]\end{matrix}\right]$$

$$\text{Mobile} = \left[\begin{matrix}\text{Meta}\\ \left[\begin{matrix}\text{Basic}\\ \left[\text{Primitive}\right]\end{matrix}\right]\end{matrix}\right],\ \text{Trans}:\ \text{Mobile} \longrightarrow \text{Mobile}$$

A chiasm between *mobile* and *diamond* seems not easy to grasp.

The diamond rules the positioning of *mobile* in the kenomic matrix. The mobile, antidromically, is enabling the structure of such positioning of the mobile by the diamond. The process-structure, i.e. the structuration of mobile and diamond are inter-related, inter-woven and building together the chiastic interactional Actor system.

A further simple step in the conceptualization of Mobile Actor Systems is introduced by the diamondzation of the chiastic approach to the diamond/mobile interaction.

Additional to the acceptional patterns of the (pure) chiasm, the rejectional behaviors shall be involved. The acceptional patterns are reflecting the dynamics of the pure chiasm into an own domain.This domain (contexture) is representing the "*what*" of the chiasm, while the chiasm itself is inscribing the "*how*" of the interaction. The rejectional behaviors are mirroring the antidromic, enantiomorph, 'inverse' patterns of the chiasm.

Diamond Actor Systems

$$\text{Diam}\left(\left[\left[\begin{matrix}\text{Matrix}\\ \left[\begin{matrix}\text{Diamond}\\ \left[\text{Mobile}\right]\end{matrix}\right]\end{matrix}\right]\right]\right) \Longrightarrow$$

$$\left[\begin{matrix}\text{Matrix}\\ \left[\delta\left(\text{Diamond} \,/\, \text{Mobile}\right)\right]\end{matrix}\right] = \left[\begin{matrix}\text{Matrix}^1\\ \left[\text{Diamond} \longrightarrow \text{Mobile}\right]\end{matrix}\right] \left[\left[\begin{matrix}\text{Matrix}^2\\ \left[\text{Diamond} \longrightarrow \text{Mobile}\right]\end{matrix}\right]\right],$$

$$\left[\begin{matrix}\text{Diam}^{(2,1)}\\ \begin{matrix}\text{Pos}^1 : \left[\text{Diamond}\right] \doteq \left[\text{Diamond} \longrightarrow \text{Mobile}\right] \doteq \left[\text{Mobile}\right]\\ \downarrow \qquad\qquad \updownarrow \quad x \quad \updownarrow \qquad\qquad \uparrow\end{matrix}\\ \text{Pos}^2 : \left[\text{Mobile}\right] \doteq \left[\text{Mobile} \longleftarrow \text{Diamond}\right] \doteq \left[\text{Diamond}\right]\end{matrix}\right]$$

Nevertheless, the whole drama, as just sketched, is one and only one *thematization* of the possibilities of mobile computing based on diamonds and polycontexturality inscribed into the kenomic matrix.

Mobility
"There are three types of mobility in distributed systems: resource *migration to improve locality of access,* code *migration for dynamic application behavior, and* user *mobility - multiple points of application access."* (Varela, p. 4)

Polarizations
Resources: Abstractness of classical semiotic systems vs. kenomic concreteness of morphogrammatic inscriptions.
Code: Universal code for migration and dynamics vs. pluri-versal thematizations for metamorphosis and interchange.
Users: Ego-based mobility in a homogeneous physical and informatical space vs. interactionality/reflectionality based interplay in a kenomic matrix.

3.2.5. Disseminated ASs

$$\left[\begin{matrix}\text{General} - \text{Matrix}^{(m,n)}\\ \begin{matrix}\left[\begin{matrix}\text{Diamond}_{1.1}\\ \left[\text{Mobile}\right]\end{matrix}\right]\left[\begin{matrix}\text{Diamond}_{1.2}\\ \left[\text{Mobile}\right]\end{matrix}\right] \cdots \left[\begin{matrix}\text{Diamond}_{1.n}\\ \left[\text{Mobile}\right]\end{matrix}\right]\\ \left[\begin{matrix}\text{Diamond}_{2.1}\\ \left[\text{Mobile}\right]\end{matrix}\right]\left[\begin{matrix}\text{Diamond}_{2.2}\\ \left[\text{Mobile}\right]\end{matrix}\right] \cdots \left[\begin{matrix}\text{Diamond}_{2.n}\\ \left[\text{Mobile}\right]\end{matrix}\right]\\ \cdots \qquad\qquad \cdots \qquad\qquad \cdots \qquad \cdots\\ \left[\begin{matrix}\text{Diamond}_{m.1}\\ \left[\text{Mobile}\right]\end{matrix}\right]\left[\begin{matrix}\text{Diamond}_{m.2}\\ \left[\text{Mobile}\right]\end{matrix}\right] \cdots \left[\begin{matrix}\text{Diamond}_{m.n}\\ \left[\text{Mobile}\right]\end{matrix}\right]\end{matrix}\end{matrix}\right]$$

Disseminated Actor systems (DAS) are necessary to handle polycontextural constellation of the knowledge grid. Knowledge, hence is conceived as categorial strictly different from concepts and strategies like information, data, informatic objects which are all defined mono-contexturally, i.e. independent from the reflectionality and interactionality of the co-creating participant and designer of a knowledge grid. A grid or a mesh is not a web.
A grid is understood as a mediation of distributed contextures (of meaning) which are arranged, interactionally and reflectionally, into a multi-layered and heterarchic complexions.

Therefore, a single Actor system is not covering the complexity of knowledge but the uniformity of a informatical domain only.

4. Agha's UAMs in the Matrix

4.1. How to map universals onto the matrix?

"The universal actor model [UAM] *extends* the actor model [Agha, 1986] by providing actors with *universal* names, location awareness, remote communication, migration, and limited coordination capabilities [Varela, 2001]." (Agha, Varela, p. 6, 2004)

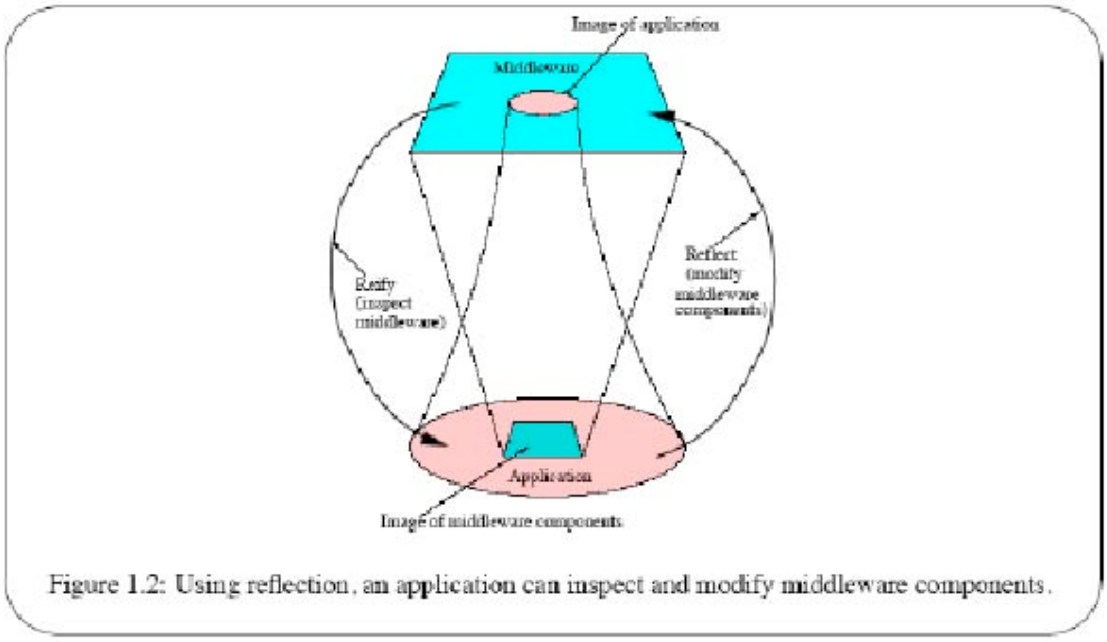


Figure 1.2: Using reflection, an application can inspect and modify middleware components.

Sometimes, a diagram offers more information about the modeling philosophy than the verbal and formal descriptions of it. At least, I don't easily see the hierarchic structure between *application* and middleware [Agha, Varela 2004] as it is proposed in Varela's text. Astonishingly, it looks much more like a Yin-Yang-Figure than a hierarchic diagram.

Infinite regress, again?

It seems not yet been reflected by the UAM approach to reflection that the *infinite regress* problem, or is it a progress?, of reflection and meta-reflection of meta-level actors (meta-actors) occurs automatically in meta-reflectional systems again as it happened for the base actors who are depending on the stopping facilities of the primitive actors. As it was necessary to introduce the regress stopping primitive actors as *rock bottom* actors it seems necessary to introduce a new kind of regress stopping ultra-meta actors as *top rocket* (or *high sky*) actors to stop the system transcending into unknown horizons.

Reflection of Application/Middleware = χ[Reflect, Reify, $\text{Image}_{\text{Appl}}$, $\text{Image}_{\text{Middle}}$].

$$\left[\begin{array}{l} \text{Chiasm}^{(2,1)}: \\ \quad \text{Reflect}^{1}: \left[\text{Application} \longrightarrow \text{Middleware}\right] \\ \qquad\qquad\qquad\qquad \updownarrow \quad x \quad \updownarrow \\ \quad \text{Reify}^{2}: \left[\text{Middleware} \longleftarrow \text{Application}\right] \end{array}\right]$$

The modeling strategy to map the Universal Actor Model (UAM) onto the kenomic matrix is quite simple: Universals are mapped into pluri-versals. That is, the *uniqueness* of the

Universal Actor Model has to be disseminated over the pluri-versal matrix of polycontexturality. As a consequence of such a distribution and mediation new interactional and reflectional mappings between the distributed UAMs are introduced.

As a result, some modeling of the original UAM might be reframed into other strategies. For example, the modeling of reflection as *"Using reflection, an application can inspect and modify middleware components."* might get a more chiastic and therefore polycontextural modeling than the uni-versalist approach proposed by the original UAM model[15].

Main differences

All those new approaches, like the Universal Actor Model, are based, at the end of the journey, on the strictly *algorithmic* and non-interactional concept of the Lambda Calculus with its simple abstraction procedures. Everything else, like reflection, distribution, interactivity, etc. is added secondarily and is a construct on the base of the primary calculus. Even if the Actor Model is surpassing the computational conception of the Lambda Calculus by definition, as it is postulated by Carl Hewitt, its *realization* is still fighting with the past, and topics like reflection, interaction and inconsistency (paraconsistency) are not genuinely incorporated and have to be added as an extension of the basic model. That is, some new generalizations and abstraction mechanism have to be added or supplemented on a higher level of the originary system based on the basic abstraction of naming and identification.

Diamond systems are from the very beginning distributed, mediated, reflectional and interactional, and based on *thematizations* instead of identification. All those features are at hand from the very beginning of modeling and computation, say mobile computing, at least on a *conceptual* level of modeling and implementation.

I also can't see any reason given by the reflectional UAM approach that could prevent it from being involved into all the known *conceptual problems* of computational reflection as studied by Brian Smith and Pattie Maes (meta-level architecture, meta-circularity, inspection, infinite regress).
This is by no means a failure of the conceptual designers involved but an inherent consequence of the general paradigm of thinking which is leading, i.e. limiting all those approaches. On a conceptual level all the possibilities of self-reflectional systems had been explored by philosophers long ago (Kant, Fichte, Schelling, Hegel, Heidegger, Ryle, Henrich, Tugendhat, Gunther).

Notes&References

1 Kenogrammatic systems are regarded simply as equivalence classes of semiotic systems.
This is the standard academic interpretation of Gunther's kenogrammatics. From that it follows, that the whole idea and apparatus of kenogrammatics is obsolete.
This opinion is based on ignorance in respect to the written texts, which are introducing kenogrammatics in a double gesture of philosophical interventions and mathematical inventions. Because this field is still in its early stage of development, criticism is easy to apply. There is no serious academic carrier to do with it, hence deny its significance. But even with this ignorance, and based on tiny fragments of the trans-classical approach, some academic degrees had been achieved .

2 http://www.thinkartlab.com/pkl/ lola/AFOSR-Place-Valued-Logic.pdf

3 http://www.rudolf-matzka.de/dharma/semabs.rtf

4 http://www.logoi.com/notes/chinese_alphabet.html

5 http://www.thinkartlab.com/pkl/tm/MG-Buch.pdf

6 http://www.thinkartlab.com/pkl/media/SKIZZE-0.9.5-medium.pdf

7 http://www.thinkartlab.com/pkl/lola/Categories-Contextures.pdf

8 http://www-osl.cs.uiuc.edu/

9 **Hierarchy: primitive actors -> basic actors -> meta-actors**
It seems that the basic concept of the Actor Theory is not the Actor (event, message) but the *differences* between primitive/basic/meta, i.e., the architectonic distinction of different Actor types. The common trick of generalization/specification is not working. That is, a primitive actor is not simply a special case of a basic actor because the system of basic actors can not be defined consistently without the help of the primitive actors. Nor is it possible to define the meta-actor as a generalization of the common basic actors.
Thus, the differences in architectonics of the Actor Theory, up to now, is three-fold: primitive/basic, basic/meta and primitive/meta.
R. Kaehr, Actors, Objects, Contextures, Morphograms
http://www.thinkartlab.com/pkl/lola/Actors+Objects.pdf

10 **1.2.5 Universal Naming**
Since universal actors are mobile--their location can change arbitrarily--it is critical to provide a universal naming system that guarantees that references remain consistent upon migration. Universal Actor Names (UAN) are identifiers that represent an actor during its life-time in a location-independent manner. An actor's UAN is mapped by a naming service into a Universal Actor Locator (UAL), which provides access to an actor in a specific location. When an actor migrates, its UAN remains the same, and the mapping to a new locator is updated in the naming system. Since universal actors refer to their peers by their name, references remain consistent upon migration.

1.2.5.1 Universal Actor Names
A Universal Actor Names (UAN) refers to an actor during its life-time in a location-independent manner. The main requirements on universal actor names are location-independence, worldwide uniqueness, human readability, and scalability. We use the Internet's Domain Name System (DNS) [Mockapetris, 1987] to hierarchically guarantee name uniqueness over the Internet in a scalable manner. More specifically, we use Uniform Resource Identifiers (URI) [Berners-Lee et al., 1998] to represent Universal Actor Names. This approach does not require actor names to have a specific naming context, since we build on unique Internet domain names.
The universal actor name for a sample address book actor is:
uan://wwc.yp.com/~smith/addressbook/
The protocol component in the name is uan. The DNS server name represents an actor's home. An optional port number represents the listening port of the naming service--by default 3030. The remaining name component, the relative UAN, is managed locally at the home name server to guarantee uniqueness.

1.2.5.2 Universal Actor Locators
An actor's UAN is mapped by a naming service into a Universal Actor Locator (UAL), which provides access to an actor in a specific location. For simplicity and consistency, we also use URIs to represent UALs. Two universal actor locators for the address book actor above are:
rmsp://wwc.yp.com/~smith/addressbook/
and
rmsp://smith.pda.com:4040/addressbook/
The protocol component in the locator is rmsp, which stands for the Remote Message Sending Protocol. The optional port number represents the listening port of the actor's current theater, or single-node run-time system--by default 4040. The remaining locator component, the relative UAL is managed locally at the theater to guarantee uniqueness.
While the address book actor can migrate from the user's laptop to her personal digital assistant (PDA), or cellular phone; the actor's UAN remains the same, and only the actor's locator changes. The naming service is in charge of keeping track of the actor's current locator.

1.2.5.3 Universal Actor Naming Protocol
When an actor migrates, its UAN remains the same, and the mapping to a new locator is updated in the naming system. The Universal Actor Naming Protocol (UANP) defines the communication between an actor's theater and an actor's home, during its life-time: creation and initial binding, migration, and garbage collection.
UANP is a text-based protocol resembling HTTP with methods to create a UAN to UAL mapping, to retrieve a UAL given the UAN, to update a UAN's UAL, and to delete the mapping from the naming system.
Gul Agha and Carlos Varela. Worldwide Computing Middleware. In M. Singh, editor, Practical Handbook on Internet Computing. CRC Press, 2004. http://wcl.cs.rpi.edu/papers/chmiddleware.pdf

11 http://www.lix.polytechnique.fr/Labo/Robin.Milner/bigraphs-tutorial.pdf

12 http://www.thinkartlab.com/pkl/lola/Interactivity.pdf

13 http://www.thinkartlab.com/pkl/media/Diamond_Web2.0/Diamond_Web2.0.html

14 http://osl.cs.uiuc.edu/docs/firstpaper/final.ps

15 http://yangtze.cs.uiuc.edu/Theses/varela-phd.pdf

Rudolf Kaehr

Double Cross Playing Diamonds

Understanding interactivity in/between

bigraphs and diamonds

in:

Paradoxes of Interactivity

Perspectives for Media Theory, Human-Computer Interaction, and Artistic Investigations

Double Cross Playing Diamonds

Understanding interactivity in/between bigraphs and diamonds

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5 Bibliography

1. Models of Interactivity between flows and salti[1]

"Interactivity is all there is to write about: It is the Paradox and the Horizon of Realization."

Grammatologically, the Western notational system is not offering space in itself to place sameness and otherness necessary to realize interaction/ality. Alphabetism is not prepared to challenge the dynamics of interaction directly. The Chinese writing system in its scriptural structuration is able to place complex differences into itself, necessary for the development and design of formal systems and programming languages of interaction. The challenge of interactionality to Western thinking, modeling and design interactivity has to be confronted with the decline of the scientific power of alphanumeric notational systems as media of living in a complex world. (cf. Kaehr 2006a)

The challenge I see for media artists is not only to develop interactional media constellations but also to *intervene* between the structures and dynamics of interactional systems as international corporations, governments, military and academia force them on us. (cf. Kaehr 2003a, b)

1.1 Comparison of two approaches to interactivity

This paper takes the risk to compare two fundamentally different approaches to interaction and reflection in computational systems: Milner's *bigraphs* and *diamond* theory. Milner's bigraph model and theory of interaction is highly developed, while the diamond model applied to this interactional scenario and confronted with the bigraphs model is presented here for the first time.

The Milner model is presupposing a world-view (ontology, epistemology) of homogeneity and openness. Its basic operation is composition in the sense of category theory. Composition is associative and open for infinite iterability. Milner's model is a model of interaction in a global sense but it is not thematizing formally the chiastic interplay of local and global aspects of interaction. Its merits is to have developed a strict separation of topography (locality) and connectivity for a unifying theory of global and mobile interaction (ubiquitous computing) surpassing, in principle, the limits of Turing computability.

In contrast, the diamond model, which is just emerging, (cf. Kaehr1996), is based on an *antidromic* and *parallactic* structure of combination of events in an open/closed world of a multitude of discontextural universes. In such a pluriversal world model, each composition is having its complementary combination. With that, iterability for diamonds is not an abstract iterativity but interwoven in the concrete situations to be thematized, and determined by iterative and accretive repetitions, involving their complementary counterparts, without a privileged conceptual initial/final object.

This leads to a theory of diamonds as a complementary interplay of categories and saltatories (jumpoids) with the main rules, globally, of complementarity and locally, of bridging. Diamonds are involving bi-objects belonging at once to categories and to saltatories, ruled by composition and saltisition (jump-operation). (Kaehr 2007a)

[1] Thanks to Marianne Dickson, Edinburgh, for bridging the corrections and correcting the bridges of this composition.

1.2 Interactionality as interplays between categories and saltatories

In less technical terms, the polycontextural approach of diamond theory is supporting three new features:

First, it supports the idea of irreducible multi-medial contextures and their qualitative incomparability. That is, different media like sound, video, picture, text, graphics, etc., are conceived as logically different and as organized and distributed conceptually in a heterarchical sense. To thematize media as a digital contexture is not more than to emphasize their informatical and physical aspect, which is as such a contexture, too.

