Information design – informing for the 21st century

Dino Karabeg

Abstract—*Information design,* as this term is defined by the author, promises to align the creation and use of information with the contemporary needs of people and society. This article summarizes the results of a decade of work on developing *information design* and bringing it to academic practice and practical use.

Index Terms—Information, information design, information technology.

I. Introduction

Confronted with increasingly sensationalistic and subtly manipulative media news, we sometimes dread that this trend is here to stay, and wonder if a better use of information and information technology will eventually be developed.

For about a decade I have been doing research whose purpose was to *design* a new *informing* (the way information is created and used). More precisely, I designed a small prototype, which was still sufficiently detailed to demonstrate the naturalness and the power of the underlying approach. I called the new approach '*information design*' (I am using italics to distinguish *information design* and other custom-defined or *designed* concepts from the common or *traditional* ones). I called my prototype *informing* 'Polyscopic Modeling methodology'.

The Polyscopic Modeling methodology has been published in terms of a series of articles and conference presentations [1-18]. The purpose of the present article is to outline the Polyscopic Modeling methodology as a whole, point at various possibilities which follow from the approach, and survey various projects and actions which have been undertaken towards bringing *information design* into practice. The article is intended to serve as a summary and as the conclusion of a decade-long project.

The possibility to *design* an *informing* as a whole is the main novelty and the main advantage in the proposed approach. The analogy with the design of a technical object, the headlights of an automobile, is crude, but it will help us understand this key point. The automobile headlights consist of many elements which need to be fitted together in the right way, if the wire inside the light bulb should be connected with the suitable energy source so that the light can shine. Furthermore, the headlights must fit into the provided space in the automobile; they must provide the sort of light which suits the function of the automobile, so that the automobile as a whole can function safely and well.

Making a good design is like solving a puzzle: Many pieces need to fit together, many criteria need to be satisfied. But when they do, a whole new quality emerges: A coherent, well-constructed *whole*!

Similar statements may be made of an *informing*. An *informing* too has many elements, ranging from epistemological assumptions to presentation techniques, which depend on one another and must fit together if the *informing* should be *coherent*. The *informing* too has a role in a larger whole, the society or the *culture,* which cannot be *whole* and functional unless its *informing* is *functional*. There is, however, one notable difference between the *informing* and a technical object: The *informing* cannot be seen! And we are not usually aware of the fact that an *informing* can be *designed.* Therefore our *informing* might be arbitrarily ill-conceived and dysfunctional, without us noticing that and taking action. The consequence of this oversight might be that we (our civilization, society or *culture*) are 'driving in the dark'.

In Section II, which follows this introduction, a number of information-related anomalies and mishandled issues are described in order to show that our existing *informing* cannot be considered as *coherent* and *functional.* This means that our *culture*'s illumination is not working properly, and that our *informing* 'puzzle' is not coherently put together.

In Section III, the *information design* approach is introduced and a rough outline of the Polyscopic Modeling methodology (a prototype implementation of that approach) is presented. The main point behind the Polyscopic Modeling methodology prototype proposal is that it shows that our 'puzzle' *can* indeed be solved: **A *coherent* and *functional informing* can be *designed***! The *methodology* serves as a prototype design plan of an *informing* which is coherently structured, which gives us a way to resolve the *anomalies,* and which allows us to make much better use of both information and information technology.

In Section IV it is shown how the practice of *information design* may lead to a radically different way of understanding and handling of key issues such as economic and political

Final version October 11, 2004. D. Karabeg is with the Department for Informatics, University of Oslo, POBox 1080, 0316 Blindern, Norway (phone: +47-2285-2702; fax: +47-2285-2401; e-mail: dino.karabeg@ifi.uio.no).

power, free choice, values and sustainability. It is also shown how the *methodological* approach to information can serve as foundation for reconstructing the way we handle a variety of common information-related tasks, such as making Web pages, user manuals and university classes and textbooks. Steps which have been made towards establishing *information design* as academic and commercial practice are outlined.

Another metaphor will help us understand the nature of the work presented in this article: Taking the *methodological* approach to information a decade ago was similar to going through a mirror. Like Lewis Carol's hero, I found myself in a completely new realm, free from many of the restrictions, in this case quite unnecessary, which dominate our common *informing*. Having 'stepped into' this new terrain, I worked in the manner of an urban architect who outlines the hospital, the school, the neighborhoods and the communication infrastructure that might be possible there. My intention was to illustrate the possibilities of *information design* to 'architects' and 'masons' with varying backgrounds and talents, who are needed for the construction of the new *informing*.

The analogy with the mirror highlights another point: The constructed methodology *mirrors* our existing *informing.* As we shall see, a designed alternative can mirror the incongruities and point to possibilities for creative change.

When proposing *information design* as the informing which suits our conditions, my interest is not only and not even primarily academic. We are living in a uniquely sensitive moment in human history when many of the old cultural patterns are no longer functional and when new ones need to be created. I consider *information design* to be a necessary 'piece' in another much larger 'puzzle' which our generation is called upon to solve: The creation of a sustainable or simply *better* world [1,4].

II. Anomalies and Issues

In this section a number of symptoms are pointed at which indicate that our *informing* is anomalous (unable to meet our needs, inconsistent with what we know about information and information making etc.). My purpose is to show that a different *informing* has become necessary.

A. Information overload

At the very least, information should be 'a good thing'. The information overload shows that under present conditions even that may not be the case.

Information overload is a well-known and widely recognized problem [24][25]. As Neil Postman exclaimed, "we are glutted with information, drowning in information, have no control over it, don't know what to do with it."[26]

This anomaly shows that unless we reconsider our *informing,* more efficient information creation and dissemination, which has been made possible by information technology, may actually *harm* us.

B. Inadequate use of new media

The *traditional* approach to information is an obstacle to adequate use of new media in *informing*. A historical view will allow us to see this anomaly.

Before the civilization, oral tradition was the only way of recording explicit information. Speech is by its very nature *flat* (has little or no provisions for distinguishing *levels* of detail, abstraction etc.) and *linear* (created and processed sequentially). Although paper (being two-dimensional) allowed in principle for completely new ways of communicating, it was used mainly for mechanizing the already established practice, the oral tradition, by recording the speech in terms of sequences of characters. The printing press only automated the hand copying of manuscripts. And now when we have the Internet and the multimedia technology, we again use them predominantly to automate the kind of *informing* that the *tradition* has given us, namely for displaying the traditional documents.

It is obvious that the new media allow us *inform* in completely new ways. But our *traditional* approach to information prevents us from doing that: A scientist writes *scientific articles*; a journalist writes *newspaper articles*. The power of the new media is mainly employed for new and less 'serious' purposes, such as Internet advertising and computer games.

C. Crumbling foundations (epistemology)

The correspondence with 'reality' or 'factual truth,' which is the age-old foundation on which our information making practices and criteria have been constructed, can no longer be relied upon.

Since antiquity, the alleged purpose of philosophizing, and of *informing,* was to distinguish the 'truth about reality' from prejudice and illusion. Good information was supposed to be a reflection of reality, i.e. 'true'. But during the past century we have understood that 'reality' was really our own [28][29][30] and our culture's construction [31]. Modern physics taught us to question both reason and sensory experience as keys to 'reality' [32]. Even our common sense cannot be expected to conform with matters which are beyond common experience [33]. Hence the supposed correspondence between information and 'reality' crumbled, and along with it, our traditional foundation for information making.

In philosophy and sociology this development is associated with the transition from modernism to postmodernism. As R. Richter observed, "Postmodern critical theorists had some success in exposing the limitations of modernist thinking and behavior. Key to their success was their finding that notions of truth, made evident by the application of a universally shared reason, were not what modern people thought they were. Under the scrutiny of modern critics, such ideas lacked the universal validity originally claimed for them. This tended to show that exercise of reason in modern society could be a mask for the exercise of power over those lacking it. Modernity based on Enlightenment notions was not what people had been led to think it was."[34]

However, a culture can hardly live and develop without some suitable way of creating 'what we commonly believe in', or more generally, without some agreed-upon way of

distinguishing good information from nonsense and deception. While the postmodern critics deconstructed the modernist 'truth', they failed to show us how to construct a new one: "The postmodern project, in short, failed to provide the West with an adequate understanding of politics, society, and self in conditions that veered farther and farther away from the Enlightenment-based picture of modernity. The insights of postmodern theorists lacked the power to put modernity in clear perspective and to reenergize its sources for the future."[34]

D. Confining worldview

Based on the idea that good *information* is an accurate or 'true' picture of 'reality', a way of creating *information* was developed in science which resembles putting together a jigsaw puzzle by discovering new pieces and fitting them in [27]. This places unnecessarily stringent restrictions on both new and traditional *information* which we are able to integrate into our *culture*.

Although disproved and disowned by modern science, the 19th century conception of the universe as a large mechanism (matter governed by causal 'natural laws') still lingers in our education and popular culture as 'the scientific worldview.' According to this view, only that which can be explained in causal or 'scientific' terms, or in other words only that which fits into the current 'puzzle' of science, may be considered as real, possible or true. At present, this confining worldview is closest to serving as 'shared truth' in *modern culture.*

In 'Physics and Philosophy,' after explaining how the mechanistic metaphysics had been disproved through quantum-physics experiments, Werner Heisenberg critiqued the popular worldview which resulted from it as follows: "In this way, finally, the nineteenth century developed an extremely rigid frame for natural science which formed not only science but also the general outlook of great masses of people. This frame was supported by the fundamental concepts of classical physics, space, time, matter and causality; the concept of reality applied to the things or events that we could perceive by our senses or that could be observed by means of the refined tools that technical science has provided. Matter was the primary reality. The progress of science was pictured as a crusade of conquest into the material world. Utility was the watchword of the time.

On the other hand, this frame was so narrow and rigid that it was difficult to find a place in it for many concepts of our language that had always belonged to its very substance, for instance, the concepts of mind, of the human soul or of life." [37]

E. Documented anomalies

A variety of anomalies which contradict the mechanistic worldview are well documented and available (see, for ex. [38]). They point at possibilities which are latent in human beings and culture.

F. Obsolete language

Marshall McLuhan's well-known adage "We look at the present through a rear-view mirror. We march backwards into the future." [35] was a warning against viewing our increasingly non-*traditional* situation through our *traditional language* (I use the word *language* to refer not only to the spoken and written words, but also to everything else that is used for communication). And Ulrich Beck recently wrote: "I cannot understand how anyone can make use of the frameworks of reference developed in the eighteenth and nineteenth century in order to understand the transformation into the post-traditional cosmopolitan world we live in today. Max Weber's 'iron cage' – in which he thought humanity was condemned to live for the foreseeable future – is to me a prison of *categories and basic assumptions* of classical social, cultural and political sciences." [36]

The root of the *language* issue is that our world is changing rapidly and often 'by *design'*, while our *language* has remained *traditional.* As we shall see, *language design* (called *scope design*) is the main characteristic of Polyscopic Modeling.

G. Subtle effects of information

While our *culture* (education, legislation, ethics...) is focused on the factual side of information, our values and market and political preferences are manipulated through visual and other forms of *implicit information* [7].

The belief that communication is predominantly explicit is a consequence of a historical error which has been detected and explained by modern cognitive science [39]. Research, education and various forms of practical action are needed if this error should be corrected.

We communicate not only explicitly but also through the tone of our voice, body language, clothes, choice of fonts and colors, images and very many other implicit ways. This form of communication needs to be made conscious, explained and included in university and basic education.

To see the *cultural* importance of *implicit information* I recommend the following mental experiment. Imagine that information is the sort of 'food' which nourishes our beliefs, emotions and values but, as the case was with physical food five centuries ago, the 'information nutrients' are not yet known. According to this analogy, 'information nutrition' too might be subtly deficient without us noticing that, or quite harmful and even poisonous. Do the following exercise: Improvise a list of possible information 'nutrients' and 'poisons' and buy a sample of newspapers from the news stand. Read the newspapers ignoring the factual information and focusing only on 'information nutrients' and 'information poisons'. Which ones are present? Which ones are missing? This experiment might give an insight into the way how the subtle 'information nutrition' might be shaping our emotions and our culture.

