


# Structural Coupling of Regulatory Elements and Reality Challenges: When Mixing Matters

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## ABSTRACT

Different realities are possible and thus also different decisions. They are based on predispositions faced with different challenges that people (do not) acknowledge. The research objective is to point at differences when the reality is based on the opinions of experts, public delivery deliberation, a small group of experts or committees, an individual who decides based on diverse inputs, a small group of experts that does the same, or on collective wisdom. This paper presents a way of independent managing of various perspectives that nevertheless can exhibit their symbiosis in collective opinions as one form of (collective) reality, here named as a “visa” approach of decision making. This paper, based on presented differences, systemic regulatory elements, and their challenges, presents them as synergies (structural coupling) in the form of collective decision making. Independent and individual participation based on collective intelligence can diminish the pressure of interest groups, lobbying, or other informal influences, and can better align various interests.

## KEYWORDS

Challenges, Collective Intelligence, Structural Coupling, Systemic Legal Decision Making

## INTRODUCTION

Public problems are at least indirectly connected with problems of administration, with institutions that do not or do not know how to prevent the financial and other social crises, how to end wars, prevent poverty and provide access to clean water, safe food, etc. Holmberg and Rothstein (2012) go even further and claim that dysfunctional government institutions cause such problems. Although 705 million people were still in extreme poverty in 2015 – (the measure of ‘one dollar per day’) (Roser and Esteban, 2017), the enormous rise of applications allocated to a judicial formation of the European Court of Human Rights from 1999 (8.400) to 2016 (53.600) (with the peak in 2013 with 65.800) (ECHR, 2017), and more pipelines in the world for the gas, liquid petroleum gas, oil and refined products, and not for water as the basic ingredient of life (CIA, 2016) – on average people live better than in the past. This inference depends on a context in which *institutions* formally recognise and act on such (dis)comforting information.<sup>1</sup> Dysfunctionality or legitimacy depends on criteria and

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a time frame in which institutions operate. They do so based on *decision-making*, as the lifeblood of every organization and the central focus in the practice of evidence-based management (OECD, 2014, 2012, 2011; Rousseau, 2013).<sup>2</sup> Despite such promising focus, problems are still trying to be solved in the classical regulatory frames developed in the 18<sup>th</sup>-19<sup>th</sup> century, notwithstanding the known methods developed in other fields like the mathematical Bayes theorem (Ayres and Nalebuff, 2015; Carrier, 2012; Finkelstein and Fairley, 1970; Hacking, 2001), statistical sampling (Dodge and Romig, 1959; Fiedler and Juslin, 2006; Schilling and Neubauer, 2009; Wetherill, 2013), decisional analysis (Edwards, 1999; Edwards et al., 2007; Keeney and Raiffa, 1993; Raiffa, 1994) and risk analysis (Black, 2012; Franklin, 1998; Hood et al., 2001; Molak, 1996; Slovic, 1996). It seems an *underlying systems structure* has to be changed before changes can be implemented. A gap between theory and practice, between – officially and/or even constitutionally proclaimed – democratic participation and practices should be filled by the people. How come Amazon, Internet Movie Database and many Internet shops allow users' reviews, while this is not common to public operations? Decision-makers – despite their professionalism that “suppose to know-how”,<sup>3</sup> – struggle to cope with the unpredictable future. Their decisions are also frequently not immune on the rigidity of human character: personal decisions are often obfuscated by erroneous or incomplete analyses that e.g. use relative risks instead of absolute ones (Gigerenzer, 2003; Rifkin and Bouwer, 2007), are prone to heuristics and biases (Kahneman, 2013; Terje, 2003; Tversky and Kahneman, 1974), without real, scientific evidence that results in a measurable reduction in risk or improvement in decisions (Hubbard, 2009, 2007), with the lack of good communication and confrontation of risk management solutions with reliable partners (Beck, 1992; Lynch, 2009), etc. It is hence no wonder why different opinions exist on the same matter.

