

THE “COMPLIANCE PROGRAMS” AS AN ALTERNATIVE TO BUSINESS MANAGEMENT TO DEAL WITH THE RIGHT TO CONSUMER INFORMATION AND WITH THE RISKS BROUGHT BY NANOTECHNOLOGY

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ABSTRACT

The current essay aims at investigating the possibilities to develop “compliance programs” in Law, from the guidelines derived from the Business Area, through the dialogue between the Sources of Law, focused on the effectiveness of the right of the consumer for information about nano products. The work will be developed using the structuralist method, drawn from Niklas Luhmann. It is expected to bring to Law the preventive attitude and ethical concern, characteristics of *compliance programs*, considering the absence of specific regulation for nanotechnology. From Luhmann's contributions it is feasible the development and construction of compliance programs, especially decision programs, which can redeem the return of feelings in decisions involving the risks of the products produced at the nano scale, respecting the right of the consumer for information.

Keywords: Nanotechnology; Right to Information; Consumer Law; risks; Compliance programs.

1. INTRODUCTION

Nanotechnology is presented as a new and revolutionary set of technologies, operating in an ever-existing scale in nature, which was only made available to humans from the end of the twentieth century, due to the development of equipments able to glimpse the order of a billionth of a meter.

On one hand, in this order of magnitude, the physicochemical properties of things suffer considerable changes, such as higher electrical conductivity, increase of the resistance of materials (the smaller the surface is, larger is the concentration of atoms and molecules in the surface layer), new results on the interaction of materials with the environment and with humans, causing still unknown toxic effects: the material which in a larger scale is stable, insulating and opaque, at the nanoscale may be reactive, conductive and transparent. On the other hand, the financial possibilities of these applications are almost endless and can provide an unprecedented economic development in human history. There is the challenge that nanotechnology is bringing to contemporary society: economic gains and the possibility of attending human needs show to be almost unlimited, but with the enhancement of invisible and incalculable risks that could destroy the Earth, making the very continuity of life unfeasible.

This is the crossroad that is drawn to Law and to other areas of knowledge involved with Nano-techno-scientific Revolution, which is to find safe and responsible alternatives to deal with the present-future of life of all living beings on the Earth, allowing the healthy use of scientific contributions produced by human intelligence.

Everyone ends up being a consumer of “nano products”. However, only a small portion of these “everyone” knows something about nanotechnology. Therefore, there is an important space for the alignment of the contours of the so called “right to information”. The implementation of this right passes, necessarily, by a renewed posture of businessmen, who manufacture products based on the nano scale. Thus, the *compliance programs* can be a business management strategy focused on attending the current legal set in Brazil and abroad, in particular the principles and constitutional rules, consumerist and those derived from the Treaties related to the Human Rights. So, in the current business scenario, a responsible precautionary approach, focused on the fulfillment of the legal rules concerned with the health and safety of human beings, even if they are not directed to the “nano world” should be highlighted.

In this scenario, the article aims to confront the following problem: will the *compliance programs*, if appropriated by the Law System, be able to equate the exercise of the consumer right to information with a business approach focused on managing risks that could emerge from the results of nanotechnology? To methodologically support this research it is used the functional analysis, proposed by Niklas Luhmann, considering that it “[...] uses the process of relating in order to understand the existing as contingent, and the distinguishing as comparable [...]”. That is, “the relationship between problem and solution of the problem is not regarded here as an end in itself; but it serves as a guideline of the question for other possibilities, as a guideline in the search for functional equivalence” (LUHMANN, 1990, p. 131-2). It is in the systemic-functionalist perspective that the article seeks to establish this link between the problem and a solution to be built by the constructivist bias, notably by the observation of the regulatory frameworks able to cope with the challenges introduced by nanotechnology. It is already known that the regulatory activity, characteristic of the Legislature, within the State, and the normative scope of the compliance programs are not equal, but functionally equivalent. This will only be possible from the moment when the borders, which are strongly embedded on the construction of the legal by legal positivism, with emphasis on the legalistic line, are opened.

Within this composition, Luhmann refers: “in this sense, the functional method is, ultimately, a comparative method, and its introduction in reality serves to open the existing to other possibilities”. It is in this space that are located two probabilities: “[...] the functional analysis can clarify structures and ‘latent’ functions; [...] on the other hand, [it] lays the known and familiar, which means, the ‘manifest’ features (the purposes) and structures, in the context of other possibilities” (LUHMANN, 1990, p. 134 and 140). The problem presented above is flanked by latency and contingency to the extent that several forwarding possibilities are opened, pointing to uncertainty, or “[...] in the form of a plurality of criteria, which may not be all satisfied in the best way, at the same time” (LUHMANN, 2010, p. 301). The scenario brought by nanotechnology settles in this characterization of uncertainty, opening up through the systems theory a creative and sophisticated alternative option to the observation of new structures and functions from the Law System, through the communication between the Science System and the Management System. There is one of the main objectives of this article.

