THE ACCELERATION OF THE SPEED OF CHANGE – THE ULTIMATE THREAT FOR SOCIETY

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1. Problem statement

We are facing a new generational threat for the functioning of society that has not been recognized yet on the scale necessary and sufficient to even begin solving this complexity melt-down – not on a governmental level, in the health or economic sector, nor on the level of the individual. It is a generational problem because never before was society faced which such an acceleration of speed of information and resource flow and interconnections as today. Phenomena and repercussions of globalization and the internet have become so dominant and intensifying that the individual has according problems to deal with the complexity hitting on daily basis. The nervous system, to return to Stafford Beer's work about viable systems, often seems to be incapable to attenuate the Variety to such an extent to stay viable. Calm phases are impossible, but biocybernetically needed. The brain literally overheats due to the incoming information complexity, frequency, amplitude and density.

Through this high interconnectivity new problems arise exponentially. New problems don't mean just more social interrelated problems, but also those regarding the economy, environmental and cultural realms. Individuals, organizations, states and countries interact that a decade or so ago wouldn't have. In a cybernetic sense, behavioral patterns protecting the nervous system of the individual and the organization from this Variety Explosion have not been developed organically since the organisms never were exposed to that speed of change. It is new for the planet and for human kind. Desperately, all Recursion Levels, the State (R+2), the organization (R+1), the individual (R0), try to match the external Variety and brake down in their attempts. Parents (R0) often fail to protect their children (R-1) from this complexity threat.

People of all age are affected, but it is a generational problem since the exponential speed acceleration of interconnecting systems affects people in different stages in their life in different ways. A teen got used to and taught those tools of the new "digital information society" in school. People in their 20ies and 30ies, when life needs to be settled, had different challenges to adopt to those changes. People in their 40ies and 50ies and already settled in life, had more capacity to adjust, since life generally has less challenges. And sometimes, older people refused to be up to speed and using the internet, a sort of healthy Variety attenuation but cutting them off the new "virtual world". Their social relationships stayed somewhat all "real". Today, internet-affine people have several hundred facebook-friends, but this leads to alienation of society in a sense: I had an Indian roommate whose French boyfriend moved to our house in Hawai'i so they could be in a relationship. Though often enough I found them sitting in their shared room across the table with a laptop in front of them chatting with someone around the globe and I thought: spend time in reality. Space and time are shortened to almost nothing. Location and time don't seem to matter anymore, but they do ("the soul travels by foot", Arabian saying, unknown Author). Time is nihilized and

"sofortness" ("immediateness") is permanently demanded. One demonstrative example are the "Gebetomaten" in Kretzberg, Berlin, where you can get a "Gebet (prayer) to go". The social pathology might manifest in psychosomatic health conditions such as the Burn-Out Syndrome, Chronic Fatigue Syndrome and related pathologies, which are on the rise and so are the costs in the health sector of many Western societies. Even children show burn-out Syndromes, more than ever seen before.

Socially, another symptom can be observed – it has effects on the family level as well: with that many opportunities, why stay together and fight for the inner core of family well-being? The next option seems to be around the corner. More and more patch-work families with more complex social relationships are one consequence. Economic, moral or other forces weigh less than last century.

On the individual level (R0), the problem is often denied and underestimated because it comes on silently and seems to be a psychological problem. Fear of loss of status, job or social acceptation play a role here, plus symptoms are medically hard to diagnose. Therefore, it stays a tacit phenomenon on the lowest Recursion Level R0, the individual, and hits the next Recursion Level R+1, the organization the affected person works for or is affiliated with, once it is too late and the individual became unviable itself, and also unviable in the organization's terms. Recognizing the social pathology, preventing it, knowing why it is hard to identify and why the individual needs certain Variety Filters and a functioning System 3* of the higher Recursion Level is essential to stay viable in this increasingly faster changing world environment. 'The point of self-consciousness is reached by a system that has developed the power to recognize itself at the infinite recursion' [Beer, 1979, p.373]. If being self-conscious one can avert incipient instability, and stop it from becoming actual. Otherwise one ignores the pre-symptoms of pathology and becomes sick.