H. Sensationalism

Gardner, Csikszentmihaly and Damon [40] showed that the traditional standards of 'good work' in journalism are systematically yielding to commercial pressure.

For the sensationalist press, only the bad news is good news. Honest and loving people are of no interest. The crooks and the murderers are. Such press gives us a highly biased picture of the world. We respond by adjusting our values and actions

to that picture, and perhaps by ultimately creating the world which corresponds to it.

I. Democratizing information

In Information Age, information is the supreme power. Greatly increased by the new media, this power can now be used to liberate us or to dominate us. The issue of democratizing information is motivated by the need to subject the power of information to democratic control.

As long as we were convinced that information gives us 'the truth about reality' the 'free press regulation' seemed sufficient. Now that this belief has been proven to be ill-founded, the need for regulating the creation and use of information by some form of social contract is similar to the need for subjecting other forms of power to a democratic constitution [41].

J. Inadequate vision

Information is the source of awareness. The fact that we can send people to another planet, and at the same time be on the verge of destroying our own planet [42], points to the existence of large gaps in our awareness, and consequently in our *informing.*

K. Basic information

The *basic information* is the one which tells us about *basic* things: what to eat and wear, what values to pursue, how to form personal and social relationships etc. In the traditional society people live as the tradition prescribes, by following the footsteps of their ancestors. The *basic information* is *implicit* in the customs and mores of the tradition. The *explicit information* serves for less vital purposes, such as satisfying curiosity and providing the technical know-how.

The sociologists now talk about 'post-traditional society' [43], 'risk society' [36] and 'reflexive modernity' [34]. In the post-traditional society, we no longer rely on the ways of the tradition; we *reflect* back upon our social and cultural patterns (the relationships we create, the food we eat, the values we pursue etc.).

It is not difficult to see that the practice of reflexivity requires *explicit basic information.* To satisfy our basic information needs, we now need information which is very different from the one the traditional culture needed to develop [3][10].

L. Cultural environmentalism

I use this last issue and anomaly to point to a trend which is likely to lead to an increased public and commercial interest in the approach to information which is advocated in this article.

To understand *cultural environmentalism* it is enough to observe that *culture* is also our living environment. As civilization develops, our *cultural* environment tends to determine our life quality even more than our natural environment does.

Traditional people tend to trust their *cultural* environment unconditionally and take it for granted, in a similar way as other species trust their biophysical environment and make no organized efforts to improve it. While our culture was *traditional,* that was probably the best approach that was possible: On the one hand, the *traditional cultural environment* was reliable because it had been tested by generations of people before; on the other hand, means were not yet developed for understanding the dynamics of that environment sufficiently well to give reasonable hope for meaningful conscious intervention. In the *traditional culture,* trusting the tradition was safest and best. However, our *modern* or post-*traditional* cultural environment is changing too much and too fast to be relied upon without questioning. Furthermore, *culture,* both *traditional* and *modern,* can be corrupted through various power relationships (i.e. by *power structures,* see [3]).

The *cultural environmentalism* begins with the realization that our *cultural environment* can no longer be taken for granted. It continues by applying the familiar environmentalist way of thinking and acting to *culture.*

The key issue of *cultural environmentalism* is the quality of our *cultural environment.* How does our modern lifestyle influence our well-being *in the long run*? Notice that, contrary to the 'myth of progress' [44], this question is not at all easy. The factors that determine our well-being are far from obvious. If even a single essential nutrient is lacking from out diet, having everything else in abundance will be of no use. Furthermore, as already mentioned, the 'psychological nutrients' are more subtle and less known, but possibly no less important that the physical ones.

It is difficult to think of an issue which would be more relevant than *cultural environmentalism*. Could we be using the resources of science and technology to ultimately harm ourselves? Could we be living incomparably better already on the existing level of development of science and technology if only *something* were different?

While the pursuit of happiness is allegedly the purpose of our civilization, the level of happiness cannot be measured. We will never be able to 'step into the shoes' of our pre-civilized ancestors and feel how they felt, in order to decide if we indeed are happier than they were and if there really has been progress. It is similarly impossible to perform the scientific experiment where a large sample of people would be pursuing a certain lifestyle for many years or several generations, in order to measure how well they are doing compared to a control group who lived differently.

Such experiment, however, did happen naturally. In the 1920's a number of populations existed around the globe which were just reached by civilization, so that a part of the population was pursuing the civilized lifestyle while the rest was living in the old, indigenous way. In a ground-breaking study, Weston Price visited fourteen of them and carefully compared the well-being of the two groups. The results, which suggest that we perhaps indeed *are* less happy than our uncivilized ancestors, are summarized in his book "Nutrition and Physical Degeneration" [45]. His findings were explained and confirmed by another great researcher of health effects of civilization, Werner Kollath [46]. The degenerative disease statistics, which are now commonly in the headlines, show that the trends which those researchers pointed at can no longer be ignored [47]. What is missing to bring *cultural environmentalism* to the focus of public attention is the insight that the health statistics are an indicator of the *decline in well-being which affects us all*, as Kollath aptly pointed out [46].

The fact that the work of these researchers has remained practically unknown for more than a half-century is itself an anomaly worth reflecting about.

In the shadow of those alarming trends are no less spectacular unused possibilities. In the world traditions an abundance of insights has been accumulated, showing that the limits of human potential are far beyond what we believed, and showing us ways to get there (see, for example, [57]). When the resources of science and technology are consciously applied towards improving our *cultural environment* and our living conditions, radical improvements may be expected to result.

When the issues described here are understood, it becomes obvious that *conscious* or *informed choice* must replace the 'free choice' if our 'pursuit of happiness' should be meaningfully directed. The practice of *conscious* or *informed choice* obviously depends upon *conscious* or *informed informing* [4][6].

III. Methodology

A resolution of the above anomalies is proposed in terms of the Polyscopic Modeling *information design* methodology. The methodology is described here in terms of its main building blocks. For each of them it is shown that it represents a departure from our common or *traditional informing*. The challenge left to the reader is to verify that the described building blocks fit together and compose a *coherent informing.*

The reader who is not interested in the details of the methodology may skip to 'Polyscopy' at the end of this section, which is a self-contained and intuitive introduction to the main ideas of Polyscopic Modeling.

A. Information

The key question is the one of the meaning and purpose of *information*. What is '*information'*? What purpose does it need to fulfill for us?

In Polyscopic Modeling *information* is defined as 'recorded experience' [2][14]. (Like other Polyscopic Modeling definitions, the definition of *information* is *postulated,* i.e. declared as a convention. It is not claimed that *information* 'really is' as defined.) According to this definition, the purpose of *information* is to preserve and communicate human experience.

The need to preserve and communicate experience may be understood in the context of evolution or *cultural environmentalism*. Owing to the available experience of others, we do not need to find out by trial and error that we may eat oysters but that we should stay away from poisonous mushrooms. Other species use genes, but such recording of experience is much slower. By developing various ways of storing and communicating *information* 'in software' rather than 'in hardware', we humans have acquired an enormous competitive advantage. That has allowed us to, in effect, greatly speed up our evolution.

The above definition of *information* introduces an alternative to the *traditional* idea that the purpose of information is to mirror reality or satisfy curiosity. In Polyscopic Modeling, *information* is considered as our evolutionary heritage, as the blueprint of our *cultural environment* which ultimately determines our lives.

From this definition of *information* a completely different priority structure on *information* naturally follows. If information is supposed to mirror reality, then every piece of information is equally relevant, being a piece in the large puzzle without which the puzzle could not be completed. Discovering new pieces is then naturally what information making is all about. From the Polyscopic Modeling point of view, we must above all secure that the vitally important *information* is created and communicated, and that the essential *information* heritage is preserved and made available. The common 'puzzle solving' style of *informing* may well be perceived as a distraction, if it keeps our awareness away from the vitally important issues.

Another consequence of this definition of *information* is that the validity of any piece of *information* can be established simply by referring to experience, even when that piece of information fails to fit into the current scientific or any other sanctioned 'puzzle'.

This allows us to democratize information by placing it on the broad and solid empirical foundation.

In the first example in Section Four it is explained how this foundation allows us to preserve, combine and communicate essential *information* about well-being, originating from diverse cultural traditions.

B. Design

Information design has been proposed as the approach to information which suits *modern culture* [6]. The key to understanding this proposal lies in the Polyscopic Modeling definition of *design.*

By definition, *design* is the alternative to *tradition* [1][2]. *Design* and *tradition* are respectively creation and evolution in *culture*.

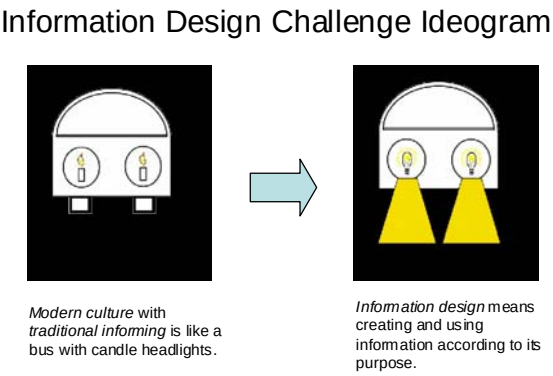
To understand this definition recall that creation and evolution are the two ways in which some coherently structured functional whole (such as a mechanism, organism or an ecosystem) can originate. Since our *culture* is no longer *traditional* [43], we can no longer rely on its spontaneous evolution. Therefore *design* must be used [1].

There is a general agreement that 'holistic thinking' is the main characteristic of the emerging *cultural paradigm*. Indeed, in the post-*traditional culture,* we can no longer take our important wholes (*informing, culture, healthcare,* well-being, society etc.) for granted. But holistic thinking is not enough; it must be followed by holistic acting. That holistic acting is *design.*

In [4] I use the term *holiscopic design* to denote the sort of *design* which suits the post-*traditional culture*. The word *holiscopic* is derived from 'holistic' and 'polyscopic'. The idea is that *design* should produce things that are really good for us, and in order to do that, we must look at the designed object 'from all sides', making sure that it satisfies all the relevant criteria. That obviously requires *polyscopic information*, both for discovering all the relevant sides, for

understanding what really is good for us, and for making the good *designs* marketable. I usually use the word *design* as a synonym to *holiscopic design*.

C. Information design



How can we characterize the '*informing* for the 21st century'?

Information design is simply *design* applied to *information*. *Information design* is defined as '*design* of *information*' [6].

Information design may be understood as the conscious or purposeful creation and use of information. It needs to be distinguished from the so-called *traditional informing* which automatically follows the habitual practice of traditional professions and disciplines, as well as from all approaches which are based on attention grabbing and sensationalism.

As suggested by the Information Design Challenge ideogram, adopting *traditional informing* as the sole *informing* in the *modern culture* would be similar to using traditional candles as headlights in a modern bus. The challenge behind *information design* is to *design* an *informing* which suits its role within our *culture* so that the *culture* as a whole can fulfill its role. While *designing* such *informing*, we naturally employ the state-of-the-art knowledge and technology.

Information has an essential role within our society and culture: To orient our actions. If information fails to fulfill its role, or worse – if information is used to misdirect our actions, we may end up using all other resources in ways which are harmful rather than beneficial. When we practice *information design*, we create and use *information* in the way which best suits this role [3].

It follows from the definition of *design* that *information design* is the alternative to *traditional informing*. It follows from the definition of *traditional culture* that *information design* is the natural *informing* in the post-*traditional culture*.

D. Methodology

The methodology is an answer to the question 'What should our *informing* be like in order to allow us to make the best use of information and information technology?' The Polyscopic Modeling methodology is proposed as a *prototype* answer to that question [6].

The Polyscopic Modeling methodology is also intended to serve as a mirror, reflecting the disadvantages of our present *informing* and showing possibilities for improvement.

The Polyscopic Modeling methodology is itself a model, specifying what an *information design methodology* might consist of, what sort of issues it may need to address and what cultural and other consequences it might have.

The Polyscopic Modeling methodology is not a prescription but a (postulated and justified) convention. As such, it democratizes information.

The Polyscopic Modeling methodology is a consistent application of the philosophies of phenomenology and constructivism to general *informing*.

The methodological (postulated) approach to information is the natural and more advanced alternative to founding information on the presumed correspondence with 'reality' [1].