2. MYTHS AND TRUTHS ABOUT NANOTECHNOLOGY¹

Considering the novelty and curiosity brought by nanotechnology, besides the interfaces with the various areas of human knowledge, there is a growing perspective for the emergence of myths on the subject. For some, through research and work at the nanoscale it will be possible to create many new and unknown things in the present days of this early twenty-first century. To others, there are not many changes, considering the nanoscale as just one more alternative to the creation and development of things, without bringing deeper structural innovations.

The confrontation of these two faces of the problem will start from the concept of nanotechnology presented by the Technical Committee 229 (TC 229, acronym in English) of the ISO (International Organization for Standardization): it is the understanding and manipulation of matter, especially, but not exclusively, under 100 nanometers (100nm), at least at one of the examined surfaces. The other feature, which seems to point to something very different, is the change of the physical-chemical characteristics that the particles may present when manipulated in this size dimension.

In the characterization of nanomaterials, which means, of the materials created at the nanoscale and from human intervention, two characteristics are observed: a) the smaller the surface area, the bigger the concentration of atoms on this surface; b) the quantum effect: at the nano scale, the connection between the atoms is different because there is the presence of shared orbital energy levels, producing changes in electrical, magnetic, thermal, mechanical, chemical, and optical properties (GRAY, 2012, p. 17). These two features indicate a set of novelties brought by nanotechnologies. Why to use the term in the plural? This is a varied set of technologies that enable the research and the production of objects at the nanoscale. Its use may be present in the cosmetics industry, medicine, food, and clothing, among others.

Therewith, it is also drawn another area of knowledge that is nanotoxicology, that is, “the toxicological effects of nanoparticles are complex and involve a variety of factors, including physical and chemical characteristics, cell particles interactions, routes and levels of exposure, biokinetics, logistics and other considerations” (PLEUS, 2013, p. 81. Our translation). It is an area that is arising, but that should be developed quickly, as it will be responsible for predicting the toxicological effects of the interactions between nanoparticles, the environment and human beings. It is from nanotoxicology that it will be possible to evaluate and develop risk management courses in laboratories, industries, consumer market and in the environment.

A statement that is produced in relation to nanoparticles and that can be cataloged as a myth, taking into consideration the aspects examined, presents itself this way: “in many cases, nanomaterials are not new materials; they are just smaller versions of greater width materials already in use and considered safe in non-nano forms or combinations” (GRAY, 2012, p. 46. Our translation). The reference to “myth” here intends to signify the absence of objective or scientific foundation, because, by the explained characteristics, it seems to be clear that this is not just a matter of size. The issue is much more sophisticated, because at the “nanoscale the behavior of atoms is dictated by different laws of physics, which is, quantum mechanics” (GRAY, 2012, 46. Our translation). The paradigm shift of “Newtonian mechanics” to “quantum mechanics” seems that has not yet been

¹Title adapted from: GRAY, Kimberly A. Five Myths about Nanotechnology in the Current Public Policy Debate: a Science and Engineering Perspective. IN: DANA, David A. (Edit.). The Nanotechnology Challenge: creating legal Institutions for uncertain risks. New York: Cambridge University Press, 2012. p. 11-60.

perceived by many scientists and that is a meaningful “detail” in the analysis of materials prepared from the nanoscale².

Another aspect to be used to refute the referred myth is found circumscribed to the following delineation:

Nanomaterials are new chemical products, due to its unique combination of atoms, the location (which is, on the surface) and linking patterns of its constituent atoms are fundamentally different from in bulk materials [in a larger scale], consisting of the same (although in higher number) atoms. Nanomaterials are new [due to] its structure and atomic and molecular function and not because they are composed of newly discovered elements (GRAY, 2012, p. 46-7. Our translation).