As the human factor is sometimes heavier to overcome than its tangible and technological counterpart (Trevisani, 2007) – could it be in the latter a technical method present that could overcome the first, *i.e.* “collect and administrate” people's opinions without the mentioned shortcomings, and hence establish a “different reality”? This paper aims to present the-mentioned technical method based on a systemic design that could find synergies among the rigidity of human character and conclusions of behavioural analysis *in* a form of collective (decision-making) system. Such design is based on connections between parts that as any kind of *ex-ante* design, “discover truths” based on questions or hypotheses we have in our mental frames and on processes through which hypotheses are tested, while a difference is in more objective conclusions. This understanding of the (*unknowable*) whole emerged in the previous century in systems theory (Ackoff, 1978; Beer, 1966; Bertalanffy, 1968; Forrester, 1968; Luhmann, 2013) as an interdisciplinary theory on systems that investigates phenomena in their entirety. Tightly connected with systems theory is cybernetics or control and communication in the animal and the machine (Wiener, 1961) with its focus on signals, information, feedback and control. This paper will – based on the inadequacy of classical regulatory tools, the rigidity of human character and possibilities of technology – present a way of independent sharing of various perspectives, that based on collective opinions (also for the general regulatory decisions) present collective reality. The research methodology is based on the study of system theory and complexity that are with the help of bibliographic synthesis applied to the decision-making system. The latter can progress if collective decision-making and/or collective intelligence is used, especially with the help of nowadays' computing power that can extract correlations and patterns humans cannot see. Historic discoveries show that realities' origins (*i.e.* ways of making perspectives) are more important than hypotheses because the first give new frames from which hypotheses are then made. The paper beyond summarizing recent research also integrates various perspectives on decision-making, offers an integrated framework of collective decision-making and highlights directions for future research. A better than human intuition which is many times used in decision-making this IT that can validate conclusions based on collective intelligence, presented in the fifth section. The mentioned framework is based on a here developed “visa” approach of decision-making, based on lat. *vīsum*, things seen.<sup>4</sup> Evidence is here understood not only as ‘something that tends to prove or disprove the existence of an alleged fact’ (Garner, 2004, p. 595) but also as the construction of fact itself, as ‘an outward sign:

indication; something that furnishes proof” (Merriam-Webster, 2017a) that emanates not from parts but connections. In the following parts of this paper predispositions for different decision-making are established, for which answers are given to multiple challenges (the challenges of signs, of the internal construction of meaning, of reasoning and emergence) that affect the reality construction and its understanding. In the next section, basic elements of systemic legal decision-making are given, to be able to put them into a new light through their challenges (of reality construction) that are enumerated in the third section. In the fourth section, structural coupling among regulatory elements and reality challenges is presented to be able to present in the fifth section collective decision making that can conceptually address the mentioned parts individually, and to connect them at the same time to obtain “new reality”.

## BASIC ELEMENTS OF A SYSTEMIC LEGAL DECISION-MAKING

A systemic perspective<sup>5</sup> emphasises parts, their relations, feedbacks and purposes; in connection with the most important elements of legal science the first is here used to enumerate the basic elements of systemic legal decision-making. Traditional regulatory thinking neglects the basic system’s predisposition based on interconnections. Instead, it mainly looks towards final goals and assumes a single (or few) cause(s) rather than multiple interrelated causations.<sup>6</sup> In the system, each part is connected with all parts (try to lift one part of spider’s net without shaking other parts), and the overall system’s behaviour cannot be predicted from a one part’s behaviour.

### Regulation

The assumption is that people’s problems are not caused by a lack of technical equipment or lack of knowledge of the natural or engineering science (by these tools they can be even enhanced), but by the lack of effective, efficient and ethical social science, especially by the lack of (good, better, effective, etc.) administration that cannot be given or embraced solely by principles<sup>7</sup> or values as they are mutually contradictory (Simon, 1997), but by the administration of the community, institution and regulation<sup>8</sup> (hereinafter:  $\mathcal{R}$ ) within which principles/values are reflected through different importance of rules or their weights. Within these three frames the human action, reasoning and collective consciousness take place. Communities and institutions are more static forms than  $\mathcal{R}$  that daily reflects the babbling and living content of the first two. To narrow the focus on the rule of law, community and institution are presented through  $\mathcal{R}$ ; as the first two are the ways of social control on individuals, which is the content of the third, a presumption is that if  $\mathcal{R}$  is considered, its results can hopefully be applied also to communities and institutions.

