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# *Epistemological foundation, coordination, the role of quality and tools in the implementation of the Indicators for the Sustainable Development Goals (SDG's)*

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# Abstract

The concrete background for this paper is my reflections on consultancy in various countries. The first example is about handling challenges when implementing indicators related to sustainable development. The other example is related to consultancy about the implementation of Quality in Official statistics.

Considering the discussions about statistics, some people see statistics as objective and depicting reality, assuming that reality can be measured independently of social and cultural and social processes. The opposite position is subjective, showing little trust in statistics expressed as "lies, damned lies and statistics" or "I only believe in statistics I doctored myself" (Churchill).

The author finds a more coherent approach to epistemology, quality, coordination and supporting tools is needed. The paper suggests an approach using elements from Luhmann and other sources. This includes reflections on the role of statistics in society and, in relation to this, reflection on the question: how is knowledge possible? This led to a presentation of cognition and epistemology. These theoretical reflections are used as background for reflection on statistics with positions of Luhmann and Radermacher. The paper is closed with brief reflections on coordination, quality and tools.

The paper has the following four claims: 1) the theory of self-referential systems should be used as the epistemological foundation to shed light on the production and use of statistics in a modern differentiated society 2) there is a need for a new approach to coordination in the National Statistical System 3) terms related to quality frameworks for statistics should be defined more precisely and play a key role in the description of work processes, products and user perceptions 4) there is a need for simple and flexible tools to support coordination.

The paper is mainly aimed for discussions at the Luhmann conference 2022 in Dubrovnik. In addition, the paper is also aimed at readers with little or some knowledge about Luhmann. Therefore, parts of the paper might seem too detailed for Luhmann experts. This includes detailed aspects about the function system and various analyses by Luhmann.

Keywords: Sustainable Development Goals, coordination; communication; co-creation of statistic, quality, epistemology

# Contents

# 1.Context and claims

We have witnessed significant changes in communication during the previous five to ten years in all spheres of daily life, including science, politics, the economics, the media, and others. These developments coincide and resonates with shifts in the technological environment, such as new forms of mass media, data processing and storage technologies, search engines, AI etc. In our daily lives, the new communication patterns have brought about both opportunities and difficulties**,** such as managing stress. In the same way, the use of data in political and economic communication contexts has produced both potential and a number of difficulties, such as a decline in confidence in experts.

## 1.1 CONCRETE CHALLENGES

Based on these very broad observations, the specific context for this paper is my reflection on consulting work I did for several nations on how to deal with difficulties while implementing indicators for sustainable development. The 17 Sustainable Development Goals (SDG) are logical and appear to be quite simple to comprehend. (UN, 2022). However, each nation must measure the 600+ indicators that are listed beneath the goals. Some assessments show an urgent need for brand-new information from numerous sources outside of the statistics organisations. The task of a specific consulting project was to offer guidance on how to manage this effort. In a simple understanding of organisations it is just a matter of top-down planning, some knowledge about statistics and how to collect, process and disseminate data.

However, this thinking expecting simple casualties does not work. There are simply too many factors influencing the coordination and the decision making in each country. These can be stories from the past, ways of doing things, various views on the goals, etc. In other words, each nation has its unique viewpoints and methods for carrying out tasks.

From an outside consultancy position, it is my experience that there is no simple recipe on how to do implement the indicators as opposed to promises in various guidelines. In the article “Communication Barriers in Management Consulting” (Luhmann, 2006). Luhmann suggests getting rid of “knowing better” attitudes, including the idea of simple applied science. These should be replaced with first and second order observations aiming at suggesting and stimulating new understanding. The use of second-order analysis also be implemented in order to reflect on the production of statistics.

The other concrete background is reflections related to consultancy about the implementation of Quality in Official statistics. In a widespread definition in the statistical community quality is defined as ‘fitness for use’. Thus quality is not just a characteristic of a product. In practice the implementation of quality aims at compliance with principles and rules about products, users and processes. These are formulated in global quality frameworks for statistics. The principles are about relevance, accuracy, timeliness, equal access, confidentiality, legislation etc (UNECE, 2014). Implementing these aims at ensuring that statistics are provided and suitable for political decisions, but also relevant for science and public debate. In addition, handling communication in various media plays an

increasingly important role and related to this focus on user perceptions and improving statistical literacy. These aspects related to users must be ensured as well.

Thus, the implementation of these principles is important. In a traditional understanding it is just a matter of deciding and implementing the quality principles. However, they are difficult to implement (Nielsen, 2014) and, as mentioned about coordination above, there are multitude of factors in play in each country. In many countries the usual statistics on population, national accounts, household budget, consumer prices and statistics on business have been established. But when new data sources and new types of statistics have to be implemented, such as the SDGs described, the complexity increases and brings in a lot of challenges for countries – especially in low-income countries (PARIS21, 2022b)

## 1.2 STATISTICS AND SOCIETY

The challenges mentioned above have brought me to reflect on the role of statistics in society, and the possibilities for observing this from science but also as a consultant observing using various models and techniques. My main interest for Luhmann lies mainly in the need for a more humble theoretical perspective on society focusing on, respecting, understanding and reflecting on the concrete observations taking place in a given political administrative system and other systems: economy, law, mass media, etc.

In a common and widespread understanding, statistics should aid in decision making in all parts of society. Statistics should provide stable reference points that everyone – no matter what their role or politics – can agree on. However, the ideal of official statistics is under attack with growing misinformation and lack of trust. William Davies published a widely acclaimed article “How statistics lost their power - and why we should fear what comes next”. In it, Willam Davies expresses his concerns that nothing less than the end of a statistical era has arrived, with serious consequences for public discourse, trust in experts as well as politics, and with options for populist politicians to use this for their purposes. (Davies, 2017).

These problems are being discussed in the statistical community but only seldom at a more basic level considering epistemology and how statistics are not a simple description of society but instead must be seen as a kind of dynamic ‘co-creation’ of statistics and society. One exception is Walter Radermacher, a former director general of Eurostat. In his recent book “*Official Statistics 4.0 Verified Facts for People in the 21st Century”,* (Radermacher, 2021b) he gives a substantiated proposal on the development and role of statistics in society.

He seeks to clarify that one cannot simply look at and be excited by the possibilities that the abundance of data offers. “So, when talking about the ‘Data Revolution’, the second revolution, that of the neo-liberal governance, and the third, the populist resistance to expert opinion, should all be mentioned in the same breath. All three developments are related to each other and from each other in a certain way. All three together must be perceived as a social framework for official statistics in the present and in particular in the future.” (Radermacher, 2021b). Note that governance is a central concept. It is in focus especially in relation to global development used by the UN, IMF and the World Bank. E.g.

Goal 16 in the SDG's focuses on good governance (UN, 2022). It is being discussed in various fora related to global development (Fukuyama, 2013).

Radermacher stresses that fundamental changes in the statistics are needed now. "… A simple continuation of the previous way of doing things, but including some 'softer' changes, is therefore not an option, even if this smooth manner of adaptation has been successful in the past. (Radermacher, 2021b, chapter 4).

Radermacher lists a series of reports on the need for better statistics. Although these reports cover a very wide range of topics and focus on different aspects, there is a high degree of agreement on future (global) risks. He emphasises a representative summary from the World Economic Forum " … World Economic Forum rate the following risks as the most serious in terms of likelihood of occurrence and impact (in decreasing order): "extreme weather events, failure of climate-change mitigation, natural disasters, cyber-attacks, water crises, biodiversity loss and ecosystem collapse, man-made environmental disasters, large-scale involuntary migration, interstate conflict and failure of regional and global governance" (Radermacher, 2021b, chapter 4).

He stresses the need for sound information "while all these reports place great emphasis on the need for sound information to manage all these risks and the social upheaval they entail, it is imperative that all attention and prioritisation of long-term planning follow this assessment. Although a movement has been set in motion with the Sustainable Development Indicators, the question remains whether this individual activity is sufficient or whether a more fundamental revision of the statistical programmes with a reprioritisation in favour of these fields would not be necessary". (Radermacher, 2021b, chapter 4).

## 1.3 How is knowledge possible?

Considering the discussions about statistics, some people see statistics as objective and depicting reality, assuming that the "reality" should and can be measured independently of social and cultural and social processes. The opposite position is subjective, showing little trust in statistics expressed as "lies, damned lies and statistics" or "I only believe in statistics I doctored myself" (Churchill).

These two positions, that I will call 'objectivistic' and 'subjectivistic', have been able to coexist for many years even though you cannot both see statistics as something objectively depicting reality on the one hand and something completely subjective on the other. These problems are of course being discussed in statistical organisations but only seldom being discussed at a more basic level regarding the relation between "reality" and statistics.

One exception is Walter Radermacher as mentioned above. In his reflections on quantification of social phenomena, he asks what it is that characterises the relation of statistics to reality and truth. Radermacher presents various approaches and advocates for critical realism rejecting naïve realism and relativism.

Thus, Radermacher is aware of the epistemological aspects and suggests solutions related to the three revolutions mentioned above including handling the fundamental problem with statistics used as description of phenomena in the world.

However I think Luhmann can contribute and possibly supplement Radermacher with a deeper and historical understanding, based on the two main observations. *Firstly*, we live in a society differentiated into functions systems, science, politics, law, mass-media etc. They function autonomously using their own medium and codes. As a consequence there is no single truth or morality on how to observe and describe society. And *secondly* based on this, the only common denominator across differentiated systems is observations or the possibility of observing observations. This includes the observations from science of observations used in other function systems aiming at improving reflections in the scientific system itself but also in other systems. The second part of chapter two below will shortly dive into and discuss the positions by Luhmann and Radermacher.