The “newness” of nanomaterials needs to be observed by the right perspective, because it crosses the common notion of something that was recently discovered. It is the entrance into a “new world” for human beings, where the constitutive characteristics of the materials are unknown. Because of this, Law, from the moment it is cognitively opened to communicate with the areas of knowledge in which these materials are already being studied, will be able to formulate regulatory frameworks or adequately adapt existing ones to the various developments that this theme will yet promote in society. Anyway, Éric Gaffet, who is a pioneer in France in the study of toxicology of engineered nanoparticles, highlights the difficulty of studying these particles because their unique properties vary according to the manner of its usage and the stages of their life cycle. For this reason, prudence is a necessary element in this area (NANOMÉDECINE, 2013, p. 93).

These issues gain importance, especially for the consumer, when analyzing the contents of a text written by David Biello, published in Scientific American Brazil, in June 2013 (p. 11), with the following title: “Nibbles. Doughnuts sprinkled with nano powder? Yuck. Will they be harmful to health?”. In the text there is more: “food companies have been interested in using nanotechnology to enhance flavors and make the creamiest products without adding fat”. The use of nanotechnology, in this case, does not seem to be concerned with the physical and chemical issues before studied. What is really significant is adding new features to the product, besides the increase of the value in its marketing. In the analysis of the text it can also be emphasized that there were found “titanium dioxide nanoparticles of less than 10 nanometers in diameter, on the icing sugar coverage on doughnuts from Dunkin’ Donuts and the now extinct Hostess Brands”. This finding was conducted by the environmental health group As You Sow, from the analysis of doughnuts in an independent laboratory.

² “In Newtonian mechanics, which was consecrated as a classic paradigm of empirical-formal rationality, the macroscopic physical world, space, time and matter of the universe are treated separately, independently and deterministically. The absolute Newtonian view is based on the non-reciprocity of the principle of cause and effect. The relativistic mechanics formulated by Einstein and the quantum mechanics formulated by Plank deeply re-dimensioned our understanding of the physical world according to classical Newtonian mechanics. At the microscopic subatomic world, space, time and matter are interactive, complementary and switchable. According to Heisenberg’s principle of uncertainty, the position and momentum of a particle cannot be known simultaneously. The principle of complementarity of Niels Bohr demonstrates the complementarity of wave and particle in the interpretation of the electron. It is not possible to observe both aspects, wave and particle, simultaneously: they are perceived separately. Together, however, complementarily present, they give a more complete description than any of them taken alone. If we want to know what is essential, we must stop thinking of the world just as consisting of isolated pieces and begin to regard them as an interrelated whole” (AQUINO, 2013, p. 6-8).

There is a necessary classification of nanomaterials: a) engineered nanomaterials or nanoparticles, which mean, produced by human beings from the manipulation of matter at the nanoscale; b) nanoparticles produced unintentionally, but as a result of a diverse process that has generated particles at the nanoscale and by human action; c) nanoscopic material as the one that has always existed in nature, that is, not made by human intervention.

In the case of titanium dioxide nanoparticles found on the doughnut icing sugar, a double possibility can be located, conjugated or separately derived from the manufacturing process: the manufacturing company may be adding these particles, intentionally, in order to achieve certain special features, or the nanoparticles accidentally fall into the coverage of doughnuts as “result of a milling process used in the sugar powder mixture”. In either situation it is necessary to ask: who is responsible, now or in the future, for any unknown risks to human and environmental health, from the moment that these particles are ingested or enter the environment, through the disposal of the packaging, washing process of industrial tools or human excrement?

THE IMPORTANCE AND TOPICALITY OF ART. 31, FROM CPC, AND ITS REQUIRED INSERTION INTO THE DIALOGUE BETWEEN THE SOURCES OF LAW TO ENABLE PROPER INFORMATION ON NANO PRODUCTS

Considering the effects of the issue before seen, it is highlighted the importance of the flow of information on nanotechnology that is being used in the manufacture of various products. Society has a fundamental right to know the composition of the products that are on the market. It is a prerequisite for the exercise of other right, which is, the right to choose. The Consumer Protection Code (CPC), through his art. 31³, establishes a number of requirements that should be observed when the products are released for sale. This legal device carries within it an effective characterization of elements necessary to know the purchased product. However, it is not enough. The information should be accompanied by education. It is not enough to put a lot of information on the label or on the advertising of the product. It will be necessary to educate the consumer to read and interpret, know and understand its contents (ENGELMANN, CHERUTTI, 2013). The full exercise of the right to information, which belongs to the consumer, depends on a preliminary point: the practice of the information duty, which belongs to the manufacturer and marketer. So, there is a reciprocity and complementarity between rights and duties, which assume particular importance in the case of nanotechnology.