### The Duty to Give Reasons

The rule against bias (*nemo iudex in causa sua*), the right to a fair hearing (*audi alteram partem*) and errors of law have their common denominator in the duty to give reasons, so a focus is on the latter to connect the former. Decisions and institutions not only respond to their environments but create them at the same time as “objective” reality (Berger and Luckmann, 1991; March and Olsen, 2010); it is hence important that stated reasons promote objective decisions, but all the more important is that such carefully elaborated facts and reasoning *de facto* contribute to goals. A substantive demand to give reasons (as an expression of legal demand to be heard) fits into the most important aspect of law, the rule of law and its procedural images that contain e.g. a rule by general norms rather than particular; statutes rather than decrees; rules *pro futuro* rather than retrospective ones; sufficient stability and flexibility at the same time; transparent, clear and determinate legal norms. ‘The rule of law requires that public institutions sponsor and facilitate reasoned argument in human affairs’ (Waldron, 2011, p. 19). The duty to give reasons is coming more to the fore directly (Bamforth and Leyland, 2003; Bell et al., 2016; De Smith et al., 1995; Dyzenhaus, 2004; Taggart, 1997) and

indirectly through the demand for impact assessment, cost-benefit analysis, risk analysis, access to public information, evidence-based management, in other fields (medicine, finance) as the right to clear information that is not only given, but also non-misleading (Gigerenzer, 2003; King, 2004; Topol, 2016), or as a part of rational choice of the well and the less educated (Sniderman et al., 1993).<sup>9</sup> Reasons must be given, but it is not straightforward *how*. Reasons can be presented only to justify an already made decision (known also as confirmation bias) than to make one, and there is no way how to know this. Technicalities of decision-making processes many times do not apprehend real processes on which decisions are made, especially in group situations, where each contributes its (small) part into a larger frame. Bounded rationality where individuals pick from an incomplete range of options (Simon, 1997), choose the familiar (the representativeness heuristic), overreact to a recent situation in which his own choice went wrong (availability bias), go to extremes (Sunstein, 2014) or exhibit collective follies when groups cannot see consequences of their collective actions (Briskin et al., 2009) in the larger frame cannot be immediately seen, while reality “does not care” for the formally stated reasons.

### **Differences and Similarities**

Reasons are based on differences and similarities; the former are not present only in a decision, but behind cases’ differences and similarities: ‘until it is established what resemblance and differences are relevant, “treat like cases alike” [although it is a central element in the idea of justice] must remain an empty form. To fill it we must know when, the purposes in hand, cases are to be regarded as alike and what differences are relevant’ (Hart, 1994, p. 159). A legal rule cannot determine what resemblances and differences are among cases and individuals, but – this was so far done – only through the conscientious and intelligent officials individually, or through some established procedures that could purify objectivity as more “objective”. In cases where a deciding authority is not a single person, equality can be “more equal” not only in the presence of Hart’s criteria but through the various inputs and methods of extraction of information that could establish resemblances and differences with a higher resolution and in a more calibrated manner. The (different kind of) duty to give reasons is coming more to the fore, not at adjudication, but at the EU level of general rule-making;<sup>10</sup> its value is in the contribution to predictability (which for Hayek is indispensable for liberty) (2011),<sup>11</sup> to man’s dignity (Fuller, 1969),<sup>12</sup> or the functionality of institutions.<sup>13</sup>

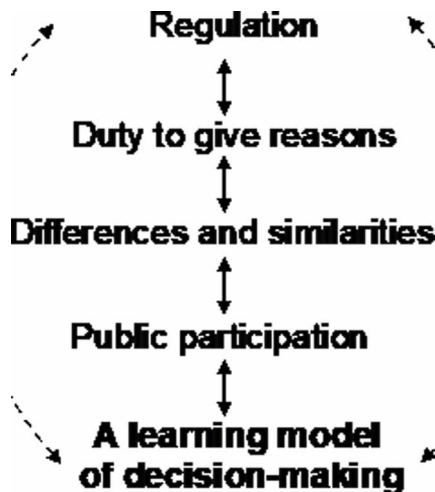
### **Public Participation**

System theory is tightly connected with information and communications technology (ICT) that could empower decision-makers to find innovative ways of addressing people’s needs. At the centre of this aim is still the Ancient Greek notion of direct democracy (reflected in the basic human right to participate in the management of public affairs), now with a growing ability to use data to improve services the public needs. Public institutions collect data from 18<sup>th</sup> century onwards, but they still keep records many times for themselves, although such stance misses one basic thing: information that affects the people can be established and legitimised only by the people. People understand differences and similarities in the frame of national values/contexts; public participation and deliberation are important for the legitimacy and active democratic citizenship. This holds all the more because of (administrative) values – as Dworkin’s principles<sup>14</sup> – ‘have a weight which varies’ (Daly, 2016, p. 24). By associating public needs, the rule of law or other legal notions with weights rather than with determinate norms ‘the procedural aspect of the rule of law seems to place a premium on values that are somewhat different from those emphasized in the formal picture’ (Waldron, 2011, p. 19). Participation can show different weights people give on values as they act as decisions’ predispositions (Posner, 2010). It is thus important how values could be achieved in reality; weights or “what is important in the people’s eyes” can give more insight into a deeper reality than solely representative (and not deliberative) democracy.

