CREAZENE
Research towards Sustainability

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Sustainable and unsustainable Systems

Introducing 'Realimiteit Theory'.

Sustained functionality is only feasible within natural boundaries of functionality which are called 'limits of reality' i.e. 'Realimiteit'.

The **If – Then** principle applies: **If** relevant information (for example Ethics) is ignored, **then** living systems of communication (organisations, companies, institutions, political process, people, etc.) become instable and will be unsustainable or are already dead, because they stop communicating and learning by denying natural cognition. Ethics as negative feedback is not fed back into a living system preventing the system to learn and adapt. We speak about living or dead systems.

Lynn Margulis: 'if it metabolizes it is alive, if it not metabolizes it is not.'

Sustained life or living systems are emergent properties or in other words the resulting qualitative improvement of a combined interdependence and cooperation of all information carriers. (Fritjof Capra, Pier Luigi Luisi, Arend van Campen)

In other words; energy and matter are dependent on information which is the key element for possible emergence. Stability, equilibrium or homeostasis are dynamic processes which form the basis of sustainability. This stability cannot be compared with the stability of a chair or table, for example. The stability of a living system is a continuous process of balancing between order and entropy (disorder) using all the available information by interaction between all the parts of a system. Natural systems like humans, animals, flowers or plants and the organisations we create should always be maintained in a state of equilibrium with the environment in order to keep functioning. This is an ongoing process of communication.
Life or living systems according to Fritjof Capra and Gregory Bateson depend on the criteria needed for survival; for example health, a non-polluted environment, social safety or cohesion, biological and ecological balance. According to Humberto Maturana and Francisco Varela Santiago's Theory of Cognition, life is autopoietic, which means that it creates, maintains and sustains itself through communication (cognition) with the environment. The maintenance of life therefore depends on the availability of creative conditions and the continuous exchange of information which was called feedback by Norbert Wiener who wrote in his book; The Human Use of Human Beings; 'feedback is a method of controlling a system by re-inserting into it the results of its past performance, i.e. learning.' So, in short, we cannot evolve without learning. Cybernetician Dr. Stafford Beer used the term that information 'in forms' us, meaning that in fact it is information that gives us shape and build us into who we are, giving us form. Maintaining or sustaining life without the combined use of matter, energy and information is impossible. Try to ignore traffic coming from the left when you want to cross a street and see what happens? The law of physics which explains the conservation of energy confirms that information is energy which forms matter and reality. Once information is communicated either by thinking, speaking or through any kind of expression, it becomes real and cannot be ignored or suppressed. Information is real.

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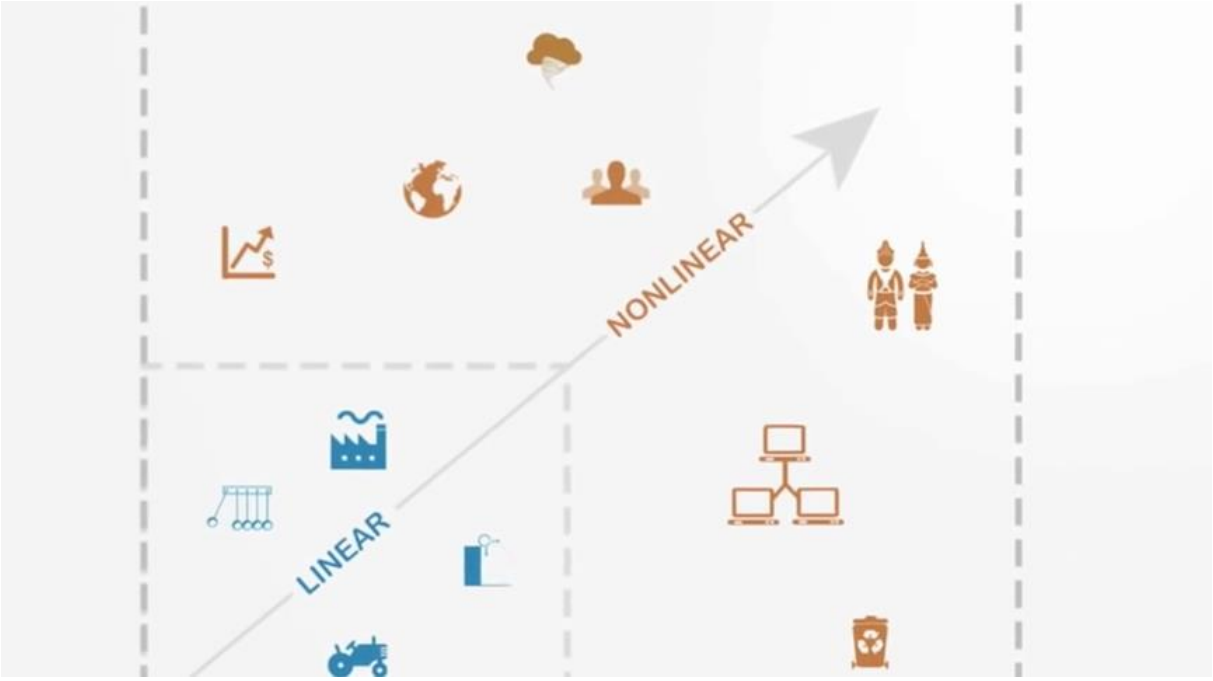
Organisations are Living systems of communication (information exchanges).