This threat to the viability of society as a whole and specifically the economic and the health care sector – if one looks at all Recursion Levels – costs Western countries a big portion of their health budget. Sick days due to psychological reasons rose from 33,6 mio in 2001 to 53,5 mio in 2010 (Bundesanstalt für Arbeitsschutz und Arbeitsmedizin, 2011) . The German health insurance BEK reports that hospital stays due to psychological dysfunctions rose by 129% in the last two decades. For the social pathology of the Burn-out or Chronic Fatigue Syndrome there is no medical diagnosis. It is a complexity problem, a personal complexity melt-down. In the European Union the damage of the Burn-out Syndrome alone accounts for 20 Billion € each year (European Agency for safety and health at work, 2012). Other factors than complexity itself can arise from food, environmental toxins or living conditions.

2. Objective

This problem has clear cybernetic causes and an analysis can highlight the interconnections and potentially help solve first of all health problems for the individual on R0, on the level of the organization the person is spending a lot of their life time in R+1 and also on R+2, the governmental and societal level.

This paper should give an inspiration to look at this messy problem from those three Recursion Levels, recognize the interconnections, stimulate solutions and further research and different ways of thinking.

3. Biocybernetic logic of the social threat and the complexity melt-down

Overall, through the mentioned globalization phenomena the social and economic realms experienced an increase of complexity in the last decade never seen before. Dangerously, the acceleration of the speed of change is increasing and we experience an exponential development in complexity. As a consequence, the natural systems, in this case the human being, cannot keep up. One indication is the immense cost for the European Union mentioned before. Since those health conditions are hard to diagnose, a clear number cannot be allocated.

If we look for answers to this complexity problem in nature, one can easily observe that change in all environments continuously occur and reveal biocybernetic logic: Change is not problematic in itself. Climate change for example existed all along the planet's history with ice ages and warm phases on a long time scale to rapid climate change events that heavily impacted planet earth. The problem now is again rapid climate change that could have global impact and affect strongly our very vulnerable socially built systems: the economy, food production, infrastructure or the High-tech sector. Due to the agglomeration of values in cities and megacities over the last 150 years society became immensely vulnerable to natural and man-made perturbance. But specifically, the acceleration of the speed of change is the real danger. Nature displays an articulate picture of processes where change is so fast that large mammals cannot keep up: due to the acceleration of speed of climate change it was observed that ice bears cannot keep up with the melting ice (Figure 1) and drown in the open ocean World Wildlife Fund (2012). Research shows that cups drown because of the increasing lengths of long-distance swims. What that means is that nature changes at a rate that other natural system cannot keep up with – natural systems die out because of the rate of change. There are many indices that this increase in change is human-caused, specifically the CO2 level changes in the atmosphere.

Figure 1: Nature cannot keep up with the speed of change

The real danger does not lie in change itself, but in the acceleration of the speed of change. Our society doesn't only suffer from an economic crisis as it might seem or the media proposes, but a complexity melt-down of many parts of society. The interconnection of information can absolutely have positive effects as well evident in the Arab Spring 2010, where the single consciousness interlinked to a collective power and became stronger than the power of the governing systems. But in many parts of society we observe an increase in change of our environments, the social, economic, environmental and cultural areas, which the single human organism is overstrained with. The Variety is so dense and high that the

brain literally overheats like an electronic device that gets hooked up to a high voltage current (Bohn, 2010; Klingberg, 2009).

4. Illustration of phenomenon as VSM

The Recursion Levels for this purpose are the following (see Figure 2): The individual is chosen as Recursion Level R0 since here the problem emerges in terms of health. Higher levels of organization develop from here in the organization (R+1) the person is affiliated with and the State (R+2) the person is living in. The State can be independent or belong to a county or State Union. In this example, Germany was chosen, but is cybernetically variant.