## A Learning Model of Decision-Making

$\mathcal{R}$ , reasons, differences, similarities and public participation reflect the basic legal starting points that should be upgraded with relevant feedbacks. Based on double-loop learning the latter should be able to connect “cognitively-open” (to the environment) with “operationally-closed” (homeostatic and internal) parts of legal systems. A self-corrected, learning model of decision-making at first communicates in cognitively-open domains, to be able later to change also presumptions of the structurally-closed ones.<sup>15</sup> What will emerge from opinions depends on the regulator’s attention and interaction of all (public, legal, factual, personal, organisational, financial, etc.) parts that based on the differences and similarities of opinions (of representative or deliberative democracy) produce reasons. The mentioned predispositions constantly affect each other, are visually presented in Figure 1.

Figure 1. Predispositions of decision making



While the first four elements are the classical elements of decision-making, the learning model of decision-making is new, and changes also relations between the former ones, because it does not primarily address the static environment, but the dynamic one vis-à-vis each element. Based on these elements and their relations/combinations it could be inferred they serve as the prerequisites of different decision-making that can thus indirectly incorporate also a presumption of “different realities”. The mentioned elements (as complex as they can be) further address different challenges from the environment which establish different contexts and relations. “Reality” is hence understood differently when different perspectives are used, so it matters how they are understood, which is the topic of the next section.

## CHALLENGES FOR THE GIVEN ELEMENTS

### A Challenge of Signs

In the traditional frame of C&C  $\mathcal{R}$  public authority determines the content of public interest, sometimes with the participation of public interest advocates to protect public health or other valuable things from risks (Breyer et al., 2006; Smismans, 2016; Stewart, 2003); it can be present also in the private interest representation, in the neo-corporatist model (a system of interest intermediation in which a limited number of socio-occupational organisations have a privileged role in informal policy-

making) or in the current EU “institutionalised but not proceduralised” model of interest group participation (Smismans, 2016). It can be present further in the procedural better  $\mathcal{R}$  agenda (the impact assessment, cost-benefit analysis, access to public information, and evidence-based management), in the institutional, net and other models, it can be understood as a sign of public sovereignty<sup>16</sup> or as an aspect of human rights.<sup>17</sup> Public interest is thus just a sign of its various models/approaches. They all have a common denominator in striving for legitimacy<sup>18</sup> in the increasingly complex environment, but the latter with its dynamic and unpredictable nature causes hardship to define its various contexts vis-à-vis public interest’s or other terms’ content. There should be thus some criteria or ways of recognition based on which content is evaluated. This will be named the challenge of signs (on which the field of evidentiary law has evolved).

### A Challenge of the Internal Construction of Meaning

New terms are sometimes developed to replace the past non-effective practices, like adding the notions of good, responsive, better, wise, smart, to (not good enough) administration, governance,  $\mathcal{R}$ , etc. New names based on the same presumptions will probably also be non-effective in the changing and flexible environment. This disregard on systems’ relations also neglects the mental, internal processes/relations of living organisms, which differently control aspects of their external environments.<sup>19</sup> If systems were completely open to their surroundings, they would scatter in them to become unrecognisable, so they must have internal structures to maintain their unity. To solve this problem, Luhman (1991) has transferred Maturana and Varela’s (1980) concept of autopoiesis<sup>20</sup> from living beings in legal systems; they are autopoietic when they self-determine their operations *vis-a-vis* the environment as a data source. Systems are “cognitively-open” (to inputs), but “operationally-closed” (the communication and administration of meaning are defined in the system’s language).<sup>21</sup> The information does not enter in the system *per se* from the “outside” – it is internally constructed concerning the system’s criteria that are “thrown in reality as fishing hooks” (hypotheses) and recognise data as information through the system’s structure (input/output is replaced with the non-causal structural coupling) if the latter is appropriate to a specific nature of the information. An individual is also the system, composed as a part of even larger systems (a family, community, society). It seems that also the challenge of signs corresponds to the system’s internal structure. This will be named the challenge of the internal construction of meaning.