Let's fast forward this to organisations, businesses, industrial production or political processes. Organisations often seem to ignore information which contradicts their goals or purposes, while only accepting the information that confirms them. When we understand organisations also as autopoietic, living, social systems of communication (Niklas Luhmann), we intuitively understand that stability and sustainability can only be achieved by using positive – and negative feedback (information) in a balanced order. Communication or the constant gathering and sharing of (new) information creates the very basis for steering, maximum control and predictability. A continuous learning process is the basis for long term continuity.
This fact confirms value-driven business ethics and corporate social responsibility as feedback (information) which, along with all other information, needs to be accepted, considered and used to maintain stability and therefore an organisation cannot afford to ignore. Again I emphasize that ignoring relevant information directly causes instability and risk.

Linearity and Non Linearity To explain linearity and non linearity.



Systems are linear when they consider direct cause and effect only, such as our economic and many current governing or industrial models. But reality and life are quite different. Only acknowledging of cause and effect is based on the current and still dominant empirical scientific paradigm or a so-called mechanistic way of seeing our world. But new sciences show us a reality which is non-linear, non-predictive, non-controllable. Up to a certain extent, processes are 'controllable', but then we have to manoeuvre them within boundaries of functionality (Realimiteit) by using *all* information. James Gleick in his book 'Chaos' talks about the ending of deterministic sciences which are replaced by 'chaos, complexity and uncertainty principles' based on 'non linear' sciences: as follows:

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1. Relativity eliminated the Newtonian Illusion of absolutes.
2. Quantum Mechanics eliminated the dream of a controllable measurement process.
3. Chaos Theory eliminates the fantasy of deterministic predictability, but found that order from chaos is a natural phenomenon.
4. Systems Theory: Everything is connected, interrelated and interdependent. (the observer effect)
5. Cybernetics (Norbert Wiener, Stafford Beer and Ross Ashby) understood and used this notion of non-linearity and came up with the solution of requisite variety, which is maximizing learning and using information to control and steer energy and matter by the human mind and actions.
6. The notion of the butterfly effect had to be included in science to understand chaos and complexity theory as unpredictability (non-linear effects. Mechanistic thought had been playing tricks to the human mind. It gave people the illusion that they were in control.

Chain Reaction Through Feedback Loops

Mapping and measurement; The Realimiteit Principle.

Natural boundaries can be also described as environmental limitations, borders or thresholds. Continuity of life depends on undisturbed functionality, which continues throughout life because nature constantly evolves through communication with and within its environments. If a functionality can no longer be sustained, nature will stop its continuity either by adaptation, replacement or extinction. This drive for continuity allows natural systems to grow, but always within the limits of reality (Realimiteit), because if it trespasses such boundaries of functionality, systems either grow too big or too small which would indicate illness or non-equilibrium and announces an inevitable discontinuity of the whole system. When we apply systems science or systems theory it become much easier to understand that systems are systemically connected and dependent on communication and information exchange. Systems can be understood not from their direct functions but rather from their relationships which support and enable their functioning. What does this all mean to our Realimiteit principle? Well this should be getting obvious by now; systems that surpass boundaries of natural functionality become instable and no longer can be continued outside of Realimiteit. Without learning they cannot be continued and will have to be adjusted and if possible steered back to remain inside of reality.