Second, it supports the possibility of mapping the (outer) environment of a contexture (media) in itself, i.e., to offer an inner environment for reflectionality. Contextures, to be different from systems, have to reflect their environment into their own domain. Hence, a contexture has to be understood as being involved into interplays of inner and outer environments.

Third, it supports the possibility of realizing simultaneously movements (actions) and complementary counter-movements on a basic level of conceptualization and formalization. If composition of events inside a contexture and mediation of different contextures to a compound contexture, polycontexturality, are characterized by the rules of combination, i.e., identity, commutativity and associativity, a new feature of composition is discovered by the diamond approach, which is antidromic and parallax, corresponding structurally the otherness of the categorical system.

Therefore, the questions of interactionality in a diamond framework are not primarily, how do we globally move, physically and informatically, from one topographic place to another, but how do we move by interaction from one medium to another medium of a complex knowledge space. With the appearance of the semantic web and knowledge grid (cf. Kaehr 2004b) such developments are unavoidable. Obviously, the polycontextural diamond approach is not opting for a principally homogeneous global field of informatical and physical events but for a discontexturality of different media, situations, contexts of meaning.

The Milner Model is well based, principally, on *category theory*, the diamond model has to develop its own new formalism, risked here as a diamondization of category theory. Hence, both theories are in a constellation, which offers a reasonable possibility for comparisons.

Because the bigraph model is based on category theory and its concept of *composition* with its abstract *iterability*, the diamond model has to develop a distinct concept of composition (combination), one which involves a complementarity of, at least, two different concepts of composition; technically, the categorical and the saltatorical composition, and which is opening up the operativity of an open/closed concept of iter/alterability.

Even if only metaphorically and still vague, what is common to both models is there dichotomous, dual, *complementary* and *orthogonal* approach to interaction and interactionality. The Milner model is focused on message passing, flow of informatic objects, the diamond model on agents and their reflectional/interactional activities with an emphasis on intervention.

2 Milner's bi-graph model of interaction

Out of his cloud of keywords to ubiquitous computing and interactivity, Milner chooses at his Beijing 2005 performance 3 leading features: *locality*, *mobility* and *connectivity*. (Milner 2005: 49)

2.1 Locality and connectivity

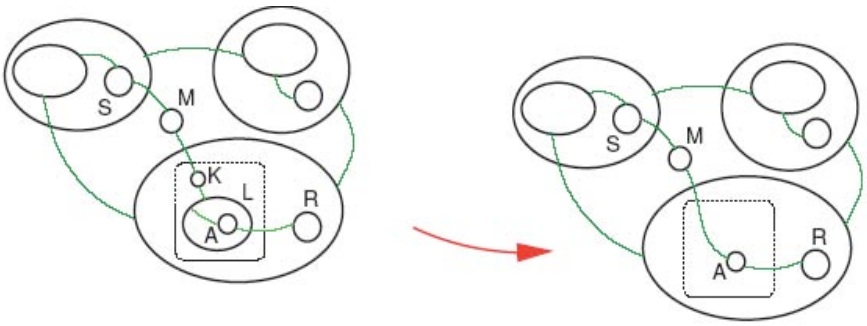
locality

"Programming the digital computer ramifies the use of space and spatial metaphor, both for writing programs and for explaining why they work. This shows up in our vocabulary: flow chart, location, send and fetch, pointer, nesting, tree, etc. Concurrent computing expands the vocabulary further: distributed system, remote procedure call, network, routing, etc.

We are living with a striking phenomenon: the *metaphorical* space of algorithms qgraph, array, and so on q is mixed with the space of *physical* reality." (Milner 2007:1)

physical and virtual space

"Informatic objects flow in physical space; physical objects such as mobile telephones manipulate their informatic space."



"The picture illustrates how physical and virtual space are mixed. It represents how a message M might move one step closer to its destination. The three largest nodes may represent countries, or buildings, or software agents. In each case the sender S of the message is in one, and the receiver R in another. The message is en route; the link from M back to S indicates that the messages carries the sender's address. M handles a key K that unlocks a lock L, reaching an agent A that will forward the message to R; this unlocking is represented by a reaction rule that will reconfigure the pattern in the dashed box as shown, whenever and wherever this patterns arises." (ibid:1)

"Bigraphical reactive systems are a model of information flow in which both *locality* and *connectivity* are prominent. In the graphical presentation these are seen directly; in the mathematical presentation they are the subject of a theory that uses a modest amount of algebra and category theory. A bigraph may reconfigure both its locality and its connectivity. The example pictured above shows how reconfiguration is defined by reaction rules; in that case, the rule may be pictured thus:

The mathematical structure of bigraphs allows concepts to be treated somewhat independently; for example, connectivity and locality are treated *orthogonally*." (ibid: 2)

"So the challenge to bigraphs is to provide a uniform behavioural theory, allowing many process calculi to be expressed in the same frame while preserving their treatment of behaviour." (ibid: 2)

The aim of a new design

"The challenge for global ubiquitous computing is to devise theories and design principles in close collaboration, . . ." (Milner 2005: 64)

"The long-term aim of this work is to provide a model of computation on a *global* scale, as represented by the Internet and the Worldwide Web. The aim is not just to build a mathematical model in which we can analyse systems that already exist. Beyond that, we seek a theory to *guide* the specification, design and programming of these systems, to guide future adaptations of them, and not to deteriorate when these adaptations are implemented. [...]

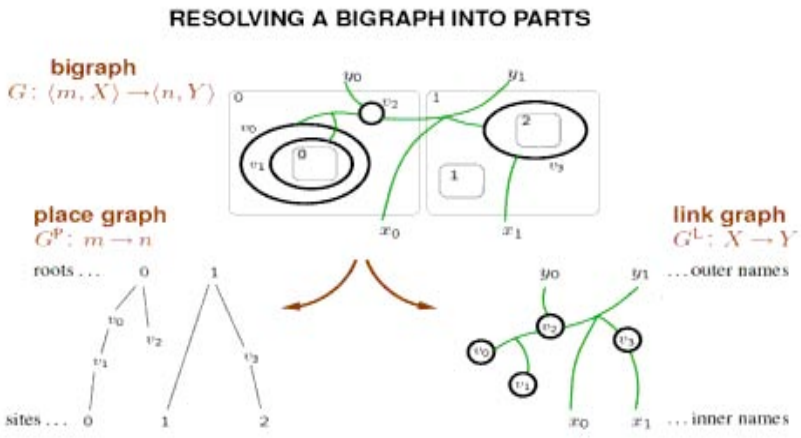
This will only be achieved if we can *reverse* the typical order of events, in which design and implementation come first, modelling later (or never). For example, a programming language is rarely based thoroughly upon a theoretical model. This has inevitably meant that our initial understanding of designed systems is brittle, and deteriorates seriously as they are adapted.

We believe that the only acceptable solution, in the long run, is for system designs to be expressed with the concepts and notations of a theory rich enough to admit all that the designers wish." (Milner 2004b: 7)

2.2 Strategies of orthogonal simultaneity

"So our strategy here is to tackle just two aspects – *mobile connectivity* and *mobile locality* – simultaneously. In fact this combination contains a novel challenge: to what extent in a model should connectivity and locality be interdependent? In plain words, does where you are affect whom you can talk to? To a user of the Internet there is total independence, and we want to model the Internet at a high level, in the way its connectivity appears to users. But to the engineer these remote communications are not atomic, but represented by chains of interactions between neighbours, and we should also provide a low-level model, which rejects this reality. So we want to have it both ways; furthermore, we want to be able to describe rigorously how the high-level model is realised by the low-level one." (Milner 2004b: 7)

Milner's Model of bigraphs (Milner 2006: 21)



2.2.1 Statics of interaction: Categorical framework

"Abstract. This paper axiomatises the structure of *bigraphs*, and proves that the resulting theory is *complete*. Bigraphs are graphs with double structure, representing *locality* and *connectivity*. They have been shown to represent dynamic theories for the pi-calculus, mobile ambients and Petri nets, in a way that is faithful to each of those models of discrete behaviour. While the main purpose of bigraphs is to understand mobile systems, a prerequisite for this understanding is a well-behaved theory of the structure of states in such systems. The algebra of bigraph structure is surprisingly simple, as the paper demonstrates; this is because bigraphs treat *locality* and *connectivity orthogonally*." (Milner 2004a: 1)

2.2.2 Dynamics of interaction: Labeled process calculi

"Let us repeat: in a pure bigraph G : <m, X> –> <n, Y> we admit no association between its outer names Y and the roots (regions) n, nor between the inner names X and the sites m. It is this dissociation that enables us to treat locality and connectivity independently, yielding a tractable theory." (Milner 2004b: 20)

The dynamics of bigraphs is are formalized by labeled process calculi:

"The challenge from process calculi is to provide a uniform behavioural theory, so that many process calculi can be expressed in the same frame without seri-

ously affecting their treatment of behaviour. We now outline how research leading up to the bigraphical model has addressed this challenge.

It is common to present the dynamics of processes by means of reactions (also known as rewriting rules) of the form r –>r′, meaning that r can change its state to r′ in suitable contexts. In process calculi this treatment is typically refined into labelled transitions of the form a –>^{l} a′, where the label *l* is drawn from some vocabulary expressing the possible interactions between an agent *a* and its environment. These transitions have the great advantage that they support the definition of behavioural preorders and equivalences, such as traces, failures and bisimilarity. But the definition of those transitions tends to be tailored for each calculus." (Milner 2005: 8)

2.2.3 Formalization of interaction: Bigraphs as tensor categories

"This chapter establishes place graphs, link graphs and bigraphs as arrows in certain kinds of category. Any kind of category is concerned with operations upon arrows, especially *composition*." (Milner 2007: 13)

"Note that this *combination* is quite distinct from the categorical composition used to insert one bigraph into another (e.g. an agent into a context). But it is simply related to them; to compose two bigraphs categorically, we first resolve them into their respective *place* graphs and *link* graphs, then compose these, and finally combine the results into a new bigraph." (Milner 2004b: 19)

2.2.4 Axiomatics of bigraphs

"The topic of this paper is to axiomatise the resulting structure of bigraphs. The justication for such a specific topic is threefold.

First, the work already cited gives ample evidence that a graphical structure combining topography with connectivity has wide application in computer science; for as we have seen it brings unity to at least three models of discrete dynamics, each of which has already many applications.

Second, it appears that the algebraic treatment of such dual structures has not been previously addressed; yet the behaviour of systems whose connectivity and topography are both reconfigurable may be so complex that their dynamics cannot be properly understood without a complete and rigorous treatment of their statics. Bigraphs are just one possible treatment of such dual structure, but it is likely that their static theory can be modified for other treatments.

Third, as we shall see, dual structures seem to require a novel kind of normal form which is essential to a proof of axiomatic *completeness*." (Milner 2004a: 4)

Axiomatics (Table 1)

CATEGORICAL AXIOMS:

$$
\begin{aligned}
A\,\mathrm{id} &= A = \mathrm{id}\,A \\
A(BC) &= (AB)C \\
A \otimes \mathrm{id}_\epsilon &= A = \mathrm{id}_\epsilon \otimes A \\
A \otimes (B \otimes C) &= (A \otimes B) \otimes C \\
(A_1 \otimes B_1)(A_0 \otimes B_0) &= (A_1 A_0) \otimes (B_1 B_0) \\
\gamma_{I,\epsilon} &= \mathrm{id}_I \\
\gamma_{J,I}\gamma_{I,J} &= \mathrm{id}_{I \otimes J} \\
\gamma_{I,K}(A \otimes B) &= (B \otimes A)\gamma_{H,J} \qquad (A\colon H \to I, B\colon J \to K)
\end{aligned}
$$

LINK AXIOMS:

$$
\begin{aligned}
/_y \circ {}^y/_x &= /_x \\
/_y \circ y &= \mathrm{id}_\epsilon \\
{}^z/_{(Y \uplus y)} \circ (\mathrm{id}_Y \otimes {}^y/_X) &= {}^z/_{(Y \uplus X)}
\end{aligned}
$$

PLACE AXIOMS:

$$
\begin{aligned}
merge(1 \otimes \mathrm{id}_1) &= \mathrm{id}_1 && \text{(unit)} \\
merge(merge \otimes \mathrm{id}_1) &= merge(\mathrm{id}_1 \otimes merge) && \text{(associative)} \\
merge\,\gamma_{1,1} &= merge && \text{(commutative)}
\end{aligned}
$$

NODE AXIOMS:

$$
(\mathrm{id}_1 \otimes \alpha)\mathsf{K}_{\vec{x}} = \mathsf{K}_{\alpha(\vec{x})}\ .
$$

"In other words, the axioms are both sound and complete. They say simple things: The *place* axioms say that join is commutative, has a unit and is associative; the *link* axioms say that the formation of links obeys obvious rules; the node axiom says that we can name ports arbitrarily." (ibid: 23)

2.2.5 Completeness of the axiom system

"The completeness of the axiom system in *Table 1* depends primarily on two things:

first, that all linking can be exposed at the outermost level of an expression;

second, that we have a strict symmetric monoidal category of bigraphs, with a tensor that is partial on objects.

Crucial to the tensor is that it is bifunctorial, i.e.

$(A_1 \times B_1)(A_0 \times B_0) = (A_1A_0) \times (B_1B_0)$; this axiom underlies most of our manipulations.

Thus the discrete normal form, DNF, has been crucial for the proof of completeness." (ibid: 21)

2.3 Orthogonality of topography and connectivity

2.3.1 Underlying world model

The bi-graph model of interaction is highly flexible and is liberating from unnecessary fixations. Bigraphical reactive (re-writing) systems as models of information flow are dealing *locality* and *connectivity* as *orthogonal* events, distributed over two dimensions. Such a separation of structural locality and behavioral connectivity enables a clear modeling and an effective formalization as a bi-graph or bipartide system. Spaciality is conceived as static, formalized by category theory and behavior as dynamic, formalized by process calculi (pi-calculus).

The bigraph model of interaction seems to belong to a world model with the characteristics of: *"Everything in this world is changing but the world in which everything is changing doesn't change."* Ubiquitous and global computing is presupposing an epistemologically uniform, homogeneous world of physical and informatical events. (cf. Kaehr 2007d)

Diamond theory can be set in some kind of a correspondence with a bipartide model but it is turning to a world model where there are many worlds in which things are changing and in which worlds themselves are changing too, being involved, not in a new super-stable world, but in the game of interactionality/reflectionality between worlds and events, hence, enabling system designers and media artists to *intervene* in and between those worlds guided by the metamorphic dynamics of polycontextural diamonds.

Hence, messages, in the diamond model, are conceived as polycontextural and are belonging simultaneously to different contextures of irreducible kinds of meaning. Message passing in such a model is not done by the metaphor of key/lock/unlock/agent in a location/connectivity setting because a key in this pluriversal world-model appears always as necessarily polysemic and its acceptance has to be negotiated by reflectional and interactional activities. If such complex transactions are becoming stable in their usage, a reduction to the mono-contextural key-model can be introduced by reducing complexity.

2.3.2 Chiastic transition metaphor

Hence, in a chiastic metaphor, we can state, that statics in the bigraph model becomes dynamics in the diamond model; and dynamics becomes statics in the diamond setting because its dynamics is bracket and moved into a multitude of process-structures wherein the dynamics of the different behavioral systems are getting an arena to act. Therefore, category theory as formalism for interaction has to be dynamized towards diamond theory. That is, category theory has to be diamondized towards a dynamic structural formalism, which is an operational structuration.

2.3.3 Opting for an interventional design

The British Grand Challenge project for computing is not touching the principle hierarchy between mathematics and informatics. Time since the Greeks has changed and a reversion and displacement of this hierarchy might be the grand challenge of a new understanding of global computing. (cf. Kaehr 2003a)

From a model of interactions to a design of interactionality, the transitions to be risked might be:

From the *global*, ubiquitous and universal web of computation, to the kenomic grid of *pluriversal* contexturality, containing the chiasm of global/local scenarios.

From the *locality* in the Actor model of informatical events to the *positionality* of contextures in the kenomic grid, positioning informatic localities.

From *the mobility* in the Actor model of informatical flows between ambients (context, locality) of the same contextural (ontological, logical, semiotic) structure to a *metamorphosis* between contextures, augmenting complexity/complication of contextural scenarios implementing clusters of informatical ambients and mobility.

From the *operations* between actional ambients to the *operationality* in polycontextural situations realized by the *super-operators* (identity, replication, permutation, reduction, bifurcation) placing ambient operations into the grid.

From the *connectivity* of actions at a locality of message passing, using a key to unlock a lock of an agent, to different kinds of *mediation* between contextures containing informatical connectivity.

These transitions seem to record a catalogue of *minimal* conditions to be fulfilled to realize interactionality/reflectionality and interventionality in such complex constellations as the emerging knowledge grid. (cf. Kaehr 2006b)

3 Diamond theory of interactionality

3.1 Diamond Strategy

Encounter

Diamond strategies are sketching transitions from the mail model of interaction in bigraphs to the *encounter* model of interactionality/reflectionality and intervention.

Before we can play the bipartide game of locking and unlocking by passing a key in a structure of orthogonal locality and connectivity to reach an agent, capable of passing the message to another agent, the *otherness* of the actors involved has to be acknowledged and accepted by the interactional activities of the actors involved.

It can be described as the action of addressing an addressee, which is able to accept the addressing by offering its own addressable structure. After having been addressed and the addressing is accepted by the addressed and the addresser has recognized the acceptance of being addressed and the addressing is thus established, information can be exchanged between agents in the sense of communication. (cf. Kaehr 2004)

Interactivity in the encounter-model, therefore, is conceived as a *mutual* action of *acceptance* and *rejection* between different agents. Only on the base of this interactional agreement information exchange can happen. (Kaehr 2004a)

Therefore, the structure of interaction is always complex: at once realizing the addresser and the inner environment of the addressee. This simultaneity of inner and outer environments of agents is involving a kind of structural bifurcation and mutual actions of *acceptance* and/or *rejection* of the involved agents based on the complexity of their architectonics. That is, the addressee has to give space (einräumen) to the addresser to be addressed. To address and to accept to be addressed is a *mutual* action of at least two agents in a common co-created environment. Hence, the actional structure of interactionality is not only bipartide but antidromic, too. This phenomenon is forcing a formalization paradigm beyond mathematical category theory, which finds a very first attempt to a realization in the proposed diamond theory. (cf. Kaehr 2007c)

Intervention

An interaction of an agent, including reflections on the behavior of a partner agent, which is intended to change the meta-rules of the partner-agent can be called an *intervention*. An agent is intervening into an interaction in attempting to change the meta-rules of the agent. An intervention takes place if an agent is interacting with another agent in a way that the agent is forced to change his meta-rules to stay in the game of computation and interaction. (cf. Kaehr 2005, 2006c)

> "The aim is not just to build a mathematical model in which we can analyse systems that already exist. Beyond that, we seek a theory to guide the specification, design and programming of these systems, to guide future adaptations of them, and not to deteriorate when these adaptations are implemented. There is much talk of the vanishing ubiquitous computer of the future, which will obtrude less and less visibly in our lives, but will pervade them more and more. Technology will enable us to create this. To

speak crudely, we must make sure that we understand it before it *vanishes*." (Milner 2004b: 7)

Diamond strategies are not only asking for an understanding of such trends, like the vanishing of computational challenges for users by ubiquitous computing, but for the possibility of intervention by computer designers, scientists and users into such trends. Thus, opening up interplays between users and general computation, avoiding any kind of regression into euphorism, criticism and luddism of humanistic self-defence.

3.2 Towards Diamond Theory

3.2.1 From categorical composition of morphisms to diamonds

Actions from A to B can be considered as morphisms, symbolized by an arrow from A to B, A –> B. In this sense, morphisms are universal, they occur everywhere. But morphisms don't occur in isolation, they are composed together to interesting complexions. The composition of morphisms (arrows) is defined by the *coincidence* of codomain (cod) and domain (dom) of the morphisms to be composed, called the matching conditions (MC). That is, (f, g) is composed (f o g) iff cod(f) = dom(g). This highly general notion of morphism and composition of morphisms is studied in *Category Theory*. (cf. Kaehr 2007a)

A general descriptive explication of the concept of composition of morphisms is given by the following diagram. It contains the table of the matching conditions. Here, the distinction between objects, A, B as domain and codomain properties of morphisms, and the alpha (a) and omega (w) functionality of morphisms are included.