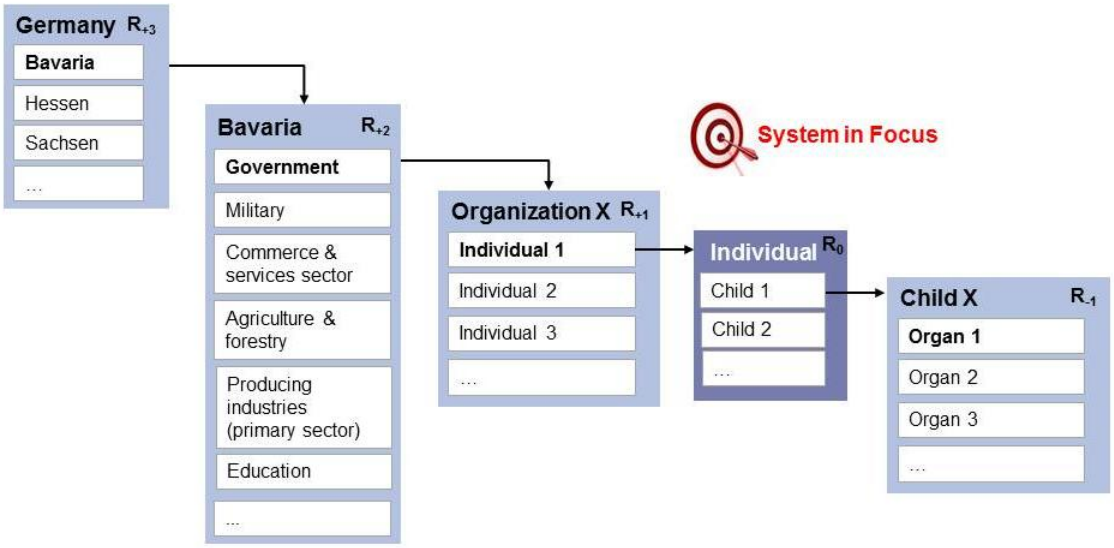

Figure 2: Recursion Levels

Ideally, we could see the following set-up (see Figure 3 as VSM): a person in the 20ies with high aspirations in all System 1s in his/her life: Professional life, social life, health, family, career aspirations and hobbies (System 1s).System 5 is very dominant, strong and multifaceted with a university degree experience in foreign countries, fluent in several languages. Consequently, the System 4 must be strong as well, firm in planning and organizing; capable to think outside the box and intelligent – and therefore amplifying internal Variety to take the Variety of the external, unknown environment into full account. If a person is talented and capable to perceive its environment on a more detailed scale than the average person or is more intelligent, the internal Variety can be amplified even more. Competition on the job market with their peers is on a global scale due to the high interconnectivity caused by developments of globalization and the internet. With high internal Variety one can ensure to not miss opportunities, provoke incidents and luck. Therefore certain instances happen, that don't happen to their peers. Starkmuth (2010) explains the Realostat – analogous to the thermostat –, how persons create their own reality in their way of thinking. If one cannot think in certain realms, it will not happen. You cannot realize something you cannot think of. System 2 and 3 are strong as well with good and right management and organizational skills. Overall, the Metasystem entails a high vertical Variety

to deal with any horizontal Variety from the environment to succeed in life. On the horizontal level, all changes in environment, culture, social setting and economy are sources of Variety.