## 1.4 CLAIMS

The **first claim** in this paper is that the theory of self-referential systems should be used as the epistemological foundation to shed light on the production and use of statistics in a modern differentiated society including how to overcome the problem on objectivistic vs subjectivistic view on statistics.

It will be done using reflections by Edmund Husserl in *The Crisis of The European Sciences and Transcendental Phenomenology* as a starting point. Based on this the paper introduces system theory and a historical perspective on rationality and the transformation into the modern differentiated society. On this background the paper focuses on Luhmann's conceptualisation of cognition and epistemology. It is shown, as a case, how this conceptualisation can give us a broader understanding of ecological dangers we are facing. The chapter is closed with reflections on statistics with Radermacher and Luhmann. This includes reflections on knowledge, the SDG-indicators, the co-construction of statistics and society and reflections on solutions proposed by Radermacher.

The **second claim** in the paper is: there is a need for a new approach to coordination in the National Statistical System.

The chapter first presents the problem faced with coordination of the production of SDG in many countries. A lot of guides have been produced. However, it is argued that these often do not work in practice, and they reflect a traditional system perspective on coordination.

Luhmann’s conceptualisation of organisations as autopoietic social systems that reproduce themselves on the basis of decisions is presented. Decision premises can be programs in the form of plans and conditions for decision making. Understanding organisations in the National Statistical System as social subsystems operating self-referentially, operationally closed systems implies that steering can only ever be self-steering. Planning is only possible by way of influencing the different self-steering processes involved in a planning situation. In

other words: any attempt at planning has to take a detour via the self-steering of the different systems in a planning situation.

The **third claim** in the paper says that terms related to quality frameworks for statistics should be defined more precisely and play a key role in the description of work processes, products and user perceptions.

The current understanding of the conception of quality is quite messy. At the European 2022 quality conference it was said that 'quality is everything' etc. Quality is an old concept usually associated with quality of products. In the last 10-20 years a change has taken place in the role of quality. It has gone quality as characteristics of products towards focusing on quality as description of user perceptions, processes and product guiding improvement.
In a system theoretical approach quality can be used as distinction between first order and second order observation. The second order observation guided by quality framework contains description making self-observation possible seeing the blind spots. Introducing a quality framework across organisations in the national statistical system is not straight forward. It cannot be done from outside, but, like planning described above, it can only take place as self-planning.

The **fourth claim** in the paper says that there is a need for simple and flexible tools to support coordination.

There are tools available focusing on these aspects. Examples are ADAPT, EPIC and StatAct (see references). They help with several aspects of planning, resources, etc. However, the tools often reflect the traditional system perspective. In continuation of the understanding in this paper tools must support the communication in the National Statistical System.

It is argued that quality as a meta language and quality defined as the difference between operations and their descriptions. The operations cover communication events related to processes, products and user perceptions.

The descriptions are seen as second-order observation. These can enable improved cognition and enable the statistical system to see blind spots. Seeing blind spots pave the road towards improvements.

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# 2.Self-referential systems as epistemological foundation

I'll begin by addressing a concern I had with the methodology part of papers and assignments during both my time in college and during my professional career. You must decide how to do your research and how to defend your position. I had always thought this kind of work was kind of arbitrary. Citing examples of good practice in the argument did not help, as this only made it harder for me to choose between different schools of thought. For instance constructivism vs realism is not like choosing between having an omelet or a boiled

egg for breakfast. Reflecting on these choices made me even more unsure as they are so fundamental and difficult to distinguish. For constructivism realism is just a construction etc. Is it just a matter of my choice? Would it be possible to include the activity on choosing in my reflections? This is where Luhmann comes in.

I first read Social Systems by Niklas Luhman at the start of the 1990s He attempted to answer some of my concerns when he said: “As the reflection theory of the scientific system, the theory of cognition has primarily to do with the relationship between cognition and object, that is, with the reality reference of cognition. Pure self-reference in this place would be called: Real is what cognition designates as real. This notification has always been and still is unsatisfactory.” (Chapter 12 of Luhmann, 1996)

As I read the book Social Systems again and several other works by Luhmann, it became clear to me that he was presenting a wholly fresh method of writing and thinking, including insights on the role of theory. This insight did also include his own theory of social systems. His theory is set up so that it may recognise itself as one of its objects. It took me years to finally grasp it.

It might be challenging to express and clarify Luhmann's theories to people who are not familiar with this change in thinking. Usually I say “take your head off and put it back on again”. In order to introduce Luhmann, I will therefore first introduce Husserl with a specific focus on Husserl's term the Lifeworld. In my eyes, this is central to Luhmann's system theory. The world is differentiated into sub-systems, each with its own logic, including science as subsystem. Thus, the starting point is communication in concrete systems and not analytical systems or theories about these systems.

Furthermore, some suggest that the core ideas of Luhmann's philosophy can be viewed as a reformulation of Husserl's: “in contrast to Luhmann’s rhetoric of starting afresh, that his theory inherits and reformulates the phenomenology of Edmund Husserl". (Paul, 2001). One example is the use of the concept of consciousness and system: “Luhmann speaks of systems, whereas Husserl writes of consciousness. It is helpful to keep this conceptual shift in mind so as to gain clarity regarding the origins of the concept of system. At the same time, systems that make use of meaning need not necessarily be a consciousness; they could just as well be a self-grounding communications network closed within itself like consciousness, e.g. interaction between persons who are present” (Paul, 2001)

## 2.1 SELF-REFERENTIAL SYSTEMS AND EPISTEMOLOGY

### From Husserl to Luhmann

Husserl is from Germany. He was born in 1859 and died in 1938. Husserl himself was jew and therefore expelled from the university where he worked. His latest writings in the 30’s The Crisis of the European Sciences and the Vienna lectures are the main offset for Luhmann. These writings were implicitly directed against the political situation. “.. placed back into the communicative situation of its time so that one can recognize what it was directed against without this being said in the text itself. At the time of Husserl's Vienna lectures, dictatorial regimes that one retrospectively terms "fascist" seemed to be marching forward unstoppably. Bourgeois intellectuals kept an anxious eye on the few still-

functioning democracies that, squeezed between communist and fascist dictatorships, seemed to keep alive a remnant of freedom" (Luhmann, 2002a)

Husserl was an important founder the school of phenomenology. The aim of phenomenology was to disclose the meaning that the world has for all of us prior to all philosophy and exclusively on the basis of our experience. In The Crisis of the European Sciences (Husserl, 1936) Husserl considers the question of how the Lifeworld and the ''world of science'' are related to be one of the most pressing issues in modern philosophy. The urgency of this question derives from the fact that the relation between the Lifeworld and the ''scientific image'' seems to be one of potential conflict. (Husserl 1936, Moeller 2000, Wiltsche 2016, Luhmann, 2002a). This was the case in the 30's and this is still the case today as showed in situations described above on lack of trust (the context in this paper). It is in my view this is the case in many other devastating crises e.g. war, the climate crisis, food crisis

Husserl argues that early modern science, exemplified in Galileo, separates the Lifeworld from a world of science by forgetting its origins in bodily perception on the one side, and the practices which found the science on the other. In Husserl's view, Galileo's distinction between primary and secondary qualities drives a wedge between the Lifeworld and the ''world of science''.

The decisive step in Galileo's approach is to mathematicise nature by substituting geometrical models for the Lifeworld of pre-scientific experience. There are two reasons why this step is crucial for Galilean science: First, Galileo is convinced that physics can only become a real science if its problems are formulated and solved mathematically. While the use of geometrical idealization and model construction could also be justified pragmatically, Galileo holds the much stronger view that these methods are actually truth-producing. Hence, instead of merely allowing us to deal with reality in a predictively successful way, models are said to be representative of the ''real world'' of pure, accident-free phenomena. Following Husserl's lead, it is precisely this objectivist interpretation that brings science and the Lifeworld on a collision course with each other.

*"*On the one hand, objectivism implies that the Lifeworld is nothing but a veil that needs to be removed in order to catch a glimpse of the ''real world'' of pure, accident-free phenomena. At the same time, however, the methods through which this veil ought to be removed presuppose the Lifeworld as their necessary ''meaning-fundament''. If this is true, then objectivism leaves us in a paradoxical situation indeed: To advocate objectivism is, as I have said earlier, to saw off the branch on which science is sitting." (Wiltsche, 2016).

I have spent some time with Husserl and Galileo in this paper, because in my eyes it put words on the problem in a good introductory way. Husserl rejects the objectivistic position and the subjectivistic position and paves the way for a "life-world" position that is directed at both on our observations in the world and the way we observe.

In the text that follows, I will present in more detail how Luhmann transforms Husserl's life-world perspective into the theory of social systems. But first we have to discuss perhaps the

most decisive element that Luhmann brings forward from Husserl. It concerns Husserl's thoughts on consciousness and intentionality.

The intentional content of an intentional event is the way in which the subject thinks about or presents to herself (noesis) the intentional object (noema). The idea here is that a subject does not just think about an intentional object. Rather the subject always thinks of the object or experiences it from a certain perspective and as being a certain way or as being a certain kind of thing. Thus one does not just perceive the moon, one perceives it “as bright”, “as half full” or “as particularly close to the horizon”. For that matter, one perceives it “as the moon” rather than as some other heavenly body.