Descriptive Composition

$$\begin{array}{ccccc} \left(A^1,\ \alpha_1\right) & \xrightarrow{\ f\ } & \left(B^1,\ \omega_1\right)\ o\ \left(A^2,\ \alpha_2\right) & \xrightarrow{\ g\ } & \left(B^2,\ \omega_2\right) \\ & \searrow & & \swarrow & \\ & & \left(A^3,\ \alpha_3\right) \xrightarrow{\ fg\ } \left(B^3,\ \omega_3\right) & & \end{array}$$

Matching Conditions

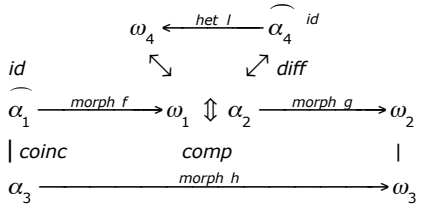
$$\begin{bmatrix} \omega_1 \Updownarrow \alpha_2 \\ A^2 \triangleq B^1 \\ \left(A^1,\ \alpha_1\right) = \left(A^3,\ \alpha_3\right) \\ \left(B^2,\ \omega_2\right) = \left(B^3,\ \omega_3\right) \end{bmatrix}$$

Hence, not only the codomain B^1 and the domain A^2 as objects have to coincide, but also the actional domain "alpha$_2$" (a_2) and the actional codomain "omega$_1$" (w_1) as functional properties of the morphisms f and g, have to match. Obviously, the commutativity of the diagram has to fulfill, additionally, the matching conditions for (A^1, a_1) with (A^3, a_3) and (B^2, w_2) with (B^3, w_3), defining the composition (f o g).

First, without the actional alpha/omega-notation we get the matching conditions, coincidences, for categorical composition based on the objectional distinction of domains and codomains.

Second, stripped off of the set-theoretical or objectional content of the domains and codomains of morphism, the functionality of beginnings (a) and endings (w) remain. Composition then means an *exchange* relation between the ending of a morphism and the beginning of another morphism, i.e., between (w_1) and (a_2). Both founded in the coincidence relation between the actional domain of the first and the actional codomain of the second morphism, establishing the commutativ-

ity of "object-free" categorical composition, i.e., the morphism between (a_3) and (w_3), i.e., (a_3)–>(w_3).



Such a chiastic approach, emphasizing the pure functionality of composition, is discovering the possibility of a new relationship involved in the definition of *actional* composition: the complementarity of the commutative morphism between the beginning (a_2) and the ending (w_1) involved in the categorical composition, building the "*antidromic and parallax*" hetero-morphism between (a_4) and (w_4), i.e., (w_4)<q(a_4).

Hence, functional composition of morphisms, which are represented by *order* relations, is based on the functional matching conditions, MC, of two types of relations: *exchange* and *coincidence* relation building together with the order relations, a *chiastic* pattern in form of a *diamond*. Obviously, this singular diamond is occupying a place and is localized in a grid of diamonds and thus ready to be disseminated.

Third, both thematizations together, the objectional and the actional, with morphisms and hetero-morphisms, are defining the *diamond composition* of morphisms.

3.2.2 Diamond model of system/environment

Some wordings to the diamond system/environment relationship might be listed:

What's my environment is your system.

What's your environment is my system.

What's both at once, my-system and your-system, is our-system.

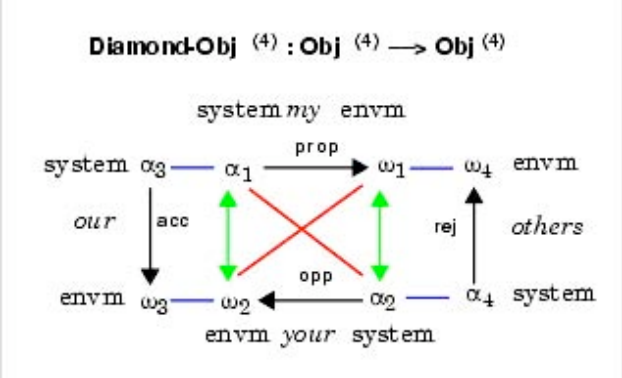
What's both at once, my-environment and your-environment, is our-environment.

What are our environments and our systems is the environment of our-system.

What's our-system is the environment of others-system.

What's neither my-system nor your-system is others-system.

What's neither my-environment nor your-environment is others-environment.



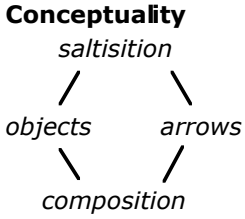
The diamond modeling of the otherness of the others is incorporating the otherness into its own system. An external modeling of the others would have to put them into a different additional contexture. With that, the otherness would be secondary to the system/environment complexion under consideration. The diamond modeling is accepting the otherness of others as a *"first-class object"*, and as belonging genuinely to the complexion as such.

In another setting, without the "antropomorphic" metaphors, we are distinguishing between a system, its internal and its external environment. The external environment corresponds the *rejectional* part, the internal to the *acceptional* part of the diamond. Applied to the diamond scheme of diamondized morphisms we are getting directly the *diamond system scheme* out of the diamond-object model.

Much work had been done about interactionality/reflectionality and interventionality/interlocutionality on the base of *polycontextural* notions and formalisms (cf. Kaehr 2005&2006d). Despite its chiastic and proemial approach, this work did not yet include the others-system of the diamond model.

3.3 Diamond Structuration

Diamonds in this sketch are conceived as interplays between categories and saltatories based on morphisms and hetero-morphisms with their compositions, saltisitions and bridgings. Saltatories are the complementary concept of categories.



The conceptuality of diamond theory is introduced by an application of the *diamond strategies* to the basic concepts of category theory: *objects* and *morphisms* (arrows). Objects are understood in this setting as propositions, arrows as oppositions. Compositions appear as the both-at-once of objects and arrows, and saltisitions as the neither-nor of objects and arrows. Composition and saltisitions, hence, are complementary concepts.

saltisition, saltatory

salto mortale: jump from the apriori to the empirical (Imannuel Kant).

diamond strategies: double salto mortale from the theoretical to the hyper-theoretical.

Diamond Theory

Category : $\mathbf{A} = (Obj^{A}, hom, id, o)$

Saltatory : $\mathbf{a} = (Obj^{a}, het, id, \|)$

DTh $= \left(\left[\mathbf{A}; \mathbf{a}\right], compl, diff, \bullet\right)$

Diamond duality

Category		**Saltatory**	
Cat	Cat^{op}	*Salt*	$Salt^{op}$

Categories are dealing with *composition* of morphisms and their laws. Saltatories are dealing with the jump-operation (*saltisitions*) of hetero-morphisms and their laws. Diamonds are dealing with the *interplay* of categories and saltatories. Their operation is interaction realized by the *bridging* operations.

The laws of *identity* and *associativity are ruling* compositions, as well as saltisitions. Complementarity between categories and saltatories, i.e., between acceptional and rejectional domains of diamonds, are ruled by *difference* operations. Duality operations are applicable to both, categories and saltatories.

Commutativity and associativity

Commutativity Condition

If $f, g \in MC,\ l \in MC$:

then

$g \lozenge f = \left(g \circ f\right) \| l$

with $\begin{pmatrix} \omega(f) \Updownarrow \alpha(g) \\ diff\left(\alpha\left(g\right)\right) = \alpha\left(l\right) \\ diff\left(\omega\left(f\right)\right) = \omega\left(l\right) \end{pmatrix}$

such that

$$\begin{array}{ccc} A & \xrightarrow{\ f\ } & B \\ {\scriptstyle gf}\searrow & \downarrow g & \| \\ & C & \| \end{array} \quad \begin{array}{c} \| \\ b_1 \xleftarrow{\ l\ } b_2 \end{array}$$

bi – commutes.

Associativity Condition

If $f, g, h, k \in MC$ *and* $l, m, n \in MC$:

then

$\left(k \lozenge h \lozenge g \lozenge f\right) =$

$$\begin{bmatrix} k \circ \left(h \circ \left(g \circ f\right)\right) = k \circ \left(\left(h \circ g\right) \circ f\right) \\ \left(\left(k \circ h\right) \circ g\right) \circ f = \left(k \circ \left(h \circ g\right)\right) \circ f \\ \left(k \circ h\right) \circ \left(g \circ f\right) = k \circ \left(h \circ g\right) \circ f \end{bmatrix} \left\| \; l \| \left(m \| n\right) = \left(l \| m\right) \| n \right.$$

3.3.1 Identity and difference

"This shift becomes even more apparent if one examines the foundational concepts Nishida develops later in his career, the *"self-identity of the absolute contradiction"* and the "*many in one, one in many"* (tasokuitsu, issokuta); the former can be paraphrased as the "identity of absolute difference" and the latter as "plurality in oneness, oneness in plurality." (Kopf 2004: 80)

Identity and difference morphisms

$$\mathbf{bi-Object}\left[\mathbf{X, x}\right]$$

$$\left.\begin{array}{l} \widehat{id} \\ x \in Salt \\ \updownarrow diff \\ X \in Cat \\ \widehat{id} \end{array}\right\} \in Diam$$

Identity is a mapping onto-itself as itself.

For each object X of a category an identity morphism, $ID_{[X,\ X]}$, which has domain X in the category and codomain X in the same category exists. Called ID_X or id_X for $ID_{[X,\ X]}$.

For each object x of a saltatory an identity morphism, $ID_{[x,\ x]}$, which has domain x in the saltatory and codomain x in the same saltatory exists. Called ID_x or id_x for $ID_{[x,\ x]}$.

Difference is a mapping onto-itself as other.

For each object X of a category, a difference-morphism,

$DIFF_{[X,\ x]}$, which has domain X in the category and codomain x in the saltatory exists.

For each object x of a saltatory a difference morphism, $DIFF_{[x,\ X]}$, which has domain x in the saltatory and codomain X in the category exists.

This wording is a strict paraphrase of the common wordings of category theory. It also emulates its architectonics: from objects to morphisms to isomorphisms and to natural transformation, etc. Nevertheless it is not yet reflecting the reversed architectonics of the diamond way of thinking, where objects occur last and not first.

Identity and difference composition

ID and DIFF composition

Identity

$\forall f, X, Y, o \in Cat :$
$f\ o_{XXY}\ ID_X = f = ID_Y\ o_{XYY}\ f.$
$\forall l, x, y, \| \in Salt :$
$l\ \|_{xxy}\ ID_x = l = ID_y\ \|_{xyy}\ l.$

Difference

$Om\ Cat, Salt \in Diam :$
$\forall [X, x], [Y, y] \in Diam$
$[f, l]\ (o, \|)_{[XYy,\ xyY]}\ DIFF_{[Y,\ y]}$
$= [f, l] =$
$DIFF_{[y,\ Y]}\ (\|, o)_{[xyY,\ XYy]} [l, f].$

3.3.2 Diamond concepts between iso- and xenomorphism

"One philosophical reason for categorification is that it refines our concept of 'sameness' by allowing us to distinguish between isomorphism and equality." (Baez/Dolan1998: 7)

Isomorphisms

Isomorphism in Cat : Cat_{Iso}

$\forall f, g \in Cat :$

$$X \underset{g}{\overset{f}{\rightleftarrows}} Y \text{ iff } \begin{cases} g \circ f = id_X \\ f \circ g = id_Y . \end{cases}$$

Isomorphism in Salt : $Salt_{iso}$

$\forall l, m \in Salt :$

$$x \underset{m}{\overset{l}{\rightleftarrows}} y \text{ iff } \begin{cases} m \parallel l = id_x \\ l \parallel m = id_y . \end{cases}$$

Diamond Isomorphism : $Diam_{Iso}$

$Om\ Cat, Salt \in Diam :$

right - domain - ISO :

$$\begin{pmatrix} \widehat{x} \\ \updownarrow diff \\ X \underset{g}{\overset{f}{\rightleftarrows}} Y \end{pmatrix} \text{ iff } \begin{cases} (g \circ f) \bullet id_x = id_{[X,x]} \\ id_x \bullet (f \circ g) = id_{[Y,x]} \end{cases}$$

left - codomain - ISO :

$$\begin{pmatrix} \widehat{y} \\ \updownarrow diff \\ X \underset{g}{\overset{f}{\rightleftarrows}} Y \end{pmatrix} \text{ iff } \begin{cases} (g \circ f) \bullet id_y = id_{[X,y]} \\ id_y \bullet (f \circ g) = id_{[Y,y]} \end{cases}$$

Hetero - ISO

right - domain - ISO :

$$\begin{pmatrix} x \underset{m}{\overset{l}{\rightleftarrows}} y \\ \updownarrow diff \\ \widehat{X} \end{pmatrix} \text{ iff } \begin{cases} (l \parallel m) \bullet id_X = id_{[x,x]} \\ id_X \bullet (m \parallel l) = id_{[X,y]} \end{cases}$$

left - codomain - ISO :

$$\begin{pmatrix} x \underset{m}{\overset{l}{\rightleftarrows}} y \\ \updownarrow diff \\ \widehat{Y} \end{pmatrix} \text{ iff } \begin{cases} (m \parallel l) \bullet id_Y = id_{[y,Y]} \\ id_Y \bullet (l \parallel m) = id_{[Y,y]} \end{cases}$$

Category theory is studying, at first, isomorphisms between objects as domains and codomains of morphisms, then the trip goes on with functors, natural transformations and so on. Their basic element, thus, is an elementary, single morphism and their basic operation is a single identity morphism. Diamond theory is dealing with the interplay between categories and saltatories, hence, the elementary situation is not a single morphism but the interaction of the selected morphism and its two corresponding, i.e., interacting hetero-morphism based on identity and difference operations. That is, the domain and the codomain of the selected morphism has to consider the corresponding domain and codomain of the hetero-morphisms involved. This is ruled by the difference operation.

Hence, the isolated objects as domains and codomains have to be supplemented by their own counter-parts, codomain and domain, to build their heteromorphisms. In other words, the full interplay of morphisms, identity and difference mappings, have to be involved to realize proper diamond iso- and xenomorphisms.

Full *combined* isomorphisms between morphisms and hetero-morphisms are naturally constructed out of the partial iso- and xenomorphisms. (cf. Kaehr 2007a)

3.3.3 Diamond concept of transversality

A difference-philosophical interpretation of *transversal* isomorphisms could be found in the classical formulations of *"The identity of oppositions, i.e., the identity of difference and identity."* and *"The difference of identity and difference"*. Both formulations are in some sense dual.

Further, more complex isomorphisms are easily composed by a combination of right- and left-isomorphisms.

Transversality ISO

$$trsv_A : diff\,(A) \longrightarrow (B)$$

$$trsv_B : A \longrightarrow diff\,(B).$$

right - transversal - ISO

$$\begin{pmatrix} \widehat{X} \\ \updownarrow diff \;\; \nwarrow trsv \\ X \underset{g}{\overset{f}{\rightleftharpoons}} Y \end{pmatrix} \; iff \; \begin{bmatrix} trsv_{[x,\,Y]} \bullet diff_{[x,\,x]} = id_{[Y]} \\ trsv_{[x,\,Y]} \bullet (f \;\; o \;\; g) = diff_{[Y,\,x]} \end{bmatrix}$$

left - transversal- ISO :

$$\begin{pmatrix} \widehat{Y} \\ \nearrow trsv \;\; \updownarrow diff \\ X \underset{g}{\overset{f}{\rightleftharpoons}} Y \end{pmatrix} \; iff \; \begin{bmatrix} (g \;\; o \;\; f) \bullet trsv_{[y,\,x]} = diff_{[y,\,x]} \\ trsv_{[x,\,y]} \bullet diff_{[y,\,Y]} = id_{[x]} \end{bmatrix}$$

3.3.4 Facets of diamond isomorphisms

The concept of diamond isomorphisms is not solely dynamizing the realm of sameness, as it is the aim of category theory, but it is also inert-wined with the differentness and strangeness of otherness.

Facets of diamond isomorphisms

1. Sameness (up to isomorphism)

$$ID_{T1} \circ T_1 \bullet \underset{g}{\overset{f}{\rightleftarrows}} \bullet T_2 \circ ID_{T2}$$

2. Differentness (up to xenomorphism)

$$\begin{array}{ccc} T_1^{\,2} \bullet & \xleftarrow{\;g\;} & \bullet T_2^{\,2} \\ diff_{T1} \Updownarrow & & \Updownarrow diff_{T2} \\ T_1^{\,1} \bullet & \xrightarrow{\;f\;} & \bullet T_2^{\,1} \end{array}$$

3. Strangeness (up to heteromorphism)

$$\begin{pmatrix} X \underset{m}{\overset{l}{\rightleftarrows}} Y \\ \Updownarrow diff \\ X \underset{g}{\overset{f}{\rightleftarrows}} Y \end{pmatrix} iff \begin{bmatrix} (g \;o\; f) \bullet (m \parallel l) = id_{[X,\,x]} \\ (f \;o\; g) \bullet (l \parallel m) = id_{[Y,\,y]} \end{bmatrix}$$

3.4 Interactionality as interplays in diamonds

Interactionality of diamonds is studying the interaction between disseminated categories and saltatories of polycontextural diamond systems. Taken contextures in isolation, topics like *duality* and *complementarity* in diamonds are interactional, but they are not yet considering the inert-wining and intervening properties of interactivity as it happens with *bridging*. Thus, interactionality as an intracontextural interplay occurs in elementary diamonds in forms of *duality*, *complementarity*, *bridging* and *distributivity*.

Duality for Categories: *"two for the price of one"*

"The Duality Principle for Categories states

Whenever a property P holds for all categories,
then the property P^{op} holds for all categories.

The proof of this (extremely useful) principle follows immediately from the facts that for all categories A and properties P

(1) $(\mathbf{A}^{op})^{op} = \mathbf{A}$, and

(2) $P^{op}(\mathbf{A})$ holds if and only if $P(\mathbf{A}^{op})$ holds." (Herrlich 2004: 27)

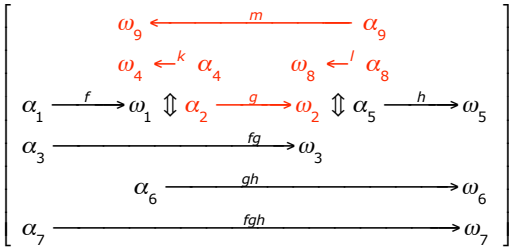
Duality is defined for diamonds as duality of categories and duality of saltatories.

Complementarity of formal languages

"The general principle underlying these limitations was called the *linguistic complementarity* by Loefgren. It states that in no language (i.e. a system for generating expressions with a specific meaning) can the process of interpretation of the expressions be completely described *within* the language itself. In other words, the procedure for determining the meaning of expressions must involve entities from outside the language, i.e. from what we have called the context. The reason is simply that the terms of a language are finite and changeless, whereas their possible interpretations are infinite and changing." (Heylighen: § 6.3)

The double meaning of diamond objects, bi-objects, is complementary and in their orientations they are not parallel but *antidromic* (gegenläufig) and *deferred* regarding the complementary system.

Bridging categories and saltatories



Bridging is not an operation of mediation or switching of and between diamonds or acceptional and rejectional actions in diamonds but an operation to knot the two realms together, the categorical and the saltatorical. In the diagram, between the hetero-morphism k, l, the morphism g is offering a bridge, marked in red, and thus interacting between the saltatorical and the categorical domain of the diamond. Complementary, the two bridge pillars of the bridge are offered by the two hetero-morphisms l, k defining the bridgework g. Hence, bridge and bridging are complementary actions, too. Hence, reflecting the complementarity between categories and saltatories.

Distributivity of composition, saltisition and bridging

Because diamonds are based on interplays between categories and saltatories, which are involved with two fundamental operations: *composition* (o) and saltisition (| |) with bridging (ź) too, it is reasonable to find interactive laws as distributivity between those basic operators inside the very definition of the conception of diamonds.