According to Paulo Luiz Netto Lobo, “the duty to inform is fulfilled when the information received by the typical consumer completes the suitability, sufficiency and accuracy requirements. The requirements should be interconnected. The absence of any of them implies in noncompliance of the duty to inform” (2011, p. 605). Everything indicates that there is no exaggeration in this composition of the duty to inform, because who is in the origin of the production knows — or at least should know — the product composition, besides specifying their risks and taking responsibility for its management. As far as possible, ensuring the industrial secret, the content of the information must be available to the recipient — the consumer — in a clear and understandable way. Going one

³ “The offer and presentation of products or services shall ensure information that are correct, clear, accurate, visible and in Portuguese language on their characteristics, quality, quantity, composition, price, warranty, validity and origin, among other data, as well as the risks posed to health and to the safety of consumers”.

step further: the manufacturer should think about ways to teach the consumer to make the best choice of product.

Moreover, the right to information is not only set as an infra-constitutional right, but as one of the consumers rights, rooted in the public interest, considering that “[...] its organization is co-involved with inevitable inserts under the Constitutional Public Law, because the consumer relations are necessarily trans individual, as they radiate effects beyond the specific subjects of the purchase or use of a determinate product to reach all who are affected by them, by act or power” (LÔBO, 2011, p. 596). Consumer rights are a legal category that expresses the genuine constitutionalization of Private Law. A set of relations that emerge in the private field, which receive the public mantle of the Constitution, when the protection and defense of the consumer are hoisted to the fundamental rights and integrant rights of the state economic order. Because of these contours, it is unacceptable, for example, that there are sold “doughnuts” with a cover that contains titanium dioxide nanoparticles without the manufacturer’s explanation about its origin — if accidental or intentional.

Risk management permeates the right to information and the duty to inform. It is worth asking: who does this management? To whom is it made? How can this management be done? “In fact, there is no problem in managing risks, even life-threatening. What the individual does not accept is that a risk of damage to him is managed by others without his proper knowledge and complete understanding” (HARTMANN, 2011, p. 544). This is the point: through nanotechnology there are developed new products, with particles with unknown physicochemical characteristics, but that are added without any control, subjecting consumers to incalculable risks.

In the case of the aforementioned article 31 of the CPC, there is an express reference to the obligation to inform the risks that the product can generate in relation to health and safety of consumers. There has been a failure in communication among Law Systems, Economy and Science. This last, Science, should seek subsidies so that the Law System can decide, observing the guidelines coming from the Economic System. There is a marked uncertainty, previously defined for the purposes of this work, in all Social Systems that are required to operate with nanotechnology. In the case of the Law System, this situation is characterized by the inadequacy of the consumerist legislative formulation related to the right to information. Products containing nanoparticles are coming to the market, but consumers are not getting appropriate information to enable them to democratically exercise the right to buy or not to buy.

The introduced scene reveals the insufficiency of the text of law to manage information, both from the perspective of law, and by the side of duty, since it is about ethical, legal and social aspects. To the Law System, from the need to operate with the multiplicity of actors working on normative production, it is generated one of the basic values of postmodernity, according to Erik Jayme, which is pluralism. “In the language of Law pluralism means to have available alternatives, options, possibilities” (JAYME, 1999, p. 29). Taking into consideration that Law is not able, momentarily, to regulate the subject of nanotechnology, aspect which is also present in the Consumer Protection Code, new possibilities are drawn, from the legal pluralism, to achieve the dialogue among the sources of Law.

The renewal of the Theory of Sources of Law and how they relate to each other, integrates an attempt to approach the Law and its responses / communications to other Social Systems and to

seek alternatives for the outlining of the legal through a more flexible and adaptable framework. Because of this, it has been proposed the replacement of the pyramid structure of organization of the sources, where there is a strong hierarchical and vertical trend, by a horizontally disposed organization. And more: the displacement of the Federal Constitution, from the pyramid apex to the horizontal construction center (whether in circles, rings or side by side) of conditioning of the Sources of Law. It will continue to be essential to the legitimacy of the legal response. All of them must go through the constitutional filter, where it will be located the effective center of conformation of factual support. It will not be preceding, as Pontes de Miranda advocated in his Theory of Legal Fact, but concomitant by the adequacy to rules and to constitutional principles.

Here it is adopted the perspective of the Constitution drawn by Marcelo Neves, “although the Constitution can be seen as the structural coupling between Law and Politics or as a mechanism of transverse rationality between these systems, it acts, by the Law point of view, as the broader reflective mechanism of the legal system” (NEVES, 2013, p. 116). There is the role that the Constitution represents in relation to the Law System and in structuring the dialogue between the sources, horizontalizing the constitutionalization of standards and answers drawn from this more fluid process.