Cybernetics

This steering mechanism brings us to the explanation and understanding the word ‘kubernetes’ which is the Greek word for ‘Helmsman’ to be understood as the one who steers the ship. From kuber, the way of adjusting course, Cybernetics was derived which is now called the way to govern and control a system – all systems in our universe are guided by this principle of feedback (information exchange).

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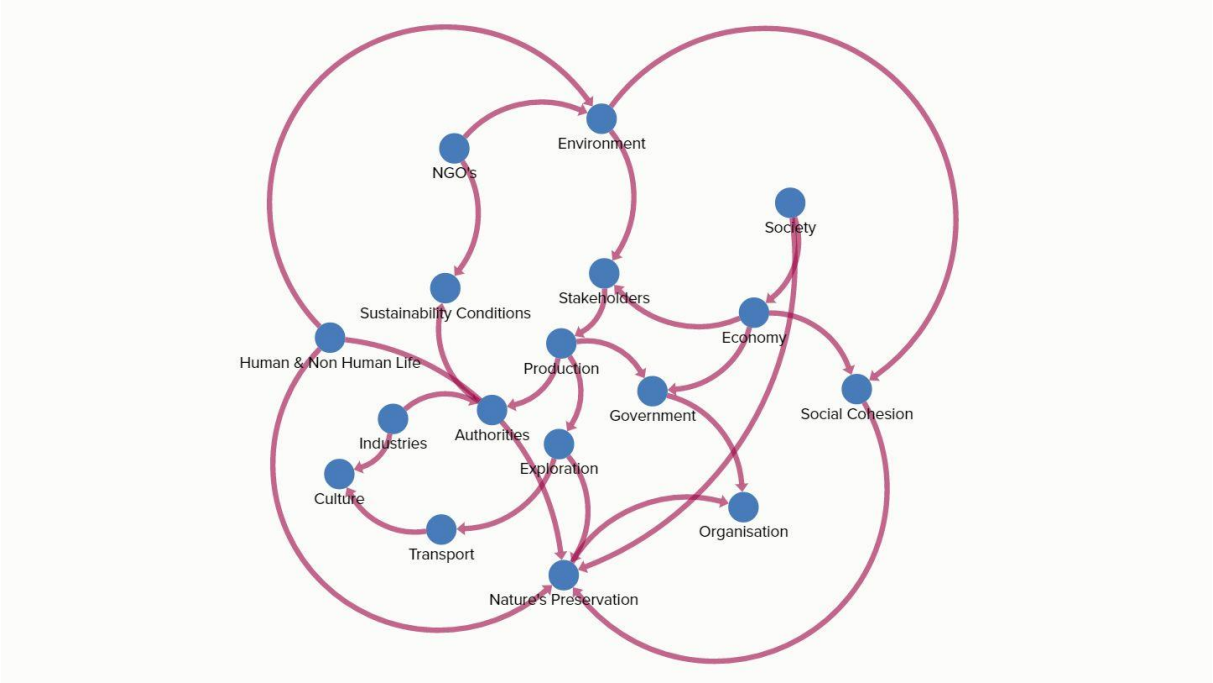
This science of controlling and governing systems was proposed by mathematician and systems theorist Norbert Wiener in 1948, who connected information with the concept of feedback loops, because earlier the concept of feedback was usually used in mechanics. Ross Ashby added the Law of Requisite Variety which also is overlooked or ignored, but would be THE way to control and govern systems in a more sustainable way; 'The variety of a regulator has to match the variety of a system.' Variety is about the capabilities of a system to regulate (by as much information, knowledge and capabilities as possible).' This important Law is ignored by oppressive governments or profit driven organisations which collude to regulate social systems by force, which is unsustainable and always ends in entropy (rebellion, conflict, etc). Cybernetics as a control system has been ignored, hence the instability of our world, because organizations, religions, industrial processes based on market ideology, are unable and certainly unwilling to allow information which contradicts their usual main objective (profit).