3.4.1 Duality in diamonds as duality in categories and saltatories

Duality in Diamonds

duality in categories	*duality in saltatories*
$(g\ o\ f) = A \to C$	
$dual(g\ o\ f) = dual\ (dual(B \to C)\ o\ dual(A \to B))$	$u = (\omega_4 \leftarrow \alpha_4) = compl(g\ o\ f)$
$= dual\ ((B \leftarrow C)\ o\ (A \leftarrow B))$	$dual(compl(g\ o\ f)) = dual(u)$
$= ((A \leftarrow B)\ o\ (B \leftarrow C))$	$dual(u) = dual(\omega_4 \leftarrow \alpha_4)$
$= (A \leftarrow B \leftarrow C)$	$= (\alpha_4 \to \omega_4).$
$= A \leftarrow C.$	$compl(dual(g\ o\ f)) = compl(f\ o\ g) = (\alpha_4 \to \omega_4).$
Hence, $((g\ o\ f) = A \to C) \in Cat$	*Hence,* $(u = (\omega_4 \leftarrow \alpha_4)) \in Salt$
iff	*iff*
$(dual(g\ o\ f) = A \leftarrow C) \in Cat^{op}.$	$(dual(u) = \alpha_4 \to \omega_4) \in Salt^{op}.$
$X = g \lozenge f = [(g\ o\ f); u]:$	
$X \in Cat$ *iff* $dual(X) \in Cat^{op}$	$\mid X \in Salt$ *iff* $dual(X) \in Salt^{op}$

3.4.2 Complementarity of categories and saltatories

Complementarity of Acc and Rej

$X \in Acc$ *iff* $compl(X) \in Rej$

$X = g\ o\ f$:

1. $X \in Acc$ *if* $compl(X) \in Rej$

$$compl(g\ o\ f) = compl\ (compl(g)\ o\ compl(f))$$
$$= compl(diff(cod(f))\ o\ diff(dom(g)))$$
$$= compl(\overline{B_{cod}}\ o\ \overline{B_{dom}}) = \omega_4 \leftarrow \alpha_4.$$

$(u : \omega_4 \leftarrow \alpha_4) \in Rej$

Hence, $(g\ o\ f) \in Acc$ *if* $(u : \omega_4 \leftarrow \alpha_4) \in Rej$

$$(g\ o\ f) \in Acc \text{ if } \overline{(g\ o\ f)} \in Rej.$$

2. $compl(X) \in Rej$ *if* $X \in Acc$

$$compl(\omega_4 \leftarrow \alpha_4) = compl(compl(\omega_4) \leftarrow compl(\alpha_4))$$
$$= compl((A_{dom} \rightarrow B_{cod}) \leftarrow (B_{dom} \rightarrow C_{cod}))$$
$$= ((A_{dom} \rightarrow B_{cod})\ o\ (B_{dom} \rightarrow C_{cod}))$$
$$= (f\ o\ g).$$

3. *Hence,* $X \in Acc$ *iff* $compl(X) \in Rej.$

3.4.3 Bridging between categories and saltatories

This new feature of bridge/bridging is ruling concrete intrinsic interactions.

Bridging Conditions and Associativity for Interactions

Bridge and Bridging Conditions BC

1. $\forall k, l, n \in HET, \forall f, g, h \in MORPH :$

a. composition

$g \circ f, g \circ h,$

$(h \circ g) \circ f, h \circ (g \circ f) \in MC,$

b. saltisition

$l \parallel k, n \parallel l,$

$n \parallel (l \parallel k), (n \parallel l) \parallel k \in \overline{MC},$

c. bridges

$g \perp k, l \perp g,$

$(l \perp g) \perp k, l \perp (g \perp k)$ *are in* $\widehat{BC}.$

d. bridging

$g \bullet k, l \bullet g,$

$(l \bullet g) \bullet k, l \bullet (g \bullet k)$ *are in BC.*

2. $(g \bullet k) \in BC$ *iff* $dom(k) = diff(dom(g)),$

$(l \bullet g) \in BC$ *iff* $cod(l) = diff(cod(g)),$

$(l \bullet g \bullet k) \in BC$ *iff* $(g \bullet k), (l \bullet g) \in BC.$

3. $(g \perp k) \in \widehat{BC}$ *iff* $diff(dom(k)) = dom(g),$

$(l \perp g) \in \widehat{BC}$ *iff* $diff(cod(l)) = cod(g),$

$(l \perp g \perp k) \in \widehat{BC}$ *iff* $(g \perp k), (l \perp g) \in \widehat{BC}.$

Bridging

Assoziativity :

If $k, g, l \in BC,$ *then* $(k \bullet g) \bullet l = k \bullet (g \bullet l),$

Bridging :

$bridging_{(g, l, k)} : het(\omega_4, \alpha_4) \bullet hom(\alpha_2, \omega_2) \bullet het(\omega_8, \alpha_8) \to het(\omega_9, \alpha_9).$

Bridge

Assoziativity :

If $k, g, l \in \widehat{BC},$ *then* $(k \perp g) \perp l = k \perp (g \perp l),$

Bridge :

$bridge_{(g, l, k)} : het(\omega_4, \alpha_4) \perp hom(\alpha_2, \omega_2) \perp het(\omega_8, \alpha_8) \to het(\omega_9, \alpha_9).$

Bridges vs. Bridging vs. Jumping

$(l \perp g \perp k) \triangleq (l \bullet g \bullet k) \triangleq (l \parallel k),$

$(l \perp g \bullet k) \triangleq (l \bullet g \perp k) \triangleq (l \parallel k),$

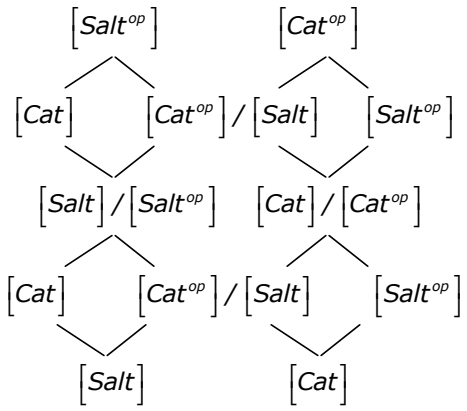
$(l \bullet g \perp k) \triangleq (l \perp g \bullet k) \triangleq (l \parallel k).$

$diff(\perp) = (\bullet), (\perp) = diff(\bullet).$

4 Bigraphs in diamond webs

Instead of labelling transitions of the behavioral calculus, the whole system of bigraphs could be labeled (disseminated), i.e., distributed and mediated. Reflectionality between disseminated bigraphs, then might be realized by the "double-character" of diamonds. The possibility to disseminate bigraphs would open up a chiastic chain of connectivity and locality graphs, of statics and dynamics, as a new play of interactionlity/reflectionality between bigraphical systems.

4.1 Disseminated Diamonds



Diamonds, in this possible dissemination, are mapped as categories and saltatories with their dualities.

Mediation between diamonds happens horizontally, by complementarity and accretion from dual-categories to saltatories. An iterative, vertical, mediation is realized by duality and iteration from one diamond to another diamond. (cf. Kaehr 2007c)

4.2 Towards a diamond web of bigraphs

In this setting we would have to introduce first the dual theory of bigraphs, which are themselves incorporating the dual structure of topography and connectivity. The more intriguing step would be to develop the complementary system to bigraphs and its duality being placed in saltatories. Both together are building the diamond of bigraphs, which then could be disseminated to model and design interactionality and reflectionality in a polycontextural system of interaction including the chiasm of global and local situations. Such a diamond web would not be restricted to informatic and physical global interactions like for bigraphs but would be open to offer a framework for knowledge related semantic and pragmatic aspects of pluriversal computation and communication. Dissemination of diamonds might offer a scheme for a distribution and mediation of the orthogonality of connectivity and locality in bigraphs, which are themselves thematized as dualities.

From a more futuristic vision, also with not much theory, Hai Zhuge (Beijing) develops the idea and sketches some steps towards a methodology of a *knowledge grid*, which is to *"foster worldwide knowledge creation, evolution, inheritance, and sharing in a world of humans, roles and machines"*. (Zhuge 2004:1), (cf. Kaehr 2007e, f)

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Morphogrammatics of Change

A monomorphy based sketch of morphogrammatic transformations

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zurück Seite 4

Abstract

Sketch of (descriptive) morphogrammatics based on monomorphies. Change of morphograms as evolutive, integrative and reconfigurative transformations. Positionality of morphograms and monomorphies.

1. Modi of change/changes of modi

Its all about change. From the Book of Change (I Ching) to the challenges of a change in politics.

How to change something?
What are the possibilities of a change of something?
How to be changed by changing something?
How can change happen without something being changed?
How can change be changed by change?
How can something change the changer of a change?
How can something change the changer of a change without being itself neither change nor something at all?

And what's about the ***"Change we can believe in"***?

Is it not enough into what we believed in all the time, again and again?
Isn't it time to stop believing and to start to compute our beliefs in an arithmetic we have not to believe in, like we have to do with our *natural and universal* systems of computation nobody believes in because nobody even knows that their calculations are based on beliefs.

To study such difficult conceptual challenges it seems to be reasonable to study it with the most simple model possible.
There is nothing more elementary and well known than natural numbers, sign systems or the stroke calculus.

By adding a new stroke to a chain of strokes, or by adding a numeric unit to a number, or to add a sign to an existing sign sequence is the most elementary operation of change. As we know it until now. And this simple operation is secure. It is based on our fundamental intuition, initialized by education - and its axiomatics. And this simple operation can be repeated endlessly. Never ever encountering any obstacle. There are no limits in the resources of matter, time and space. And the poor guys who have to count. At

least in this world of abstraction.

Slate : http://cartoonbox.slate.com/hottopic/?image=7&topicid=114

But is that enough?
In a non-notational scenario children or scientists are adding to their Lego blocks new Lego blocks to build an extension, prolongation, i.e. a change towards more exiting Lego constructions. Such an extension of a pattern can happen at all loci possible for continuation. No linearity has to be supposed. And for the metaphor we can forget the need for any atomicity of the added elements. In the same sense, the actor is changing his identity depending on what and how he or she or it is creating his constructions and how those interactions are changing simultaneously the definitions of the actors.

In an experimental scenario children or scientists might add at each possible location of their chemical formulas new elements to produce more complex chemical patterns. Or they may organize mutations to their organisms.

And obviously, this all started in the caves and ended with Paul Lorenzen's stroke calculus.

Nevertheless, there are different modi of change. Are there?

And why should we trust in numbers which don't know their past and are blind for their future - by principle?

There are no changes without new beginnings and no new beginnings without changes.

For real-world systems based on numbers there is necessarily only endless iteration of the same or fatal crash.

What has changed for the formal theory of change, keno- and morphogrammatics, in the last 40 years?

For a change I will sketch some ideas about elementary features of change in formal systems surpassing, as it will turn out, the principal limitations of known formalisms. This sketch of morphogrammatics is choosing thoroughly a *descriptive* approach.

Maybe there is still a way out of the cave of neolitic inscriptions and its culmination in the stroke calculus of digital speculations?

2. Modi of beginnings and transformations

Instead of a beginning with the statement *"Given X"*, the kenomic formulation might be *"Having encountered Y"*. That is, if having encountered Y, find an appropriate succession or predeccession of Y. Depending on the structural complexity of Y, different prolongations are opened up. Not all have to be realized. Hence, a decision for a specific prolongation (succession) has to be drawn.

Therefore, there is no beginning pre-given. Each situation encountered might be accepted as a beginning of an interaction. Complementary, there is no situation given which coulden' t be accepted as an end.

Semiotics, category theory and arithmetic are playing with a single ultimate beginning and are believing in endless continuation. *"One start, no end"* is the slogan of the dream. Until it gets stopped by a wee crash.

To begin with the simplest elements in a formalism is more a question of an economic or stylistic decision than a compulsory conceptual necessity. As much as we can agree to start a stroke calculus with a single elementary stroke as the first action of the calculus we can agree to accept to encounter a morphogram of whatever complexity and to start to interact with it on the level of its encountered complexity.

To get access to the complexity of an encountered situation, the situation might be confronted with the interaction of *decomposition*.

[1]Disremption

Atomic concatenation

The most secure mode of change is to add to an existing linear sequence of signs, numbers or marks an new one. This addition, called *concatenation*, is strictly independent of the pre-existing sequence and refers only to a pre-given sign repertoire, i.e. to its alphabet.
Its security is demanding to accept the linear order of the atomic signs and the rule not to intervene into the pre-given sign sequence.

Probably the most popular presentation of semiotic concatenation is given by the concept of lists and its manipulation in the programming language Lisp. Lisp was leading the advent and decline of AI (Artificial Intelligence) research.

The concatenation scheme for signs:

If $\boxed{s_1\, s_2 \ldots s_n} \in$ SIGN and $\boxed{s_i} \in$ Alphabet, then $\boxed{\boxed{s_1\, s_2 \ldots s_n}\, \boxed{s_i}} \in$ SIGN.

$$\text{Alphabet} = \{\text{sign}_1, \text{sign}_2, \ldots, \text{sign}_i, \ldots, \text{sign}_n\}$$
$$\downarrow$$
$$(\text{sign}_1, \text{sign}_2, \ldots, \text{sign}_n) \oplus_i (\text{sign}_i) = (\text{sign}_1, \text{sign}_2, \ldots, \text{sign}_n, \text{sign}_i)$$
$$\downarrow \qquad\qquad \uparrow$$
$$\xrightarrow{\text{concatenation}}$$

Kenomic evolution

Kenogrammatic concatenation still relies to some degree on the linear order of its kenoms. But there is no need anymore for a pre-given alphabet and concatenation itself is only one of elementary operation of change. Further operations are *chaining* and different kinds of *fusion*. Without a pre-given alphabet the risk has to be taken to develop change out of the encountered kenogram sequence only. With that the abstractness of the semiotic concatenation is surpassed. There is not only no alphabet given, but the kenoms involved are semiotically indistinguishable. The operation of concatenation is defined by an interaction with the encountered kenogram sequence. Its range is determined by the occurring kenoms of the sequence which remains itself still untouched by the process of concatenation. Hence, kenogrammatic concatenation is not defined in an abstract way but retro-grade to the encountered kenomic pattern.

$$\xleftarrow{\text{retro}}$$
$$\downarrow \qquad \uparrow$$
$$(kg_1\, kg_2 .. kg_i .. kg_n) \oplus_i (kg_i) = \begin{cases} (kg_1\, kg_2 .. kg_i .. kg_n\, kg_i) & : 1 \le i \le n : \text{iteration} \\ (kg_1\, kg_2 .. kg_i .. kg_n\, kg_{n+1}) & : n+1 : \text{accretion} \end{cases}$$
$$\downarrow \qquad \uparrow$$
$$\xrightarrow{\text{progr}}$$

Lack of a pre-given alphabet
Because of the lack of an alphabet as a source for signs from the outside, i.e. from a lower level of the tectonics of the formal system, evolution of morphograms have to be constructed as extensions out of their inner structure.
This is a kind of an evolution of morphograms based on the mononomorphies of the morphogram.

Self-generated alphabets
The wording that there is “no" alphabet means, there is no alphabet pre-given as the start of a kenogrammatic calculus. But what is not pre-given is not denied to exist in a different way. Hence, a positive wording concerning the alphabet of kenogrammatics might be turned into this: Encountered a morphopgram, a kenomic abstraction is collecting the kenoms involved into the morphogram. A successor operation then can rely on those kenograms to precede to the next morphogram, in an iterative or an accretive way.
Therefore, albeit there is no alphabet pre-given, kenogrammatic operations are producing situatively their own alphabet, i.e. set of kenoms, to proceed their operations.
Again, it is reasonable to speak about a parallelism or diamond movement of operators and

operands of kenomic operations. The kenomic alphabet has to be elicited. There is no need for a kenomic alphabet without the intended interactions with morphograms.

Despite the big difference between semiotic and kenogrammatic concatenation there are still some important similarities. Both share a kind of a linear order of their objects, signs and kenoms. And their units of iteration and concatenation are of similar structure. Semiotics depends on atomic signs, kenogrammatics on the other hand, on monadic kenoms.

The successor operation in kenogrammatics was up to now defined mainly as the *iterative* or *accretive* repetition of the kenoms in a kenogrammatic sequence. This approach is still supposing a kind of atomicity, i.e. of atomic separability of kenoms to be repeated. With this presumption, interesting results have been achieved.

Morphic evolution

The morphogrammatic approach to change is changing the presumption of a *linear* order of kenoms as it is supposed in the term “keno-sequence” and is emphasizing the *tabular pattern* structure of morphograms (morphe=pattern, Gestalt). As a consequence, changes in the sense of an evolution out of the pattern itself can happen at all *loci* of the pattern.

Hence, their is no need for a reduction to a successional prolongation. It can happen at all loci involved. Therefore, the encountered morphogram which is involved into a morphogrammatic concatenation operation is loosing its neutrality and gets itself involved into a change. This might be called an *interventional* evolution.
Kenogrammatic concatenation is played by a retro-grade self-referentiality, which has a *diamond* structure. To success, simultaneously, a retro-grade action happens. But the actand itself isn’t touched by this intriguing retro-grade interaction. It remains stable and is solely offering kenograms for further prolongations of the morphogram.

Such a change of the actand itself happens with the *morphic* evolution. The actand of change gets itself changed in the process of change.
This is realized with operation of *reconfiguration* (reconfigurative evolution, coalitions, composition).

Monomorphic concatenation

Morphograms are changed by the monomorphic concatenation according to their monomorphies. Monomorphies are patterns of kenoms and parts of the whole of the pattern-structure of the morphogram.
A new feature out of the morphic evolution is the change of the *actor* (operator) of the interaction.

Such an immanent evolution of morphograms is not changing the structure of the morphogram involved into the process of evolution. The structure of the original morphogram stays untouched. Despite the retro-grade movement of the kenomic successor operation to build successions the beginning morphogram is not involved in any change of the successor procedure.
The triviality of this observation gets a new turn with the tabular notational successor operation which is changing its beginning morphogram too. That is, to add something to a morphogrammatic structure might change the structure itself. Hence, two events happens, a) the succession of the morphogram and b) the ‘self'-transformation of the morphogram.
Therefore, an interaction with morphograms might emerge into a monomorphic evolution of the involved morphograms. Further interactions between morphograms are, e.g. concatenation, chaining and fusion.
That is, the progression or succession is not depending on any external objects, kenoms, to be added from the outside to the kenomic pattern but is fully defined by the structure of the morphogram involved into the interaction.
With that, a kind of a symmetry between the composition of morphograms and their decomposition into monomorphies is established.

Actional concatenation

A change of the actor in the process of interaction happens as a transformation of the actor “concatenation” into other evolutionary operators. It turns out that “concatenation” is only one interaction of a family of different interactions, like “chaining” and"fusion”.
Combinations of actors are involved into the *actional abstractions* responsible for the behavioral equality of different morphograms.

In an actor terminology we can say that change in the sense of morphogrammatics is changing all parts of interactivity, the *actor* and the *actands* and thus *interaction* as the operation.

Discontexturality

But with such a fulfillment of a change in the conceptual triadicity a new feature emerges.
Until now I stipulated only one encountered morphogram. Interactions happened with the morphogram which had been answered by a kind of a self-evolutionary process.

But what happens if two morphograms encounter? The same game might go on. In this case it doesn't make much a difference to the singular situation of self-evolution. We continue triadicity and silently suppose that there is no *discontextural* difference between morphograms. How can different morphograms interact if they are of different contextures, thus not only disjunct in their elements and operators but discontextural in their conceptionality?

With the introduction of a multitude of contextures, i.e. with polycontexturality, interactions between morphogrammatic systems are enabled which are surpassing the limits of operational triadicity by disseminating it.

To mention proudly, *"the sum is more than its parts"*, is supposing that a summation is possible and that the terms are commensurable. This innocent constellation might turn out as a fundamental limitation of the desire for change.