A *methodology* is a design document. It is a plan for a *designed informing*.

A *methodology* is information about information. It provides guidelines for an informed *informing*.

The Polyscopic Modeling methodology is also a research result. It comprises a number of ideas and insights about information and *informing*.

E. Polyscopic information

In what way should the *designed information* be different from the conventional information?

A central idea in Polyscopic Modeling is that *information* (in general, as well as related to any particular subject) is *polyscopic* (a function of the way of looking or *scope*). Multiple *scopes* are possible and necessary [6][15].

The best way to understand the idea of *polyscopic information* is by using the metaphor of a mountain, where each standpoint represents a *scope*. We may view something 'from the top of the mountain' and have a *high-level view* or *high-level information*, or 'from the bottom of the mountain' and have a *low-level view* or *low-level information*. The *scopes* can also be distinguished 'horizontally' as giving different *aspects* (or 'side views').

The idea of *levels* may be understood by analogy with geographical maps, where each map represents a certain level of detail. The idea of *aspects* may be understood by analogy with projective geometry or technical drawing, where a certain number of suitably chosen side views are used to give a clear and accurate representation of the whole.

The main point behind *polyscopic information* is that *information exists* on multiple *scopes*. It is no longer the case that something is simply 'known' or 'not known'. The entire *polyscopic hierarchy*, or in any case all the essential *views*, must be available.

[1] This situation resembles the 'foundations crisis in mathematics' at the turn of the 19th century. Until then it was believed that mathematics was the result of abstracting reality which gave mathematics both consistency and relevance. When the supposed correspondence with reality crumbled due to the discovery of the 'paradoxes', David Hilbert proposed that mathematics should be based on a convention or postulation rather than on questionable tacit assumptions. Metamathematics (mathematics studying itself) was born.

Now, at the turn of the millennium, we have a similar but more comprehensive foundations crisis. The way out of the crisis too might be similar.

Different *views* have different purposes. The *high-level information,* like the view from the top of a mountain, gives us a general understanding of things and allows us to choose directions. *High-level information* is close to traditional notions of knowledge and wisdom, while *low-level information* is closer to data.

The *traditional* factual truth-based *informing,* additionally sidetracked by reductionism, tends to neglect the *high-level information*. Polyscopic Modeling methodology provides specific techniques and criteria for its reconstruction. An example of *high-level information* is the *view* of *culture* and its *informing* presented by the Information Design Challenge ideogram in Figure 1.

The goal of Polyscopic Modeling is to consciously create or choose several ways of looking at an issue or phenomenon (multiple *scopes* and *views*) which are most functional or beneficial. Typically, a 'new discovery' is not a new piece in the existing 'puzzle' which corresponds to our current understanding of a certain subject, but a whole new way of looking at the subject.

F. Epistemology

In *traditional informing* the concepts 'epistemology' and 'ontology' refer to the relationship between information and 'reality' or 'truth'. In Polyscopic Modeling, the *epistemology* postulates the conditions or assumptions for creating good *information* without resorting to 'truth' and 'reality' [2].

Our challenge is to avoid both dogmatism (belief that there is only one version of reality, or that we are right and everyone else is wrong) and relativism (belief that everything is just a matter of personal opinion and that there is no way to distinguish good information from nonsense and illusion). The challenge is, in other words, to create the kind of 'truth' which suits our post-modern conditions.

The *epistemology* of Polyscopic Modeling is simple. The experience is not assumed to have any a priori structure whatsoever. Rather, the experience is treated as an ink blot in a Rorschach test. The Polyscopic Modeling models are considered as something we construct and then fit to experience in order to organize it and communicate it. The verification of a model resembles a scientific experiment: If the reader finds that the model fits the experience well enough, the communication ('experiment') is considered successful [5].

G. Approach

Each *traditional* discipline or profession has a fixed choice of subjects, terminology and methods. Because of that the *traditional informing* overproduces certain kinds of information, and has no provisions for producing new kinds of information, which may be necessary in new conditions. The *traditional informing* may be imagined as isolated candles with large dark areas between them.

The Polyscopic Modeling approach is defined as '*information design* by *scope design'*.[2] *Scope design* means conscious creation or choice of 'what is being looked at and how'. We *design* the *scopes* consciously and freely, so that we can see and communicate what must be seen and communicated.

In Polyscopic Modeling there are no disciplines. All *information* is considered as one single whole. Methods and insights from arts, sciences and other *traditions* are generalized and combined to produce a completely general and versatile *informing.* The Polyscopic Modeling methodology may be imagined as a flexible searchlight which can be pointed into the dark, there where *information* is most needed.

Scope design is an alternative to descriptive narration which is common in both social sciences and media informing. Narration is meaningful if we assume that the author is telling 'how the things really are', questionable if we don't make that assumption. In Polyscopic Modeling what is offered to the reader is not 'the truth', but a *scope* - a way of looking at experience and of making sense of experience.

The challenge of *scope design* is to create simple ways of understanding essential issues which are accessible to most people, and sufficiently accurate or *functional*.

Scope design requires that we give the reader the possibility to see and verify what is claimed. That democratizes information.

H. Criteria

By postulating the criteria we can specify what *information* should be like. In that way, we can give the creation and use of information a new, more conscious and purposeful direction. How should the *informing* be redirected? What criteria should we use?

In Polyscopic Modeling four criteria (*perspective, nourishment, relevance* and *foundation*) are formulated in order to supplement, refine and replace the factual truth and uncultivated interest [2].

The *perspective* criterion postulates that *information* needs to allow us to 'see through' the whole, to see the whole in correct proportions, with nothing essential left obscure or hidden. The *perspective* roughly corresponds to the intuitive notion of 'whole truth'.

The *perspective* criterion guides *informing* in a new direction. While the factual truth requires that we use the established methods in order to find facts with relative or presumed certainty, the *perspective* criterion makes us focus on the dark areas where the information is lacking and most needed, and to illuminate them *as well as we can.* The factual truth makes us remain within *traditional* professions and disciplines; the *perspective* criterion stimulates us to seek new knowledge and develop new ways of creating knowledge.

The *perspective* criterion gives role and prominence to *ideograms* and other intuitive, artistic or visual techniques in *informing* [12].

The *nourishment* criterion reminds us that information has subtle long-term effects, influencing our values, emotions, preferences, habits etc. This criterion gives prominence to *implicit information*.

The *relevance* criterion imposes a priority structure on *information*. We are reminded that *information* has a purpose, and that we must create and choose *information* according to that purpose. Less *relevant information* should not be allowed to take precedence over more *relevant* one.

The *foundation* criterion postulates that '*information* needs to have a broad and solid *foundation*'. This roughly means that *information* must be reliable, proven or verifiable. More precisely, the *foundation* criterion requires that we *found information* consciously[2]. Conscious *founding* of *information* is to *culture* as architecture is to house construction. Conscious *founding* of *information,* in particular of *high-level information,* can bring substantial benefits to *culture* [19].

I. Definitions

In our *traditional* scheme of things a definition is expected to say what the defined concept 'really is'. In Polyscopic Modeling the definitions are postulated. They are conventions which hold within a given scope (a document, the methodology etc.).

The *traditional* definition of concept X is expected to delineate the borderline of X, so that we can in every case determine whether something *is* or *is not* X. A Polyscopic Modeling definition is expected to convey the essence or *perspective* of the defined concept [7]. The concepts are defined so that they best serve their purpose.

Postulated definitions are the sword which can cut through the Gordian knot of ill-defined concepts and questions.

Postulated definitions are the key technique of *scope design.*

J. Culture

An example will allow us to clarify the above ideas.

'Culture' is known to be a very difficult concept to define in the *traditional* way. Zygmunt Bauman dedicated a whole book to the definition of culture, in which the opening paragraph reads as follows: "The unyielding ambiguity of the concept of culture is notorious. Much less so is the idea that this ambiguity follows not so much from the way people define culture, as from the incompatibility of numerous lines of thought, which have come together historically in the same term." [50] If Bauman's book had a conclusion, it would be that no consensus on 'what culture really is' might be reached.

In Polyscopic Modeling the meaning of *culture* is postulated as '*cultivation* of well-being', where *cultivation* is further explained by analogy with planting and watering a seed [14][19]. This definition assigns a clear purpose to *culture*. We can then discuss what a *culture* needs in order to function and how can it function better. The same definition also assigns a clear purpose to *information*: Without *information* we would not know that a seed should be planted and watered. Similarly, *information* needs to tell us how to *cultivate* out well-being.

The *traditional* manner of defining 'culture' suits the *traditional culture* (where we don't need to secure consciously that the *culture* can evolve and function). In the *traditional* scheme of things, *culture* is what it is and it functions by definition. The Polyscopic Modeling definition suits the post-*traditional culture,* where we must consciously secure that our *culture* is *functional.*

K. Logic

Our traditional logic, which is based on truth and falsehood, reflects the belief that there is a single 'true' description of 'reality'.

According to traditional logic, it is legitimate to take a part out of a whole and draw conclusions. But obviously, practically anything can be 'proven' in that way. This possibility is widely misused in politics and advertising.

In [15] a sketch of the Polyscopic Modeling logic is made based on the so-called **ab** modeling language which is specifically created for that purpose. This approach allows us to talk about multiple models and their properties and relationships. In Polyscopic Modeling logic it can be formulated, for example, under what conditions a certain model *implies* another, and when should two given models be considered as *mutually incompatible*. Conclusions are drawn by *reducing* models (taking transitivity and other kinds of compound relationships into account), not by *restricting* them (taking a part out of the whole).

L. Generalizing mathematics

The fundamental concepts of mathematics such as the function and the relation serve as a generic language for stating and proving results in physics and other branches of science. The usefulness of mathematics as generic language is at the same time limited by the applicability of its concepts.

Patterns have a similar role in Polyscopic Modeling as graphs and functions do in mathematics [9][18]. They are, however, completely general. *Patterns* are defined as 'abstract relationships' or (in the **ab** modeling language) as 'isomorphism classes of models'.

Patterns allow us to create *high-level* concepts and define relationships.

Patterns allow us to bring insights from one domain to another.

Patterns play a prominent role in the work of Gregory Bateson.

By using the **ab** modeling language it is possible to define basic *patterns* and study their properties and relationships, in a similar manner as functions are defined and studied in mathematical analysis.

M. Generalizing science

We need something like science, but without the restrictions of science. In *modern culture* science serves as the trusted information provider, and for a good reason: Science has provisions for creating 'truth' by consensus; scientific information is the same across countries and traditions; science is reliable and partially democratized. However, science as the *informing* of choice in *modern culture* also has the disadvantage that its range of application is limited by the *scopes* of its disciplines.

In Polyscopic Modeling the basic approach of science is generalized and made applicable to any subject [6] [9][18].

By *designing scopes* and *patterns* it is in principle possible to do in any subject domain what Newton did in physics:

[2] Sometimes, as when judging what is good for us, direct experience may be deceptive and reason combined with experience of others must be used; and sometimes, as when assessing what may be possible for a human being, conventional scientific reasoning must give precedence to direct or indirect experience. 'Conscious *founding* of *information*' means knowing for each sort of *information* how it should best be *founded,* and consciously using and developing such knowledge.

define concepts by which the subject of interest can be discussed in a precise and rigorous way; define an abstract language similar to mathematics by which relationships among the concepts in the *scope* can be precisely described, so that *results* can be formulated; since both concepts and relationships are defined in a precise and abstract way, *results* and their consequences can be justified theoretically; since experience is the ultimate foundation of all *information,* the *results* can be verified *experientially.*

The Polyscopic Modeling criteria direct the use of this general method towards creating *good information* there where such *information* is most needed.

N. Including art

Informing the reason alone is not enough. *Information*, as our extended vision, must allow us to see and feel the large abstract entities we increasingly depend on, such as our *culture* and our *well-being*. *Information* must make the risks that threaten us modern people as palpable and as real to us as wolves and forest fires were real to our pre-civilized ancestors. *Information* needs to create a *functional* vision of reality for us.

Recent insights from cognitive science have shown that our reason is far more emotional than we believed [51][52].

In Polyscopic Modeling *science* and *art* are not distinct kinds of information but two inseparable *aspects* of all *information* [6].