Luhmann wants to apply Husserl’s terminology not in explaining only the “characteristics of consciousness,” but also for “the emergence of order in general” (Luhmann, 1996). Thus, Luhmann is no longer mainly interested in how consciousness produces intentions, a world, a horizon, and meaning, but also in how such a cognitive construction functions in a variety of other non consciousness systems. Like Husserl, he seeks to rehabilitate experience and perception as the human being’s basic link to reality, beyond which we cannot go. As for Husserl, so too for Luhmann, reality is a construction or a substrate whose underlying object-relatedness or validity is measured by criteria of coherence and consistency that are internal to the construction.

In the Luhmann reading of Husserl he draws on the intellectual development taking place in system theory but also a lot of related disciplines in the European thinking in second half 20 century. This includes the development in mathematics/logic (Spencer Brown, 1994); Semiotics (Luhmann,1997b); Biology and cognition (Maturana, 1980, 1987), Anthropology (Bateson 1972) and Second Order Cybernetics (Glanville, 2002). Second-order cybernetics is the recursive application of cybernetics to itself. It is cybernetics where the role of the observer is appreciated and acknowledged rather than disguised, as had become traditional in western science.

The main contribution from Spencer Brown can be found in the book Laws of Form (Spencer Brown 1994). Luhmann combines this insight with insight from Husserl. There are two operations in play: *Firstly* Luhmann associates intention (noeis) with ‘draw a distinction’ with marked and unmarked space. “ (…) intention is nothing more than the positing of a difference, the drawing of a distinction with which consciousness motivates itself to designate, to think, to want something determinate (and nothing else). That would accord with a mathematical theory that George Spencer Brown has worked out as a calculus of indications or as a theory of operatively produced forms. The first and unavoidable commandment of consciousness would accordingly be to draw a distinction, and to do so consciously as an autonomous achievement of the self-reproduction of consciousness.” *(…) Secondly* Luhmann associates the noema with the indication of marked space and not the unmarked space, where actuality is the marked space and the unmarked space is the horizon. “According to Husserl, "world" is an infinite horizon of ever greater possibilities, albeit on in which everything that is all intended has to assume determinacy (…) In George Spencer Brown, the same statement could run along the lines that every distinction requires the crossing of a border (posited by the distinction itself) between unmarked space and marked space.” *(*Luhmann, 2002a),

In Luhmann translation into system theory he also associates the distinction noesis, noema with the system theoretical distinction self-reference and hetero-reference: “The operational method of consciousness that steers by means of intentions is possible only on the basis of this distinction between self-reference and hetero-reference. This distinction keeps open for consciousness the possibility that, in its further operational course, problems may surface regarding the phenomena of consciousness itself.” *(*Luhmann, 2002a)

Furthermore, Luhmann stresses the distinction between noesis and noema is required for describing the world. He emphasizes Husserl's objections to modern science as discussed in Galileo's ambitions. “In other words, it is the difference between noesis and noema, between presenting ( Vorstellen) and presented (Vorgesteltem) that ensures the describability of the world and that constitutes determinable ‘objects’. There is thus no sense - and here we come to Husserl's objection to the modern sciences - in using methodological provisions to neutralize the accomplishments of consciousness that subjectively create meaning. For with them, the world of objects would also vanish. According to Husserl, forgetting this was the aberration of the Galilean-Cartesian idea of science.” *(*Luhmann, 2002a)

Lastly, sense for Husserl consists in my consciously distinguishing between the actual object and the potentially objects. This distinction is made possible culturally and historically. Luhmann takes over this term and uses this for psychic and social systems. *“With the distinctions of the operations constitutive of meaning according to whether they generate psychic or social systems in their recursive self production, we have come a good bit closer to our goal of introducing Husserl's intuition of theory into a completely different “life world”. (*Luhmann, 2002a)

## System theory

In systems theory, one often comes across three paradigms: closed systems, open systems and self-referential systems. The closed system operates with a simple view of the system as parts forming the system as a whole. The system constitutes a totality. It is closed and has no outside world. Weber's concept of bureaucracy is an example of a closed system. (Morgan, 1986)

An open system consists of elements that interact. An organization thus consists of a number of interacting elements that interact internally and with the outside world. This is, for example, taken into account in organizational theories that see organization and including management as a complex interaction between technology, tasks, management and culture. Studies of organization typically start from this or similar analytical models. The ambition is to have a sufficient complex model so that one can understand and explain organization and management descriptively and prescriptively. It was the Austrian biologist Ludwig von Bertalanffys who introduced this type of systems theory. In a political context it was taken over by David Easton (Harste, 1992)

Self-referential systems are capable of observing and reflecting about themselves. A central element in Luhmann’s conceptualisation of the self-referential system is autopoiesis. It refers to systems that reproduce all the elementary components out of which they arise by

means of a network of these elements themselves and in this way distinguish themselves from an environment whether this takes the form of life, consciousness or (in the case of social systems) communication. An autopoietic system is structurally coupled with its environment, but it is operationally closed. That is to say, while material (information, resources etc.) is mutually exchanged between a system and its environment, the ways in which systems (re-)produce themselves are solely based on their own resources (material, processes, information, cognition etc.). An autopeicic system maintains the border between system and environment by reducing external complexity and thereby separating itself from its environment to protect its own functionality. (Luhmann 1997a, Moeller 2012)

Structural coupling establishes specific mechanisms of irritation between systems and forces different systems to continuously resonate with each other. The term resonance can be used to explain how operationally closed systems “interact.”. Through taxes, for instance, the political system irritates the economy. The economic system resonates with these irritations by adding taxes to sales prices. Under the conditions of structural coupling, irritation and resonance gain the status of permanent influences between systems. In this way, the structural development of both systems is interrelated.

Luhmann classifies *social systems* into interactions, organisations and societies. Interactions (conversations), these are fleeting systems with a limited capacity to process environmental complexity. Organizations are social systems with clear boundaries reproducing themselves by means of decisions. Societies are social systems, not delineated by membership but by the specificity of their perspective. Law, economy, politics, religion, science and education are examples of function systems that each play a role in the reproduction of society as the encompassing social system.

A social system comes into being whenever an autopoietic connection of communications occurs and distinguishes itself against an environment by restricting the appropriate communications. Accordingly, social systems are not composed of persons and actions but of communications. Communication is defined with three parts, namely, selection of information, selection of the utterance of this information, and a selective understanding or misunderstanding of this utterance and its information. In contrast to traditional communication theories this definition of communication does not consist of a substantial “transfer” of information from sender to receiver. The sender does not hand anything over (or give away something) to the receiver.

## Rationality in a historical perspective

Before getting into details on epistemology we will need some history on rationality. Luhmann uncovers the ambitions of rationality in the article "European rationality". (Luhmann 1998b). He views rationality in three phases: the classical metaphysics, subject thinking and the modern rationality. The ambition in ancient Greece (classical metaphysics) aimed at correspondence between thinking and being. The visible order was secured through, among other things, Plato's doctrine of ideals. "The intelligence activity aims according to the Aristotelian-Thomist doctrine on the thing and ends there. And the fact that you can understand 'what is and what happens' as a visible order (...) in the Christian

faith you can trace it back to the knowledge and will of the creator" The Christian faith is a priori given as good.

In subject thinking, questions are raised about the thinking-being distinction, including our access to thinking in being. In subject thinking, one moves rationality as something given from the outside to properties with which the subject is equipped with. (Descartes, Kant)

Luhmann believes that this demand for man is unrealistic. We do not see just one rationality, but instead a plurality of different rationalities. "Perhaps man only crumbles by exalting himself to be the subject of the world (...) And perhaps emancipation was the last excessive demand on man, because it a priori determined him as a slave and did not see him in that individuality". (Luhmann 1998b)

In other words, Luhmann maintains that it is not possible today to have a point from which one can observe. There are many points. This is primarily due to society's differentiation into subsystems such as politics, economics, religion, etc. In system theory "differentiation" the number of subsystems increases in parallel with the increasing complexity of the society. Each subsystem can make different connections with other subsystems, and this leads to more variation within the system in order to respond to variation in the environment.

Historically, and in parallel with the history of rationality Luhman distinguishes three kinds of differentiation: segmentary, statificatory and functional. *Segmentary* differentiation divides parts of the system on the basis of the need to fulfil identical functions over and under. These are archaic societies. The dissemination was oral. *Stratificatory* differentiation or social stratification is a vertical differentiation according to rank or status in a system conceived as a hierarchy. The dissemination was literal based on access to books being discussed by philosophers, priests and kings.

*Functional* differentiation is the form that dominates modern society and is also the most complex form of differentiation. The society differentiated into function systems for economy, politics, science, religion etc. The transformation to modern societies in Europe is often associated with creation of nation states at the end of the 17th century. E.g. This idea on modernity is expressed in the outcome of the Westphalian Peace in 1648. In these, religiously based societies are replaced by nation-states based on political power (Gøtke, 1997). The transformation can also be seen in statistics. In chapter *3.3.2 the Co-construction of Statistics and the Society,* Radermacher stresses the parallel development of statistics and the nation state (Radermacher, 2021b).