Summary of some new aspects of morphogrammatics

1. Shift of focus from kenoms to monomorphies in morphograms.
2. Transforming the concept of kenomic sequences to monomorphic patterns.
3. Understanding of the kenomic successor operation as a diamond structure of pro- and retro-gression.
4. New features of the succession operation on the base of the pattern and monomorphy approach (integration).
5. Chiastic definition of equivalence (dissimilarity) of morphograms (1994) as an abstraction over operations instead over operands.
6. Understanding of proemiality from an open to closed (cyclic) chiasms and finally to a complementary diamond formation.
7. Changing the idea of beginning(s) to an interactional concept of encounters.
8. For patterns there is no need to restrict to append a prolongation at the tail of a monomorphy. It can be the tail or the head of any monomorpy or other parts of a monomorphy if the monomorphy is not yet fully reduced.
9. Introduction of different kinds of positionality for morphograms.
10. Complementarity of kenomic beginnings in the sense of diamond category theory.

Metaphors and heuristics

Morphograms are considered as groups of monomorphies. A group, of whatever kind of objects or agents, might be in a situation where it has to change its constellation by growing or by self-differentiation. Also the group might encounter another group and strategies of co-operations, fusions or incorporation are occuring as necessary.

What are the structural possibilities for such a group to change?

The group may decide to not to grow, i.e. not to enlarge its domain with new positions but better to differentiate into a more complex structure or to reduce its complexity (complication) to a lower degree of differentiation.
The group is emanating between higher or lower complication and keeping its complexity stable.

This shall be called an *emanative* change of the group.

Emanative developments are preserving the structural complexity of the actional system. Hence, it easily reaches its limits.
A new strategy is called for. The group might extend its complexity by divesting parts of it. Every part might be divested and helping the group to evolve. Such evolvement by divestment is not outsourcing its agencies but is repeating and adding its existing agencies of the group to the group as a whole.

This is a relatively secure procedure but nevertheless it is augmenting the structural capacity of

the group (organization, company, organism, chemism, etc.). Because such a divestment is purely structural it is not a simple repetive addition of existing faculties but an augmentation of the structural complexity of the whole.

This shall be called *iterative* transformation (change, disremption, prolongation, augmentation, etc.).

The group might decide to augment its complexity with a structural risk. The risk for the new to be taken by the group is transforming the complexity of the group by accepting to evolve into an unknown domain (contexture), creating a structurally new position. Again, the degree of the risk is ruled by the structure of the group. The new, added to the group, is new only in respect to the existing constellation of the group. Hence, there is nothing hazardous involved into this risk of extending the complexity into new dimensions. What's new is new solely in respect to the historically developed structuration of the group (organization).

This shall be called *accretive* transformation (metamorphosis, change).

Hence, *iteration* and *accretion* are the two modi of change which are augmenting the complexity of the group (whole).
Gotthard Gunther calls this two complementary modi of transformation, *evolutive* change.

Both, *evolution* and *emanation* together, are designing the framework of structural change of organizations (groups, wholes, etc.), i.e. the *morphogenesis* of structuration. This kind of double structuration shall be called *disremption*.
Disremption is understood as the keno- and morphogrammatic opposite to the semiotic operation of concatenation.

Hence, a group inscribed as a morphogram is embedded into a complementarity of evolutive (iteration/accretion) and emanative (differentiation/reduction) transformations.

Because the whole is build by its parts, those strategies of evolution and emanation, are applicable to the single parts as well as to the whole as such.

Such an understanding of the structuration of change is not depending on any identities, objects, agents, processes, information, etc in the known sense.

Therefore, this strategy and theory of change (structuration) is called *morphogrammatics*.

Morphogrammatics is independent of any system and complexity theory. Its material resource are kenograms, i.e. the place-holders for the parts of morphograms (groups, constellations) created in the process of structuration. The parts of morphograms are called the *monomorphies* of the morphogram.

Morphogrammatics of change sounds extremely simple.

There are no strange attractors, chaos theory, maturation and adaption, autopoiesis and homeostasis, etc. involved at all. Neither any logical systems, multiple-valued, modal, paraconsistent, etc. nor terms like paradox, circularity, antinomy, etc. nor information processing, computability, diagonalization, etc. and so on.

But there is a morphogrammatics of logic and arithmetics, mono- and polycontextural. With this turn, logic - and formal systems in general - are appearing as maximally reductionist theories of change, i.e. as stable theories and formalisms of zero structural change.

3. Morphograms as patterns of monomorphies

3.1. Positionality of morphograms

Morphograms are conceived as patterns of *monomorphies*. This perception of morphograms as patterns of monomorphies is realized by the operation of decomposition.
To be able to interact with an encountered morphogram it has to be decomposed into its monomorphies.

A decomposition of a morphogram into its monomorphies gives the key to understanding its behavior. Its behavior is essentially characterized by two dimensions: *evolution* and *emanation*.

Evolution happens as *iterative* and *accretive* repetitions of monomorphies.

Emanation happens as *differentiation* and *reduction* of monomorphies of a morphogram.
Differentiation is augmenting, reduction reducing the number of monomorphies in a morphogram.

Morphograms, therefore, are placed in a *grid* of emanative and evolutive iterability.

Monomorphies are build by kenograms, called *kenoms*.
Kenoms might represent classes of signs.

Each monomorphy of a morphogram is positioned at a place in the morphogram.

Change happens as evolutive, integrative and reconfigurative transformations of morphograms.
Differentiation of change happens as emanative transformations.

This leads to the positional matrix for morphograms:|

Position $MG^{(m,n)}$

$MG^{(m)}$	locus
$Dec(MG^{(m)})$	monomorphy
$Ken(MG^{(m)})$	kenom

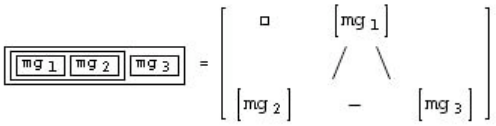
Example

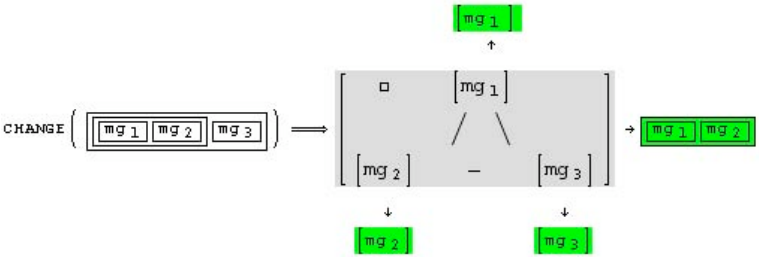
MG	loc_1 loc_2 loc_3 loc_4 loc_5
Dec	mg_1 mg_2 mg_3 mg_1 mg_5
Ken	*a b c a b* *a b c a b* *a ø c a b* *a ø ø a b* ø ø ø ø ø *x y z u v*

Positionality of morphograms: <Position, Locality, Place>.
Position of the morphogram in a morphogrammatic system defined by emanation and evolution.
Locality of the monomorphies in a morphogram; loci are offering place for different monomorphies.
Monomorphies might be reduced to homogeneous patterns or they might keep some structuration.
Place of a kenom in a monomorphy depending on the length of the monomorphy.

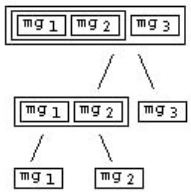
3.2. Pattern structure of morphograms

Pattern structure



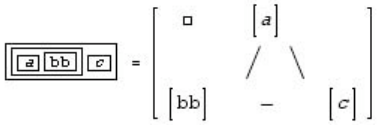


Tree structure

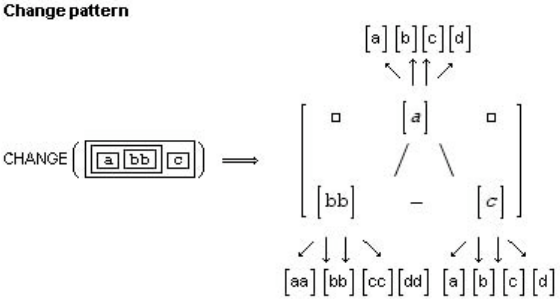


Kenomic representation

Kenomic representation with mg_1 = [a], mg_2 = [bb], mg_3 = [c]:

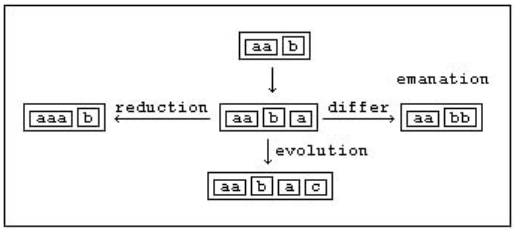


Change pattern



Morphograms in the grid of evolution and emanation

Example

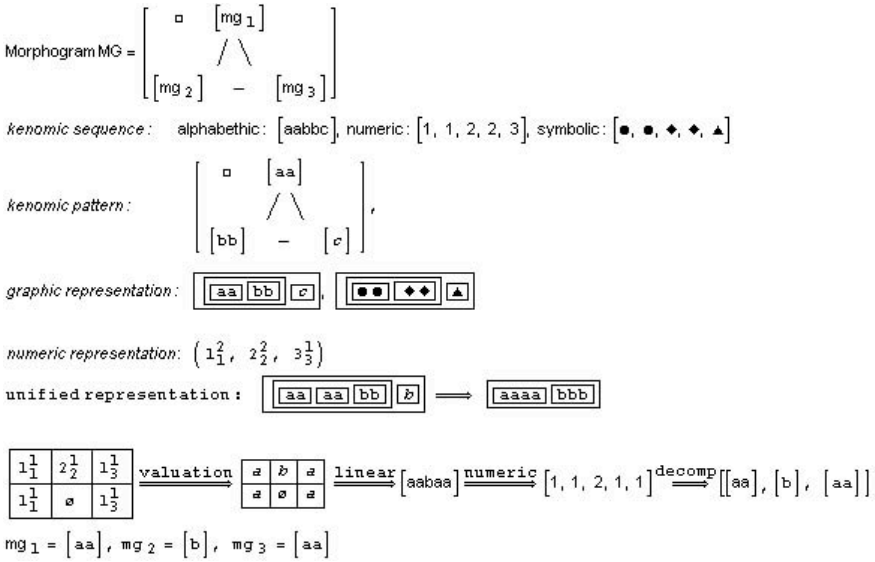


3.2.1. Notations

Depending on the usage, different representations for morphograms can be applied : kenomic, linear and pattern, numeric, alphabetic, symbolic, graphic.

Example

MG = (mg_1, mg_2, mg_3) with kenom(mg_1) = [aa], kenom(mg_2) = [bb], kenom(mg_3) = [c].



3.2.2. Tectonics

Morphogrammatics : $\mathbf{MG}^{(m,n)} = \left[MG^{(m,n)}, Ops\right]$

Morphograms : $MG^{(m,n)}$

Monomorphies : mg_i^j

Kenomic interpretations of monomorphies : [kseq]

Semiotic interpretations of kenoms : (sign – seq)

3.3. Epsilon/Nu-structure of morphograms

3.3.1. Kenomic equality

A way to characterize and compare morphograms without a direct recurs to semiotic signs is introduced by the Ε/Ν-structure of morphograms. A comparison of kenoms in the morphogram is defined as a relation between each tupel of kenoms as *equal* (Ε) or *non-equal* (Ν), hence the procedure is called (Ε,Ν)-procedue and is delivering the (Ε,Ν)-structure of the morpgogram. This relational characterization of morphograms is defining morphograms as (Ε,Ν)-structures. It is not depending on the identity of the kenoms or signs (marks) but on the differences between the kenoms. With that a further abstraction from any concrete signs as notational conventions is achieved. What counts are the relations of equality and non-equality of the marks and not the identity of the signs involved. Therefore, the alphabetic signs and their lexical order "a", "b", "c", etc. are used for conventional reasons only.

Also the Ε/Ν-structure of morphograms was introduced quite early it got a first mathematical and programming treatement by Wolfgang Niegel and his students. The final formalization, implementation and bibliography, again, can be found at ThinkArt Lab [2] "*MorphoLab 1.0*".

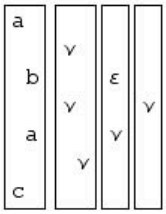
Nevertheless, this approach is equivalent to other more set theoretically oriented approaches which are building equivalence classes over sign sequences to define morphograms.

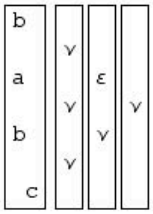
While the decompositional interaction with morphograms is asking for its monomorphies, the Ε/Ν-procedure is asking for its internal structure concerning the differences between the kenoms of the morphogram.

Two morphograms as keno-sequences are kenogrammatically equal iff they have the same (ε, ν) -structure.

Example.

$[\text{abac}] : (\varepsilon, \nu) - \text{comp}([\text{abac}]) = (\nu\varepsilon\nu\nu)$ $[\text{babc}] : (\varepsilon, \nu) - \text{comp}([\text{abac}]) = (\nu\varepsilon\nu\nu) \Longrightarrow [\text{abac}] =_{kg} [\text{babc}$





$\Longrightarrow [\text{abac}] =_{kg} [\text{babc}]$

As a ML – module :

```
datatype EN = E | N
fun delta (i, j) z = if (pos i z) = (pos j z)
then (i, j, E)
else (i, j, N);
type enstruc = (int * int * EN) list list;
```

Because the Ε/ν-test is applied to all kenoms of a string of kenoms, it seems to be more reasonable to understand Ε/ν-structures not simply as linear strings of kenoms, like it happens for sign sequences, but as tabular complexions of kenoms. The tabular notational system for morphogram, introduced in this paper, is stressing this point further and new possibilities of defining kenomic and morphogrammatic operations will be sketched.

Again, in contrast, two sign sequences A and B are equal iff they are equal in all their atomic signs and of the same length.

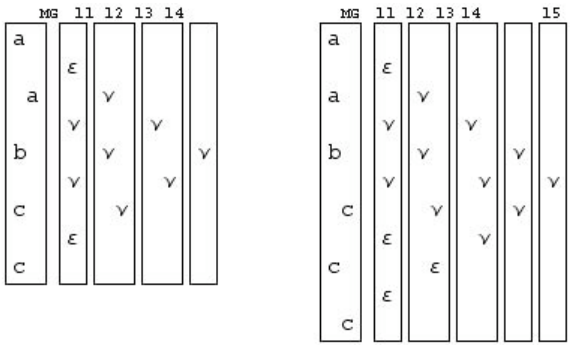
$A = (a_1, a_2, \ldots, a_n),\ B = (b_1, b_2, \ldots, b_m)$
$A =_{sem} B$ iff
1) $m = n$
2) $\forall i, 1 \leq i \geq m, n: a_i =_{graph} b_i$.

On the base of the Ε/ν-procedure for morphograms it is straight forward to define operations over morphograms in analogy to recursive word arithmetics. Hence, *successor*, *concatenation*, '*multiplication*', *reflector*, etc. operations are naturally introduced.

3.3.2. Decompositions

Decompositions[3]of morphograms into monomorphies might be defined by the Ε/ν-structure of the decomposable morphogram. *Homogeneous* monomorphies are characterized by Ε-structures in ν-environments of the Ε/ν-structure of level l1 of the morphogram.

Examples
Dec([aabcc]) = {[aa], [b], [cc]} and Dec([aabccc]) = {[aa], [b], [ccc]}



Relativity of monomorphies

The concept of monomorphies is relative to the *degree* of decomposition. It depends on the degree of decomposition from the morphogram into its decomposable parts as what a monomorphy is conceived. Monomorphies might be distinguished as *homogeneous* or *heterogeneuos* monomorphies. Homogeneuos monomorphies are decomposed into monads.
Thus, e.g. the decomposition of [abc] with $[abc] \longrightarrow ([ab], [c]) \longrightarrow ([a], [b], [c])$, can be considered as $([ab], [c])$, consisting on one *heteromorph* monomorphy [ab], or as ([a], [b], [c]), consisting of homogeneous monads.
This might have interesting consequences for further formalizations.

Example
1. Two – level decomposition

$$\text{Succ}\left(\text{Dec}_2([abc]\right) =$$
$$\text{Succ}([a],[b],[c]) =$$
$$\{([aa],[b],[c]),([ab],[b],[c]),$$
$$([a],[ba],[c]),([a],[bb],[c]),([a],[bc],[c]),$$
$$([a],[b],[ca]),([a],[b],[cb]),([a],[b],[cc]),([a],[b],[cd])\},$$

$$\sum |\text{Succ}([a],[b],[c])| = 9 \blacksquare$$

One – level decomposition

$$\text{Succ}\left(\text{Dec}_{1.2}([abc]\right) =$$
$$\text{Succ}([ab],[c]) =$$
$$\{([aba],[c]),([abb],[c]),([abc],[c]),$$
$$([ab],[ca]),([ab],[cb]),([ab],[cd])\},$$

$$\sum |\text{Succ}_{1.2}([ab],[c])| = 6 \blacksquare$$

$$\Longrightarrow \text{Succ}_2([a],[b],[c]) \neq \text{Succ}_{1.1}([ab],[c])$$
$$\Longrightarrow \text{Succ}\left(\text{Dec}_2([abc]\right) \neq \text{Succ}\left(\text{Dec}_1([abc]\right)$$

$$\text{Succ}\left(\text{Dec}_{1.1}([abc]\right) =$$
$$\text{Succ}([a],[bc]) =$$
$$\{([aa],[bc]),([ab],[bc]),$$
$$([a],[bca]),([a],[bcb]),([a],[bcc]),([a],[bcd])\},$$

$$\sum |\text{Succ}_{1.1}([ab],[c])| = 6 \blacksquare$$

$$\text{Succ}\left(\text{Dec}_{1.1}([abc]\right), \text{Succ}\left(\text{Dec}_{1.1}([abc]\right) \subset \text{Succ}\left(\text{Dec}_2([abc]\right) \blacksquare$$

3.4. Monomorphic evolution of morphograms

3.4.1. Evolution schemes

Morphograms are holistic patterns. Any change of a whole has to take into account that a whole is composed by parts. Hence, the concept of change for morphograms has to consider all possibility of changing a whole by its parts and by changing the parts in respect to the whole.

Tail and head appendices
As a consequence of the pattern structure of morphograms, operations like successor operation, have to applied to each monomorphy of the morphogram. As a further consequence,

successor operations can be applied as prolongations not only at the tail of the monomorphy but dually also at the head of a monomorphy.
An addition to the body can be seen as an prolongation into the future, i.e. evolving into new complexity of the new.
Additions to the head can be seen as a retro-directed prolongation into the past, i.e. as a re-definition of what happened before.

Backwards prolongations
A backward prolongation is re-interpreting the history of the object in a *productive* way. A decomposition of a morphogram into its monomorphies is de-composing the morphogram into its constituents which led to the actual structure of the morphogram. Hence, it is a reconstruction of the past of the morphogram in a *re-productive* way. And it is not involved into any semantic re-interpretation of the existing morphogram.

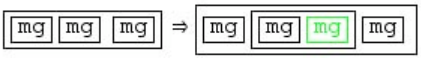
Change as evolution happens in different ways.

Different modi of evolution

1. Evolution of morphograms:

Evolution of a morphogram happens as a kenomic concatenation of a monomorphy with the morphogram.

2. Evolution of a monomorphy

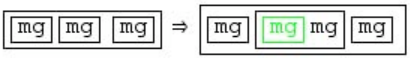


Evolution of a monomorphy of a morphogram happens as a kenomic concatenation of a new monomorphy with a monomorphy of the morphogram.

3. Reconfiguration of morphograms:

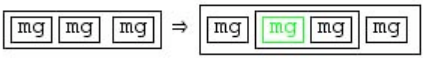
Reconfiguration of a morphogram happens as a concatenation of a monomorphy with the head of a morphogram.

4. Reconfiguration of a monomorphy



Reconfiguration of a monomorphy happens as a concatenation of a monomorphy with the head of a monomorphy.

5. Integration of a monomorphy into the morphogram.



An integration of a monomorphy into a morphogram happens as a concatenation of a monomorphy with a monomorphy.