Art gives expressiveness to *information*. It allows us to experience what is being told directly.

Art is naturally used for creating *high-level information.*

Art conveys *implicit information* [7]. One of the purposes behind Polyscopic Modeling is to make explicit guidelines for *implicit informing.*

Art in Polyscopic Modeling provides patterns for the use of new media in *informing.*

O. Ideograms

Ideograms are an *artistic* technique which is used extensively in Polyscopic Modeling [12][18] . They allow us to 'see' and 'feel' abstract things such as *modern culture* and its *informing*, as illustrated by the Information Design Challenge ideogram in Figure 1.

Ideograms allow us to represent *results*. They have a similar role in Polyscopic Modeling as mathematical formulas do in physics.

Ideograms serve for presenting *high-level information.*

At present, most of the *ideograms* in Polyscopic Modeling are simple sketches. They serve as placeholders for a variety of techniques that can be developed by using the new media technology.

P. Information holons

The term 'holon' was coined by system theorist Arthur Koestler to denote something which is both a whole and a part in a larger whole [53]. In Polyscopic Modeling *information holons* (or simply *holons*) are used for creating *high-level information* (or 'knowledge') from *low-level information* (or 'data').

Each *information holon* is a specific method for creating, *founding* and presenting *high-level* facts. Three *information holons* are defined (Σ, Π and Φ *holon*) [22]. Those three *holons* roughly correspond to sum, product and function application in mathematics.

As information structuring primitives, the *information holons* may be compared to the familiar 'do loop' and 'if-then-else statement' in programming.

Q. Polyscopic information presentation

Based on the methodological approach, new information formats, alternative to the *traditional* ones such as the book, article and letter, may be developed.

The methodological approach allows us to create guidelines for formatting and presenting information. This allows us to free information from traditional formats and to tailor the presentation to the task and the content.

Polyscopic presentation is in terms of as a structure (usually a hierarchy) of modules. Each module represents a *coherent view* (a *view* is *coherent* if it reflects a single level of detail and way of looking, as if it were a view from a single standpoint on the mountain). This is a departure from the conventional *flat* and *linear* presentation styles.

R. Polyscopy

Polyscopy is the brand name which is intended to be used for commercial and real-world applications of Polyscopic Modeling.

Polyscopy may also be understood as a strategy for cultural renewal [4].

The essence of *polyscopy* is a certain insight followed by corresponding change of attitude and action.

The insight is that our mind has a tendency to consider a certain *conceptualization* of reality (be its origins religious, scientific or otherwise) as the reality itself. More precisely, a certain 'aha' or 'eureka' feeling which results when the pieces associated with our conceptualization of a situation fit nicely together is taken as the sure sign that what we have is the unique and accurate description of 'reality' itself. Cognitive science allows us to understand the origins of this illusion[3].

The tendency of our mind to reify a worldview becomes transparent when we notice that practically every cultural tradition in history had a different reality picture, which to the people belonging to the tradition appeared as *the reality*. So many wars and atrocities were conducted in defense of such 'realities'! The tendency of our mind to hold on to a certain 'reality' is the prime cause of cultural inertia, closed-mindedness and intercultural misunderstanding. The same tendency is the main obstacle to *culture* and to *cultural environmentalism,* because as long as we adhere to our own cultural view and look down upon others, there can be no

[3] This tendency may be explained by using insights from cognitive science. I call this explanation 'believing is seeing'. It is, namely, well known that the verbal-rational reasoning developed in evolution only recently. Older parts of the brain, notably the ones associated with vision, have been adapted to this new purpose. And vision, as it is now well known, is *constructed* by our brain. Since we use the same mechanisms for believing and for seeing, what we believe appears to us as similarly *real* as that what we see. Both what we see and what we believe, however, are just *gestalts,* influenced by our cultural and other habits and subject to change.

communication, no preservation and no cross-fertilization of the heritage of traditions. In Polyscopic Modeling this pathological tendency of the mind has been called *pseudo-consciousness* and defined as '*addiction* to information' [9].

The essence of the on-going critique of modernity is that we have once again fallen pray to *pseudo-consciousness*.

Fixed worldviews have always been the way of dividing and controlling people. They have served the source of power to various historical and modern *power structures.*

The attitude associated with *polyscopy* is to consciously counteract this deceptive tendency of the mind.

The action associated with *polyscopy* is to consciously seek new ways of looking at things, which show us clearly what we most need to know.

Polyscopy stands for conscious creation and use of new ways of looking at things. It emphasizes the *high-level view* or 'the view from the top of the mountain' as the way of looking which is both most needed and most neglected.

Polyscopy is a prerequisite for 'holistic thinking', *design* and conscious choice [3]. It is not enough that something looks good and whole from one point of view; something which indeed is *whole* must look *whole* from all sides and angles.

Polyscopy stands for the fact that proper handling of any issue presupposes that the issue is perceived, understood and dealt with within an *appropriate scope*. An airplane cannot be understood at the level of detail of nuts and screws. We need to think in terms of large building blocks such as the steering and the engine, and in terms of their function.

Polyscopy allows us to see 'the whole thing' in clear and simple terms.

Like alpinism, *polyscopy* also has its 'fear of heights' that must be overcome. We are unaccustomed to look at issues 'from above', to see them in simple and clear terms and to take responsibility.

Polyscopy also stands for contextualizing *information* and action. *Polyscopy* allows us to see the large issues and *contextualize* the smaller ones by understanding them within the context of the larger ones. That assigns purpose to action.

The paradox that we are lacking exactly the sort of information we most need may easily be understood as a consequence of historical conditions and accidents. The *traditional culture* did not need *polyscopy* because 'the whole thing' evolved spontaneously, and the traditional people only needed to perform their traditional roles within it. Reductionism damaged the *high-level information* by reducing it to *low-level* one, which was considered to be more 'real'.

Polyscopy offers a way to construct reliable or 'scientific' *high-level information*, by using the methods of Polyscopic Modeling. The methodology offers a multitude of tools and guidelines for practicing *polyscopy*: the notion of *polyscopic information* with multiple *scopes* and *views*, *levels* and *aspects*; the *criteria*, *epistemology*, *approach*, methods (*holons*) etc.

It should not surprise us if it turns out, when we apply the methodological or conscious or 'scientific' approach to *high-level information*, that our present *high-level views* are dominated by myth and prejudice, which remind of the pre-scientific ideas about the natural phenomena.

Applications of *polyscopy* show that our views on basic issues such as values, well-being, freedom, *informing*, *culture*, sustainability, power and free choice 'from the top of the mountain' will be completely different from the ones we have 'down here in the jungle'. *Polyscopy* points to new ways of handling those issues.

I am currently writing a book whose working title is *Polyscopy* and whose purpose is to foster a simple vision of the new *informing*. The subtitle/alternative title of the book: "We can come out of the information jungle by climbing to the top of the mountain" explains the vision. The book has three parts. The first part describes the 'information jungle', by expanding on the 'anomalies and issues' sketched here in Section Two. The second part describes the way out of the 'jungle', by outlining the Polyscopic Modeling method, as outlined in this section. The third part describes the view from the top, by elaborating some of the examples given in the next section. It is shown that a completely new worldview emerges, as different from our common worldview as the view from the top of the mountain is different from the view from within the jungle. Examples of applied *polyscopy* show that when we look in that way, we have a similar experience as when we come out of a jungle by climbing to the top of a mountain: We see clearly where we are, what goes on and where we need to go.

IV. Examples and applications

In this section we outline a number of examples of application of Polyscopic Modeling. We also survey various actions which have been undertaken in order to put *information design* into practice. Those practical *information design*-related initiatives are intended to serve as building blocks of a small prototype of *information design* in practice, or as seeds which may grow to become elements of a new practical *informing.*

While reading the provided examples, the reader may imagine standing on the top of a mountain: What sort of 'peak' issues emerge 'from the jungle' and meet the eye? What do those issues look like 'from the top of the mountain'? What over-all view do they compose?

A. Values, well-being

The highest 'peak issue' is the issue of *well-being. Well-being* (understood as 'being well') is, by definition, the purpose of *culture*.

It is generally agreed that 'pursuit of happiness' is what our civilization is all about. But what if we are habitually pursuing happiness in the wrong direction? What if we need to 'climb to the top of the mountain' in order to see the way?

By modeling *well-being* we can create guidelines for an informed pursuit of happiness. We can also explain why the common *naive* pursuit of happiness so often fails to take us to the goal.

A Polyscopic Modeling *result* called *Convenience Paradox* [20][22][16][5][3] has been developed as an example of *polyscopic information* about *well-being.* Its *high-level view* allows us to understand why we so often tend to pursue *well-being* in the wrong direction. Its *low-level views* provide

guidelines for meaningful pursuit of *well-being.* They also serve as a *foundation* for the *high-level view.*

When we use the uninformed or *naive* judgment we identify *convenience* (what *feels* pleasant and easy) with *well-being*. The *convenience paradox* is the type of a situation (more precisely the *pattern*) where the pursuit of *convenience* leads to lower *well-being.* The *Convenience Paradox* result shows that this *pattern* occurs so often in practice that it should be considered a rule rather than exception.

It follows from the *Convenience Paradox* result that using *convenience* as the guiding principle for reaching ease and pleasure is similar to going down (because that is easier and more pleasant) instead of going towards the place where we really want to be (because being there and living there is easier and more pleasant).

It also follows from this *result* that proper *information* is necessary to steer our pursuit of happiness.

The Convenience Paradox book shows that *well-being* is determined by subtle factors which are commonly ignored and neglected. In correct *perspective,* happiness has very little to do with the sort of things where we try to find it.

The Convenience Paradox book shows that the right way to *well-being* is *cultivation.* When the *informed* pursuit of *well-being* replaces the *naive* one, *cultivation* replaces *convenience* as dominant value. This value change may be expected to have profound cultural consequences[4].

On the *lower level*, the Convenience Paradox book shows that the possibilities for *cultivating well-being* are far more spectacular than what is commonly believed.

Four *aspects* of *well-being* are studied on the *low level*: bio-chemical, physical, emotional and cognitive. It is shown that each of them displays the paradoxical *pattern.* By correcting the *naive perspective* of *any* of the four *aspects* of *well-being* and by acting accordingly, living can be made a much more rewarding experience.

The example of the study of effort, which belongs to the *physical well-being* part of the book, will allow us to illustrate these ideas. We develop technology allegedly to eliminate effort, but that is the 'jungle' approach. A more *informed* approach would first look at the issue of effort 'from the top of the mountain' in order to understand its true causes. In the book it is shown that the main source of effort are involuntary pathological muscle contractions, both temporary and permanent, which may be eliminated through a certain kind of *cultivation.* However, the increasingly unnatural patterns of body use which are characteristic for civilized living, tend to increase those muscle contractions. The result is that, quite often, what seems to make life easier, actually makes it more difficult.

The data showing the nature of effort and effortlessness are taken from the writings of F. M. Alexander [54] and M. Feldenkrais [55], from scientific studies associated with Alexander technique and from the martial art literature such as [56]. It is shown not only that effortlessness is possible, but also that that human beings can develop levels of physical prowess which are far beyond what we consider possible [57].

The *experiential* data for the *Convenience Paradox* study are taken from a variety of cultural traditions. The reason why it is legitimate to combine sources from a variety of traditions is the Polyscopic Modeling *epistemology*: Each of those sources is a record of human experience.

Credibility is increased by showing that all the used sources contain the same basic *high-level* insight. A *justification* technique called *testimonies* is developed and used for this study, where sources from various cultural traditions have a similar role as witnesses in court. The *testimonies* democratize *information*.

By showing how essential insights about *well-being* from a variety of cultural traditions can be distilled, re-combined and presented in a way which is understandable and credible to a modern person, it is shown how *polyscopy* can serve *cultural environmentalism.*

Although the works of Alexander and Feldenkrais are readily available, it would be unlikely that we would perceive them as fundamental and consciously seek them out, unless we are looking 'from the top of the mountain' and seeing their implications for our *well-being.* By showing how *high-level information* can provide access to essential *low-level information* which would otherwise be lost in the information jungle, it is shown how *polyscopy* can remedy the information overload.