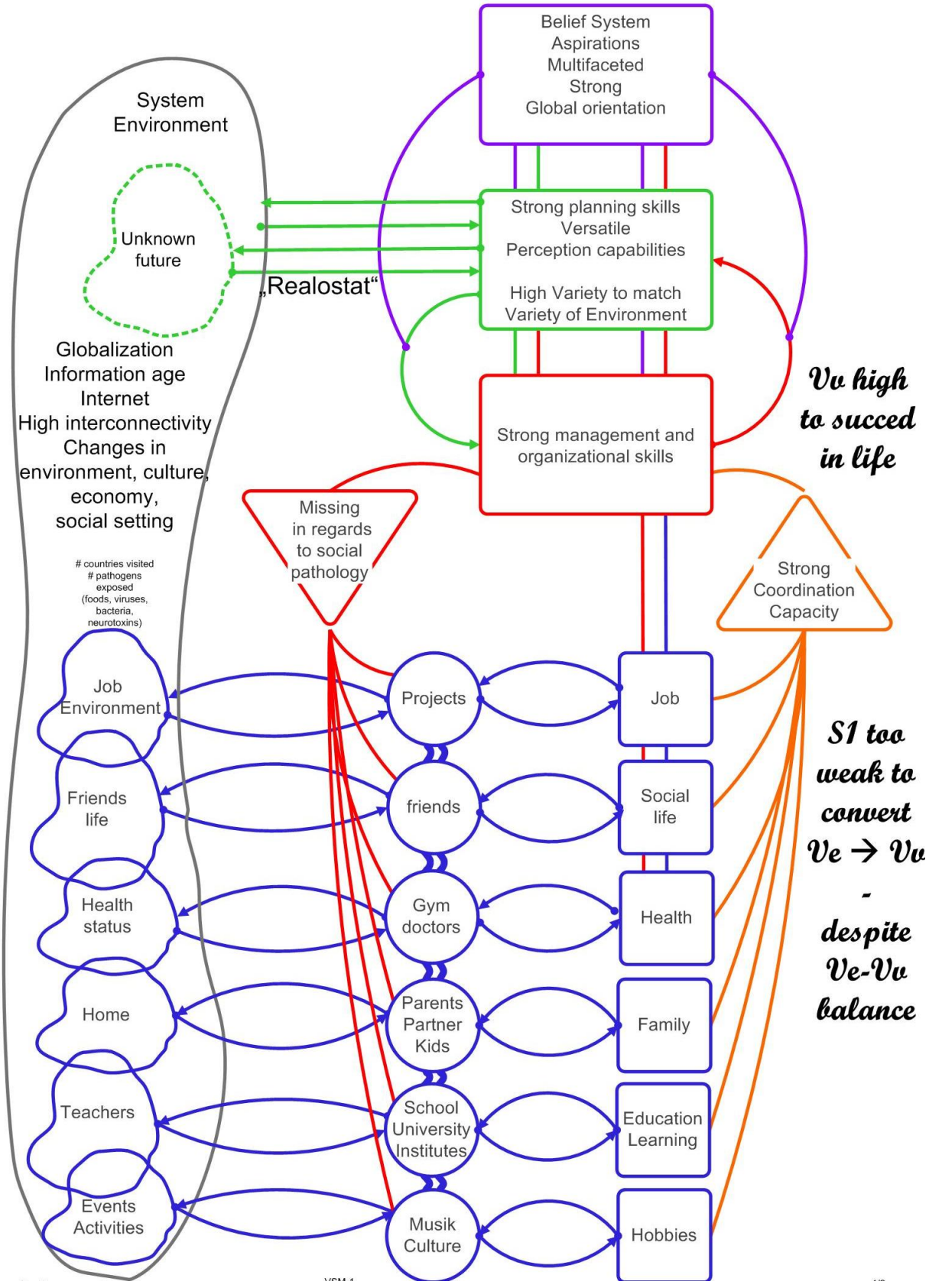

Figure 3: Recursion Level R0 The individual

On Recursion Level R-1, the System 1 "Health", the following can be observed: The Environmental Variety is amplified by globalization and internet phenomena and related repercussions such as high travel rate, exposure to different pathogens in food, viruses, and bacteria. The complexity of disease pattern and health threats is increasing as the debate about pandemics, vaccination availability virus adaptation and bacteria resistancies deepens. Contributing to this complexity is the genetic modification and global consumption of major food groups (corn, wheat) with unknown health impacts. On another note, health care personnel (belonging to System 1 operations) suffer immensely from the systemic complexity disease. They are the society's last resort to heal and get back to health. If the health system breaks down, society's health concerns will accelerate immensely.

Cybernetically, the situation is this: incoming Horizontal (environmental) Variety is very high. The Vertical Variety of the Metasystem is high as well. Let us look at the System 1s balancing this Variety Commerce. What is the problem here? Cybernetically it is clear. It seems not clear to governments, organizations or individuals.

5. Cybernetic problem revealed

Obviously, despite Vv=Vh, the System 1s are incapable of Variety Conversion. Chart IV (Beer, 1985, p.147) exercises Variety Engineering on the horizontal level and here it would show that Variety attenuation is not performed at a rate to stay viable. An individual's System 1s on R0 are incapable to deal with the environmental Variety (Vh) pushing into it, even though the Metasystem could handle it (Vv).There are pressures on the System 1s from both ends: horizontally and vertically.

The internal engine, the Metasystem with Vv, is stronger than the car body (System 1s) can handle (Vh). Cybernetically, the Variety Commerce would be in balance: the environmental horizontal Variety could equal the vertical Variety of the Metasystem (First Axiom of Management)(Beer, 1994) but the capacity of the System 1s cannot adjust to the incoming Variety, cannot manage the Variety Commerce and becomes sick. In real life, the capacity of a System 1 is a day with 24h hours, of which about 1/3 should be reserved for sleeping to be viable and the rest divided by private (family, friends, social life, sports, etc.) and professional life (work).But, effective and efficient Systems 3* are missing on all Recursion Levels as well as Variety Filters to attenuate Variety. Those need to be designed and set to keep the System viable.