Society looks different from the perspective of each subsystem and its function, and there is no perspective, or super-system, that can “supervise” the subsystems. The economic reality is different from the world as seen in education or politics. But there is no social reality that can claim to present the “whole picture.” Even religion has lost this privilege. In this sense, society consists only of subsystems. (Moeller, 2012)

This is according to Luhmann rationality in the modern version. An immediate reaction to this is that it will lead to relativism or pluralism, with multiple theories having their own

perspective. Reacting to this point Luhmann hits back: " … the laziest of all compromises, is to agree on "pluralism." This both begins and avoids the deconstruction of the distinction between subject and object. We concede to each subject its own way of seeing, its own worldview, its own interpretation (…) but only in a framework that at the same time allows for the "objective" world, text, and so forth. " (Luhmann, 1998b). The consequences of theory pluralism in science are directly destructive as stressed by Andersen: ".. it seems that the fact that the differentiation of the social sciences into sub-disciplines, which link to a special functional area in society, has become increasingly problematic. For example, economic science applies to the economy, jurisprudence to the court, media science to the mass media, etc. It is today clearer than ever that the different fields contribute to destroying each other. Each area has its own language and concepts, its own limited resonances. Each area is only able to communicate with itself without regard to the other areas" my translation (Andersen, 1999).

## Functional differentiation

Based on the approach presented above Luhmann provides us with a way to understand the details of functionally differentiated society or as Moller calls this "A new way of talking about society". (Moeller, 2012)

In short each function system operates using a medium, code, and program. (Elaborated based on table from Moeller)

| ***System*** | ***Function*** | ***Code*** | ***Program*** | ***Medium*** |
|---|---|---|---|---|
| Law | Elimination of the contingency of norm expectation | Legal/illegal | Laws, constitutions etc | Jurisdiction |
| Politics | Making collectively binding decisions possible | Government / opposition | Program of political parties, ideology | Political power |
| Science | Production of scientific knowledge | True / false | Theories, methods | Truth |
| Religion | Elimination of contingency | Immanence / transcendence | Holy scriptures, dogma | Faith |
| Economy | Reduction of shortages | Payment / non payment | Budgets | Money |
| Mass media | Providing society with a universally available memory (the generation of | information / non information | News, advertising, entertainment | Public opinion (nonconsensual, nonpersonal data or ratings) |

| | | | | |
|---|---|---|---|---|
| | familiarity and its variation from moment to moment) | | | |

I will not go into details on each function system, but only introduce mass media and science and politics.

Mass media

First mass media as this is the newest and most modern: “In a certain sense, the mass media are among the most “modern” of all modern function systems. Therefore, they may be especially well suited for demonstrating the decisively modern aspects of Luhmann’s theory of modern society: its nonhuman, global, polycontextural, and radically constructivist features”. (Moeller, 20212).

The function of mass media is to provide society with universal memory. It works in the medium public opinion using the code information / non information and news, advertising and entertainments as programs. Note public opinion is the totality of non-censensual and non-personal data. It therefore does not express, as in the traditional sense of media, a common public understanding or consensus.

In everyday speech, we understand mass media as a series of technologies: radio, television, computer, internet, etc. You often see a specific technology used in causal explanations of social development. E.g. the internet is causing fake news. In a social system perspective, technologies are the outside world of communication. “How communication reacts to technological developments is decided by and in communication alone. Strictly speaking, the Internet does not change society—society (not only the mass media, but also the economy, politics, and so forth) changes itself by resonating with changes in its technological environment.” (Moeller, 2012)

Luhmann defines the mass media as all those institutions of society which make use of copying technologies to disseminate communication. Thus defined, the mass media include the printing press used in early modernity. In the twentieth century, new technologies profoundly widened the possibilities for the dissemination of the mass media: radio, film, TV, and now computer technology. The decisive difference between mass media communication based on technology and non technological communication is that there is no interaction among those co-present. In other words: in a communication event information is separated from utterance and understanding.

We are suspicious of the mass media. Luhmann traced two kinds of suspicion. The first is that they are controlled from the outside: “According to this view, it is not the mass media themselves that fake reality, but some force behind them which actually controls them. In this version both the audience and the mass media are victims of manipulation.” (Moeller, 2012). In the second suspicion the media themselves are the culprit: “Here, the mass media are the origin of manipulation because they do not neutrally serve the legitimate information

interests of the people. They influence reality by their own powers—for instance, by manipulating politics and elections through their reporting" (Moeller, 2012)

Social systems theory agrees that the media does not truly present reality and that there are links to the economic and political system, However, at least three problems can be found: *Firstly,* the mass media are to be blamed on a group of evil people. Powerful politicians and rich capitalists should stop manipulating the media, then everything would be okay. In this conception neither the economy or politics are conceived of as function systems, but as something that is handled by individuals. The problems of the mass media are then finally reduced to the ethical errors of some certain human beings. *Secondly*, it is assumed that if manipulation stopped, then the mass media would present the real reality. As described above the differentiation of society made this problematic, as the various function systems operate with their own code and programs. *Thirdly,* some critics about mass media forgets that they themselves operate using the mass media code and medium.

Moeller exemplifies this with the book by Noam Chomsky about 9/11, in which, among other things, he explains the distortion of political reality by the mass media. It consists in large part of quotations from news reports, but there is no reflection that the book itself is part of mass media communication. "How can a theory of the mass media totally neglect the fact that it itself takes part in the mass media communication that it pretends to objectively analyse?" (Moeller, 2012)

Despite scandals like Trump's use of Analytica to get detailed information about voters to be used in campaigns (see the movie The Great Hack) the mass media continue their autopoiesis with irritations and in resonance with other function systems. The political system reacts to the scandal via regulations. Facebook itself reacts with rules for content.

In other words, there is no "single truth". However, using the epistemology, as presented below, can sharpen reflections on how the mass media work in interaction with other functional systems.

<u>Science</u>

Science works in the medium truth using the code true / false having theories and methodologies as programs. With science as a functional differentiated autopoietic system the modern theory design must therefore be designed in such a way that one co-reflects that the observed observes/reflects itself. Observations in the medium power (including observations by statistics) can be observed by itself or from the scientific system including second order observation and blind spot. Alternatives can be set up. Observations from the scientific system can only be included if the observations in the medium of power so chooses. Thus, there is not one rationality at the top, as in antiquity. Science cannot provide definitive observations. However, according to its function, it must deliver reflections based on truth established internally. The ambition in this perspective is then only to set up possibilities, seek to compare them etc. on offering some solutions to a given problem.

In the article *Modernity in Contemporary Society* (Luhmann, 1998a) Luhmann provides some background reflections including connecting back to Husserl. Science must provide knowledge and refrain from defining the world for society. "In a peculiar way, scientific

knowledge must stand its ground and take itself back; it must continue to produce new achievements, and at the same time, it must refrain from defining the world for society. To be sure, no one seriously doubts the descriptions of the world furnished by science, insofar as science itself trusts them. Nonetheless, the effect is virtually non-binding as far as other systems of communication are concerned." (Luhmann, 1998a).

In a way this is parallel to the Husserl critique of science as described above. Husserl claimed that science for the technicalisation of the world is one-sidedly aimed at formalisation, idealisation, etc. This technicalization overlooks the life-world perspective. Nevertheless, with rationality in the more modern understanding, science must provide knowledge and simplifications. These are constructed by science with the code true-false. Parallel to this, there are knowledge creation and simplifications in other function systems. For example, accounting in the economic system. Science must be able to observe society and be able to point out blind spots, but not comprehend itself as producing a full abstract representation of the world. "Science can no longer comprehend itself as representation of the world as it is and must therefore retract its claim of instructing others about the world"ft achieves an exploration of possible constructions that can be inscribed in the world and, in so doing, function as forms, that is, produce a difference." (Luhmann, 1998a).

## Politics

The function of the political system is to make binding decisions. It happens in the media power with the code government-opposition. Luhmann divides the political system into three sub-systems: the parliamentary subsystem, the administrative subsystem and audience as a subsystem. They can again be divided into several subsystems. The parliamentary subsystem is differentiated into supranational national, regional. The administrative sub-system is divided into various administrative areas and organisations etc

The traditional view of the connection between these three subsystems is that the parliamentary system via parliament, government and audience makes binding decisions expressed in laws and directives and passes this on to the administrative system.

This is, according to Luhmann, a simplistic view of how the political system works. "Seen from Luhmann's system theory, it is highly naive to talk about a hierarchical control chain as the backbone of political power. Power should rather be understood as a productive cycle between subsystems that have gained independence over time, which in return reinforces the dependencies between them and thus the possibility of power." – my translation (Andersen, 2018)

Luhmann distinguishes between two power circles. The parliamentary circle between the parliamentary system and the audience. This results in binding decisions on new laws etc. The administrative circle run from administration system to the parliamentary system. The administrative system prepares budgets, policies etc. The audience can be included in the administrative system via user-groups, hearings and other interaction.

For statistics this is well described by Radermacher, including the changing conditions for these types of interactions. "A highly fragmented landscape, as we find in official statistics,

is the result of long-term developments in which (by consensus between producers and users) a focus on isolated statistical 'silos' dominated. This resulted in a matrix of users and producers broken down by subject areas (e.g. agriculture, labour market, prices…), where essentially the main diagonal was of mutual interest. This has changed radically, not least because the policy areas themselves are no longer so one-dimensional … No example could be better suited to portray these relationships, and the full range of complexities of both the statistical subject and the disciplines engaged than Sustainable Development." (Radermacher, 2021b).

If the internal complexity of the political system is constantly increased through internal differentiation, why does it not fall apart? Why don't we just see chaos? Luhmann suggests how the State as a self-description creates opportunities for the many operations of the political system to be attributed to the State as a form of unity. The starting point is that a social system can not only communicate about something but can also communicate about itself and over time develop self-descriptions. These self-descriptions have an important function: They create the possibility that the system can thematize operations such as actions and attribute them to oneself. (Andersen, 2018)

The political system communicates about itself and describes itself. What does this exactly mean? How does it work in practical terms? A broadly used term is governance. This word has been introduced to stress the process of governing in contrast to the static term government. The term today encompasses the activities of a wide range of public and private institutions. It is in focus especially in relation to global development used by the UN, IMF and the World Bank. E.g. Goal 16 in the SDG's focuses on good governance (UN, 2022). It is being discussed in various fora related to global development (Fukuyama, 2013).