Evolution, integration and reconfiguration schemes

$$\forall\, i,\ 1 \le i \ge n:$$

$$\text{Evol}_{mg_i}\left(\left[[mg_1], [mg_2], \ldots, [mg_n]\right]\right) = \text{kadd}_i\left(\left[[mg_1], [mg_2], \ldots, [mg_n], \langle [mg_i] \rangle\right]\right)$$

$$\text{Integr}_{mg_i}\left(\left[[mg_1], [mg_2], \ldots, [mg_n]\right]\right) = \text{kadd}_i\left(\left\langle [mg_1], [mg_2], [mg_i], [mg_i] \right\rangle, \ldots, [mg_n]\right)$$

$$\text{Reconfig}_{mg_i}\left(\left[[mg_1], [mg_2], \ldots, [mg_n]\right]\right) = \text{kadd}_i\left(\left[mg_i\right], \left\langle [mg_1], [mg_2], \ldots, [mg_n] \right\rangle\right)$$

3.4.2. A kenomic interpretation of monomorphies

A kenomic interpretation of the schemes of changes as given by the example has to consider the *kenomic context rule*. A self-evolution of a kenomic pattern is strictly ruled by the kenomic distinction of sameness and differentness of the encountered kenograms in the morphogram. The *range* of the kenograms is given by the morphogram and is applied to its monomorphies.

For the morphogram MG = ([mg 1], [mg 2]) with its kenomic interpretation ([a], [bb]) =  , the range of kenoms is {a, b} and its accretion is {c}, hence the kenomic operational range of the morphogram is {a, b, c}.

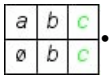
Evolution:

Evol$_{mg\,1}$: Evol $_{mg\,2.1}$ (MG) = ([mg 1], [mg 2], ⟨[mg 1]⟩)

The pattern  forms (develops, looms, evolves, emerges) for Evol$_1$ in the mode of *sameness* to  , and in the mode of *differentness* to  and  .

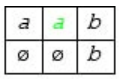
Evol$_{mg\,2}$: Evol $_{mg\,2.2}$ (MG) = ([mg 1], [mg 2], ⟨[mg 2]⟩)

A similar development happens for Evol^2:

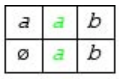
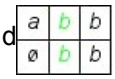
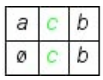
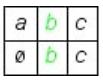
The pattern  evolves in the mode of *sameness* to:  , and in the mode of *differentness* to:  and  .

Integration

Integr$_{mg\,1}$: Integr $_{mg\,1.1}$ (MG) = ([mg 1], ⟨[mg 1], [mg 2]⟩)

The pattern  evolves *integratively* in the mode of *sameness* to:  and in the mode of differentness to  and  = 

Integr$_{mg\,2}$: Integr $_{mg\,1.2}$ (MG) = ([mg 1], ⟨ [mg 2], [mg 2]⟩)

The pattern  evolves *integratively* in the mode of *sameness* to:  and  and in the mode of differentness to  =  .

Reconfiguration

$Reconfig_{mg_1}$: $\text{Reconfig}_{mg_{1.1}}(MG) = \left(\left\langle\left[\mathbf{mg}_1\right], [mg_1]\right\rangle, [mg_2]\right)$

The pattern $\begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \end{array}$ evolves *reconfiguratively* in the mode of *sameness* to : $\begin{array}{|c|c|c|}\hline a & a & b \\ \hline \varnothing & \varnothing & b \\ \hline \end{array}$

and in the mode of *differentness* to $\begin{array}{|c|c|c|}\hline b & a & b \\ \hline \varnothing & \varnothing & b \\ \hline \end{array} = \begin{array}{|c|c|c|}\hline a & b & a \\ \hline \varnothing & \varnothing & a \\ \hline \end{array}$ and $\begin{array}{|c|c|c|}\hline c & a & b \\ \hline \varnothing & \varnothing & b \\ \hline \end{array} = \begin{array}{|c|c|c|}\hline a & b & c \\ \hline \varnothing & \varnothing & c \\ \hline \end{array}$.

$Reconfig_{mg_2}$: $\text{Reconfig}_{mg_{2.2}}(MG) = \left(\left\langle[mg_1], \left[\mathbf{mg}_2\right]\right\rangle, [mg_2]\right)$

The pattern $\begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \end{array}$ evolves *reconfiguratively* in the mode of *sameness* to : $\begin{array}{|c|c|c|}\hline a & a & b \\ \hline \varnothing & a & b \\ \hline \end{array}$ and $\begin{array}{|c|c|c|}\hline a & b & b \\ \hline \varnothing & b & b \\ \hline \end{array}$

and in the mode of *differentness* to $\begin{array}{|c|c|c|}\hline a & c & b \\ \hline \varnothing & c & b \\ \hline \end{array} = \begin{array}{|c|c|c|}\hline a & b & c \\ \hline \varnothing & b & c \\ \hline \end{array}$.

Summary

$\begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \end{array} \xrightarrow{\text{Evol}\,(mg_1)} \left\{\begin{array}{|c|c|c|}\hline a & b & a \\ \hline \varnothing & b & \varnothing \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & b \\ \hline \varnothing & b & \varnothing \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & c \\ \hline \varnothing & b & \varnothing \\ \hline \end{array}\right\}$

$\begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \end{array} \xrightarrow{\text{Evol}\,(mg_2)} \left\{\begin{array}{|c|c|c|}\hline a & b & a \\ \hline \varnothing & b & a \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & b \\ \hline \varnothing & b & b \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & c \\ \hline \varnothing & b & c \\ \hline \end{array}\right\}.$

$\begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \end{array} \xrightarrow{\text{Integr}\,(mg_1)} \left\{\begin{array}{|c|c|c|}\hline a & a & b \\ \hline \varnothing & \varnothing & b \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & b \\ \hline \varnothing & \varnothing & b \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & c \\ \hline \varnothing & \varnothing & c \\ \hline \end{array}\right\}$

$\begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \end{array} \xrightarrow{\text{Integr}\,(mg_2)} \left\{\begin{array}{|c|c|c|}\hline a & a & b \\ \hline \varnothing & a & b \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & b \\ \hline \varnothing & b & b \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & c \\ \hline \varnothing & b & c \\ \hline \end{array}\right\}.$

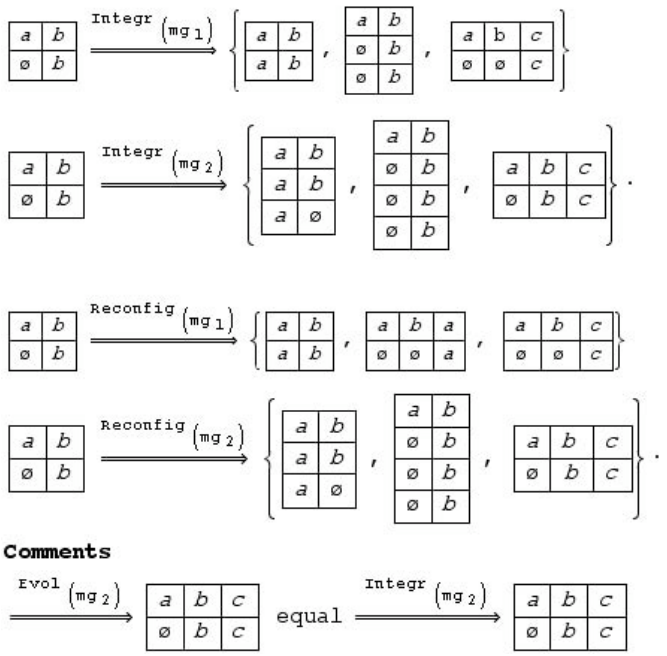
$\begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \end{array} \xrightarrow{\text{Reconfig}\,(mg_1)} \left\{\begin{array}{|c|c|c|}\hline a & a & b \\ \hline \varnothing & \varnothing & b \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & a \\ \hline \varnothing & \varnothing & a \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & c \\ \hline \varnothing & \varnothing & c \\ \hline \end{array}\right\}$

$\begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \end{array} \xrightarrow{\text{Reconfig}\,(mg_2)} \left\{\begin{array}{|c|c|c|}\hline a & a & b \\ \hline \varnothing & a & b \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & b \\ \hline \varnothing & b & b \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & c \\ \hline \varnothing & b & c \\ \hline \end{array}\right\}.$

Unified interpretation

$\begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \end{array} \xrightarrow{\text{Evol}\,(mg_1)} \left\{\begin{array}{|c|c|c|}\hline a & b & a \\ \hline \varnothing & b & \varnothing \\ \hline \end{array}, \begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \varnothing & b \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & c \\ \hline \varnothing & b & \varnothing \\ \hline \end{array}\right\}$

$\begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \end{array} \xrightarrow{\text{Evol}\,(mg_2)} \left\{\begin{array}{|c|c|c|}\hline a & b & a \\ \hline \varnothing & b & a \\ \hline \end{array}, \begin{array}{|c|c|}\hline a & b \\ \hline \varnothing & b \\ \hline \varnothing & b \\ \hline \varnothing & b \\ \hline \end{array}, \begin{array}{|c|c|c|}\hline a & b & c \\ \hline \varnothing & b & c \\ \hline \end{array}\right\}.$



Comments

3.5. Monomorphic devolution of morphograms

Predecessor and subtraction functions are naturally defined in primitive recursive arithmetic. How are they represented in morphogrammatics?

Devolution scheme

$$\forall\, i,\ 1 \le i \geqslant n:$$
$$\text{Devol}_{mg_i}\left(\left[mg_1\right],\ \left[mg_2\right],\ \ldots,\ \left[mg_n\right]\right) = \text{pred}_i\left(\left[\left[mg_1\right],\ \left[mg_2\right],\ \ldots,\ \left[mg_n\right]\right],\ \left[mg_i\right]\right)$$

The predecessor function in arithmetics acts as the opposite of the successor function and is recursively defined by the rules:

$$\text{pred}(0) = 0,$$
$$\text{pred}(n+1) = n$$

What's the analogon of the predecessor function in morphogrammatics? Is the decomposition function an analogon to the predecessor function?
Obviously, the predecessor of a monad is a monad:
Dec(monad) = monad, hence in analogy: pred(monad) = monad
But what's a monad?
Trivially, it is a 1-kenomic pattern: [a]. Thus, Dec([a]) = [a] and analogous: pred([a]) = [a].
On the other hand we also learned, that 1-kenomic pattern of higer complication are not decomposable into monomorphies.
Dec([aaaa]) = [aaaa]. But this is not in an analogy to pred([aaaa]) = [aaa].

Therefore, the terminology of predecessor and successor gets a reasonable application for the sequence-approach of kenogrammatics. Kenomic sequences are decomposable into monadic kenoms, hence the analogy to the predecessor function applies.

$$\text{Dec}(MG) = (mg_1, mg_2, \ldots, mg_n),$$

$$\text{pred}(\text{Dec}(MG)) = (mg_1, mg_2, \ldots, mg_{n-1})\ \text{pred}([mg_1, mg_2, \ldots, mg_n]\text{kadd}_i[mg_{n+1}]) = [mg_1, mg_2, \ldots, mg_n]$$

$$\text{pred}_i(\text{succ}_j(MG)) = \text{succ}_j(\text{pred}_i(MG)),\ i = j$$

3.6. Morphogrammatic coalitions

The modi of morphogrammatic coalitions have to reflect and implement the different modi of evolution into their definitions. Hence, coalitions appears as *evolutive*, *integrative* and *reconfigurative* coalitions.

3.6.1. Change as coalitions

$$\text{coal}\left(\left([mg_{i_1}], [mg_{i_2}], \ldots, [mg_{i_n}]\right), \left([mg_{j_1}], [mg_{j_2}], \ldots, [mg_{j_n}]\right)\right) =$$

$$\text{coal}_1 : \left([mg_{i_1}], [mg_{i_2}], \ldots, [mg_{i_n}], [mg_{j_1}]\right)$$

$$\text{coal}_2 : \left([mg_{i_1}], [mg_{i_2}], \ldots, [mg_{i_n}], [mg_{j_2}]\right)$$

$$\bullet\bullet\bullet$$

$$\text{coal}_n : \left([mg_{i_1}], [mg_{i_2}], \ldots, [mg_{i_n}], [mg_{j_n}]\right)$$

Example

$$MG_1 = [mg_{i_1}],\ MG_2 = \left([mg_{j_1}], [mg_{j_2}]\right)$$

$$\text{coal}_1\left([mg_{i_1}], \left([mg_{j_1}], [mg_{j_2}]\right)\right) =$$
$$\text{kadd}_1\left([mg_{i_1}], \left([mg_{j_1}], [mg_{j_2}]\right)\right) = \left([mg_{j_1}], [mg_{j_2}], [mg_{i_1}]\right)$$

$$\text{coal}_2\left([mg_{i_1}], \left([mg_{j_1}], [mg_{j_2}]\right)\right) =$$
$$\text{kadd}_2\left([mg_{i_1}], \left([mg_{j_1}], [mg_{j_2}]\right)\right) = \left([mg_{j_1}], [mg_{i_1}], [mg_{j_2}]\right)$$

3.6.2. Evolutive coalitions

1. Example

$$\text{coal}_{\text{evol}}\left(\begin{array}{|c|}\hline a\\\hline b\\\hline\end{array}\,,\ \begin{array}{|c|}\hline a\\\hline b\\\hline\end{array}\right)=\left\{\begin{array}{|c|c|}\hline a&a\\\hline b&b\\\hline\end{array}\,,\ \begin{array}{|c|c|}\hline a&a\\\hline b&c\\\hline\end{array}\,,\ \begin{array}{|c|c|}\hline a&b\\\hline b&a\\\hline\end{array}\,,\ \begin{array}{|c|c|}\hline a&b\\\hline b&c\\\hline\end{array}\right\}$$

2. Example

$$\text{coal}_{\text{evol}}\left(\begin{array}{|c|}\hline a\\\hline a\\\hline\end{array}\,,\ \begin{array}{|c|c|}\hline a&b\\\hline \varnothing&b\\\hline\end{array}\right)=\left\{\begin{array}{|c|c|c|}\hline a&b&a\\\hline \varnothing&b&a\\\hline\end{array}\,,\ \begin{array}{|c|c|c|}\hline a&b&b\\\hline \varnothing&b&b\\\hline\end{array}\,,\ \begin{array}{|c|c|c|}\hline a&b&c\\\hline \varnothing&b&c\\\hline\end{array}\right\}$$

3. Example

$$\text{coal}_{\text{evol}}\left(\begin{array}{|c|c|}\hline a&b\\\hline a&\varnothing\\\hline\end{array}\,,\ \begin{array}{|c|c|}\hline a&b\\\hline \varnothing&b\\\hline\end{array}\right)=$$

$$\left\{\begin{array}{|c|c|c|c|}\hline a&b&a&b\\\hline a&\varnothing&\varnothing&b\\\hline\end{array}\,,\ \begin{array}{|c|c|c|c|}\hline a&b&a&c\\\hline a&\varnothing&\varnothing&c\\\hline\end{array}\,,\ \begin{array}{|c|c|c|c|}\hline a&b&b&a\\\hline a&\varnothing&\varnothing&a\\\hline\end{array}\,,\ \begin{array}{|c|c|c|c|}\hline a&b&c&a\\\hline a&\varnothing&\varnothing&a\\\hline\end{array}\,,\ \begin{array}{|c|c|c|c|}\hline a&b&c&b\\\hline a&\varnothing&\varnothing&b\\\hline\end{array}\,,\ \begin{array}{|c|c|c|c|}\hline a&b&c&d\\\hline a&\varnothing&\varnothing&d\\\hline\end{array}\right\}$$

$\text{coal}_{1.2}$: $\begin{array}{|c|c|c|c|}\hline a&b&a&b\\\hline a&\varnothing&\varnothing&b\\\hline\end{array}$ $\text{coal}_{1.3}$: $\begin{array}{|c|c|c|c|}\hline a&b&a&c\\\hline a&\varnothing&\varnothing&c\\\hline\end{array}$

$\text{coal}_{2.1}$: $\begin{array}{|c|c|c|c|}\hline a&b&b&a\\\hline a&\varnothing&\varnothing&a\\\hline\end{array}$ $\text{coal}_{3.1}$: $\begin{array}{|c|c|c|c|}\hline a&b&c&a\\\hline a&\varnothing&\varnothing&a\\\hline\end{array}$

$\text{coal}_{3.2}$: $\begin{array}{|c|c|c|c|}\hline a&b&c&b\\\hline a&\varnothing&\varnothing&b\\\hline\end{array}$ $\text{coal}_{3.4}$: $\begin{array}{|c|c|c|c|}\hline a&b&c&d\\\hline a&\varnothing&\varnothing&d\\\hline\end{array}$ •

Numeric representation

$$\text{add}_{1.2}\left(\boxed{1_1^2,\ 2_2^1}\,,\ \boxed{1_1^1,\ 2_2^2}\right)=\boxed{1_1^2,\ 2_2^1,\ 1_3^1,\ 2_4^2}$$

$$\text{add}_{1.3}\left(\boxed{1_1^2,\ 2_2^1}\,,\ \boxed{1_1^1,\ 2_2^2}\right)=\boxed{1_1^2,\ 2_2^1,\ 1_3^1,\ 3_4^2}$$

$$\text{add}_{2.1}\left(\boxed{1_1^2,\ 2_2^1}\,,\ \boxed{1_1^1,\ 2_2^2}\right)=\boxed{1_1^2,\ 2_2^1,\ 2_3^1,\ 1_4^2}$$

$$\text{add}_{3.1}\left(\boxed{1_1^2,\ 2_2^1}\,,\ \boxed{1_1^1,\ 2_2^2}\right)=\boxed{1_1^2,\ 2_2^1,\ 3_3^1,\ 1_4^2}$$

$$\text{add}_{3.2}\left(\boxed{1_1^2,\ 2_2^1}\,,\ \boxed{1_1^1,\ 2_2^2}\right)=\boxed{1_1^2,\ 2_2^1,\ 3_3^1,\ 2_4^2}$$

$$\text{add}_{3.4}\left(\boxed{1_1^2,\ 2_2^1}\,,\ \boxed{1_1^1,\ 2_2^2}\right)=\boxed{1_1^2,\ 2_2^1,\ 3_3^1,\ 4_4^2}\ \bullet$$

Null

3.6.3. Integrative coalitions

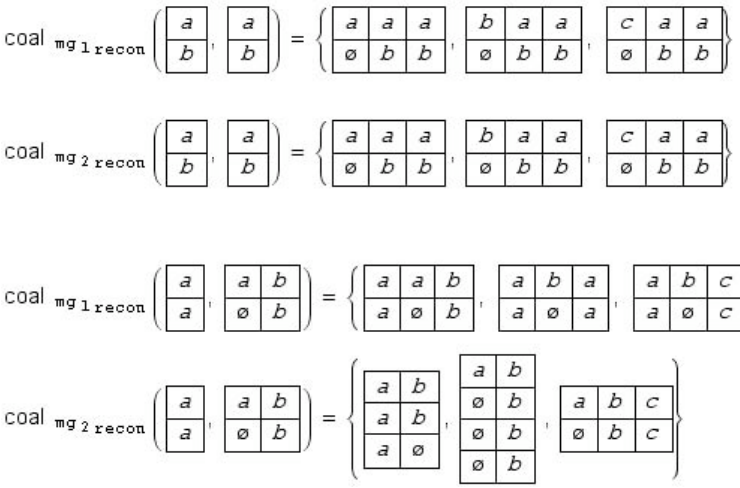
$$\text{coal}_{\text{mg}_1\text{integr}}\left(\begin{array}{|c|}\hline a\\\hline b\\\hline\end{array}\,,\ \begin{array}{|c|}\hline a\\\hline b\\\hline\end{array}\right)=\left\{\begin{array}{|c|c|c|}\hline a&a&a\\\hline b&\varnothing&b\\\hline\end{array}\,,\ \begin{array}{|c|c|c|}\hline a&b&a\\\hline b&\varnothing&b\\\hline\end{array}\,,\ \begin{array}{|c|c|c|}\hline a&b&a\\\hline b&\varnothing&c\\\hline\end{array}\right\}$$

$$\text{coal}_{\text{mg}_2\text{integr}}\left(\begin{array}{|c|}\hline a\\\hline b\\\hline\end{array}\,,\ \begin{array}{|c|}\hline a\\\hline b\\\hline\end{array}\right)=\left\{\begin{array}{|c|c|c|}\hline a&a&a\\\hline b&\varnothing&b\\\hline\end{array}\,,\ \begin{array}{|c|c|c|}\hline a&b&a\\\hline b&\varnothing&b\\\hline\end{array}\,,\ \begin{array}{|c|c|c|}\hline a&b&a\\\hline b&\varnothing&c\\\hline\end{array}\right\}$$

$$\text{coal}_{\text{mg}_1\text{integr}}\left(\begin{array}{|c|}\hline a\\\hline a\\\hline\end{array}\,,\ \begin{array}{|c|c|}\hline a&b\\\hline \varnothing&b\\\hline\end{array}\right)=\left\{\begin{array}{|c|c|c|}\hline a&a&b\\\hline \varnothing&a&b\\\hline\end{array}\,,\ \begin{array}{|c|c|c|}\hline a&b&a\\\hline \varnothing&b&a\\\hline\end{array}\,,\ \begin{array}{|c|c|c|}\hline a&b&c\\\hline \varnothing&b&c\\\hline\end{array}\right\}$$

$$\text{coal}_{\text{mg}_2\text{integr}}\left(\begin{array}{|c|}\hline a\\\hline a\\\hline\end{array}\,,\ \begin{array}{|c|c|}\hline a&b\\\hline \varnothing&b\\\hline\end{array}\right)=\left\{\begin{array}{|c|c|}\hline a&b\\\hline a&b\\\hline a&\varnothing\\\hline\end{array}\,,\ \begin{array}{|c|c|}\hline a&b\\\hline \varnothing&b\\\hline \varnothing&b\\\hline \varnothing&b\\\hline\end{array}\,,\ \begin{array}{|c|c|c|}\hline a&b&c\\\hline \varnothing&b&c\\\hline\end{array}\right\}$$