The main question you may ask to predict whether an organisation is dying or already dead is the following: Here is a model of feedback loops which illustrates the importance of connectedness. As you can see, all loops are connected, keeping this system alive.



If, for example, a corporation or government does not share potential harmfulness of its products or services i.e., by not sharing relevant information, the feedback loops are broken, rendering the corporation vulnerable and ultimately unsustainable. To verify which processes, industries, organisations or governments are durable and would not run out of their expiry date, all we have to do is to synthesize (map) their communication feedback loops and ask if they are either positively or negatively interdependent.

I did this in Holland. I work in the oil and gas sector and wrote a book called 'Toxic Tanker'. When I used Realimiteit modelling and created feedback loops maps, I understood quickly that because oil products may have harmful effects the information about this is not shared on purpose.
Here are the maps:

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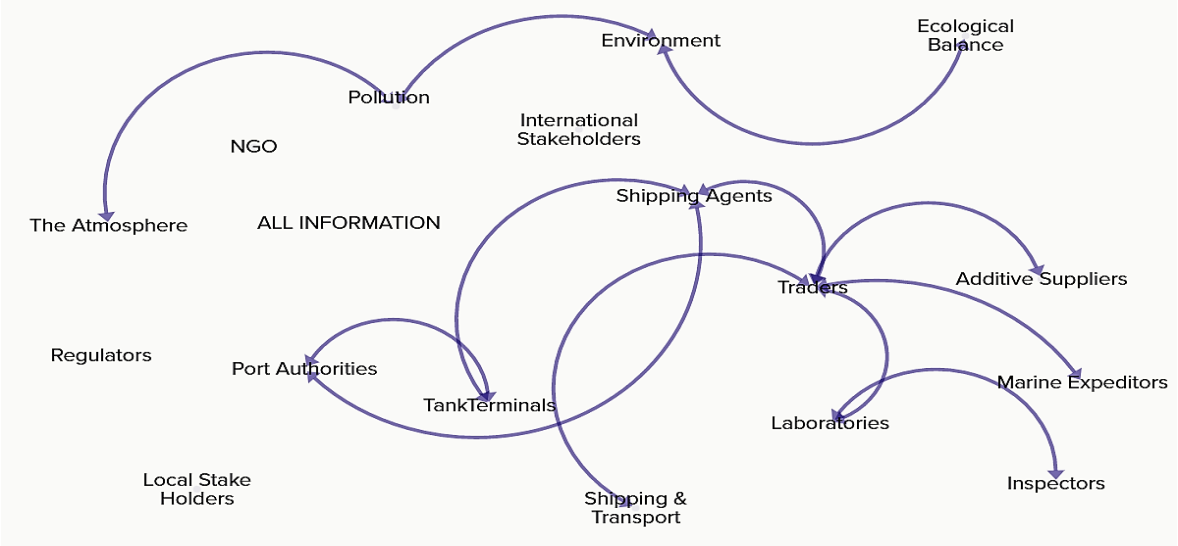
Dirty Diesel Report Syntheses 2017



Instable and Vulnerable Petroleum Products Blending System

This seems to be the current ARA (Amsterdam-Rotterdam-Antwerp) information model. Not *all* information is shared with *all* stakeholders. Not *all* relations in the network are connected through feedback loops. This disturbs effectiveness, functionality and sustainability. The system is instable and non-controllable. It is a dead (dying) system. (The motive to deliberately not share information is that harmful, toxic chemical or petroleum components are blended (mixed) into the final product and exported to unexpecting countries (Africa, India, etc). An entire industry and port sector became dependent on this unethical practice).