The *perspective* of *well-being* which is created in this study clearly shows that true *well-being* is *wholeness*[5] [9][20]. (Indeed, if a single vitamin is lacking from our organism or if a single essential organ is dysfunctional, having everything else in perfect shape and abundance will be in vain. It can easily be shown that this is equally true on the positive half of the spectrum of possibilities: A radical improvement of *well-being* is not reached by acquiring more of what we already have in abundance, but by discovering an aspect of our *wholeness* which is presently lacking, such as the change the diet or a love relationship. or a more 'spiritual' approach to life which we are presently lacking.)

Adopting *wholeness* as value instead of *convenience* may have profound cultural consequences.

B. Informing, culture

The book "What's Going On?" [19][5] is a showcase example of the new *informing*.

The main question associated with the book is "When can we say that we know what goes on?" or in other words "When can we say that we are properly *informed*?"

In the book this question is answered with the help of a *designed* concept, *appropriate gestalt,* which is the correct over-all grasp of a situation. (It is not difficult to see that having an *appropriate gestalt* is tantamount to correct *informing*: We can, for example, know everything about the water levels in various parts of the ship on which we happen to be sailing, along with temperature, humidity and a

[4] For example, the advertising which appeals to *convenience* would easily be perceived as deceptive, because it fails to address the real issues. The marketing which explicitly addresses the values which are behind the product is called *value-based marketing.*

[5] *Wholeness* is, by definition, the quality of a whole organism, ecosystem or mechanism.

multitude of other data. But that is not the same as knowing that the ship is sinking.)

Culture largely functions by giving us *gestalt*-action pairs. But what if the situation is completely new and no *traditional gestalt*-action pair applies? Then a new *gestalt*-action pair needs to be *designed* before the situation may be properly understood and handled. The book "What's Going On?" presents an example of such situation.

In the book it is shown that what goes on in our time is a profound *cultural paradigm change.* The *paradigm change* is to *culture* as foundations change is to a house. All manner of problems emerge but, like the cracks in the walls of a house with failing foundations, they cannot be solved by fixing and patching. Our problems do have a solution, says the book. But that solution is fundamental and systematic change, not fixing.

By definition, the *foundations* of a *culture* are its various ways of *founding information.* It is shown that the existing *foundations* of *modern culture* no longer work, and that far better ones can and need to be developed. Conscious *founding of information* is what the *cultural paradigm change* is (by definition) all about.

The main *result* of the book is carefully *justified* by using Polyscopic Modeling. Anecdotal and controversial dialogs are used to convey *low-level* experiential data. This *experiential justification* is combined with a theoretical one.

At the beginning of the book an agreement between the author and the reader is sketched according to which the reader is responsible for using the given *scopes,* while proving the points is the author's responsibility. If the reader has followed the instruction and failed to see the *gestalt,* it is the author's fault. In this way it is shown how *informing* can be democratized.

The book "What's Going On?" shows that the approach to information exemplified by Polyscopic Modeling is necessary for correct *informing*. Indeed, without *scope design,* it would be impossible to 'see' the *foundations* of our *culture,* they would in effect remain hidden under the ground. It would in such case be impossible to create the correct *gestalt.*

C. Revitalizing words, addiction, religion

The issue discussed here will be properly understood if we imagine that our concepts define a kind of a grid which we use to 'grasp' the things and issues in the world around us in order to understand them and communicate them. What if this grid (like a fishing net with large holes) is incapable of capturing the main issues ('the biggest and tastiest fishes escape through the holes')?

In the language of Polyscopic Modeling, we are talking about the possibility that our *traditional* language may no longer suit our post-*traditional* condition.

The textbook example of this situation is the word 'addiction'. Our vague *traditional* understanding of the word identifies addiction with such *things* as drugs and gambling. This leaves open the possibility that completely new *addictions* are created daily without being recognized as such. Furthermore, by the *traditional* view, something *is* or *is not* an addiction. This leaves open another, more subtle but also more dangerous possibility, that a certain amount of *addiction* may be present in very many otherwise good and useful things. (To see this subtle possibility more clearly imagine that *addiction* is heroine, and that some amount of it is present in very many things around us. The net effect might be that we could be *addicted* without any possibility to become aware of that.)

In Polyscopic Modeling *addiction* is defined as a *pattern* [9][21]. Defined in that way, the word can be used for theorizing about *addiction,* as well as a benchmark to measure how much *addiction* there is in any practical thing or situation.

By definition, *addiction* is the sort of situation where we are acquiring momentary pleasure by pursuing an action which makes our condition worse. *Addiction* is a pleasant action which takes us in the opposite direction from *cultivation* and further away from *wholeness* [9].

Addiction is the shadow aspect of *culture.* Like *cultivation,* the word *addiction* gives due prominence to subtle long-term effects of our actions and environment on our *well-being.*

We are using an unknown share of our technical and other resources to produce *addictions*.

Separating *cultivation* from *addiction* is a key distinction in *culture.*

Polyscopic Modeling manner of definition is necessary for such distinction.

The *designed* concept *religion* is another example of giving a new life to an old word.

Religion is the core element of every traditional culture. In the *modern culture*, following the familiar *modern* bent towards 'truth' about 'reality', religion is perceived as a belief system and, given that it competes with our 'scientific' belief system, it is given a bad name.

In Polyscopic Modeling the word *religion* is defined as the reconnection with the experience associated with words 'love', 'inspiration', and 'intrinsic motivation'. As it is well known, the access to such experience facilitates and enhances the success and enjoyment in any endeavor.

Religion is defined as a *pattern.* By using such definition we can perceive that *religion* is present in very many different things and situations, most of which have no relationship with what we are normally calling 'religion'.

Religion is subject to *cultivation*. As one of the key factors of *well-being, religion* is one of the central preoccupations of *culture.*

Addiction and *religion* are related in an interesting way. 'Religion' understood as a belief system gives us some of the pleasant symptoms of the real *religion* (a sense of meaning, security etc.), while at the same time taking us further away from the pursuit of the real *religion*. Therefore what is usually called 'religion' is really a form of *addiction* [9][21]. (Karl Marx's maxim 'religion is the opiate for the masses' expresses the same point.)

By freeing *religion* from *addiction,* we can bring this essential element of *culture* back into *culture*.

D. Power, freedom and ethics

Without doubt, one of the most central issues in *culture* is the one of power and its misuse. The misuse of power means that the resources which would otherwise be used as it suits our *well-being* are used as it suits the power holder.

The purpose of applying *scope design* to the issue of power is to avoid the unpleasant possibility of focusing on a small fraction, say 10%, of the power misuse, and neglecting the larger share. In other words, our goal is to correct the *perspective* of power and power misuse.

In Polyscopic Modeling, the *power structure* concept is defined to express the intuitive notion of 'power holder' or 'power monger' [13][10].

A *power structure* is not necessarily a single entity but a *structure,* consisting of abstract and concrete entities and their relationships. Institutions, work-related pressure, advertising, values, legal regulation and all manner of other things may be freely combined together to form a *power structure.* The *power structure* is a complex condition where abstract and concrete things co-create each other.

Power structures compete with each other for dominance and control. The 'fittest' (most powerful) *power structures* prevail.

Power structures can originate through spontaneous evolution, without anyone's intention or conscious doing. Insights from combinatorial optimization, artificial life and artificial intelligence may be used to understand the nature of this evolution more precisely [3], but already the analogy with a box with sand will be accurate enough: When the box is shaken, the sand levels. It is as if every sand particle 'knows' about all other particles, possibly quite distant, and under their influence finds its right place. While understanding this dynamics *causally*, on the level of individual sand particles and their interaction, would be impossible, thinking in terms of the properties of the over-all sand surface and its configuration makes the understanding easy. The key point behind the *power structure* concept is that the dynamics of *power* needs to be understood in similar terms.

Bruno Latour's actor networks [58] have been applied towards a similar goal, holistic understanding of power and power relationships. The message behind the *power structure* concept is that in order to have the correct *perspective* of the issue of power, looking at individual actors is not enough; they are like grains of sand or like molecules in a gas. As in gas mechanics, the statistical way of thinking must be used.

Applied in practice, the power structure concept gives us a way to understand how complex conditions, which from the point of view of *well-being* might be highly unfavorable, can develop through spontaneous evolution and 'free choice', under the subtle influence of distant or non-specific causes.

The rule which shapes the reality of modern international business is the survival of the fittest. If, for example, a company that has ruthless managers is more fit in competition, then the *power structure* will tend to 'create' ruthless managers (either by forcing existing managers to become ruthless, or by favoring ruthless people to become managers).

Since the *power structures* can develop 'strategies' through trial and error, they need to be considered as (artificially) intelligent.

Power structures can increase their power by creating *addictions.*

The *power structure* concept allows us to understand how power can create values.

Power structures can not only make us act against our ethical sensibilities. *Power structures* can even *change* our ethical sensibilities.

Yielding to a *power structure* is usually not a matter of conscious choice. People may belong to multiple *power structures* without being aware of their existence.

The *power structure* is a *pattern,* not a thing. Such definition allows us to perceive the power misuse as an *aspect* of otherwise useful and good things and situations.

The *power* of the *power structure* may be imagined as a magnet acting upon people and subtly orienting their seemingly random or 'free' behavior. People, like iron chips, orient themselves according to the magnetic field. The people who orient themselves according to the field add their power to the field which then becomes stronger.

If we imagine the *culture* as an organism in which the people are cells, the *power structure* may be imagined as malignant cancerous tissue in that organism. The problem is that the organism's immune systems fails to recognize the problem, and treats the cancerous tissues as its own healthy cells. This allows the malignant tissues to grow beyond proportion and stifle the vitality of the organism.

A number of phenomena in *modern* society and *culture* exist which cannot be properly understood without the *power structure* concept.

The power of some of the major *power structures* has been greatly increased by globalization. In the conditions of global economy, the traditional checks and balances, which exist on the state level, are no longer effective.

The power structure concept is related to Manuel Castell's notions 'network' and 'flow' [60]. Castells described the combined effect of the new information technology and globalization on power structure evolution as follows: "The outcome of this process of financial globalisation may be that we have created an Automaton, at the core of our economies, decisively conditioning our lives. Humankind's nightmare of seeing our machines taking control of our world seems on the edge of becoming reality – not in the form of robots that eliminate jobs or government computers that police our lives, but as an electronically based system of financial transactions. The system overwhelms controls and regulations put in place by governments, international institutions and private financial firms, let alone the considerations of individual investors, consumers and citizens. Since income from all sources finds its way into financial markets, where the highest capital growth takes place, this network of electronic transactions, enacting global/local capital flows, has established itself as a collective capitalist. Its logic is not controlled by any individual capitalist or corporation – or, for that matter, by any public institution. While capitalists, and capitalist managers, still exist, they are all determined by the Automaton." [59]

The proliferation of *power structures* which was due to globalization resulted in a value change, for which Ulrich Beck coined the name 'globalism': "Globalism is a thought-virus which has by now stricken all parties, all editorial departments, all institutions. Its main article of faith is not that people must engage in economic behaviour, but that everyone and everything – politics, science, culture – should be subordinated to the primacy of the economic." [59]

The effects of the power structure proliferation on collective consciousness have found expression in popular culture.

A good example is the popular film trilogy 'The Matrix', in which the machines rule, while keeping the humans in an artificially induced state of consciousness.

It is interesting to consider the healthcare as a *power structure.* In the social organism, the healthcare system is the part which is directly responsible for our well-being. But if healthcare is allowed to evolve as a *power structure,* the result would be a way of caring for health which gives us the most expensive healthcare and a largest number of sick people, that being the condition which gives the most power to the healthcare *power structure*.

It is also interesting to look at the *power structure* aspect of various religious institutions.

The existence of *power structures* compels us to understand the issues of freedom and 'free choice' in a new way. We cannot properly be considered as free if our behavior may be directed by some harmful *power structure.* The 'free choice' cannot be considered as truly free as long as it can be influenced by the *power structures.*

We cannot rely on the traditional democratic mechanisms to protect us against the *power structures.*

The global market combined with free competition is an ideal environment for the growth of *power structures.*

The *power structure* concept allows us to see that even the rich and the 'powerful' may be considered as disempowered victims of some *power structure.* Power can be only apparent: It is granted only as long as one conforms to the interests of the *power structure,* and often at the expense of one's family and emotional life and other key aspects of well-being.