### A Challenge of Collective Reasoning

Along this integrating systemic moment, individuals are also important for legal systems due to their data-inputs and information-recognition element (people as systems), because ‘[t]he question of legality is or is not picked up in the recursive network of legal communication’ (Luhmann, 1991, p. 1428). For Friedman ‘legalism is rule-following... The interesting sociological questions are, what are the rules, how they are made, and of what does “following” consist? When we speak of legalism we are describing, rather roughly, a type of reasoning’ (1966, p. 148). A discussion on rules can begin with Hart, for whom ‘[t]he use of unstated rules of recognition [the rule by which any member of society can discover what the primary rules of the society are], by courts and others, in identifying particular rules of the system is characteristic of the internal point of view’ (1994, p. 102) and thus when ‘the question is raised whether some suggested rule is legally valid, we must... use a criterion of validity provided by some other rule’ (1994, p. 107). A rule *per se* cannot provide criteria for the assessment of its legal validity, but the latter is always framed in criteria or categories. Some claim these criteria are primarily bound up with images, labels or reason they evoke in a cognitive sphere,<sup>22</sup> but here the reason is “bounded” (Simon, 1983, 1955), and for crowds not fully applied.<sup>23</sup> Although people think on reason mainly instrumentally (what means can be used to achieve goals), already Weber divided reasoning on instrumental rationality and value rationality.<sup>24</sup> Also, Habermas divided (1972) rationality into a) technical (material, instrumental or working); b) practical (social or communicative), and c) emancipatory (personal, self-reflection). At three versions (of rationality) there

are already ten combinations between them, so when people communicate from different standpoints to reach a decision the latter depends on different personal *ex-ante* perspectives and *ex-post* actions. For Habermas, rationality consists not so much in the possession of particular knowledge, but rather in ‘how speaking and acting subjects acquire and use knowledge’ (1985, p. 11), because – in Luhman’s way – ‘positive law can no longer derive its legitimacy from a higher-ranking moral law but only from a procedure of presumptively rational opinion and will formation’ (Habermas, 1996, p. 457). For Durkheim reason is the fundamental categories taken together, but not as how an individual thinks, but as ‘collective representations...[that] translate states of the collectivity. They depend upon how the collectivity is organized, upon its morphology, its religious, moral, and economic institutions, and so on’ (1995, p. 15). He knew society is more than the sum of its parts.<sup>25</sup> It seems rules are more fully understood under a (collective) procedure in which they are framed, and in which they are executed. Rationality (in the law) reflects ideas and actions in specific contexts, but this does not tell us how it is established as such in collective opinions. This will be named the challenge of collective reasoning.

### **A Challenge of Emergence**

The challenges of the internal construction of meaning and reasoning are connected with ideas that emerge *ex nihilo*; an insight into these complex interactions different to one-way cause-effect relations can give the theory of complex adaptive systems with its concept of emergence: ‘[a]n emergent property is a global behaviour or structure which appears through interactions of a collection of elements, with no global controller responsible for the behaviour or organization of these elements. The idea of emergence is that it is not reducible to the properties of the elements’ (Feltz et al., 2006, p. 241). All is not only more than the sum of its parts, but what is or could be “all” cannot be known in advance; it emerges *ex-post* only through interactions (order and complexity can be bottom-up occurrences). A further characteristic of emergent property is its ‘complex behaviour [that emerges] from simple rules. Those rules imply general regularities, but the working out of an individual case exhibits special regularities besides’ (Gell-Mann, 2002, p. 313). Connected parts exhibit new results, absent in an individual part. As information can also be seen as the system’s part there is also new (emergent) knowledge hidden in multiple information taken together in their combinations. Traditional regulatory thinking disregards this fact – new knowledge emerges also after the individual or collective general rules were enacted. In non-linear systems, a result “emerges” as a something more than the sum of the individual parts (thus, when listening two favourite songs, we do not have two pleasures) (Strogatz, 2014). Findings on a new and independently occurring “emergence” that arises from the interaction of parts put the public accountability and integrity of state agencies and public servants in a new light: the classical assertion of accountability is possible when consequences can be attributed to specific actions of an authority or an individual, while a result in the complex, nonlinear and adaptive systems is always (at least slightly) different than planned. Responsibility can be here demanded only when authority fails to build a system that indicates a course of events. This will be called the challenge of emergence.