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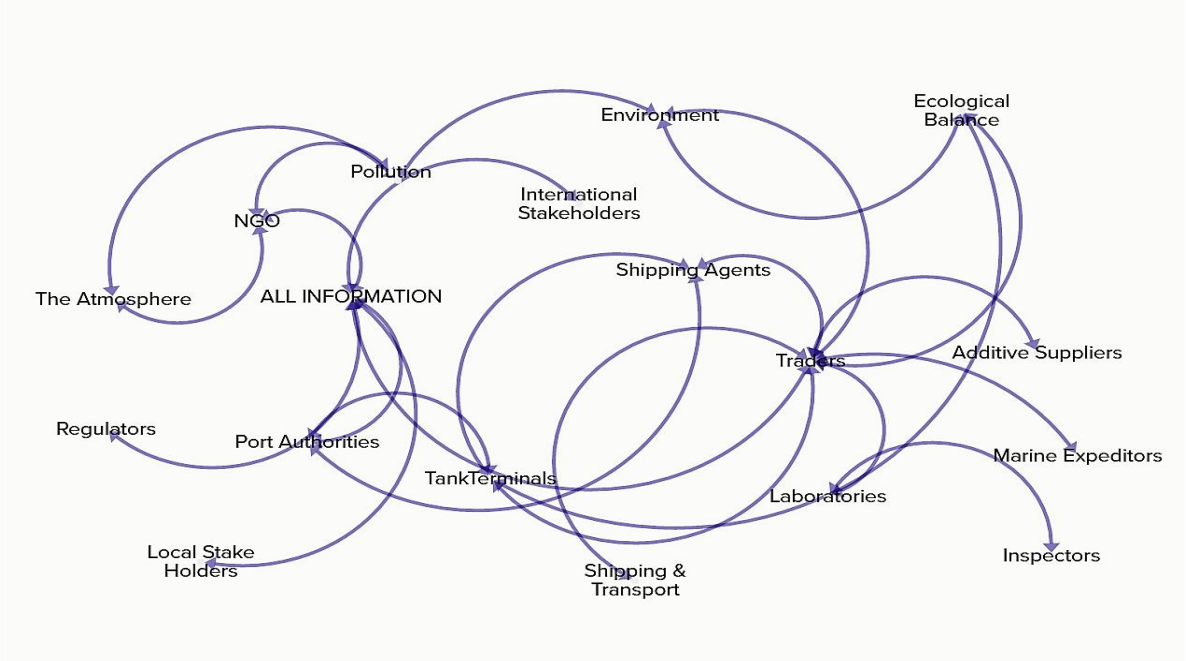

Stable and Sustainable Petroleum Products Blending System

This could be the ARA information model. *All* information is shared with *all* stakeholders. *All* relationships in the network are connected through feedback loops. This reinforces effectivity, functionality and sustainability. The system becomes stable and controllable. It is a living and sustainable system.

a. Negative Interdependence:
an economic or industrial goal, a personal ambition, production process or political ideology can only be achieved for some, but at the cost of others: people, the environment, society, ecological balance, etc. The protection of the environment, social cohesion, and human and non-human life are secondary objectives. This is unsustainable, but is the principal foundation of our current linear economic, industrial and financial systems. It runs everything into entropy.

b. Positive Interdependence:
an economic, industrial goal, personal ambition, production process or political ideology can be achieved for everyone. Protection of the environment, social cohesion and human and non-human life are principal, central and shared objectives. This is sustainable and in fact would be creating millions of jobs as negative interdependent processes, industries or policies can be phased out and replaced by positive ones. This will be manageable by cybernetical steering using information as energy to create and manage matter.

Conclusion

It would become easier to predict sustainability, longevity or inevitable downfall or implosion of an organisation by using this questionnaire to check and verify sustainability, longevity and stability of systems, companies, political ideologies, strategic goals and or any other living system. We call them Cybernetical and Social Systems of Communications. If a system has to survive, it will need to balance itself through communication and learning within natural boundaries of reality. It cannot lie or negate Realimiteit and expect to sustain itself.

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1. Is the 'system' open to cooperating and communicating with all stake holders?
2. Is all information available?
3. Is information willingly shared with all stakeholders, including all employees?
4. Is your system willing to listen to information that perhaps contradicts its goal or purpose?
5. Are you flexible and open to change course if information could interfere with your goal or purpose?
6. Could your system be 'path dependent'?
7. Could your system be negatively interdependent?
8. Would you be willing to acknowledge that the processes, products or services you offer could be harmful to human and non-human life, the environment and social cohesion?
9. Would your system be open to build in more 'variety' in order to absorb 'outside variety'?
10. Is negative and positive feedback always being fed into your system in order for it to learn and stay adaptive?
11. Is the main interest of the system sustainability, longevity and stability, or could ulterior motivations be a risk factor?
12. Do you think you 'control' yourself and your system?
13. Are you willing to accept facts that could contradict your purpose or goal? In other words, could your system be at risks of human factors i.e. psychological biases such as cognitive dissonance, confirmation bias, self-serving bias.