I will return to governance later on and put this into a new light in a reflection on society and statistics.

## Cognition and epistemology

The question on how is knowledge possible will now be approached with the insight above: Husserl, system theory, rationality and functional differentiation. The question about knowledge could be phrased more precisely like this: How do cognition work in a functional differentiated world without a single instance that can tell us whether the cognition is true or false.

Luhmann defines cognition as construction in the following way: *"Cognition* is manufactured by operations of observing and by the recording of observations (description). This includes the observation of observations and the description of descriptions. In any case an observation of the distinction takes place and, depending on the distinction, the indication of something. The concept is indifferent in regard to the system's type of autopoiesis, i.e., indifferent to the form of operation that may be life, consciousness, or communication. It is also indifferent with respect to the type of recording (memory); it may be biochemical fixations, but it may also be written texts." (Luhmann 2006)

A (now classical) reaction to this is that “anything goes” as described under the subjectivistic position above. I am free to create the knowledge I want. However, according to Luhmann there is no free choice. There is no arbitrariness in the real world. “The self-isolation of a cognizing system—a cell, an immune system, a brain, a consciousness, a communication system—does not lead to a free choice of operations which thereby would become possible. The opposite is the case. Any observer of a system that closes itself for cognition can recognize sharp limitations of what is then possible. In any case, there is no arbitrariness in the real world. The supposition of randomness instead always means observe the system that you think to be working at random; and then you will see that your assumption was wrong. Arbitrariness is, from this perspective, nothing but a term for the directive, ``observe the observer” (Luhmann, 1998b). For social system the double contingency theorem sets limits.

Using the insight above we can now replace the subjectivistic – objectivistic positions above with the system / environment distinction.

“The subjectivist problem was to state and to show how it is possible by means of introspection. (…) to form judgement about the world of others. On objectivism, on the other hand, came up with the idea of describing knowledge as a condition or process in a particular object. The mistake here lies in the assumption that it is possible to describe an object completely. (…) In order to avoid these problems, which arise from the point of departure taken, both subjectivist and objectivist theories of knowledge have to be replaced by the system /environment distinction, which then makes the distinction subject/object irrelevant.” (Luhmann, 2002c)

Constructivism goes beyond these positions by radicalizing the relationship between cognition and reality. Without the subjectivistic position and objectivistic position we can instead focus on the operation when dealing with the so-called ‘reality’. It is in this operation operating with distinctions that cogitation takes place. “It is no longer a question of the difficulties that arise from a multiplicity of sides or perspectives, and the problem is no longer how one arrives, given this situation, at unity. This multiplicity, regardless of whether it is a multiplicity of sides or of perspectives, is itself a product of cognition, resulting from certain types of distinctions, which, as distinctions, are instruments of cognition. It is precisely by means of distinguishing that cognition separates itself from everything that is not cognition. Nonetheless, one is always dealing with concretely determined operations- even in the case of knowledge. Without water the jellyfish goes limp. But in order to recognize that, distinctions are necessary: with/without water; not-limp/ limp. These distinctions are codifications specific to cognition, which function independently of the environment (i.e., of stimuli), because there are not and cannot be any equivalents for them in the external world.” (Luhmann, 2002c).

In other words: “Radical constructivism begins with the empirical assertion: cognition is only possible because it has no access to the reality external to it. A brain, for instance, can only produce information because it is coded indifferently in regard to its environment, i.e., it operates enclosed within the recursive network of its own operations”. (Luhmann, 2002c)

When addressing epistemology one has to be able to distinguish various distinctions. (Luhmann, 2006).

1. the distinction between operation and observation, in which case an observation is a specific operation, namely, the operation of distinguishing.
2. the distinction between the system-reference (system and environment) of the first-order observer and the system-reference (system and environment) of the second-order observer
3. the distinction between other-observation and self-observation which presupposes the distinction between system and environment,
4. the distinction between an observation of an observation based on what the observed observer observes (what he/she is dealing with) and one based on that which he/she cannot observe (his/her distinction);
5. the distinction between the binary code true/untrue and other forms of self- or other-observation.

The first part deals with operation and observation. *First: operation* (noesis in Husserl's conceptual world) designates every operation that refers to something beyond itself and through this back to itself. Different types of systems consist of different types of operations. Psychic systems, for instance, think and feel, whereas living systems consist of biological operations, and social systems communicate. *Second: observation* (noema in Husserl's conceptual world*)* designates the unity of an operation that makes a distinction in order to indicate one or the other side of this distinction. Its mode of operation can be life, consciousness or communication.

The second part is about *Second order observation (re-entry)*. It designates the distinction between the system-reference of the first-order observer (self-reference and external reference) and the system reference (self-reference and external reference) of the second-order observation.

Part three is about observation carried out as self observation or observation carried by other systems.

Part four is about the blind spots. What can be seen or not seen when observing in a second-order observation when observing with distinctions used in first-order observations. The fourth part is about binary code distinctions for functional systems as presented above.

Part five is about binary codes. How do operations and observations take place operating in various subsystems working with respective codes

In chapter three I will shortly describe how quality frameworks could be used as practical implementation of second order description. E.g description of user perceptions, processes and product – including when selecting what data should be included and excluded in the production of statistics.

## Case: ecological communication

Based on the ideas above, Luhmann has, in the book Ecological Communication, analyzed problems about ecological dangers. The text below does only briefly present some aspects of the analysis.

Luhmann starts by describing the traditional way we react to ecological problems. We are looking for causes and effects so we can find out who is responsible and based on this we can intervene. “The customary way of treating ecological problems begins from causes within society and then seeks responsibility for their effects. Therefore the problems are best eliminated at their source, for example, when a chemical plant disposes of poisonous waste at a garbage dump or into a river with the consequence that fish are killed or that the water-supply becomes contaminated. An enforceable legal code suffices to handle such problems. But both the problem typology as well as a systems-theoretical analysis require a change of approach: a reconstruction of the problem from a systems perspective, one that is sensitive to the effects of ecological changes.” (Luhmann, 1986)

It is possible to intervene in these casualties, but according to Luhmann, it is only one way of doing it. “Intercepting the causes is one of the possible ways of taking care of their effects, but only one among many. The problem of reaction to effects and the possible (almost limitless) causes and effects of such reactions remains. In other words, the tragedy of decisions is that the affected system is also the cause of its own damage. But this is still not a formula for the solution of problems.” (Luhmann, 1986)

Luhmann thus believes that the culprits, for example industries with high emissions of CO2, can be pointed out and punished. However, the problem is more complex. The problem has relation to communication in science, in mass media, in politics, etc. including resonance problems between systems and resonance problems in relation to our physical surroundings. We witness autopoietic systems working with the continuation of autopoiesis without any concern for the environment. We are thus all guilty: "... On the level of our analyses this question would lead to the discovery that society, itself is guilty and we know this already” (Luhmann,1989)

I will limit myself here to highlighting two issues. It concerns epistemology and the problem on overburdening the political system.

First epistemology: If the starting-point were an objectively given reality that, for the time being, was still full of surprises and unknown qualities, then the only issue would be to improve science so that it could know the reality better. But then the relations of the other systems to their environment - for even within society there are many other systems - would not be grasped sufficiently. Even science would not be able to understand why with its "better knowledge' it often finds no resonance within society because what it comes to know. It’s `better' knowledge would have no value at all as reality in the environment of other systems is at best a scientific theory for them. Not much is gained, therefore, by following an ontological theory of reality (which corresponds to a first-order observation of the environment) because this theory is not in a position to grasp the problem as such. (Luhmann, 1989)

The second problem is about the consequences for the political system. Following the simple cause effect model, one cannot avoid a decisions about what counts as cause and who is to be held responsible. This has the result that morality and politics are overburdened by the unavoidability of this decision. With this observation Luhmann says there is both to much

and too little resonance. There is too little resonance between the external environment and society. Inside society there is too much resonance. The political system gets overloaded with morality. The scientific systems produce reports but lack a broader understanding of the function systems. (Luhmann, 1989)

Luhman advocates for second-order observation as the point of departure. We have to see that what cannot be seen cannot be seen. Only then can we discover why it is so difficult for our society to react to the exposure to ecological dangers despite, and even because of, its numerous function systems.

“In many ways modern society has opened up possibilities for observing and describing how its systems operate and under what conditions they observe their environment. The only drawback is that this observation is not disciplined enough by self-observation. It appears as better knowledge. But in reality it is only a particular kind of observing of its own environment. (…) But every operation and every observation has structural limitations, which is precisely what second-order observation makes clear. A better evaluation of the situation is attainable only when this insight is applied to itself, i.e., is employed recursively. When this is done the constraints on the ability to observe, describe and turn insights into operations have to be analysed and compared”(Luhmann, 1989)

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## The helicopter perspective – what is the ambition?