In the case of nanotechnology, it is highlighted the need for a more flexible relationship between the sources of Law, moving them from a hierarchical structure, where one does not see the production of the others, to a shared and complementary situation of proximity. To deal with the necessity to create legal responses, from non-existent factual supports in the current regulatory framework, is that the horizontal arrangement shows to be appropriate. There is no hierarchy, but the passage by the constitutional filter is needed. Furthermore, to ensure an effective appreciation of international legal sources, concurrently with this filter is installed the conventionality filter. That is, the constructed response should still be aligned with the international standards on Human Rights and meet legal decisions already produced by International Courts of Human Rights, being regional or global.

This second dialogue bias has become necessary given the current interest in the “global legal space”. That is, nanotechnology, although not produced in Brazil, arrives here through the various import channels. The risks that these technologies may generate equally will not be restricted to territorial spaces of States. They will easily gain international proportions. At the same time, another phenomenon appears: until recently the States were the only actors on the international scenario. Currently, this space is already divided with large transnational corporations and international organizations, such as the UN, the ISO and the OCDE. As this international scenario does not have a constitution, it seems necessary to develop a regulatory system that is able to sort and organize this new “international society”, where there is not seen an ordering center, but an “aggregation of general and sectorial organizations, fragmented, incomplete and asymmetric” (CASSESE, 2006, p.13-31). This multifaceted space interacts with the space of internal regulations creation of its participants, where it is difficult to find a consensus. Therefore, the role of Law will be fundamental. There should be a link or a bridge that can approach the various systems involved, promoting a normative movement able to meet and respect differences. There is the space for Human Rights as a transversal member between local and global and vice versa.

This proposal, which is still under construction, seeks to broad the spectrum of legal production space, opposing to legal positivism, notably the one of legalistic nature. The foundations of this legal

paradigm are under constant aftershocks, showing signs of inadequacy, although it (the paradigm) is still very present in the practice of building rules. It seems to be an inevitable move, because the legal scenario raised in the core of legal positivism advocated the need for certainty and security, without a real concern with the world of life. The proposition here presented, however, wants to be tied to the new, to the not predictable, to the challenge of creative originality. So, instead of those characteristics of legal positivism, it is sought to increase the effectiveness, the adequacy of the answers to the questions formulated by the new nanotechnologies (ENGELMANN, 2013, p. 260). Such profound changes in the Law System are urgent and necessary in order to facilitate their dialogue with other Systems, especially the Science System, with a focus on addressing the possible risks that may come along with the enlargement of Nanotechnological Revolution.

THE ROLE OF COMPLIANCE PROGRAMS IN ORGANIZATIONS THAT DEVELOP PRODUCTS BASED ON THE NANO SCALE, AS CONDITION OF POSSIBILITY TO THE IMPLEMENTATION OF THE CONSUMER RIGHT TO INFORMATION

Society seems to be a great laboratory for various tests with new technology. With nanotechnology it is not different; just remember the aforementioned marketing of “doughnuts which coverage with icing sugar contained titanium dioxide nanoparticles”. This scenario shows the “risk” that all members of society are exposed to, and often without knowing or suspecting of. The risk here is understood as the result of decisions made. Therefore, risk and decision go together, considering the perspective of Niklas Luhmann: “[...] it is about decisions to which time is connected, although it is not possible to know enough about the future, even the future produced by our own decisions” (LUHMANN, 1992, p. 55). There is a paradoxical relation between risk and decision and their interfaces with time. It is played with the future, without knowing it, but the decisions are reported on it (the future). There is the risk in its genuine form, brought by nanotechnology, considering the almost absolute unawareness of the impacts that the decisions on them will bring.

In Figure 1 are found various forms of risk and a place where their management may act, both preventively and precautionarily:

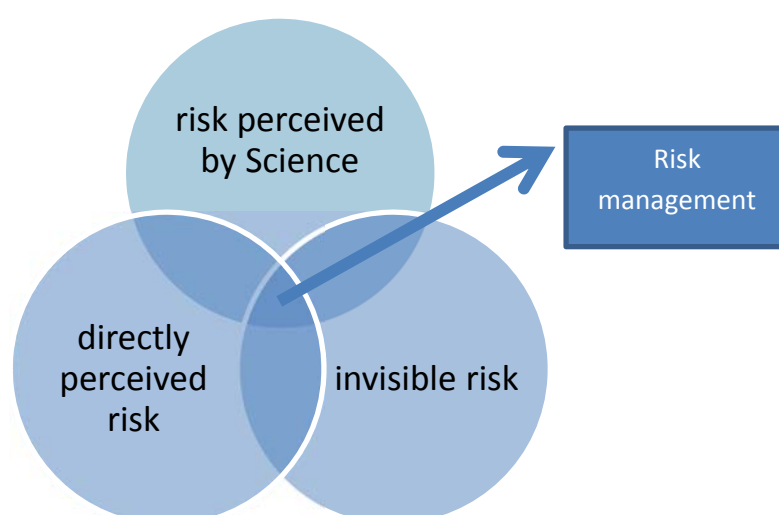


Figure 1: Several forms of risk and place of risk management acting. Source: adapted from ADAMS, 2009, p. 15.

These various forms of risk perception evidence the following features: there is a group where you can enter the daily view of risk, from the various actions and decisions made by humans. Those are the decisions arising from the experience, common of Aristotle's *phrónimos*. They may have an impact in the future, but the consequences are able to be measured by the authors involved. The risk perceived by science is undergoing a profound transformation, from the entry of possibilities brought by nanotechnology. Science that has always been categorized as a field that produced certainties and accurate answers is challenged by the unpredictability and uncertainty of their responses, precisely because of the emergence of invisible risks, brought from the nanoscale.

Here it is possible to enter the reflections of Mireille Delmas-Marty, notably in relation to future damage, involving future generations of humans and non-humans, in order to include all living beings in the pursuit of durable development, where prevention is replaced by caution. And more: it will be necessary to build connections between three paradigms, which are, solidarity, security and responsibility. A possibility to denominate precaution as anticipation is created. And there will be the possibility of communication with the present-future. Anticipate is to act before the event, from a risk analysis through the use of indicators, which opens space for risk management at the nanoscale, an environment of great uncertainty. The great line that goes through all these perspectives can be summarized as follows: it will be necessary to learn to endure and to grow in an unpredictable scenario (DELMAS-MARTY, 2013, 184-93).

The management of risks generated in / by the Nanotechnology Age needs to be perceived by the Law System from the contributions made by the Management System. The nanoscale opens an unprecedented opportunity for the exercise of transdisciplinarity, through the breaking of barriers that still separate the various areas of knowledge. The legal structuring of *compliance programs* is underpinned by the three paradigms presented above, because "it has never been required such a conduct of integrity and responsibility from the organizations as in the present times, [...]". How was this modification done? It started from "the largest circulation of information and caused an increase in transparency of organizations and, hence, the expectations of society in relation to their ethical commitment" (COIMBRA; MANZI, 2010, p XI). There is a return to certain values of human culture that seemed to be forgotten in this early twenty-first century. However, at the intersection between Law and Management it will be possible to build a scenario of "return to feeling" in the language of Erik Jayme, precisely to renew the Theory of Sources of Law, opening it to new possibilities and tools seeking to address the challenges of invisible and unpredictable nanotechnology.

In the case of the presumable new rights and duties generated at the nanoscale, the voluntary compliance of the existing legal framework, although not directly applicable, given its unpredictability, is a business model that can "[...] avoid the imposition of a penalty by the institutionalization of a true and effective culture of fidelity to Law" (DÍEZ, 2013, p. 9), bringing to the internal part of organizations the dialogue between the sources of Law, producing normative indicators from civil, criminal, business and administrative law, combined with international norms originated from the ISO and OECD and permeated by the concern about the rules and constitutional principles and respect for Human Rights. The latter here are understood as the respect for human beings and for other living beings and the preservation of the environment. Although there is no obligation to create these programs for research, production and marketing of products generated

from nanotechnology, it is worth noting that in this particular scenario lies the ethical and solidary perspective that will distinguish the organizations henceforth.

There is a privileged space for the formation of an “organizational culture”, which is “[...] the result of the analysis of the tasks and their practice transformation. The system itself is called ‘business’”. It is in this context that the “decision programs” are inserted as “[...] the conditions of objectual righteousness of decisions”, generated from the tradition raised by the context and fostering the support to the so-called “social acceptance” (LUHMANN, 2010, p. 299-300). It is in this scenario that the ethical commitment of the organization is projected, considering that “[...] it increases the quality and speed of regulatory interpretations, improving the relationship with regulators”. And more: “[...] *compliance* preserves the civil and criminal liability of owners, directors and executives, as it reduces and prevents administration errors” (COIMBRA; MANZI, 2010, p 6-7). The fulfillment of standards and legal and / or constitutional principles enters the routine of the organization, and their compliance is a positive element that favors the social acceptance of the organization. The programs of compliance of legal rules are fundamental for the management of nanotechnology risks, because the acting is anticipatory, with strong precautionary features. The perspective of the organization passes from a private scenario to a “complicity” in the composition of public space where this complicity and its results — positive or negative — are inserted.