The high rate of change will cause Variety Explosions on the lowest Recursion Level, which is not pathologic by itself, this happens in nature as well. But, a system needs a certain calm phase to return to its equilibrium before it can handle another perturbance while being out of its homeostasis. Metasystemic Calm is needed for viability (Beer, 1994). Without it, the experience curve is missing, reflection, adaptation and learning cannot happen due to the acceleration of the speed of change.

The problem now is – and what a person might need to be protected from – is what a drum teacher once brought to the point: While drumming mistakes happen because you get so excited and lose control of your concentration. He said: "Don't become a victim of your own excitement". The higher the aspirations (System 5) an individual has the higher perception

capabilities (System 4), organizational and management skills (System 3) and coordination capacity (System 2), the harder the crash on System 1 can potentially be and the longer the calm phase must be to digest the perturbance and return to viability.

We face a paradoxon (see Figure 4, Lama, n.d.): Your professional and private life offers so many opportunities that one can lose control of what one's body and mind can handle. Adrenalin junkies need the rush of standing in front of audiences and psychologically the reception of self-confirmation to a degree that they get dependent on it. This is manageable if the System 1s are capable to deal with the Variety Commerce, otherwise the overall system, the individual, goes pathologic.

Within a society, cybernetic processes of emergent self-organization evolve. Social trends develop: the wellness sector increases, people are more willing to invest in their health, drink green tea, shop in organic stores and spiritual trends are "in". The individual on R0 recognizes that the system becomes more and more pathologic and invents new ways of solution to manage the system's pathology because social alienation is more and more unbearable on the R0 level.