The notion of *power structure* gives us a new understanding of ethics. As Zygmunt Bauman wrote: "Modernity did not make people more cruel; it only invented a way in which cruel things could be done by non-cruel people. Under the sign of modernity, evil does not need any more evil people. Rational people, men and women well riveted into the impersonal, a diaphorized network of modern organization, will do perfectly."[62] If *power structures* are responsible for much of the evil in modern world, we must consider ourselves responsible not only for our individual actions, but also for the *power structures* we participate in. This participation may be as subtle as keeping our money in a certain bank or buying a certain product in the supermarket.

The *power structure* concept can be used to make it clear why spontaneous evolution, characteristic for *traditional culture,* cannot be expected to work under *modern* conditions. While our *culture* is no longer equipped for producing safe roads to *well-being* through spontaneous evolution, the evolution through *malignant power structure* makes the 'bad' evolution more likely. Hence *tradition* can no longer be trusted. *Design* must be used [4].

This example illustrates a *methodological* point: The ability to recognize malignant *power structures,* which is essential for the functioning of the *cultural* organism, cannot be secured without *scope design.*

E. Sustainability, strategy for constructive change

The people who work with such questions as futurology, ecology and sustainability tend to agree that a radical change must happen. The interesting question is the one of strategy: How can we facilitate such change?

On the Visions of Sustainable World conference in Milano last November I proposed a strategy and introduced it as follows: "What we have been talking about these two days is a revolutionary change – first of all of consciousness and of values, and then also of design. What is the strategic point that every revolution must secure? Suppose that we are talking about an armed revolution. What is the building, the strategic object that you must definitely have under control if you want your revolution to succeed? (…) It's the TV station! (...) But if even an armed revolution must first make sure that it has the information under control, should that not be even more true about our consciousness revolution? And yet, in our consciousness revolution we seem to have completely forgotten information. Given a bit more time, I could show you that our *informing* is now indeed in the hands of our enemy." [4].

The whole *information design* initiative may be understood as a key step in a strategy for constructive change, whose goal is to tip the power balance by subjecting the *informing* to democratic and conscious control.

F. Business, globalization, and research through design

Our Authentic Travel International (ATI) project is a prototype which allows us to develop and model *information design* solutions to various issues related to business, globalization and design research.

Authentic travel is characterized by *authenticity* as value. Travel can be *authentic* in a similar sense in which a work of art, unspoiled nature or a friendly gesture can be authentic. A travel is *authentic* if the outer travel is used for 'traveling' inwardly.

Travel is the world leading business, with yearly revenue of about 5 trillion dollars, and the world's largest employer.

Market research has shown that *authentic travel* is what the modern travelers want [71].

Authentic travel can sustain local cultures and economies worldwide which are endangered by globalization. *Authentic travel* can help inter-cultural understanding; it can promote and help people make worldview and lifestyle changes. Already *authentic travel* marketing can convey essential ethical and cultural messages.

In sum, *authentic travel* has the potential to become the power horse of *cultural environmentalism.*

The mission of the ATI project is to develop a complete or *whole* business model which will make *authentic travel* stronger or fitter than its competition. This presents a challenge, because *authentic travel,* organized typically in terms of small, family owned and spatially distributed operations, does not function as a modern business. This puts it at a disadvantage with respect to its large international chain-enterprise competitors. The solution is envisioned as a new business model called *value-based franchise* [8], which is designed by adapting and combining new Internet technology,

franchising and certain new directions in business organization and marketing.

In more concrete terms, the project is developed around a successful *authentic travel* agency called Authenticore and its network of contacts and suppliers. The business model design may be envisioned as looking at Authenticore and its business environment from the top of a mountain, and seeing how its operation can be reconstructed so that Authenticore may *take advantage* of the changing global business conditions.

The challenge is to create a business which is *whole,* and therefore effective. In business, as in technical design, *wholeness* is what makes the difference between success (efficient functioning) and failure (inability to function).

A business which is *whole* also needs to provide a wholesome environment for people to work in; it needs to have a positive impact on the outside environment. A business whose environmental and economic effects synergize is said to be *synergistic* [70]. In the *synergistic* business, taking care of the inner and outer environment is concordant with profit seeking. The goal of the ATI project is to design an instance of a *synergistic business.*

The growth of *malignant power structures* may be controlled by a strategy called *power structure design* [70], where the goal is to create beneficial *power structures* which, by being competitively stronger than the *malignant* ones, drive the latter out of business. The ATI project may be understood as an instance of *power structure design.*

The ATI project is also a prototype example of *design* as research. *Designing* a *whole* business model requires a variety of skills and talents, ranging from sociological and artistic to business and technical. The ATI project is an inter-disciplinary *design* project, where people from diverse backgrounds come together in order to *create* something which our socio-cultural conditions require. This approach to research is a distant alternative to the common one, where the focus is on discovering facts within a traditional academic discipline.

UTEA is the temporary name for the concrete *authentic* business under development. I am indebted to Samir Bendris from McKinsey Norway, Lars Monrad-Krohn from Oslo Innovation Center and to Venture Cup Foundation Norway for their generous help in preparing the business plan for the UTEA franchise [73].

G. 'Eventurhotellene' pilot project

In Fall 2002 a pilot version of the Authentic Travel International project, an Internet portal prototype for the Eventyrhotellene hotel organization, was completed as cooperation between Norwegian School of Art and Design under supervision of Professor Reidar Holtskog and the University of Oslo Information Design Group [74]. I was later told that this was the historical first joint project between our two institutions.

Information design requires at least a combination of knowledge and talents which is represented by these two groups. By bringing together researchers and students from art and science, we make a precedent and lay a foundation for *information design* community building.

Eight students from each department were selected, along with faculty members, an authentic travel expert (Karin Furst of Authenticore) and a community building consultant (Tore Holtskog). The start of the project was in the spirit of *authentic travel*: We spent one day in a nature resort and another in an authentic hotel, doing team building activities and making plans. In the following three weeks four student teams, with four people each (two from each department), created pilot versions of the Eventurhotellene Internet portal. The ideas were discussed and the best ones were presented to the hotel organization.

H. Mostar 2014 project

The Mostar 2014 project is an application of ATI to the situation in Mostar [75]. The goal of the project is to help reverse the effects of recent war and attempted cultural genocide.

The precursor to this project was the Mostar 2004 revitalization project, which helped rebuild the monuments including the famous Mostar Old Bridge. The next phase is the rebuilding the culture and the economy and thereby completing the revitalization.

The Mostar 2014 project is an attempt to develop an international laboratory for *resolving* globalization-related issues [76].

A part of the project mission is to develop an *authentic travel* business in Mostar. Another part is Internet-based community development. Since the original inhabitants of Mostar are now distributed world wide, so is the authentic Mostar culture.

I. Lokrum project

The purpose of the Lokrum project is to create a variety of concrete scenarios and possibilities in authentic travel. A related purpose is to help Croatia develop an approach to tourism which can give a revitalizing impulse to its economy and culture.

The mission of the project is to create a laboratory for authentic travel on the spectacular Lokrum island in the vicinity of Dubrovnik [77]. Experimental Lokrum *events,* staged by teams from Croatia and abroad, would serve for designing solutions.

J. Marketing

Two-step marketing is a more advanced alternative to common advertising [13][3].

The 'first step' of *two-step marketing* involves using *information design* to 'bring the customer to the top of the mountain', where truly purposeful choices can be clearly seen.

K. Document design

The fundamental thesis of *information design,* that the creation and use of information needs to be based on a *methodology* rather than on *tradition*, holds specifically in document design. Are the traditional document formats (such as the book and the article) the best possible ones? How should new kinds of documents such as Web pages be designed? The methodological approach to information provides a way to answer such questions.

The Polyscopic Modeling methodology can serve as foundation for structuring documents in new ways.

In [11] it is shown how this approach can be applied in user manual design. Completeness (all use cases and all details must be covered) and brevity (the user wants to read only what is essential for the situation at hand) are contradicting requirements which make the user manual design challenging. The solution can be found by organizing user manuals *polyscopically,* in terms of multiple *views.* In [11] it is shown how a taxonomy of *views* may be constructed by combining Polyscopic Modeling with some basic insights from semiotics.

In Internet design we are in the stage where we were in computer programming half a century ago: the hyperlinks are gotos. As the programming methodologies (structured programming, object orientation and others) taught us how to structure programs, *information design methodologies* can tell us how to structure multimedia Web information.

The methodological approach to Web design requires first of all that we construct a language in which what is essential about Web design can be expressed [63][63]. We are currently developing an inter-university research project whose purpose is to develop a methodological approach to Web design [65].

L. Textbook and class design

Another area of application of the *methodological* approach to information is university textbooks and classes. Teaching algorithm theory at the University of Oslo gave me an opportunity to work on the application of Polyscopic Modeling in this area. Based on my lectures, Rune Djurhuus, a Ph.D. student in the Information Design group, composed a polyscopic text for the class [66].

The algorithm is a fundamental object not only in computer science and mathematics, but also in the technological culture at large. Algorithm theory gives us a way to understand or answer a variety of practical and philosophical questions, such as What tasks can be automated? Unfortunately, this modeling aspect of algorithm theory is usually lost in algorithm theory education and research, due to the traditional *monoscopic* nature of academic information. If one *aspect* of algorithm theory must be chosen, then the natural choice is to present the theory itself. Therefore a typical algorithm theory textbook begins with definitions and ends with theorems. The message delivered to students is that algorithm theory is 'just theory'.

Polyscopy offers a solution. In the University of Oslo Algorithm Theory class different *aspects* of algorithm theory are distinguished: Real-life issues, their abstract models, and the theory itself. The students are taught to understand theory building as modeling (translating applied problems into the abstract domain and back). *Levels* have different meanings for each of the *aspects* of algorithm theory. When we talk about real-world computing, by looking 'from the top of the mountain' we see the most important or fundamental issues, such as "What kind of problems can be solved by machines?" When we talk about the theory, 'from the top of the mountain' we see its foundation stones and main building blocks.

M. Learning through design

The on-going Quality Reform at the University of Oslo emphasizes flexible and active learning. Our Information Design class is *designed* as a prototype answer to this demand.

Information design is a university subject under development. It does not yet have its curriculum. Besides, having a fixed curriculum would take the class further away from the spirit of *design* and closer to becoming just another *traditional* discipline. And finally, the best way to learn *design* is by doing *design*! In our Information Design class the students learn *information design* by designing the class and the study materials.

Information design is a very broad field. There is room for all sorts of talents and backgrounds, both technical, artistic, social and philosophical. It would therefore be unnecessarily limiting if all students would follow the same curriculum. Our Information Design class has lectures where the main ideas are introduced by the instructor and guest lecturers, and self study and group projects where special interests are pursued and practical experience is acquired.

We have recently received funding to develop the Information Design class as a template for other project-based and independent-study classes at the university [67]. The Information Design class will be organized systematically around polyscopic Topic Map technology. The idea is that the students are given the coarse-scale Topic Map of the whole *information design* terrain, to guide them in their study. Like early explorers, the students venture into various corners of the map in order to update and refine it.

N. Curriculum design

The University of Oslo Quality Reform has given us an opportunity to create new inter-departmental study programs. I have responded by proposing *Infornetics* (Informatics for the Internet) [68].

The need for *Infornetics* is on the one hand the *cultural,* and on the other hand purely pragmatic, similar to the need for establishing computer science half a century ago. Again the emergence of a new technology, the Internet and the multimedia, points to the need for new types of experts and expertise.

Infornetics has Informatics (computer science) as precursor and model. The difference is that *Infornetics* has the Internet instead of the computer as machine, and information infrastructures instead of programs as the designed object.

Infornetics is, however, far more inter-disciplinary than Informatics. Artistic/aesthetic, legal, sociological, linguistic, humanistic, business and other issues must be emphasized.

O. Information Design group

The Information Design Group at the University of Oslo Institute for Informatics was formally established in October 2002 with Almira Karabeg and myself as regular faculty members. Until now seven masters students and one Ph.D. have graduated from the group. The group is developing research projects, classes and industry ties.