3.6.4. Reconfigurative coalitions



3.6.5. Properties of coalitions

Non-Commutativity of coalitions, super-additivity

3.7. Morphogrammatic multiplication

Again, the modi of morphogrammatic multiplications have to reflect and implement the different modi of change into their definitions. Hence, multiplications appears as *evolutive*, *integrative* and *reconstructive* compositions.
A multiplication mxn is understood as an n-fold addition of m. Hence, the concept of multiplication is inheriting the features of addition, i.e. *evolutive*, *integrative* and *reconfigurative* transformations and their retro-grade definition of the range of the operations.
The definition and programming of the construct “kmul” as *evolutive (concatenational) multiplication* goes back to Thomas Mahler (Morphogrammatik 1993, pp 78 - 82).[4]

3.7.1. Evolutive multiplication

$$\text{kmul}_{\text{evol}} = (MG_1, MG_2) = \left(mg_{1_1} \times [mg_{2_1}, mg_{2_2}],\ mg_{1_2} \times [mg_{2_1}, mg_{2_2}]\right)$$

Context - Rule

$\forall\, i \in \mathrm{Dec}(MG_{i+1}),\ mg_i \in MG_1,\ mg_i \in MG_2:$

$\mathrm{kmul}(MG_1, MG_2)$ iff $\begin{pmatrix} \mathrm{head}(mg)_i \neq \mathrm{head}(mg)_{i+1} \\ \mathrm{body}(mg)_i \neq \mathrm{body}(mg)_{i+1} \end{pmatrix}$

Head = first kenom of *a* monomorphy
Body = the rest.

Order

numerical lexical order(MG) = 1 < 2 < 3 < ...
alphabetical lexical order(MG) = *a* < *b* < *c* < ...

Multiplication tables for kmult([1], [1, 2]) and kmult([1, 2], [1])

kmul	1	2
1	1	2
ø	ø	ø

kmul	1
1	1
2	2

$\mathrm{kmul}\left(\boxed{1}, \begin{matrix}1\\2\end{matrix}\right) = \begin{matrix}1\\2\end{matrix} = \mathrm{kmul}\left(\begin{matrix}1\\2\end{matrix}, \boxed{1}\right)$

In arithmetic we distinguish between a zero – and a unit – element.
This distinctions are necessary to run recursive functions.

Identity elements "*zero*" and "*one*".
addition:
a + 0 = 0 + a = a
multiplication:
a x 1 = 1 x a = a
a x 0 = 0 x a = 0

```
[] a =  [[]]
b [[] ] = [[]]
a [1] = [ a ]
[1] b = [ b ]
```

Multiplication tables for kmul([1, 2], [1, 2])

kmul	1	2
1	1	*x*
2	2	*y*

kmul	1	2	*a*	*b*	*c*
1	1	2	2	3	3
2	2	1	3	1	4

$\mathrm{kmul}\left(\begin{matrix}1\\2\end{matrix}, \begin{matrix}1\\2\end{matrix}\right) = \left\{\begin{matrix}1&2\\2&1\end{matrix}, \begin{matrix}1&3\\2&1\end{matrix}, \begin{matrix}1&2\\2&3\end{matrix}, \begin{matrix}1&3\\2&4\end{matrix}\right\}$

1. Identity: [1] x [1,2] = [1,2]: head- and body-iteration, $head_1 = head_2$, $body_1 = body_2$
2. Diversity: [2]x[1,2] =
   [2,1]: iterative component,
   [3,1] :head-accretion, body-iteration,
   [2,3]: head-iteration, body-accretion,
   [3,4]: head- and body-accretion,
   all accepting CRM: $head_1$!= $head_2$, $body_1$!=$body_2$

Multiplication table for kmul([1, 2, 2], [1, 2, 1])

kmul	1	2	*a*	*b*	*c*	1
1	1	2	2	3	3	1
2	2	1	3	1	4	2
2	2	1	3	1	4	2

$$\text{kmul}\left(\begin{bmatrix}1\\2\\2\end{bmatrix},\begin{bmatrix}1\\2\\1\end{bmatrix}\right)=\left\{\begin{bmatrix}1&2&1\\2&1&2\\2&1&2\end{bmatrix},\begin{bmatrix}1&2&1\\2&3&2\\2&3&2\end{bmatrix},\begin{bmatrix}1&3&1\\2&1&2\\2&1&2\end{bmatrix},\begin{bmatrix}1&3&1\\2&4&2\\2&4&2\end{bmatrix}\right\}$$

Multiplication table for kmul([1, 2, 2], [1, 2, 3, 1])

kmul	1	2	3	1
1	**1**	2 3333 2222 3333 3333 3	3 2244 3434 2452 24545 5	**1**
2	**2**	1 1111 3333 4444 4444 4	4 3435 1145 1113 53351 6	**2**
2	**2**	1 1111 3333 4444 4444 4	4 3435 1145 1113 53351 6	**2**

$$\text{kmul}\left(\begin{bmatrix}1\\2\\2\end{bmatrix},\begin{bmatrix}1\\2\\3\\1\end{bmatrix}\right)=\left\{\begin{bmatrix}1&2&3&1\\2&1&4&2\\2&1&4&2\end{bmatrix},\begin{bmatrix}1&3&2&1\\2&1&3&2\\2&1&3&2\end{bmatrix},\begin{bmatrix}1&3&2&1\\2&1&4&2\\2&1&4&2\end{bmatrix},\ \ldots,\ \begin{bmatrix}1&3&5&1\\2&4&6&2\\2&4&6&2\end{bmatrix}\right\}$$

Exclusion table

kmul	1	2 ≠ CRM	3 ≠ CRM	1
1	**1**	1 1 3	1 1 1 1 3 4 5	1
2	**2**	2 3 2	2 3 4 5 2 2 2	2
2	**2**	2 3 2	2 3 4 5 2 2 2	2

Inclusion table

$$\begin{bmatrix}2&3&4&5&2&2&2&3&4&4&5&5\\1&1&1&1&3&4&5&4&3&5&3&6\\1&1&1&1&3&4&5&4&3&5&3&6\end{bmatrix}\in \text{CRM}$$

Decomposition

$$\text{kmul}\left(\left[1,2,2\right],\left[1,2,3,1\right]\right)\Longrightarrow \text{kmul}\left(\left(\left[1\right],\left[2,2\right]\right),\left(\left[1\right],\left[2\right],\left[3\right],\left[1\right]\right)\right)$$

$$MG_1=\left[1,2,2\right]\Longrightarrow\left[mg_1,\ mg_2\right]$$

$$MG_2=\left[1,2,3,\ 1\right]\Longrightarrow\left[mg_1,\ mg_2,\ mg_3,\ mg_1\right]$$

kmul	$mg_{2.1}$	$mg_{2.2}$	$mg_{2.3}$	$mg_{2.1}$
$mg_{1.1}$	$mg_{1.1}$	$\{\overline{mg_{1.1}}\}$	$\{\overline{\overline{mg_{1.1}}}\}$	$mg_{1.1}$
$mg_{1.2}$	$mg_{1.2}$	$\{\overline{mg_{1.2}}\}$	$\{\overline{\overline{mg_{1.2}}}\}$	$mg_{1.2}$

$$\begin{pmatrix}mg_{1.1},\{\overline{mg_{1.1}}\},\{\overline{\overline{mg_{1.1}}}\},mg_{1.1}\\mg_{1.2},\{\overline{mg_{1.2}}\},\{\overline{\overline{mg_{1.2}}}\},mg_{1.2}\end{pmatrix}\in \text{CRM}$$

3.7.2. Properties of evolutive multiplication

1. Unit element :

$$\text{kmul}\left(\text{mg}\left[1\right]\right) = \left[\text{mg}\right] = \text{kmul}\left(\left[1\right]\,\text{mg}\right)$$

2. non – commutativity for $MG_1 \neq MG_2$:

$$\text{kmul}\left(\begin{bmatrix}a\\b\end{bmatrix}, \begin{bmatrix}a\\a\\a\end{bmatrix}\right) \neq \text{kmul}\left(\begin{bmatrix}a\\a\\a\end{bmatrix}, \begin{bmatrix}a\\b\end{bmatrix}\right)$$

$$\text{kmul}\left(\begin{bmatrix}a\\b\end{bmatrix}, \begin{bmatrix}a\\a\\a\end{bmatrix}\right) = \begin{bmatrix}a\\b\\a\\b\\a\\b\end{bmatrix} = \begin{bmatrix}a & a & a\\b & b & b\end{bmatrix}$$

$$\text{kmul}\left(\begin{bmatrix}a\\a\\a\end{bmatrix}, \begin{bmatrix}a\\b\end{bmatrix}\right) = \begin{bmatrix}a\\a\\a\\b\\b\\b\end{bmatrix} = \begin{bmatrix}a & b\\a & b\\a & b\end{bmatrix}.$$

Numeric notation

$$\left[1, 2, 1, 2, 1, 2\right] \neq \left[1, 1, 1, 2, 2, 2\right]$$

$$\left[1^1, 2^1, 1^1, 2^1, 1^1, 2^1\right] \neq \left[1^3, 2^3\right].$$

Cardinality

$$\left|\text{Kmult}_i\left(\left[1, 2\right], \left[1, 2\right]\right)\right| = \left|\left[1, 2\right] x \left|\left[1, 2\right]\right|\right.$$

$$\left|\text{Kmult}\left(\left[1, 2\right], \left[1, 2\right]\right)\right| < \left|\text{Kadd}\left(\left[1, 2\right], \left[1, 2\right]\right)\right|$$

3.7.3. Integrative multiplication

$$\text{kmul}_{\text{integr}}\left(MG_1, MG_2\right) = \left(mg_{1_1} x \left[mg_{2_1}, mg_{2_2}\right], \left\langle mg_{1_2} x \left[mg_{2_1}, mg_{2_2}\right]\right\rangle, mg_{1_2} x \left[mg_{2_1}, mg_{2_2}\right]\right.$$

Example

$$\begin{aligned}\left[1\right] x \left[1, 2\right] + \left[2\right] x \left[1, 2\right] &= \left[1, 2\right] + \left[2, 1\right] = \left[1, 2, 2, 1\right] \Longrightarrow \left[1, 2, \left(2, 1\right), 2, 1\right]\\ &= \left[1, 2\right] + \left[3, 1\right] = \left[1, 2, 3, 1\right] \Longrightarrow \left[1, 2, \left(3, 1\right), 3, 1\right]\\ &= \left[1, 2\right] + \left[2, 3\right] = \left[1, 2, 2, 3\right] \Longrightarrow \left[1, 2, \left(2, 3\right), 2, 3\right]\\ &= \left[1, 2\right] + \left[3, 4\right] = \left[1, 2, 3, 4\right] \Longrightarrow \left[1, 2, \left(3, 4\right), 3, 4\right].\end{aligned}$$

3.7.4. Reconfigurative multiplication

$$\text{kmul}_{\text{recon}}\left(MG_1,\ MG_2\right) = \left(mg_{1\,1}\ x\ \left\langle\left[mg_{2\,1},\ mg_{2\,2}\right]\right\rangle,\ mg_{1\,1}\ x\ \left[mg_{2\,1},\ mg_{2\,2}\right],\ mg_{1\,2}\ x\ \left[mg_{2\,1},\ mg_{2\,2}\right.\right.$$

Example

$$\left[1\right] x\left[1,\ 2\right] + \left[2\right] x\left[1,\ 2\right] = \left[1,\ 2\right] + \left[2,\ 1\right] \Longrightarrow \left[\left(2,\ 1\right),\ 1,\ 2,\ 2,\ 1\right] = \left[1,\ 2,\ 2,\ 1,\ 1,\ 2\right]$$
$$= \left[1,\ 2\right] + \left[3,\ 1\right] \Longrightarrow \left[\left(3,\ 1\right),\ 1,\ 2,\ 3,\ 1\right] = \left[1,\ 2,\ 2,\ 3,\ 1,\ 2\right]$$
$$= \left[1,\ 2\right] + \left[2,\ 3\right] \Longrightarrow \left[\left(2,\ 3\right),\ 1,\ 2,\ 2,\ 3\right] = \left[1,\ 2,\ 3,\ 1,\ 1,\ 2\right]$$
$$= \left[1,\ 2\right] + \left[3,\ 4\right] \Longrightarrow \left[\left(3,\ 4\right),\ 1,\ 2,\ 3,\ 4\right] = \left[1,\ 2,\ 3,\ 4,\ 1,\ 2\right].$$

New beginnings for kenogrammatics?

In arithmetic we distinguish between a zero – and a unit – element. This distinctions are necessary to run recursive functions.
Identity elements: " zero " and " one ".
In addition:
a + 0 = 0 + a = a
In multiplication:
a x 1 = 1 x a = a
a x 0 = 0 x a = 0

```
[] a = [[]]
b [[] ] = [[]]
a [1] = [ a ]
[1] b = [ b ]
```

Iterative and accretive units

A kenomic unit (identity element in algebra) as an identity or as a difference.

(This distinction is connecting to the complementarity of objects in diamond category theory.)

$$a\left[1\right]_{\text{iter}} = \left[a_{\text{iter}}\right] = \left[a\right]$$

$$a\left[1\right]_{\text{acc}} = \left[a_{\text{acc}}\right] = \left[a'\right]$$

$$a\ x\left[1\right] = \begin{pmatrix}\left[a_{\text{iter}}\right]\\ \updownarrow \\ \left[a_{\text{acc}}\right]\end{pmatrix}$$

Chiastic complementarity of beginnings

$$\begin{pmatrix}\left[a_{\text{iter}}\right]\\ \updownarrow \\ \left[a_{\text{acc}}\right]\end{pmatrix} \longleftrightarrow \begin{pmatrix}\left[a_{\text{iter}}\right]\\ \updownarrow \\ \left[a_{\text{acc}}\right]\end{pmatrix} : \text{tabular iteration} / \text{accretion}$$

$$\begin{pmatrix}\left[a_{\text{iter}}\right] & \longrightarrow & \left[a_{\text{acc}}\right]\\ \updownarrow & \square & \updownarrow \\ \left[a_{\text{acc}}\right] & \longleftarrow & \left[a_{\text{iter}}\right]\end{pmatrix} : \text{chiasm of}\left(\text{iteration} / \text{accretion and internal} / \text{external}\right)$$

Considering this observation, kenogrammatics has to start at the very beginning with the inscription of the difference of iteration/accretion. This observation is corresponding to the concept of *"bi-objects"* in diamond category theory.

At such a start of kenogrammatics there is no need for a dualism of iterativity and accretion but a *chiasm* is involved of the terms *internal/external* and *accretion/iteration*, producing the double determination of situations by the wording of iterative iterativity, accretive iterativity and iterative accretion, accretive accretion. Hence, basic terms in kenogrammatics are reflectional and second-order figures. In other terms, proemiality is opening up the beginnings of kenogrammatics.

To choose a beginning with a mark is putting a difference into the possibility of a choice for another mark of beginning. Such a difference in the notion of representation of a beginning by a mark shall be inscribed

as a *double* beginning. The question is: As which representation is a kenogram inscribed? If it is inscribed as “a” then it is differentiated from another possible inscription, say “b”. If it is inscribed as “b” then it is differentiated from another possibility, say “a”. A further differentiation, say into “c” , would be redundant and irrelevant for the characterisation of a kenomic beginning.
On the other hand, philosophically, with double beginnings, the necessity of a unique and ultimate *“coincidentia oppositorum”* (Cusanus, Hegel, Gunther) is differentiated and dissolved.

A beginning for kenogrammatics is not in the mode of an is-abstraction, i.e. a = a, but in the mode of an as-abstraction, thus, producing beginning as a complementarity of the monads “a” and “b”.

This, obviously, is not the same as an *isomorphism* between different sign systems which differ in their alphabet.

With that, the notational decision for a representation is represented as the choice for an iterative or an accretive notation of a kenogram. Both interpretations are, in *isolation* and without their chiastic interaction, isomorphic. The present *"Outline of morphogrammatics”* is not yet reflecting this situations of disremptive - iterative/accretive - identifications of kenoms by the as-abstraction.

Hence, is it necessary to accept the unit element as a sole interpretation of a monadic multiplication?
As an example: [1] x [1, 2] = [1 x [1], 1 x [2]] = [1, 2],

Multiplication is a repetition. The multiplication “1 x [1]" is a single repetition of [1] .
But repetitions in kenomic systems might happen as *iterative* and as *accretive* repetitions .

Hence, 1 x [1] = [1] for *iteration*, the same for 1 x [2] = [2], and different for *accretion*: 1 x [1] = [2], 1 x [2] = [3].