So from a helicopter perspective – what is the ambition on introducing the theory of self referential systems? First, what is not the ambition: It is not possible from the outside to understand and define a self-reference system, as it was done in closed and open system perspectives. On the other hand, it is possible to observe observations - the system's own perception. For example, in relation to a given problem e.g. the climate crisis. Secondly it is also the ambition to set up alternative solutions to a given problem, which makes it possible for the self-reference system to make comparisons. Luhmann calls the method functional analysis: "The fruitfulness of the functional method and the explanatory value of its results depends on how the relationship between problem and possible problem solution can be specified. (…) One comes (for example) to statements such as: If (it is really true that) inflation solves distribution problems relatively conflict-free, it is a functional equivalent to politically riskier, more conflict-ridden state planning. And only on the basis of such a statement outline does it prove profitable to empirically explore the underlying casualties. In this sense, the functional method is ultimately a comparative method, and its introduction actually serves to open up the existing to other possibilities. (Luhmann, 1996, Chapter 2)

In short: instead of endless discussion about reality, rationality etc we should direct our focus toward the distinction we are working with concretely in our observations. It is through these we get knowledge. We can observe observation of observations. This open the possibilities for comparisons of different solutions. I think this statement could express in a very short manner how Luhmann transforms the life-world perspective from Husserl into a life-world perspective on social systems.

## 2.2 Reflections on statistics with Radermacher and Luhmann

The first claim in the chapter was that the theory of self-referential systems should be used as the epistemological foundation to shed light on the role of production and use of statistics in a modern differentiated society including how to overcome the problem on objectivistic vs subjectivistic view on statistics. Based on this the reflections below will focus on a) the conception of knowledge, b) co-creation of statistics and society, c) SDG-indicators and d) a short reflection on solutions suggested by Radermacher.

### Knowledge – from what to how

As mentioned, statistics are often seen as simple, straightforward, and objective descriptions of society. This is questioned both by Luhmann and Radermacher. They both have, based on system theory, complexity as a central element in their approach. For Radermacher complexity is a property of systems, both of the systems that are to be statistically quantified and the system that performs that quantification. "A complex system is a system that consists of many components that can interact with each other. In these sorts of systems 'every element has systems above, below, and on the same level, related by any possible relationship: scale inclusion, control, etc. In consequence, there is no privileged perspective for an analysis of the whole system, which must be accepted as 'basic' or uniquely privileged. Nor is there a simple, linear causality among elements of the sort that is assumed in mainstream economics and in classical (but not in contemporary) physics. Accordingly, there is no possibility of conclusive knowledge of the total system' (Radermacher, 2021)

Radermacher stresses that complexity is important. Why is it, however, meaningful and necessary at this point to devote oneself to the topic of complexity when it comes to official statistics? Radermacher emphasizes that complexity is important in the relationship between knowledge and measurement, in order to pave the road for an understanding of the statistics–policy interfaces and the deduction of principles and general advice to official statistics concerning a strategic positioning in this political environment.

"An understanding of knowledge as constituted within a complex system of interaction would, on the one hand, deny that knowledge can be seen as atomized 'facts' that have objective meaning. Knowledge comes to be in a dynamic network of interactions, a network that does not have distinctive borders. On the other hand, this perspective would also deny that knowledge is something purely subjective, mainly because one cannot conceive of the subject as something prior to the 'network of knowledge,' but rather as something constituted within that network. The argument from complexity thus wants to move beyond the objectivist/subjectivist dichotomy. The dialectical relationship between knowledge and the system within which it is constituted has to be acknowledged. The two do not exist independently, thus making it impossible to first sort out the system (or context), and then identify the knowledge within the system." (Radermacher, 2021b)

In his understanding Radermacher replaces the subjectivistic vs objectivistic approach on knowledge with knowledge as constituted in a complex system of interaction. Zooming in on the role of statistics it should aid in making political decisions in society but at the same time be impartial and be produced according to principles mentioned in chapter 1. Regarding the constitution of knowledge in the interaction between the administrative statistical system

and parliamentary system Radermacher introduced the distinction between policy and political decision. The interface between the political part and the statistical part is expressed in policies. Thus policies and the measurements taken should be guided by principles including quality frameworks.

Luhman agrees on the concept of complexity where knowledge is created dynamically via political decisions and policy as opposed to simple neutral implementation of statistics based on political decisions. Regarding measurement and reality Luhman rejects the idea of statistics depicting an external 'reality'. As cognition described above Luhman sees measurements as recorded observation using distinctions constructed and expressed in a policy. In a second order observation the measurements are observations using various distinctions taking place in a political system operating in the medium of power. This system can be irritated and in more or less resonance with other function systems. In a more detailed analysis of this it would be possible to see blind spots. I will shortly touch upon these when talking about the co-construction of statistics and society.

## The co-construction of statistics and society.

An important and to many a radical statement in the approach from Radermacher is the idea that statistics and society are co-constructed. In this perspective knowledge-making and statistics is incorporated into practices of state-making, or of governance more broadly.

"Co-construction (..) highlights the mutual influence between producers and users of a technology, such as statistics, and elaborates "the simultaneous processes through which modern societies form their epistemic and normative understandings of the world. This framework, (…) shows how scientific ideas and beliefs, and (often) associated technological artefacts, evolve together with the representations, identities, discourses, and institutions that give practical effect and meaning to ideas and objects. Data, information and knowledge are human products of social processes; they are influenced by the way we see the world and they are mutually influencing the world we live in. Co-production studies therefore seek to explore how "knowledge-making is incorporated into practices of state-making, or of governance more broadly, and in reverse, how practices of governance influence the making and use of knowledge" (Radermacher, 2021)

Regarding governance, Radermacher divides governance into two: firstly (active) governing through information and secondly governance as an institutional framework. He introduces a feedback loop between information and social institutions in the sense that co-production is a fundamental part of any form of governance: on the one side, the governance through information with the purpose to guide, steer, control or manage sectors or facets of societies; on the other side, changes in institutions caused by the massive increase of information processes. Figure 1 below, prepared by Radermacher, shows governance with two sides and feedback loop.

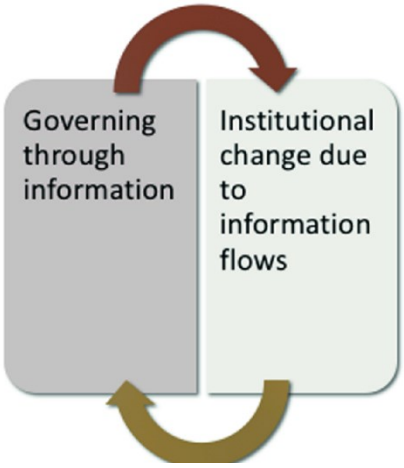



**Figure 1.** Governance with two sides and feedback loop.

In this way the history of statistical methods is linked "with the history of issues placed on the agenda for official decisions which themselves covers: (1) ways of conceptualizing society and the economy, (2) modes of public action, and (3) different forms of statistics and of their treatment".

The following table shows the historical development of the three elements:

| *Conceptualisation of society and economy* | *Modes of public action* | *Forms of statistics* |
|---|---|---|
| Engineer state | Planning of production and population | Demographic statistics, production in physical quantity, input output balance, material balance |
| Liberal state | Focus on free competition protected by the state | Statistics for market transparency, ensuring competition |
| Wellfare state | Projection of labour markets | Labor market statistics, household budget surveys, consumer prices index |
| Keynesion state | Focus on demand and its components at macro level | National accounting analysis of the economic situation and business cycles, fiscal statistics |
| Neoliberal state | Incentive, benchmarking containing the influence of the state, management by objective | Indicators for resource allocation, performance evaluation and benchmarking. |

**Table 1.** Conceptualisation of society and economy, Modes of public action and Forms of statistics

With this perspective one can see how the current official statistics programme has developed with different forms of governance.

Thus, both Luhmann and Radermacher reject the simple idea of parliaments making binding decisions followed by neutral implementation in the administrative apparatus. For Radermacher knowledge is co-created aiming for making decision and steering. This takes place via governance through information and governance as an institutional framework and feedback loop. See above.

According to Luhmann the political system is differentiated into a number of subsystems aiming at handling complexity. Luhmann suggests using the concept state to describe and handle the complexity. Regarding governance the political system communicates about itself and describes itself. What does this exactly mean? How does it work in practical terms? As communication in politics in the medium of power, discussions about governance are themselves part of the political system. They are not neutral. A similar phenomenon was described regarding mass-media above.

We are now getting a little closer to the ideas from Luhmann. The political system is able to describe itself in order to reduce complexity. The model presented by Radermacher can be seen as a kind of second order observation presented from the science system. The model challenges the dominant understanding of statistics. By bringing this model into the communication in the political system it can create resonance and awareness of pressing problems described as the three revolutions above.

However, there are some reflections needed in order to improve the model by Radermacher. The first reflection is about system theory. The system theory used by Radermacher is based on the theory of open systems and cybernetics. With this perspective the communication on measurements followed by binding decisions in the political system takes place in a cybernetic circuit. It is possible to transform input to output and have this regulated with a feedback loop. (think of thermostat)

In Luhmann's opinion we are in a situation “with such a high degree of complexity that it is not possible to describe it like a factory, i.e., in terms of transformation of input to output” (Luhmann, 1986). IoTherefore, the second order observation by Radermacher could be improved by conceptualising ‘the State’ as a self-referential system.

The employment of theories when seeing and measuring is the subject of the second reflection. With the help of the aforementioned epistemology, we may see what is happening in the political system. The function systems (politics, business, law, science, mass media, etc.) resonate with one another in a fully functional differentiated society. The political system does not, however, entirely resonate with other functional systems. As previously said, the scientific theory of economy applied in the cybernetic circuit (1. order) in the political system frequently dominates significant distinctions in observation.

A second order observation would be able to describe this phenomenon and possibly improve reflections and see blind spots aiming at finding solution of the problems described by Radermacher including the problem with fake news.