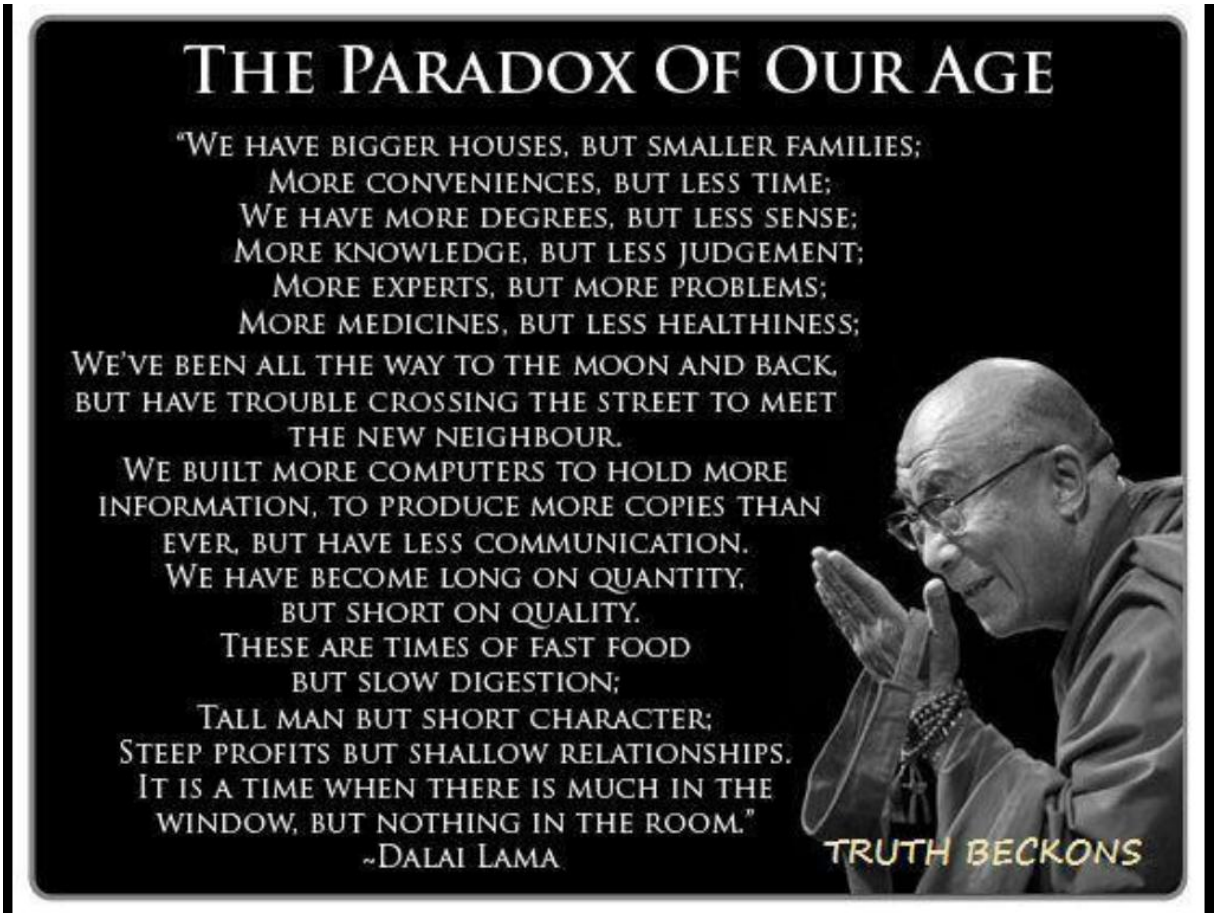

Figure 4: Truth beckons

The System tries to heal itself. Self-healing properties are little studied or not scientifically accepted or possible to validate. But, overall, a natural and self-organized resistance emerges against the developments of higher Levels of Recursions exactly because their System 1s cannot convert the Variety Commerce from incoming Horizontal environmental Variety and

the Vertical Variety. That Vertical Variety is in balance with the environmental Variety is the best case scenario, but is often not even the case.

6. Cybernetic solution and implications for the health care sector

The overall systemic or cybernetic view allows us to perceive that this system pathology happens on the lowest Recursion Level, the individual on R0, just as much as on the organizational level R+1: both become pathologic due to the external Variety, or complexity. It seeps through all Levels, R+2, the State level, or R+x. Can the Variety of a European Union with 28 States metasystemically be dealt with facing the cultural, social, economic and environmental Variety of all countries? It seems not. Sound cybernetic disconnection of systems must be the answer here.

On Recursion Level R+1, solutions are available. Large companies crash due to the overwhelming complexity and rate of change. There are tools to have the organization keep up with that change, biocybernetic models such as the Advanced Syntegration (Malik, 2011) and set ups through the Viable System Model (Beer, 1994), analyses through the Sensitivity Model by Vester (Vester, 2007) and more. A complexity problem solving tool, the Advanced Syntegration, can extract the swarm intelligence of 40 people or a multiple of this number in two to three and a half days by interlinking them equally, non-hierarchically. It reveals tacit knowledge and this way brings an organization up to speed with its environment. Compared to the problem solving tools of the last century, which were able to effectively and efficiently handle a group complexity of 7 +/-2 at the most, it represents one possibility to speed up to the environmental change acceleration in a cultural, economic, social and ecological sense and brings Variety into balance. Calculating complexity one can show the following: With 40 people you have 40x39 = about 1600 relationships, which now can be either good or bad: 2^1600 – not calculating the complexity of multi-faceted relationships. With a group of five people, you have 20 relationships (5x4). Hence, the Advanced Syntegration is able to deal with an 80-fold complexity. Speed is accelerated 100-fold if a comparable solution for this complexity can usually be found in about one year as experiences in consulting projects show, whereas the Advanced Syntegration can deal with that Variety in 3,5 days.

On Recursion Level R0, the individual, no solutions are available as of now. Successful complexity management will become an increasingly health-relevant skill. Classical medicine seems to ignore this so far and as a consequence patients are handed from specialist to specialist without receiving a proper treatment.

How can the pathologic Variety Commerce be healed from the cybernetic perspective? How can the complexity melt-down be stopped or even reversed?

First of all, an effective and efficient System 3* must be designed on all Recursion Levels to check on the System 1s capabilities to deal with the Variety Load. This is specifically important today because of the acceleration of speed of change that overstrain the System 1s. Tools mentioned for example in Managing, Performing, Living (Malik, 2006) show how to attenuate Variety on a personal (R0) and company (R+1) level. Secondly, Variety Filters need to be designed and/or implemented on all Recursion Levels to attenuate the Variety of the System 1s. On a third note, the System 5 on R+2 needs a paradigm shift that then seeps through the System: The State misses to focus on health factors such as prevention, which