Our Information Design Group is a prototype and a 'seed' for academic teaching and research in *information design.*

P. New academic community

Information design requires an international academic community. Steps are under way towards developing such community based at University of Oslo and the Inter University Centre (IUC) in Dubrovnik, Croatia [78].

The IUC Dubrovnik is chosen as the location for a series of yearly conferences and classes. The IUC can give graduate credits to students from ca. 200 member institutions, which include the leading universities around the globe.

At the University of Oslo we will be hosting an information base for sharing online information. This will allow the leading researchers to participate in the development of the Information Design community without needing to be physically present.

The possibilities behind applying *design* to *information*, which is the theme of this community, are not at all limited to the ideas described in this article. Recently Karel van der Waarde suggested another broad area of research and development: Principles and guidelines for handling various information-related tasks [79]. Typical application examples are file and email organization, and university class registration and scheduling. This reminds of the early day of computer science and the emergence of such sub-disciplines as data structures and database theory.

Q. Commercializing information design

The Information-based bUsiness and Society (or IBUS) project, whose purpose was to develop ways of commercializing and disseminating *information design,* was started in Spring 2001 as cooperation between the Norwegian Corporate University and the University of Oslo Information Design Group.

I am grateful to Håvard Grjotheim, the CEO of GAN Media, William Fagerheim of Mind The Gap, Prof. Reidar Holtskog, Head of Communications Design at Norwegian School of Art and Design, Jeanette Luytkis of FUTT-coaching, Boas Krøgh Nielsen, Head of Development at the NCU, Henrik Tschudi, the co-founder and director of the FLUX foundation and other industry and academic colleagues who have contributed their valuable time and ideas by participating as volunteers in the first and the second IBUS committee.

R. The Polyscope company

The Polyscope™ is the company created with the view towards commercial realization of Polyscopic Modeling.

According to new regulations, patentable and commercially interesting results created at the University of Oslo belong to the university. In Spring 2004 the Birkeland innovation office of University of Oslo freed Polyscopic Modeling from this obligation.

S. Information-based healthcare

An example of possible commercial application of *information design* is the information-based healthcare. The idea is to look at the issue of healthcare 'from the top of the mountain' and design a prototype which suits the modern condition.

Like Polyscopic Modeling, this *design* prototype too will look like an inverse image of the common way of handling the task. Its orientation would be caring for health, not only remedying diseases; it would help the healthy people become even healthier, not only the sick people get well.

Of course, understanding *well-being* and informing people about well-being will play a central role in such approach to healthcare.

If it is organized as a *value-based franchise,* Information-Based Healthcare may be able to expand rapidly.

This project is currently being developed in cooperation with Professor Gunnar Tellnes, the President of EUPHA and the founder of the Nature, Culture, Health (NaCuHeal) Foundation [80].

T. The Polyscopic Foresight project

The idea for this project is due to William Fagerheim of Mind The Gap foresight consulting. The purpose of the project is to create a survey of the existing foresight techniques, suggest improvements based on Polyscopic Modeling, and make the results available to the Norwegian research and development community [81].

The 'view from the top of the mountain' may indeed find a natural application in foresight.

The use of foresight to orient research and development is offered as an alternative to spontaneous interest- and tradition-based approaches.

U. Free Word information design project

The Free Word Foundation is a Norwegian organization which supports projects related to freedom of press. We have recently proposed a project to the FWF whose goal was to create a public debate on the quality of information and *informing* using the Polyscopic Modeling methodology as 'mirror'.

The idea of this project is that the word can not be truly 'free' with only 'free press regulation'. The creation and use of information must become conscious.

The project would prepare written and Web documentation and lectures and organize a series of public dialogs at the University of Oslo.

V. Mediating information design

If the *information design* initiative should be successful, it must come out of the academic environment and reach the general public.

An experiment in disseminating *information design* through public lectures and media was staged last April in Zagreb by Vesna Škuflić, Croatian journalist and writer. This experiment included a lecture for the members of Croatian Academy of Sciences and Arts, a lecture for the Department of Philosophy and Sociology of University of Zagreb, a *dialog* in the University Faculty Club, a public lecture and weekend workshop about communication through movement (see below), two daily newspaper and three TV interviews.

W. Embodied information

The written word dominates our culture and education, at the detriment of other kinds of knowledge and *information.*

When, however, we define *information* as 'recorded experience' and consider it as primarily our *cultural* heritage, then the embodied *information* emerges as no less important

than the written one. And when we tailor the *language* to what needs to be communicated and not the other way round, i.e. when we practice *scope design*, then *movement* (doing something with the body) emerges as a communication medium of central importance.

Movement is the communication medium which suits the embodied information. In the world traditions (such as yoga, qigong, martial art and others) various ways of communicating embodied *information* through movement have been developed. Those 'books of movement' amount to a large 'library' which is a prime *cultural* treasure, an object of interest for *cultural environmentalists*.

The class Movement and Qi is created to teach the art of 'reading' the 'books of movement' and to serve as a guided tour of the wealth of *information* they contain. This class was first offered to the Norwegian Association for the Blind in 1996, and subsequently in several towns in Norway, Sweden and Croatia. Presently the class is taught through the Sports and Recreation Department, University of Oslo.

In the class brochure it stands written: "Certain kinds of knowledge are naturally contained in the mind. For others, embodying is what really matters. Dictionary definitions of such words as wellbeing, effortlessness, happiness, health, love, beauty, inspiration, compassion, freedom, spirituality and God may be useful. But those words truly make sense only when they are brought into the body and experienced. Therefore their true definitions are not the ones that are found in dictionaries. They are the ones that are given in the books of movement." [83]

X. Rumi in Oslo project

The mission of our Rumi in Oslo project is to express the eternal message of the classican Persian mystical poet Mevlana Jalaluddin Rumi in the language of modern arts. The purpose of this project is cultural cross-fertilization: between modern art and oriental spirituality; between *modern culture* and love-inspired poetry.

Rumi in Oslo project is about deep love, which is the sort of 'cultural gene' which can bring a rejuvenating impulse to *modern culture*. The project may be understood as an instance of *cultural genetic engineering*, without the negative connotations of the word.

This project has recently received funding from the Arts Council Norway [84].

Y. A polyscopic autobiography

The biography is another traditional document format which may be subjected to *polyscopic* restructuring. Instead of a single chronological story line, a *polyscopic biography* would have several of them, focusing on distinct themes or *aspects* of the person's life and work.

I have been sketching fragments of my own life history in the *polyscopic* way [23]. Among the *aspects* or themes that may be covered, the following three are of interest for this article, since they reflect experiences related to communication and paradigm change.

At U.C. San Diego I had the good fortune to do my thesis work under János Komlós, a brilliant theoretician emanating from the renowned Hungarian school of discrete mathematics. While working with János and his friends I understood that genuine creativity does not involve only working harder and knowing more, but in fact working in a profoundly different way. Ever since then I have been aspiring to internalize the way of working that János showed me, and looking for ways to integrate it in education.

My *information design* work may be considered as an experiment which tests the ability of the academic community to accommodate new directions in research. This 'experiment' is well designed, because the goal to bring *informing* closer to its purpose is rationally justifiable, and at the same time in contrast with the traditional academic approach and values. I have recently made the results of my 'experiment' available to the Norwegian Research Council, which is undergoing reorganization [85].

I owe the main insights which brought me to *information design,* however, not to my academic teachers, but to the non-academic ones. I have been fortunate to study under three exceptional teachers from three distinct cultural traditions: martial arts under late Grandmaster Sang Kyu Shim, former President of the World Martial Arts Association; Sufism under Dr. Javad Nurbakhsh, who has been both the Master of the Nimatullahi Sufi Order and a researcher psychiatrist; and Qigong under Master Li Jun Feng, the current President of the International Sheng Zhen Society and former President of the International Medical Qigong Association. I approached these studies not as a believer but as a scientist, perceiving similarities between the three traditions, anticipating certain underlying principles and testing them through my own practice. As a result I experienced a radical improvement of my psycho-physical condition. I saw my practice metaphorically as travel to distant lands and places by using a time machine, where the 'travel' consisted in developing certain ranges of experience or feeling (such as 'service', 'loyalty', 'unconditional love' and others) that are beyond what modernity normally offers. Observing profound changes in myself and in others, it was not difficult for me to see that a whole new phase of progress or evolution has become possible. My *information design* interest began as an attempt to communicate the relevant insights. *Information design* became the focus of my research when I understood that the obstacles our culture has to communication are no less fundamental than the insights it is unable to communicate.

Z. The Greenhouse project

Many projects have been mentioned. The reader may well have difficulty keeping track and seeing 'the read thread'. The Greenhouse project is a single project which unites them all and leaves room for many more.

The Greenhouse is an umbrella project under development. The mission of this project is to 'sprout' and grow new cultural impulses.

The greenhouse metaphor also stands for the *cultivation* of people.

The purpose of the Greenhouse project is to practice *cultural environmentalism.*

Since *information* is necessary for cultivation, *information design* stands as the foundation from which other projects can be launched.

The key strategic point is to first put *information design* into practice.

V. Conclusion

We have seen a number of unresolved issues and anomalies which point at the inadequacy of our present-day *informing.* The Polyscopic Modeling methodology is offered as a design prototype of an *informing* which is capable of resolving the anomalies and providing the required support for cultural renewal.

The fact that the Polyscopic Modeling methodology is *coherent* (i.e. that its constituting elements are consistent with one another) can easily be verified by using the provided description. *Coherence* is a natural consequence of *design* as approach, whose main advantage is that it allows us to *create* a coherently structured whole.

The fact that Polyscopic Modeling is radically different from our conventional *informing* is the result of developing the methodology on the premise that the purpose of *information* is to communicate culturally relevant experiences, rather than on presumed correspondence between information and 'reality'. Naturally, this approach allows us to secure that Polyscopic Modeling does fulfill its chosen purpose.

It is not difficult to verify that Polyscopic Modeling is *functional,* i.e. that it allows for resolving the information-related *anomalies.* The *high-level information* alone can make a large difference. By replacing some details and pointing at others, the *high-level information* can help us remedy the information overload. As from the top of the mountain we don't see the confusing details but the simple picture which gives us an overview and shows us where we need to go, the *high-level information* also promises to change our cultural vision to a simple, clear and functional one. Naturally, the new media can find a role in creating such functional 'reality' for us. This role is pointed at by various uses of *ideograms* in Polyscopic Modeling. The Polyscopic Modeling epistemology and criteria, coupled with suitable methods, offer a new *foundation* for information making which is broad, solid and democratic. *Scope design* is a direct remedy for both 'confining worldviews' and 'obsolete language'. Explicitly stated criteria, information about *information* and the focus on *implicit information* allow us to understand the subtle effects of information and to handle them consciously. Awareness of the purpose and relevance and of the subtle effects of *information* is offered as an antidote to sensationalism and attention grabbing. The *methodology* may naturally serve as a step towards developing a social contract which regulates the power of information. And *cultural environmentalism* is what *information design* is really all about.

In sum, the Polyscopic Modeling methodology shows that a *coherent* and *functional informing* can be *designed.*

The question remains whether such *informing* could also be developed spontaneously, i.e. through *tradition*? I believe that the difference between Polyscopic Modeling and our common *informing* suggests a negative answer to this question. Expecting that our *traditional informing* would eventually evolve to become something like Polyscopic Modeling would be like believing that successive improvements of the candle will eventually produce a light bulb.

Three kinds of criticism have been raised about this work.

The first and most common criticism is that the whole Polyscopic Modeling opus is theoretical and abstract and therefore not practically relevant. My answer is that the practical relevance of such (*high-level*) thinking and doing is one of the main points that are demonstrated by the Polyscopic Modeling opus. The Polyscopic Modeling methodology itself is a *high-level* sketch of an *informing*. While we may be unaccustomed to handling such basic entities as culture and informing on so high level of abstraction, the fact that (as we have just seen) this approach may mean the difference between *functional* and *dysfunctional informing,* or even between *functional* and *dysfunctional culture,* should be a convincing enough evidence of its relevance.