The decision programs, accommodated in a broader category of compliance programs, are especially suitable for evaluating complex projects, inserted in uncertainty. And here are located the projects involving nanotechnology. The design proposed here is not tied to the complete banishment of errors. On the contrary, decision programs, within the compliance programs, should be prepared to deal with the “normal accidents”. In the set of “organizational systems”, understood as non-trivial self-referential systems, it is possible to find a plurality of *Inputs*, as the examples given by Luhmann, “the raw materials market, the supply markets, the credit market, and the labor market”. But there is also a “plurality of possible *outputs* (for distribution markets, to which decisions should be dictated)” (LUHMANN, 2010, p. 303-4). These issues generate an incalculable complexity, which is a remarkable feature is the set of nanotechnologies.

To organize the program decisions, it is essential to establish the limits of *Inputs* and *Outputs*. So Luhmann mentions: “we will call conditional programs, the programs oriented primarily to the Input and end programs, the programs primarily oriented to the *Output*”. In order to implement these forms of program, Luhmann introduces an artificial distinction, which is not pre-existing, but that should be “built in the system itself and should be performed by binding through decisions”. The decision programs, which boost the implementation of compliance programs, are composed of conditional programs, based on the following distinction: “conditional programs differ between conditions and consequences; purpose programs, between ends and means”. To operate this distinction, “cognition” becomes imperative. That is, “such programs are only usable when the world is already known and communication can count on that”. It is in this field that should be evaluated whether the means are appropriate to the purposes and if the end will be worth the cost required, or whether other means should be sought, or simply abandoned, or if alternatives should be pursued. There is a great similarity with the principle of proportionality in the operationalization of this systemic operation.

Therefore, the great challenge of the programs presented is precisely in not having ready-made answers to simply implement. “The programs have the possibility of an always appropriate to the

situation decision". Because of this, it is also necessary to distinguish "between decision programs and decision". A possibility of structuring compliance programs can be imported in general form as the conditional programs present: "[...] they have the general form of 'if – then'. In general terms, this means 'only if – then'. This, in turn, means: what is not allowed, or triggered by that condition, is prohibited" (LUHMANN, 2010, p 306-7.). Here there is an opening for the assessment and projection of risks generated from research at the nanoscale.

Moreover, there is a causal link between ends and means, allowing the construction of chains. This aspect points to a finding in the sense that the "program dispenses from the reality that is given in the moment of deciding to program". This turns out to be relevant, because reality is not paralyzed and, far less, the rules that are part of the decision program may be applied forever. Necessarily, there is a time limitation that requires a constant attention to changes and adjustments, or realignments: "the programs, when effective, are effective until they are revoked. They are the 'positive law' of the organization" (LUHMANN, 2010, 314-5). Here there is the space for the operation with the right to information and its complement, the duty to inform; in attention to the change of paradigm of organizations, focused on anticipation, transparency and compliance of consumerist standards, which are linked to constitutional rules and principles and, from this framework, to international policies leveraged by Human Rights. The standardization of nanotechnology, instead of originating from the State — especially from the Legislature⁴ — will be drawn by the organizations involved directly with its research and development. Thus, the design of the legal focus is decentralized, since it is far from the State, and moves to the periphery, in an effective blend of public and private, on behalf of the creation of the social, collective and conjunct. This means an effective and innovative turn in the specification of the legal and its effects, which are anticipated, modified and updated in the proper motion of the installation of nanotechnology.