would be less cost-intensive on the long run. A hospital should be the place of last resort and the State should focus on how to keep its population healthy in the first place.
On Recursion Level R+1, the organizations (e.g. companies, hospitals, cities), Corporate Health Management (dt. Betriebliches Gesundheitsmanagement, BGM) could be implemented to protect the individual on Recursion Level R0 from the dangers of high Variety Commerce that they are not able to perceive or protect themselves from. They cannot perceive it because the Variety stems from the overall environment and the System 4 environment. What the Advanced Syntegration is capable of – healing the organization from the complexity melt-down–Corporate Health Management (dt. BGM) must perform on the lower Recursion Level R0 for the individual.
Specifically, within BGM the System 3* needs to be designed and Variety Filters need to be set. Depending on the "working speed" of an organization, a System 3* must check on the employees' overall health status and possible symptoms of the "complexity disease". Stress levels could be measured, e.g. cortisol levels in the employee's blood. Those measures would have to be individually implemented and no general "stress-meter" can be identified here. As an example: If certain psychosomatic symptoms are reported, a monthly or bi-weekly health check or consultation should be performed. If symptoms increase, a reduction of work to 75% would have to be accepted to ensure the individuals viability. Those filters and System 3* designs have to be adapted to the time and performance variables of an organization. As this is a hypothesis, more medically-based factors need to be incorporated here.
Why is this a Recursion Level R+1 task? Because it is a Metasystemic System 3* task and System 1s cannot look into the overall and System 4 environment. R+1 Variety is too high for R0 to handle, R0 does not have the synoptic view and the Variety does not come from the local environment in the first place, but from the System 4/total environment. Overall, the speed of change in the total and System 4 environment is too fast for System 1 to handle.
So, why is an individual not capable to attenuate its own Variety anymore? Examples of explanation are social pressures ("good parents", "good co-worker"), economic pressures ("income"), and personal pressures ("adrenalin junkies"). Ignorance is bliss in this case, because it is the "lethal Variety Attenuator" (Beer, 1985).
Overall, the danger for society's viability and costs is underestimated and investment in prevention, especially through insurance companies and the resulting options of individual care and possibly Corporate Health Management (dt. BGM), is underdeveloped. Insurers and organizations should be obligated to implement prevention measures and independent systemic checks within that systemic understatement of problem perception.

It is vital to protect their own resource, the employee, in acceptance that the fast changing environment is too hostile to its System 1s at the moment. Corporate Health Management (dt. BGM), for example, can serve as Variety attenuator for today's society to ensure survival and viability and represents a self-organizing element in the overall system to save the individual and the organization to stay viable – a bottom-up approach in the cybernetic sense. In general, self-organizing principles should work and the individual should be able to stay viable itself, but since the acceleration of the speed of change is so immense, the higher Recursion Level must protect its resources, which means that R+1, the organization, should invest in the viability of their S1s on R0, the individual, because those are producing the System. The

learning and adaptation curve is not as steep as the change curve. There is a threat though if organizations monitor health stati of their employees which could lead to unwanted selections (e.g. genetic code or other health screens) that would render persons unemployable in the worst case. So this check needs to stay independent. Further thought need to be invested here.

Returning to the generational impact: Individuals past their 40ies got hit by the complexity at a time where they had enough stability in all Systems 1 through 5 to be able to convert the Variety Commerce. Individuals in their 30ies are about to settle in life in regards to all System 1s (job, social life, etc.) – are less capable to convert the Variety Commerce and are specifically vulnerable to the complexity diseases where psychological and physiological symptoms go haywire. Individuals in their 20ies are faced with the same problem but got introduced to all complexity tools (internet, communication, travel, etc.) younger and were able to learn and adapt those forms easier. Still they face all the problems. Following WHO studies, symptoms of this complexity disease, are shown increasingly in kids, on Recursion Level R-1 from a family standpoint (Eder, 2010).
It would be the task of the parents (R0) to protect their kids (R-1) from that Variety Explosion as a System 3* function just as much it is an organization's (R+1) task to protect its lower Recursion Level, the individual p http://www.hilfe-bei-burnout.de/allgemeines/burnout-bei-kindern/arent on R0. Also parents need to consciously avert dangerous behavior and protect their S1s from the high Variety voltage of our society. They mean well aiming to prepare them to the performance society, e.g. by enrolling their babies to Chinese language classes at age 1, but risk the viability of their children from a cybernetic standpoint. The importance of setting valuable Variety filters is not recognized yet.
The State principally responsible for the health of its society and the hospitals having a health care mandate, are not capable to understand the complexity problem at a speed rate that this system pathology develops, is affecting and being perceived by Recursion Level R0, the individual. In the evolution of society, a holistic and systemic approach to the complexity threat needs to be developed. Their scope of action needs to get adjusted.

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Figure 1: http://world.edu/wp-content/uploads/2011/08/What-Do-Polar-Bears-Eat.jpg; accessed : 06/25/2012