The second kind of criticism is usually expressed as the question: "What is really new here?" Edmund Husserl, a critic would add, wrote thousands of pages about the basic credo of Polyscopic Modeling that information depends on the point of view. Similar references can be found for most other claims. My answer is that *the whole thing* (the Polyscopic Modeling methodology) is new. The main contribution of the methodology is not in any detail, but in the way the details are selected and put together. A critique which separates the details from the whole is like pointing to the nuts and bolts in a new machine prototype and saying: "This has already been seen!"

The third kind of criticism is phrased as "You cannot do this!" For example, a critic would say that I cannot define *culture* because people already have an idea of what 'culture' means. My answer is "I can" and "I have to". *I can* because I am working within the Polyscopic Modeling methodology, whose *epistemology* and *approach* allow me to postulate the meaning of concepts. *I have to* because, as the described examples show, that is necessary in order to resolve the anomalies and arrive at a *functional informing*.

As it is the case with every new paradigm proposal, here too the new paradigm cannot be properly understood or evaluated from the terrain of the old one. When, on the other hand, one 'steps into' the Polyscopic Modeling scheme of things, the fact that this methodology sketch shows how our presently fragmented and messy *informing* puzzle can be put together again in a functional and orderly way becomes evident.

Even this claim is not essential. The whole Polyscopic Modeling methodology is only an academic prototype, whose main purpose is to show the value and the necessity of *information design* as approach. For developing real-life *information design*, both academically and in practice, a full spectrum of backgrounds and talents is needed. I hope that this article will provide a glimpse 'from the top of a mountain' of the fascinating variety of new directions and possibilities that *information design* has to offer. I would like to conclude

by inviting the reader to explore these possibilities and contribute to their development, by taking part in the *information design* initiative.

REFERENCES

[1] D. Karabeg, *Design Is The Alternative to Tradition*. Submitted to EAD6 conference.

[2] D. Karabeg, *Polyscopic Modeling Definition*. In Griffin at al (Ed.): The Turning of the Tide. Selected Readings of the IVLA, 2004.

[3] D. Karabeg, *Information for Conscious Choice*. Information Design Journal 11(2/3), Spring 2004.

[4] D. Karabeg, *Information Design Is The Key*. Poster and lecture on Visions Of Sustainable World conference, Milano, Italy, December 2003. The text of this lecture is available at www.holiscope.org.

[5] D. Karabeg, *Information Design – A New Paradigm In Creation And Use Of Information.* Proc. IPSI conference Sveti Stefan, Monte Negro, October 2003.

[6] D. Karabeg, *Designing Information Design*. Information Design Journal, vol. 11(1), Fall 2003.

[7] D. Karabeg, *Perspective of Visual Literacy*. In *Visual Literacy in Message Design*, R. Griffin et al. Ed. International Visual Literacy Association, 2002.

[8] D. Karabeg, *XML Technologies, Value-based Marketing, Franchising and the New Paradigm in Business*. Proc. SSGRR-2002S conference, L'Aquila, Italy, July/August 2002.

[9] D. Karabeg, *Addiction Pattern*. In *Exploring the Visual Future: Art Design, Science & Technology*, R. Griffin et al. Ed. `International Visual Literacy Association, 2001.

[10] D. Karabeg, *Information for Conscious Choice and Conscious Choice of Information.* Poster and lecture. International Visual Literacy Association Conference, 7-11 November 2001, Eskilstuna, Sweden.

[11] D. Karabeg, *User Manuals with Views*. Expert Forum on User Manual Design, 6-8 November 2000, Eskilstuna, Sweden.

[12] D. Karabeg, *Ideograms in Polyscopic Modeling*. Proceedings of the IEEE Infovision2000 conference, London, England, July 19-21, 2000.

[13] D. Karabeg, *Two-step Marketing*. Infodesign2000 conference, Coventry, England, July 10-11, 2000.

[14] Dino Karabeg, *Definitions of 'culture', 'information', 'design' and 'information design'* . International Institute for Information Design, Online Dictionary of Information Design Terms. Tokyo, Oct. 1999. http://www.visionplus7.com/DICTIONARY

[15] Dino Karabeg, *Prospectus for Polyscopic Modeling*. In Aerts et al.(Ed.): "World Views and the Problem of Synthesis." Kluwer, 1999.

[16] D. Karabeg, *Polyscopic Study of a Basic Cultural Pattern*. In *World Views and the Problem of Synthesis*,, Aaerts et al. Ed. Kluwer, 1999.

[17] D. Karabeg, *Information Design Challenge*. International Visual Literacy Association Symposium, Eskilstuna, Sweden, November 10-14, 1999.

[18] Dino Karabeg, *Role of Ideograms in Polyscopic Modeling*. International Visual Sociology Conference, Antwerp, July 1999. Journal article in preparation.

[19] D. Karabeg, What's *Gong On? A Cultural Paradigm Change.* Book manuscript.

[20] D. Karabeg, *Convenience Paradox.* Book project .

[21] D. Karabeg, *Addiction, Religion..* Book project .

[22] D. Karabeg, *Polyscopy*. (Subtitle: *We can come out of the information jungle by climbing to the top of the mountain*.) Book manuscript in preparation.

[23] D. Karabeg, *A Polyscopic Autobiography*. Book project.

[24] UC Berkeley Information Overload Project website, http://www.sims.berkeley.edu/research/projects/how-much-info/

[25] R.S. Wurman, *Information Anxiety 2.* QUE, 2001.

[26] N. Postman, *Informing Ourselves To Death.* Keynote speech at German Informatics Society conference, Stuttgart, October 11, 1990.

[27] T. Kuhn, *The Structure of Scientific Revolutions*. Univ. of Chicago Press, 1962.

[28] Piaget *The Construction of Reality in the Child.* Basic Books, 1954.

[29] P. Watzlavick (Ed.), *The Invented Reality.* W.W. Norton & Co., 1984.

[30] P. Watzlavick, *How Real is Real?* Random House, 1976.

[31] P. Berger and T. Luckmann, *The Social Construction of Reality.* Doubleday 1967.

[32] Einstein, *Remarks on Bertrand Russel's Theory of Knowledge.* From P. Schilpp (Ed.) The Library of Living Philosophers Vol. V. 1944.

[33] J. R. Oppenheimer: *Uncommon Sense.* Ch. 5 in Atom and Void, Essays on Science and Community. Princeton University Press, 1989.

[34] R. P. Richter: Notes on "U. Beck, A. Giddens and S. Lash, *Reflexivity: The modern* world *turns back on itself*." 2003. http://webpages.ursinus.edu/rrichter/becketal.htm

[35] M. McLuhan and Q. Fiore, *The Medium Is The Massage.* HardWired, San Francisco, 1996.

[36] B. Adam, U. Beck and J. vanLoon (Ed.), *The Risk Society And Beyond.* Sage, 2000.

[37] W. Heisenberg, *Physics and Philosophy*. Harper, 1962.

[38] http://users.ox.ac.uk/~shil0124/serious/paranormal.html.

[39] A. Damasio, *Descartes' Error.* Avon, 1995.

[40] H. Gardner, M. Csikszentmihalyi and M. Damon, *The Good Work. When Excellence and Ethics Meet.* Basic Books, 2001.

[41] B. Latour, *We Have Never Been Modern.* Harvester, 1993.

[42] D. Meadows et al., *The Limits To Growth. A report for the Club of Rome Project on the Predict of Mankind.* Universe Books, 1989.

[43] A. Giddens, *Living In Post-Traditional Society.* In Reflexive Modernization, ed. U Beck, A Giddens, Scott Lash. Cambridge: Polity Press, 1994.

[44] K. Sale, *The Five Facets of a Myth. http://www.primitivism.com/facets-myth.htm*

[45] W. Price, *Nutrition and Physical Degeneration.* 6th Ed., Keats 1997. First published in 1939.

[46] W. Kollath, *Civilization-induced Diseases and Death Caus.* (In German). Haug, 1962.
[47] http://healthy-living.org/html/what_a_choice_.html
[48] M. Csikszentmihalyi, *The Evolving Self. A Psychology For The Third Millennium.* Harper Collins, 1993.
[49] F. Capra, *A Systems View of the New Paradigm.* In M. Ray, A. Rinzler (Ed.), *The New Paradigm In Business*. New York: Putnam, 1993.
[50] Zygmunt Bauman. *Culture as Praxis*. SAGE publications, 2nd Ed.
[51] D. Goleman, *Emotional Intelligence.* Bloomsbury, 1996.
[52] J. LeDoux, *The Emotional Brain*. Touchstone, 1998.
[53] A. Koestler, *The Ghost in the Machine.* London : Hutchinson, c1967.
[54] F.M. Alexander (E. Maisel, Ed.): *The Alexander Technique.* London: Thames and Hudson, 1974.
[55] M. Feldenkrais: *Action, Inhibition and Fatigue.* Ch. 10 in *The Potent Self. A Guide to Spontaneity.* Harper, 1992.
[56] E. Herrigel, *Zen in the art of archery.* Pantheon, 1953
[57] J. Stevens: *Abundant Peace. The biography of Morihei Ueshiba founder of Aikido.* Shambhala, 1987.
[58] B. Latour, *Science in Action.* Harvard, 1987.
[59] Ulrich Beck: *What is globalization?* Polity Press, 2000..
[60] Manuel Castells: *The Rise of the Network Society. The Information Age: Economy, Society and Culture. Volume 1.* Blackwell, 1996.
[61] Manuel Castells: *Information Technology and Global Capitalism.* In Will Hutton and Anthony Giddens (Ed.): *On the Edge. Living with Global Capitalism.* Pp. 56-57.
[62] Z. Baumann, *Modernity and the Holocaust.* Cambridge: Polity Press, 1989.
[63] A. Karabeg, M.N. Akkøk, R Towards a Language for Talking about Information Visualization Aimed at Presentation on the Web. Proc. Information Visualization, London 2004.
[64] A. Karabeg, M.N. Akkøk 2. Visual Representations and the Web. Submitted to IVLA Selected Readings 2004.
[65] A. Karabeg, D. Karabeg *Language and principles for successful web design.* Project proposal, U.O. 2004.
[66] D. Karabeg, R. Djurhuus: Lectures in Algorithm Theory. Kompendium 50 A and B. University of Oslo, 1999.
[67] R. Guescini, D. Karabeg, *ID flexible learning project proposal.* U. O. Spring 2004.
[68] D. Karabeg, *Infornetics curriculum proposal.* U.O. January 2002.
[69] U. Beck, *What Is Globalization?*
[70] D. Karabeg, *Socio-culturally sensitive e-business.* Unpublished manuscript.
[71] D. Karabeg et al. *Authentic Norway Project.* Project proposal 2003.
[72] D. Karabeg, *Authentic Norway Project. Idea sketch, 2000.*
[73] D. Karabeg, *UTEA franchise business plan.* Oslo Venture Cup Competition, Spring, 2003.
[74] D. Karabeg, *Eventyrhotellene Internet Portal*. Project proposal, 2001.
[75] D. Karabeg, *Authentic Mostar Project.* Mostar 2004 International Workshop, Mostar, BH, 2001.
[76] D. Karabeg, *Mostar 2014.* Project outline, Fall 2003.
[77] D. Karabeg, *Lokrum Project.* Mostar 2004 International Workshop, Mostar, BH, 2001.
[78] K. Friedman and D. Karabeg: The Information Design conference and course series proposal. Draft, June 2003.
[79] Karel van der Waarde, *Personal communication.*
[80] D. Karabeg, G. Tellnes and A. Karabeg, *NaCuHeal Information Design in Public Health.* Michael Journal, to appear.
[81] W. Fagerheim, D. Karabeg and B. K. Nielsen, *The Polyscopic Foresight Project.* Project proposal, Spring 2004.
[82] D. Karabeg and B. K. Nielsen, *Conscious Choice of Information.* Project proposal, Spring 2004.
[83] D. Karabeg, *Movement and Qi.* Class brochure, 1999.
[84] D. Karabeg , A. Kittelsen and B. K. Nielsen, *The Rumi in Oslo,* project proposal.
[85] D. Karabeg, *Letter to Norwegian Research Council. August, 2004.*

Dino Karabeg has a doctorate in computer science/algorithm theory from the University of California at San Diego. Since 1992 he is an Associate Professor at the Department of Informatics, University of Oslo, where he is developing a system of results and ideas about information and culture under the common name 'information design by polyscopic modeling.'