Niels Åkerstrøm Andersen has published several excellent analyses of the political system in a Danish context on issues like privatization, self-created state administration, etc (Andersen, 1995, Andersen 1987). However, there might be more resonance applying this research in different function systems. Some of the funding for these kinds of investigations has been cut by the political system. This Luhmann conference should be useful in creating more focus on this type of research.

The analysis of ecological communications could also serve as an example. "The problem of reaction to effects and the possible (almost limitless) causes and effects of such reactions remains. In other words, the tragedy of decisions is that the affected system is also the cause of its own damage" (Luhmann, 1986) This brings me to the next topic: Sustainable development goals.

## Indicators and Sustainable Development Goals

This basic principles on sustainability was introduced by the Brundtland commission at the end of the 1980s. Goals was formulated etc. Since then several initiatives has prepared indicators for measuring the goals. Latest by UN The Sustainable Development Goals (SDGs) or Global Goals are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all" (UN, 2015) The SDGs were set up in 2015 by the United Nations General Assembly and are intended to be achieved by the year 2030. They were supplemented with additional indicators in 2017.

Radermacher has followed this development closely since the 90's. He made a statement about the sustainable development in 1999 claiming that measuring do not solve the problem on sustainability. "Sustainable Development can only be defined and achieved by a complicated restructuring process of the society including the fact that the final results of that process cannot be anticipated by (scientific) assumptions and (statistical) surveys or estimates. Consequently, the quantitative results of "Environmental Economic Accounting" or "Sustainability Indicators" must be interpreted as representations of possible margins for the manoeuvre to Sustainable Development, and inputs to policy debate in this sense". (Radermacher, 2021b)

He finds this is still the case today. In this perspective Radermacher is quite pessimistic on the work on creating the indicators and having co-creation as described above.

However, two factors—complexity and difficulty in putting the indicators into practice—as well as the remark that sustainable development necessitates social restructuring—are pertinent in this context. The usual way of co-creating statistics is not operating as intended.

## Solutions / initiatives

Radermacher stresses that we must move away from simple stepwise improvements "The continuous, bottom-up improvement of processes, technologies and data sources that has characterised the last decades of official statistics is not enough in such an era of dramatic changes. The completely new, competitive situation requires official statistics to provide

innovative strategic answers that go beyond traditional statistical methods and technologies. The core of this will be to maintain (or, if already lost, to win back) trust in official statistics, both as an institution and as an information infrastructure, in the face of skepticism towards politics and state institutions." (Radermacher, 2021b)

According to Radermacher's view, his main objective is to deal with the three revolutions of data, governance, and fake news in order to establish trust in statistics. Radermacher offers the following three ideas:

*Firstly* he focuses on the need for an ethics governing the production of statistics. "In the age of Big Data, AI and algorithms, a need exists for ethical guidance and legal frameworks under new conditions: "In the world being opened up by data science and artificial intelligence, a version of the basic principle of the partnership between humans and technology still holds. Be guided by the technology, not ruled by it" (Lohr 2016). What might facilitate the perceived new search for orientation and balance is the stock of ethical and governance principles that is available, emerging from two hundred years of history in official statistics."

An example of this is the need for reflections on the use of AI in monitoring citizens. See for example Mass surveillance in China (Wikipedia). An example from Denmark is the use of linking registers to prevent fraud. In Radermachers wording: " … the point here is to show the quantitative turn that results from the fact that in modern Western societies, it is a supposed normality to do a "systematic effort to delineate and measure the objects and results of governance quantitatively for the purpose of demonstrating competitive edge and superiority at the individual and/or collective level." (Radermacher, 2021b).

Radermacher accepts this but points out that the quantitative turn has side effects: e.g. fake news.

The possibility of ethics creating changes is rejected by Luhmann: "To moralize is to communicate that one cannot respect the other as long as she does not occupy the same position as oneself. Systems theory offers a way of formulating political projects that guard against moralization by rejecting the possibility of an idealistic, universal alternative outside the existing world" (Andersen, 2018)

"When you start with the concept of observation, then political thinking becomes a form of practice that ... begins "in the middle" ...(). As a theorist, activist, researcher, politician, civil servant, citizen, you are both an observer (who can refuse to distance himself from the observed), but also always already a participant. You are in the middle of the world, surrounded by movements that cannot be controlled from anywhere" (Andersen, 2018)

There is, for example, no privileged place outside, for example, capitalism, where one can freely develop utopias and ideals and moralize about society's inability to live up to them. (Andersen, 2018).

From a position 'in the middle', the project becomes to destabilize categories, disrupt assumptions and offer new language for society's problems, dilemmas and exclusions. (Andersen, 2018).

*Secondly* Radermacher suggests what he calls citizen science. ".. Citizen science projects actively involve citizens (as contributors, collaborators, etc.) in scientific endeavours that generate new knowledge or understanding. Although citizen science is still relatively young, it hits the point, which is becoming increasingly important for official statistics. (…)
At its core are the same problems and difficulties as the issue of using Big Data for official statistics in general: control of procedures, quality assurance, interpretability of information and neutrality/impartiality.

Luhmann would agree on citizen science having knowledge creation taking place in society. However they are observations next to other kinds of observations aiming at finding solutions to problems communicated among citizens. As all other kinds of observation they can irritate and create resonance with functions systems: mass media, science, the political and legal system.

*Thirdly,* Readermacher suggests scientific analysis of the role of statistics in society. Radermacher highlights analyses conducted by Thompson Klein. "Thompson Klein (2004) emphasises that complexity in the subject matter might be coupled with the complexity of interdisciplinarity that is needed when dealing with such complex systems. She gives a number of examples for this difficulty to answer a question, solve a problem or address a topic that is too broad or complex to be dealt with adequately by a single discipline or profession, for example:

- "Human interaction with natural systems (agriculture, industry, megacities);
- Major technical development (nuclear technology, biotechnology, genetics);
- Social, technical and economic developments interacting with elements of value and culture in ageing, energy, health care and nutrition;
- Sustainable Development" (Radermacher,2021)

Luhmann agree that there is a need for creating trust and need for scientific analysis with second order observations aiming at improvements in the reflection in society. This would include analysis of the role of statistics in various functions systems as first order observations followed by second order observation. This would enable us to see blind spots in the way we uncritically use data including AI to solve problems in society. It would be able to see the lack of resonance in the communication in society as described in the third revolution. Regarding the second revolution on the neoliberal state it was shown above that a new perspective on the functioning of the state should be introduced.

## CONCLUSION

This chapter made the case that the theory of self-referential systems should be utilized as the epistemological foundation to resolve the conflict between an objectivist and a subjectivist view of statistics, but it also provided some insight into the function of statistics from a larger viewpoint.

It was accomplished through a brief discussion of Husserl's thoughts from Crisis of the Science. On the basis of this, the development towards self-referential systems was described. The evolution into the contemporary differentiated society was then discussed from a historical viewpoint on rationality. In light of this, Luhmann's conception of cognition and epistemology was discussed, especially how the theory of self-referential systems addresses the issue of objectivistic vs. subjectivistic perception of the connection between cognition and reality.

The chapter was closed with reflections with Radermacher and Luhmann about statistics and society. This included focus on the conception of knowledge, co-creation of statistics and society, SDG-indicators and a short reflection on solutions suggested by Radermacher.

In conclusion, I have attempted to make the case that changes in the generation and application of statistics are also responsible for changes in contemporary society. My main contribution is to advocate for the inclusion of second-order analysis in the production and use of statistics as well as the acceptance of changes that necessitate new statistical coordination.

# 3.Coordination, quality and tools

As written in beginning of the paper I had three claims on coordination, quality and tools:

- there is a need for a new approach to coordination in the National Statistical System.
- terms related to quality frameworks for statistics should be defined more precisely and play a key role in the description of work processes, products and user perceptions.
- there is a need for simple and flexible tools to support coordination.

As mentioned in chapter one the traditional understanding of coordination and planning in organisations often do not work when implementing indicators for the SDG's. There are simply too many factors that influence the coordination and the decision making in each country. These can be stories from the past, ways of doing things, various views on the goals, etc. In other words, each country has their own understanding and their own ways of doing things. The chapter first presents the problem faced with coordination of the production of SDG in many countries. This followed by a reflection part covering coordination, quality and tool among other things.

## PROBLEMS FACED

As a system the National Statistical System (NSS) is the combination of statistical organisations and authorities within a country that jointly collect, process and disseminate official statistics on behalf of a national government.

The work on implementing the SDG has provided us with a way to collect, process and disseminate reliable information, guided by common global goals, targets and indicators and methodology. Preparing the SDG at global level requires more coordination. Many organisation must contribute.

The *Cape Town Global Action Plan for Sustainable Development Data* provided us with six strategic areas focusing on the improvements on monitoring the SDG goals. (PARIS21 2022b) The importance of coordination in the National Statistical System is stressed in several places. The *Handbook on Management and Organization of National Statistical Systems in section 2.1.* (UNECE 2022) gives a good introduction and stresses the importance of coordination. PARIS21 has provided a detailed publication with good models, case studies, etc: *Coordination capacity in National Statistical Systems* (PARIS21, 2021) . In addition, a number of tools have been prepared. See later in the paper.

Thus, a number of initiatives have been taken to deal with the complex issues in connection with the production of indicators related to SDGs.

However it is the experience of the author that several countries still are facing problems in planning and implementing a coherent system with smoothly running production of SDG indicators. In a country I was helping with the SDG implemention the following needs were expressed (similar problem has been identified in several countries)

1. Need for *clear responsibilities* on who is doing what, and when
2. Need to *standardize the templates for data exchange*
3. Need to agree upon a *calendar* for data collection from data providers and calendar on release of SDG indicators
4. Need to agree upon the *data collection methods* and validation with data providers

The challenge is especially on coordination of work processes where indicators are based on data from data providers outside the National Statistical Organisations.