⁴ Currently in progress, there is the law project Number 5133 of 2013, which aims to make mandatory the labeling of products that make use of nanotechnology. The author of the project is the federal representative Sarney Filho. This project was approved by the rapporteur deputy Carlos Brandão as follows: [...] this is exactly the purpose of the noble author of the proposition in question, Mr. Sarney Filho. As he makes clear, there is no intention to restrict the development of technology; it is intended only to ensure that there are applied to the products of nanotechnology, the principles that are in force since the Consumer Protection Code is effective. The Consumer Protection Code is a legal regulation that ensures, among the basic rights of the consumer, "adequate and clear information about the different products and services". Since the trend is the increase in the number of products containing nanotechnology, or which are generated from nanotechnology, it is essential that our legal framework, now, explains the need for consumers to be informed when these products are offered for sale. (Available at: <http://www.camara.gov.br/proposicoesWeb/prop_mostrarintegra;jsessionid=8804023E5BAE07C8827CD6882742E7BD.node2?codteor=1116427&filename=Parecer-CDEIC-15-08-2013> Access on 17 February 2014). This project, with the assent received from the Commission of Economic Development, Industry and Commerce (CDEIC) on 15 August 2013, courses for the analysis of the Consumer Defense Commission (CDC), and also of the Committee on Constitution and Justice and Citizenship (CCJC). Another law project which is under debate, and is the latest, is also authored by the federal representative Sarney Filho; it is the law project number 6741 of 2013, which is about the National Policy for Nanotechnology, the promotion of research, technological development and the control by the Government of the risks and impacts of nanotechnology activities. This project was presented on November 11, 2013. On December 5, 2013, it was referred to the Committee on Environment and Sustainable Development (CMADS), where was opened the deadline for presenting amendments, from December 6, 2013. This period was of 5 regular sessions. This deadline has already expired, and no amendment was presented. (Available at: <http://www.camara.gov.br/proposicoesWeb/prop_mostrarintegra?codteor=1177566&filename=Tramitacao-PL+6741/2013> Access on 17 February 2014).

CONCLUSION

Law and the production of legal shall be projected beyond the abstract forecast of legal rules and assumptions of factual support. It is necessary to promote mechanisms that enable the interaction with the social reality that underlies all legislation, focusing on local and global transformations, prioritizing “human things”. The appreciation of the entangled existing sources, many of them specified by the advances of globalization and by the emergence of new normative production centers, should integrate the compliance programs of organizations linked to nanotechnology. With this structural change, Law will renew its line with the reality of the Social System, becoming colorful and vibrant, rather than opaque, opening its arms to embrace the new rights and duties generated by the restlessness of human beings.

There is evidence that it is not the State, especially through the Legislature, which will operationalize this shift. An alternative is the dialogue between the Sources of Law, promoted by the compliance programs of national and transnational actors involved with the research, development, manufacture and commercialization of products based on the nano scale. This is the situation of Law today: it is being challenged as knowledge area and also in its intrinsic aspect, in the structuring and the way to build and list the ways of assigning legal effect to the new risks and opportunities generated by scientific and technological advances.

Replacing the pyramid by the horizontal arrangement of the sources of Law, entwined to each other by means of rings, where the communication movements occur in a much more fluid and fast way, allowing legal responses that are adequate and in tune with the values of a society that is local and global at the same time. In this figure, also, there is no concern to establish the factual support elements previously, but on the contrary, that are in harmony with the natural-human-fundamental rights. The dialogue between the sources of Law, through the constant ring movement back and forth between the sources, conducted by the thread of social solidarity, to which indicate the cautions with the current and future responsibility of the risks, yet poorly known, that human beings are activating by their insertion in the world of the nanoscale. That is, the human family should encourage the development of a “code” as a sign and not as a set of laws, which is in line with the principles, values and natural-human-fundamental rights, in a substantial combination to be dipped in judicial control and control of conventionality.

Because of this scenario, which is innovative and challenging at the same time, it is proposed the movement of rearrangement of the pyramidal-positivist structure, for a smooth side-by-side or annular organization of the sources of Law, facilitating various forms of movement, but always guided by flexibility and by a renewed construction of multiple exchanges between the normative sources, envisaged in the construction of a “world status for scientific expertise, able to work with a ‘ordered pluralism’” (DELMAS-MARTY, 2013, p. 178 -9). That is the center point of the dialogue between the sources of Law, envisioned from a resistance to dehumanization, through the responsibility of the authors involved, seeking an anticipation of the risks that are arising from nanotechnology, for example (DELMAS-MARTY, 2013). The creation of legal production alternatives, which are ethically set with the respect for human beings and for the preservation of the environment, will be necessary. And more: legal mechanisms that may act in precautionary mode, anticipating the likely adverse effects generated by nano-techno-scientific revolution, changing the boundary profile of juridicization of social facts: rather than happening after the fact, the juridicization must happen concur to them.

The compliance programs, in attention to the problem formulated in the Introduction, from the developments designed with the support of Luhmann, fit into this transforming context that will be opened in Law, showing to be a route to be followed by organizations that want to effectively project into the national and international scenario through the basic assumption: the concern with the consumer, based not only in the Consumer Protection Code, but in the normative framework designed from the interaction and dialogue between the Sources of Law.

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