Iterative and accretive multiplication
Because [1] and [2] are kenomically equal as isolated monads, $[1] =_{kenom} [2]$, the kenomic difference disappears. And with it the semiotic difference too.
But in a contextual environment of a morphogram the monadic difference is playing its part of differentiation. Hence, there is a possibility to distinguish between *iterative and accretive multiplication* as it is possible to distinguish iterative and accretive succession and coalition . This is not multiplicative accretion inherited by addition but a genuine multiplicative accretion. That is, a repetition of a kenogram with itself is not necessarily equal the repeated kenogram. The same monad is equal as an iteration and different as an accretion . Thus, $kmul_{iter} \neq kmul_{acc}$.
Similar ideas are presented at: “Lambda Calculi in polycontextural Situations”.[5]

Multiplication tables for kmul $([1], [1, 2])$ and kmul $([1, 2], [1])$

Iterative multiplication

kmul	1	2
1	1	2
ø	ø	ø

kmul	1
1	1
2	2

$$\text{kmul}_{\text{iter}}\left(\boxed{1}, \begin{array}{|c|}\hline 1 \\ \hline 2 \\ \hline \end{array}\right) = \begin{array}{|c|}\hline 1 \\ \hline 2 \\ \hline \end{array} = \text{kmul}_{\text{iter}}\left(\begin{array}{|c|}\hline 1 \\ \hline 2 \\ \hline \end{array}, \boxed{1}\right).$$

Accretive multiplication

kmul	1	2
1	2	3
ø	ø	ø

kmul	1
1	2
2	3

$$\left.\begin{array}{l}\text{kmul}_{\text{accr}}\left(\boxed{1}, \begin{array}{|c|}\hline 1 \\ \hline 2 \\ \hline \end{array}\right) = \begin{array}{|c|}\hline 2 \\ \hline 3 \\ \hline \end{array} \\ \text{kmul}_{\text{iter}}\left(\begin{array}{|c|}\hline 1 \\ \hline 2 \\ \hline \end{array}, \boxed{1}\right) = \begin{array}{|c|}\hline 1 \\ \hline 2 \\ \hline \end{array}\end{array}\right) = \begin{array}{|c|}\hline 2 \\ \hline 3 \\ \hline \end{array} = \text{kenom} \begin{array}{|c|}\hline 1 \\ \hline 2 \\ \hline \end{array}.$$

$$\Longrightarrow \text{kmul}_{\text{iter}}\left(\begin{array}{|c|}\hline 1 \\ \hline 2 \\ \hline \end{array}, \boxed{1}\right) = \text{kenom}\ \text{kmul}_{\text{accr}}\left(\boxed{1}, \begin{array}{|c|}\hline 1 \\ \hline 2 \\ \hline \end{array}\right).$$

Mixed situations for kmul $([1], [1, 1])$

$$1 x_{\text{iter}} [1] + 1 x_{\text{iter}} [1] = [1, 1]$$
$$1 x_{\text{iter}} [1] + 1 x_{\text{acc}} [1] = [1, 2]$$
$$1 x_{\text{acc}} [1] + 1 x_{\text{iter}} [1] = [2, 1]$$
$$1 x_{\text{acc}} [1] + 1 x_{\text{acc}} [1] = [2, 2].$$

$$\text{kmul}([1], [1, 1]) = \begin{array}{|c|}\hline [1, 1] \\ \hline [1, 2] \\ \hline \end{array} \Longrightarrow [1, 1] \neq \text{kenom}\ [1, 2].$$

Mixed situations for kmul $([1, 2, 2], [1, 2, 3, 1])$

kmul	1	2	3	1
1	**1**	□	□	**2**
2	**2**			**3**
2	**2**			**3**

Iteration of $[1, 2, 2]$ at the first and
accretion of $[1, 2, 2]$ at 4. column of $[1, 2, 3, 1]$ by
" $\text{kmul}([1, 2, 2], [1]) = \{[1, 2, 2], [2, 3, 3]\}$ "

kmul	1	2	3	1
1	**1**	3 3 3 3 3 3 3	3 4 5 4 5	**2**
2	**2**	1 4 4 4 4	4 1 4 5 6	**3**
2	**2**	1 4 4 4 4	4 1 4 5 6	**3**

End of " New Beginnings ".

3.8. Monomorphic subsitution

3.8.1. Substitution and context rules

Substitution might happen in the modi of the as-abstraction, which are contextualized by the context rules of substitution. Substitution is a main operation for the definition of many kinds of self-applicative functions. Self-application is the main construction for all kinds of proofs of fundamental properties of computability and its limitations.

Without doubt, kenomic function are showing fundamentally different behaviors and features. Conflicts or even antinomies or paradoxes producing substitutions are based on the very special case of substitution in the mode of identity, i.e. substitution ruled by the is-abstraction. Hence, a whole catalogue of non-paradox substitutions, framed by the context rules, are enabled by the as-abstractions of kenomic substitutions.
With this approach of multiple substitutions, polycontextural considerations of as-substitutions, as developped in the 70s, might be clearly separated and moved to further thematizations.

Kenomic substitution

Substitution too is depending on contexts. Not everything substituted for a monomorphy in a morphogram is supporting the equality between two equal morphograms. In contrast to kenomic substitution, semiotic substitution is context-free. That is, to two equal sign sequences any substitution of equal parts restores the equality between the two new sequences.

Semiotic Substitution:

$$\forall\, h,\ k_1 \in H_1,\ k_2 \in H_2,\ k_1 =_{sem} k_2 :$$

$$\mathbf{H_1 =_{sem} H_2 \Longleftrightarrow Subst_{h/k}\left(H_1\right) =_{sem} Subst_{h/k}\left(H_2\right)}$$

$$k_1 =_{sem} k_2 \text{ iff } \text{length}\left(k_1\right) = \text{length}\left(k_2\right) \bigwedge \forall\, i, j \in k_1, k_2 : \text{loc}_i\left(\text{atom}\right) = \text{loc}_j\left(\text{atom}\right)$$

Example

$$H_1 = H_2 = \left(\text{aabbcde}\right),$$

$$h = \left(\text{bb}\right),\ k_1 = k_2 = \left(\overline{\text{lkmbc}}\right):$$

$$H_1 =_{sem} H_2 \Longleftrightarrow \text{Subst}_{\text{bb}/\overline{\text{klmbc}}}\left(\text{aabbcde}\right) = \text{Subst}_{\text{bb}/\overline{\text{klmbc}}}\left(\text{aabbcde}\right)$$

$$\left(\text{aabbcde}\right) =_{sem} \left(\text{aabbcde}\right) \Longleftrightarrow \left(\text{aa}\,\overline{\text{lkmbc}}\,\text{bbcde}\right) = \left(\text{aa}\,\overline{\text{lkmbc}}\,\text{bbcde}\right).$$

Monomorphic substitution

Context rules for substitution CRS

$\forall\, h,\ m_1 \in H_1,\ m_2 \in H_2,\ m_1 =_{MG} m_2,$
$m_1 \neq_{sem} m_2,\ h \neq_{sem} m_1,\ m_2,$
$\text{length}(m_1) = \text{length}(m_2),$
$\text{kenom}(m_1) \bigcap \text{kenom}(H_1) = \emptyset,$
$\text{kenom}(m_2) \bigcap \text{kenom}(H_2) = \emptyset :$
$H_1 =_{MG} H_2 \Longrightarrow \text{Subst}_{h/m_1}(H_1) =_{MG} \text{Subst}_{h/m_2}(H_2)$; modulo CRS

Example

$H_1 = [\text{aabbacc}],\ H_2 = [\text{aaccabb}],$
$H_1 =_{MG} H_2, H_1 \neq_{sem} H_2$
$\text{Dec}(H_1) = ([\text{aa}], [\text{bb}], [a], [\text{cc}]),$
$\text{Dec}(H_2) = ([\text{aa}], [\text{cc}], [a], [\text{bb}]),$
$h = [\text{aa}],\ m_1 = [\text{ddd}],\ m_2 = [\text{eee}],$

$\text{length}(m_1) = \text{length}(m_2),$
$m_1 \neq_{sem} m_2,\ h \neq_{sem} m_1,\ m_2,$
$\text{sem}(m_i) \bigcap \text{sem}(H_i) = \emptyset,\ i = 1,\ 2$

$\text{Dec}(H_1) = ([\text{aa}], [\text{bb}], [a], [\text{cc}])$
$\text{Subst}(H_1)_{[\text{aa}]/[\text{ddd}]}([\text{aa}], [\text{bb}], [a], [\text{cc}]) = ([\text{ddd}], [\text{bb}], [a], [\text{cc}])$

$\text{Dec}(H_2) = ([\text{aa}], [\text{cc}], [a], [\text{bb}])$
$\text{Subst}(H_2)_{[\text{aa}]/[\text{eee}]}([\text{aa}], [\text{cc}], [a], [\text{bb}]) = ([\text{eee}], [\text{cc}], [a], [\text{bb}])$

$H_1 =_{MG} H_2 \Longrightarrow \text{Subst}(H_1)_{[\text{aa}]/[\text{ddd}]} =_{MG} \text{Subst}(H_2)_{[\text{aa}]/[\text{eee}]}$

$[\text{aabbacc}] =_{MG} [\text{aaccabb}] \Longrightarrow ([\text{dddbbacc}]) =_{MG} ([\text{eeeccabb}]).$

Standard representation

$[\text{aabbacc}] =_{MG} [\text{aabbacc}] \Longrightarrow ([\text{aaabbcdd}]) =_{MG} ([\text{aaabbcdd}]).$

Obviously, the case of semiotic equality of substituted monomorphies in morphograms is trivial.

4. Morphogrammatic reflection

4.1. Reflection of morphograms

Reflection or inversion of morphograms offers a convenient form of structural change without touching the complexity/complication features of a morphogram. Hence, reflection is realizing

morphogrammatic change without any change in the structure of the morphogram involved into reflection.
Nevertheless, such a simple transformation might produce *conceptual* changes which are not always easily to accept. Typical conceptual examples for dualities are: individualism/collectivism, matter/mind, true/false, virtual/rel; they all turn out to be morphogrammatically the same.
In logic, negation is fundamental. Dualities are ruled by negations. Morphogrammatics is conceived as a *negational-invariant* formalism. Nevertheless, laws of reflections, similar to the duality principle, can be studied in extenso.

In logic, reflection of a morphogram of logical operations (connectives) is interpreted as *dualization*.

Duality in logic

Duality of conjunction and disjunction: $(p \bigwedge q) = \neg (\neg p \bigvee \neg q)$

Morphogram of:

Negation: $\text{morph}(\neg\ p) = \text{morph}(p) = [\text{ab}]$

Conjunction: $\text{morph}(p \bigwedge q) = [\text{abbb}]$

Disjunction: $\text{morph}(p \bigvee q) = [\text{aaab}]$

Morphogrammatic reflection vs. logical duality:

$\text{refl}([\text{abbb}]) = [\text{aaab}]$,

$\text{refl}([\text{aaab}]) = [\text{abbb}]$,

$\text{compl}([\text{aaab}]) = \text{compl}([\text{abbb}]) = {}_{\text{proto}}\{1^1, 2^3\}$.

Duality in general:

$\text{dual}(\text{dual}(X)) = X$

$\text{dual}(X \oplus Y) = \text{dual}(Y) \oplus \text{dual}(X)$.

Morphogrammatic reflection

$\text{refl}(\text{refl}(\text{MG})) = \text{MG}$

$\text{refl}(\text{MG}_1 \otimes \text{MG}_2) = \text{refl}(\text{MG}_2) \otimes \text{refl}(\text{MG}_1)$.

Example

$\text{refl}(\text{MG}_1^1 \otimes \text{MG}_2^1) = \text{refl}(\text{MG}_2^2) \otimes \text{refl}(\text{MG}_1^2)$ with

$\text{MG}_1^1 =_{\text{MG}} \text{MG}_1^2 \wedge \text{MG}_1^1 \neq_{\text{sem}} \text{MG}_1^2 \Longrightarrow [a] =_{\text{KG}} [b]$

$\text{MG}_2^1 =_{\text{MG}} \text{MG}_2^2 \wedge \text{MG}_2^1 \neq_{\text{sem}} \text{MG}_2^2 \Longrightarrow [\text{abb}] =_{\text{KG}} [\text{bcc}]$

$\text{refl}([a] + [\text{abb}]) = \text{refl}([\text{bcc}]) + \text{refl}([b])$

(1): (1): $\text{refl}([a] + [\text{abb}]) = \text{refl}(\{[\text{aabb}], [\text{abaa}], [\text{abcc}]\}) = \{[\text{bbaa}], [\text{aaba}], [\text{ccba}]\}$
$= \{[\text{aabb}], [\text{aaba}], [\text{aabc}]\}$.

(2): $\text{refl}([\text{bcc}]) + \text{refl}([b]) = [\text{ccb}] + [b] = \{[\text{ccbc}], [\text{ccbb}], [\text{ccbd}]\}$
$= \{[\text{aaba}], [\text{aabb}], [\text{aabc}]\}$.

$\Longrightarrow (1) =_{\text{MG}} (2)$ •

Semiotic example

$\text{inv}([a] + [\text{abb}]) = \text{inv}([\text{abb}]) + \text{inv}([a])$

(1): $\text{inv}([a] + [\text{abb}]) = \text{inv}(\text{aabb}) = \text{bbaa}$

(2): $\text{inv}([\text{abb}]) + \text{refl}([a]) = \text{bba} + a = \text{bbaa}$

$\Longrightarrow (1) =_{\text{sem}} (2)$ •

4.2. Reflection of compound morphograms

Reflection happens to the whole morphogram or to its parts, i.e. to single or multiple monomorphies of the morphogram or to different morphograms of a compound of morphograms.
Again, this topic is best covered by "Morphogrammatik".

4.2.1. Morphogrammatic compounds

Compounds of morphograms are build by the chaining composition for morphograms.

$$MG^{(3)} = \left(MG_1, MG_2, MG_3\right) \xrightarrow{\text{composition}} \left[MG_1, MG_2, MG_3\right]$$

4.2.2. Reflection of morphogrammatic compounds

Reflection[6] of morphograms in compounds happens as reflections of single or multiple composed morphograms.
The tables are showing the examples for a combination of 3 morphograms of length 4. Reflection happens to the single morphograms by the reflectors r_1, r_2 and r_3 and the composed reflectors $r_{1.2}$, $r_{1.3}$, $r_{2.3}$ and $r_{1.2.3}$.
The example shows the *scheme* of a morphogrammatic compound $Q^{(3)}$ independently of its morphogrammatic interpretation by concrete morphograms.
The composition conditions are given by the main diagonal of the composition where the morphograms are connected (chained) together:

$$\begin{array}{|l} S_1 \cap S_3 = (1,1) \\ S_1 \cap S_2 = (2,2) \\ S_2 \cap S3 = (3,3) \end{array} \quad \text{with subsystems} \quad \begin{array}{l} S_1 = (1,2) \\ S_2 = (2,3) \\ S_3 = (1,3) \end{array}$$

$r_1(Q^3)$	1	2	3
1	•	•	○
2	•	•	○
3	○	○	○

$r_2(Q^3)$	1	2	3
1	○	○	○
2	○	•	•
3	○	•	•

$r_3(Q^3)$	1	2	3
1	•	○	•
2	○	○	○
3	•	○	•

$r_{1.2}(Q^3)$	1	2	3
1	•	•	○
2	•	•	•
3	○	•	•

$r_{1.3}(Q^3)$	1	2	3
1	•	•	•
2	•	•	○
3	•	○	•

$r_{2.3}(Q^3)$	1	2	3
1	•	○	•
2	○	•	•
3	•	•	•

$r_{1.2.3}(Q^3)$	1	2	3
1	•	•	•
2	•	•	•
3	•	•	•

5. Natural numbers in morphogrammatics

5.1. Natural numbers, de-mystified

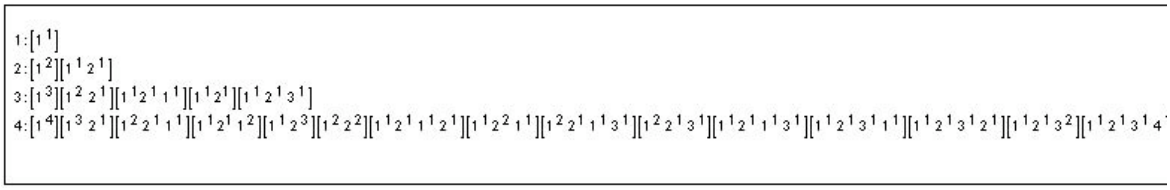
Now, what happened to our natural numbers?
Without surprise, natural numbers[7], after having lost their innocence of naturality and their hegemony of being ultimate and their dignity of uniqueness, natural numbers are re-appearing again, multiplied, distributed, cloned [89] and mediated over multiple kenomic loci, not loosing anything of their grandeur of pragmatic numeric relevancy. They are now embedded into a grid that enables number systems to have neighbors, to interact with other number systems and to reflect on such actions. And they might intervene into each others axiomatics, changing the rules of the game while playing it.

5.2. Natural numbers, disseminated

The tabular successiveness structure of morphogrammatic systems of change are offering space enough to distribute full natural number systems over multiple locations of the kenomic grid.

5.2.1. Numeric evolution

The most obvious numeric interpretation of evolutionary morphogrammatics is given by the observation of purely iterative and purely accretive evolutions or repetitions.
Hence, for a morphogram $[1^1, 2^n, ..., m^n]$ an iterative system like $([1^1], evol_{iter})$ with $evol_{iter}$ $[1^n]$= $[1^{n+1}]$ and an accretive system like $([m^1], evol_{acc})$ with $evol_{acc}[m^1] = [(m+1)^1]$ are both representing the successiveness structure of natural numbers. The same holds for all intermediary morphograms as beginnings.



5.2.2. Numeric interactivity

Interaction between different distributed number systems is guided by the emanation rules between different morphograms of the same complexity.

$\boxed{3}: [1^3] \leftrightarrow [1^2\,2^1] \leftrightarrow [1^1 2^1 1^1] \leftrightarrow [1^1 2^1] \leftrightarrow [1^1\,2^1\,3^1]$

Hence, there is a interactional mediation between the strict "*cardinal*" numbers $[1^m]$ and the strict "*ordinal*" numbers $[1^1, 2^1, ..., m^1]$ and also between intermediary number systems.

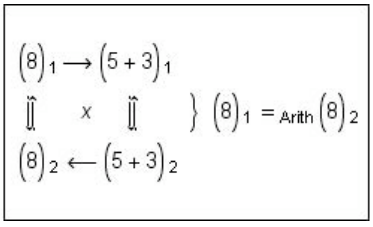
5.2.3. Morphogrammatics of arithmetic

There are many aspects under this rubric of *"Morphogrammatics of arithmetics"* to report and to study. At first, we can learn that morphogrammatics is dealing "arithmetically" not with arithmetical numbers but with arithmetical number *systems* as such. Hence, morphogrammatics offers a kind of an *"arithmetics of arithmetic" or* an arithmetics of natural number systems.
In contrast to existing alternative number systems, like fuzzy-number systems, number systems based on multiple-valued logic and set theory, etc., morphogrammatically disseminated number systems are not reducible, back to the conformity of classical natural number systems.
On the other hand, those alternative or deviant systems are easily disseminated over the kenomic grid keeping and mixing their deviancy to interesting interplays of interactions.

5.2.4. Diamond structure of the "arithmetics of arithmetic"

The diamond categorical approach to arithmetics is reflecting on the double character of any operation.

A first step towards a categorical construction might be sketched:



Arithmetically, the relations $(5+3)_1 \longrightarrow (8)_1$ and $(5+3)_2 \longrightarrow (8)_2$ are well obvious because their relata are all belonging to the same arithmetical systems A_1 and A_2. The situation is getting slightly more intriguing if the relations are belonging to two different arithmetical systems, A_1 an A_2, with $A_1 \cap A_2 = \emptyset$. Hence the relations between $(5+3)_1 \longrightarrow (8)_2$ and $(5+3)_2 \longrightarrow (8)_1$ are of special interest.

The relations (or morphisms) $(5+3)_1 \longrightarrow (8)_2$ and $(5+3)_2 \longrightarrow (8)_1$ can be seen as *translational* morphisms between two *discontextural* arithmetical systems A_1 an A_2. Hence, a possibility of a *comparison* between $(8)_1$ and $(8)_2$ is established, which is demanding its own third contexture to take place.
This little example is of interest independently of the numeric values used and the definition of their axiomatics.

Notes

[1] § 1673
The identity with the other individual, the individual's universality, is thus as yet only internal or subjective; it therefore has the longing to posit this and to realise itself as a universal. But this urge of the genus can realise itself only by sublating the single individualities which are still particular relatively to one another.
In that first instance, in so far as it is these latter which, in themselves, universal, satisfy the tension of their longing and dissolve themselves into the universality of their genus, their realised end identity is the negative unity of the genus that is reflected into itself out of its **disremption**.
Hegel, Sience of Logic, Life
http://www.marxists.org/reference/archive/hegel/works/hl/hl764.htm

[2] http://www.thinkartlab.com/pkl/pcl-lab.htm

[3] www.thinkartlab.com/pkl/media/Web_Mobility/Web_Mobility.html

[4] http://www.thinkartlab.com/pkl/tm/MG-Buch.pdf

[5] http://www.thinkartlab.com/pkl/lola/poly-Lambda_Calculus.pdf

[6] http://vordenker.de/ggphilosophy/gg_cyb_ontology.pdf

[7] http://comet.lehman.cuny.edu/fitting/bookspapers/pdf/unpubbooks/NumbersBook.pdf

[8] http://www.thinkartlab.com/pkl/media/DERRIDA/Cloning%20the%20Natural.html

[9] www.thinkartlab.com/pkl/media/DERRIDA'S%20MACHINES.pdf