This observation is confirmed in a recent global survey about the implementation of the Cape Town Action plan (PARIS21 2022b). The main results on coordination showed that only 6% of the NSOs in low, lower and middle income countries consider that coordination capacity of the NSO with partners inside the NSS is satisfactory, as opposed to 43% of NSOs in high income countries. 18% of NSOs in low, lower and middle income countries, and 26% of NSOs in upper middle-income countries, consider that coordination with partners in the wider data ecosystem remains unsatisfactory.

## REFLECTIONS

## Traditional system theory

Coordination, which refers to actions that enable or support goal-oriented interventions, is frequently viewed in conventional system theory as the primary purpose of corporate management. The coordination of these processes and structures is the major responsibility of business management, just as judgments about the concrete design of organizational processes and structures are the core activity of management. The "cybernetic circle" or "thermostat circle" of planning (definition of goals, formulation of plans), implementation of plans (division of strategic plans into operational programs), realization (with no room for discretion on the part of the task performing actors), and control can be used to describe management via coordination (with the result of a feedback towards plan definitions or towards a search for possibilities to enhance performance).

This kind of coordination does occur, but it is overly strict and disregards the author's observations, such as stakeholder interests and communication initiatives at meetings. And to be even more precise. The conventional interpretation frequently views these as deviations that must be eliminated in order to progress towards the cybernetic circle's description of a rational model.

## Social systems as an alternative

Organizations are seen by Luhmann as autopoietic social systems that reproduce themselves on basis of decisions. Decisions are described as "a choice among options" in daily English. Luhmann advises thinking of decisions as a particular kind of communication. Decisions are communications; they are not made first and then communicated. Programs and plans serve as crucial communication elements in organizations as social systems. Programs can be viewed as re-entries or second-order observations that express the system-environment perspective from a system theoretical standpoint. At the structural level, they operate. A program that addresses SDG implementation is one example.

“.. re-entry takes place on the structural level of the system. Structures “represent” internally the system/environment distinction to the system. (..)with regard to organizations, the operations of a system cannot observe their environment. Instead, they observe the system’s programmes as a substitute for the environment and orient themselves according to them. Take, for example, a business programme of a corporation. This programme refers, on the one hand, to the market situation, possible moves by competitors, characteristics of consumers, or something similar, and on the other hand, to the necessary decision processes in the organization. By taking the programme as a decision premise decisions orient themselves according to the two aspects of the programme as if to the organization/environment distinction itself.” (Seidl, 2006)

The statistical world provides the example of quality standards for products and procedures. I see the work from a system theoretical perspective as decisions premises.

Coordination

What about organization-to-organization collaboration inside the National Statistical System? Every organization operates as an autopoietic social system. Is it then possible to steer? Is outside planning even possible? Given that social subsystems are self-referential, closed systems, it follows that only self-steering is possible (Assche, 2008). Only through influencing the various self-steering mechanisms involved in a planning situation is planning possible. In other words, every attempt at planning will deviate due to the various systems' tendency to steer themselves.

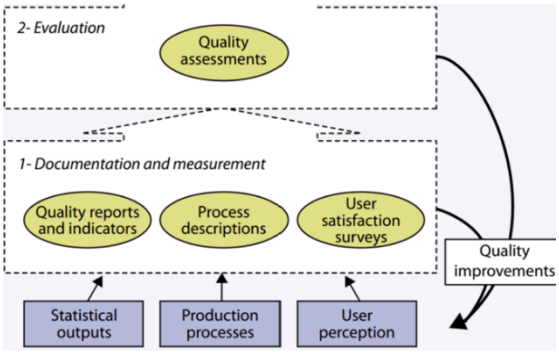
Programs as quality frameworks working as decision premises, however, might function as a form of indirect planning. How does that function? It is frequently believed that quality frameworks are merely orders from above that determine how to proceed. This represents the conventional system view of coordination and ignores the requirement that the personnel using the frameworks and standards must understand their purpose. In other words: communications in autopoietic systems must be meaningful and make sense to the participants.

Therefore, in order to serve as the foundation for decision-making in practical applications, the frameworks and standards must be carefully chosen and tailored. Also keep in mind that the decision processes involved in choosing and customizing standards and framework for the National Statistical System (NSS) as a whole must make sense. This is crucial when including organizations that produce statistics in the National Statistical System (NSS), such as the Central Bank, whose primary responsibility is not to produce statistics.

Regarding contributions from consultants they have to fit into the situation as descriptions related to the problems faced. There is no room for general recipes. “One size fits all do not work”.

<u>Quality</u>

Quality can be viewed as a type of second order observation or as decision premises, as was demonstrated above. As second order observations conducted by the organization or outsiders, they help the organization identify blind spots and make adjustments as a result. See the discussion of reflection and epistemology above. The drawing below demonstrates how documentation of output, processes and user perceptions are essential (Linden, 2009)



The key idea is that measurements and documentation generate second order observations, which not only pave the way to pinpoint blind spots and other issues. Using a quality framework (e.g. UN National Assurance Quality Framework) do also provide the organisation with cognitive capacity, if the terminology is understood and make sense for the organisation. In other words: the measurements are not simple one-to-one description of reality, but important elements in the communication and understanding in a organisation. A similar case has been made about using Management Accounting Systems *(* Scheytt, 2006). I won't go into detail about this; I'll just say that there are tools in place that could be modified in accordance with the above-described epistemology and methodology.

Tools

Coordination can be aided by the following tools: Adapt (PARIS21 2022a), EPIC Tool (2022), and StaTAct (2022). They offer assistance on planning, resource allocation and other areas. However, the tools aren't flexible enough. The issue is that the information that must be entered and shared in a tool is often very complex. It does not accurately reflect the information that a country requires for coordination, and cannot be altered after it is entered.

The ideal tool must support decisions and conversations, in light of the aforementioned considerations. This must be accomplished by applying standards and frameworks to particular situations. Using the content as second order observations, blind spots must identified and guide the decisions on improvements. An effort in this approach is the SDG Coordinator. (Nielsen, 2022)

# Conclusions

The concrete background for this paper is my reflection on consultancy in various countries. This included handling challenges when implementing indicators related to sustainable development and handling challenges on the implementation of Quality in Official statistics.

Chapter one reflected on the role of use and production of statistics. This took place starting with a widely acclaimed article by William Davies: “How statistics lost their power - and why we should fear what comes next” (Davies, 2017). Hereafter a book by Walter Radermacher, a was introduced: “*Official Statistics 4.0 Verified Facts for People in the 21st Century”,* (Radermacher, 2021b). In this book he gives a substantiated proposal on the development and role of statistics in society.

He seeks to clarify that one cannot simply look at and be excited by the possibilities that the abundance of data offers. “So, when talking about the ‘Data Revolution’, the second revolution, that of the neo-liberal governance, and the third, the populist resistance to expert opinion, should all be mentioned in the same breath” (Radermacher, 2021b)

Radermacher stresses that fundamental changes in the statistics are needed now. “… A simple continuation of the previous way of doing things, but including some ‘softer’

changes, is therefore not an option, even if this smooth manner of adaptation has been successful in the past. (Radermacher, 2021b, chapter 4).

Based the above context the paper had the following four claims: 1) the theory of self-referential systems should be used as the epistemological foundation to shed light on the production and use of statistics in a modern differentiated society 2) there is a need for a new approach to coordination in the National Statistical System 3) terms related to quality frameworks for statistics should be defined more precisely and play a key role in the description of work processes, products and user perceptions 4) there is a need for simple and flexible tools to support coordination.

Chapter two dealt with claim one about epistemology. It made the case that the theory of self-referential systems should be utilized as the epistemological foundation to resolve the conflict between an objectivist and a subjectivist view of statistics, but it also provided some insight into the function of statistics from a larger viewpoint. It was accomplished through a brief discussion of Husserl's thoughts from Crisis of the Science. On the basis of this, the development towards self-referential systems was described.

The evolution into the contemporary differentiated society was then discussed from a historical viewpoint on rationality. In light of this, Luhmann's conception of cognition and epistemology was discussed, especially how the theory of self-referential systems addresses the issue of objectivistic vs. subjectivistic perception of the connection between cognition and reality.

The chapter was closed with reflections with Radermacher and Luhmann about statistics and society. This included focus on the conception of knowledge, co-creation of statistics and society, SDG-indicators and a short reflection on solutions suggested by Radermacher.

In conclusion, I have attempted to make the case that changes in the generation and application of statistics are also responsible for changes in contemporary society. My main contribution is to advocate for the inclusion of second-order analysis in the production and use of statistics as well as the acceptance of changes that necessitate new statistical coordination.

Chapter three addressed claims two (coordination), three (quality), and four (tools). According to the analysis of claim 2 on coordination, an autopoietic system can only be self-steering. The idea of decision premise in relation to complexity reduction was presented. Programs can serve as conditions and plans for decision-making. A suggestion was made to include quality standards for products and processes as decision premises in self-steering processes.

It was advised to use quality frameworks to direct second order observation with regard to claim three on quality. These observations, either by the organisation or by others, can help it identify blind spots and make improvements as a result.

In regards to tools claim number 4, it was concluded that coordination tools need to support decisions and communications. This requires the use of frameworks and standards that are

tailored to the circumstances. The information as second order observations must aid in identifying blind spots in order to use this knowledge in improvement efforts.

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