A financial system could be built on the following foundations:
Are organisations and systems negatively interdependent?(benefiting some at the costs of others i.e. environment, life, social cohesion, conflict, earthquakes, aquifer pollution, CO2, Methane emissions, etcetera) or positively interdependent (benefiting everyone and everything) as a sustainable circular system mimicking nature using recursive patterns? (Capra, Luisi, 2014) (Mandelbrot 1980).

a. Will they be based on systems science? Without rebuilding, re-designing the current competitive linear economic model into a non-linear economic system based on relationships in equilibrium, a sustainable and durable future global economic system cannot be created. (Bateson, 1972), simply because a linear system cannot be sustained in a non-linear universe.
b. Will the system be controllable by cybernetical steering? The new system has to be built as a Viable System Model (Beer, 1972) which is able to learn, adapt and adjust and not be path-dependent. It needs to allow Ross Ashby's Law of Requisite Variety in order to be regulated and be autopoietic. (Maturana, Varela, 1978, Prigogine 1977, Asbhy 1956). The current economic and financial system can be considered as a non-learning one which in Systems Sciences is called a 'dead system.'
c. Will the new system be based on a 'full and true cost analysis'?
d. Could it be harmful for the environment, social cohesion and human and non-human life?
e. Will the global governing System be operating within so called Boundaries of Functionality and not outside of them, i.e. operating within the limitations of reality we named 'Realimiteit?' (Van Campen 2017)?
f. Will it consider complexity science, order and entropy, chaos theory (Gleick, 1987) (Poincaré, 1890) (butterfly effect (Lorenz 1963) and the Law of Unintended Consequences (Merton, 1936)?
g. Will it be quantum mechanically sound by including the unified field theory, the observer effect and consciousness? (Hagelin, 2006)

Perhaps you will ignore this abstract. But the reason why we are facing this great challenge is that information which does not fit purpose is ignored. This behaviour goes against all scientific research which endeavours to finding truth. Information through communication offer the solution towards globally beneficial and sustainable governance systems.

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References:

Aristotle (2004) *'Selection from Nicomachean Ethics'* ISBN 1-904919 111, CRW Publishing Limited, London

Bateson, G (1972) *'Steps to an ecology of mind'*, Ballantine New York

Capra, Fritjof, Luisi, Pier Luigi (2014) *'The Systems View of Life'* ISBN 978-1-107-01136-6, Cambridge University Press, Cambridge UK.

Cox, Peter. Ruelle, David, Poincaré, Henri (2008) *'High Anxieties, The mathematics of chaos'*, documentary by David Malone. https://topdocumentaryfilms.com/high-anxieties-the-mathematics-of-chaos/

Gleick, James, 1987 *'Chaos, The making of a new science'*, Penguin Books. Penguin Books; Anniversary, Reprint edition (August 26, 2008).

Hagelin, J. *'What the Bleep'* https://whatthebleep.com Documentary and Interview on Consciousness; https://www.youtube.com/watch?v=VACAqwxDUx4

Lorenz, Edward' (1995) *'The Essence of Chaos'*,ISBN-13: 978-0295975146, University of Washington Press

Mandelbrot, Benoit (1980) *'The Fractal Geometry'* ISBN-13: 978-0716711865, W.H. Freeman & Co.

Maturana, H and F. Varela (1980/1972) *'Autopoiesis; the organization of the living'*, *'Autopoiesis and Cognition*; . D. Reidel, Dordrecht Holland.

Merton, Robert K. The unanticipated consequences of purposive social action
American Sociological Review
Vol. 1, No. 6 (Dec., 1936), pp. 894-904

Prigogine: I, (1980) *'From Being to Becoming'*, Freeman San Francisco, CA.

Van Campen, Arend (2013) *'Safety of Ethics'*, ISBN 978949101314, Next Print, Den Bosch, Holland

Kind regards,

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