### **A Challenge of Considering Minority Votes Proportionally With Majoritarian Votes**

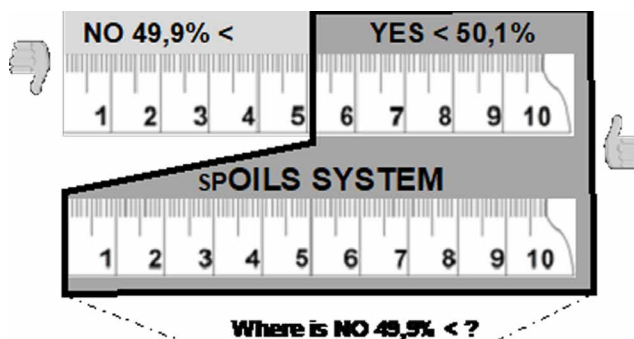
Whereas people often question an individual decision, but they do less so for elections/nominations. A decision-making process is usually taken as democratic if it involves some sort of a vote (or a verbal agreement). The right to vote is placed in the heart of democratic legal systems; combined with other political freedoms (of assembly, of press, etc.) it seems it ensures all that is needed for democratic life, but the *ex-post* conflicts after elections/voting demonstrate the inability of present majoritarian voting to resolve conflicts. The right to vote is only an *ex-ante* condition; there should be also the *ex-post* determination of the collective, common will. How can the famous medieval legal maxim, *quod omnes tangit ab omnibus approbari debet* (what is a matter of all must all approve it) – that has established the right of an electoral body to decide on important matters – be put on a higher level, not of consensus (as the latter is many times impossible to achieve due to variety of reasons), but of

its *aggregate proximity*? How can binary voting be compared with complex characteristics of public disputes,<sup>26</sup> why almost all social research is not conducted based on majority votes, or how can the integrated and lifelong training and education, innovations, cooperation, all-inclusive society and other network-based activities be based on binary voting which is used in politics/law?

The binary (yes-no) majoritarian voting procure was questioned the most in Borda's voting method,<sup>27</sup> in which the likelihood that people will be able to influence the outcome is increased when they express more than one preference. As there are rarely unanimous decisions, also the majoritarian ones can hardly turn practical reality into their favour. For 51% accepted decision there are 49% of people who are against it. The opposing party will do everything to undermine the majoritarian one. Reality is not only 51%: it is 51% + 49%, and even in this relation there are votes i) that implement the decision, ii) that were for, but they really did not mean it, iii) voted against, but agree with it, and iv) voted against. The simple majority rule can produce a tyrannical outcome, votocracy or mobocracy (Chirimambowa, 2016; Karvonen, 2004; Lagerspetz, 2015). The failure of this "ready-to-go" test does not provide a solution for the traditional problem of unequal intensities. An illustrative presentation can be helpful.

The "NO > 49,9%" of people from Figure 2 is not reflected in the decision. This part is formally as 0% involuntarily subsumed under the majority rule. The traditional majority voting disregards this almost equal part and could be in the 21<sup>st</sup> century seen also as the undemocratic stance.<sup>28</sup> How democracy can thus be reconceptualised beyond sheer numbers or votocracy? Deliberation is, on the other hand, time-consuming, and more times leads to group polarization (Sunstein, 2019, 2011) than towards unanimity, while majority rule is more time-efficient, but it cannot solve/incorporate opposing opinions – it allows only a choice of the pre-determined and majority options. In the relation between nature and the people the first always wins, even at the expense of the people who voted/agreed with a decision (if decision-makers do not respect natural laws). In the non-linear systems (society, law) the sum is always more than its parts, and "winner never takes all". This will be named the challenge of considering minority votes proportionally with majoritarian votes. The above-mentioned challenges question the classical elements of decision-making by the differently understood inputs that non-stop change, combine and emerge at different spots and levels. These challenges need appropriate methods to address them, and this is a focus of the next section.

Figure 2. Decision-system as spoils



## STRUCTURAL COUPLING OF REGULATORY ELEMENTS AND REALITY CHALLENGES

To present synergies between the presented basic elements of systemic legal decision-making (in the second section) and their challenges in the complex environment (in the third section), the notion of structural coupling is used as the upgrading approach that does not try to resolve the mentioned



challenges within the classical legal decisions but gives new perspectives (the relations, cooperation, public interest as the interest of the public, public and open communication in a multi-layered dialogue interaction and stochastic update of policies) to regulators. They could use the below-given perspectives (as couplings – put *in italics*) at regulation. ‘Coupling arises as a result of the mutual modifications, that interacting unities undergo in the course of their interactions without loss of identity’ (Maturana and Varela, 1980, p. 107). Coupling reflects the complementarity of different organisms that can emerge when they operate interdependently over a prolonged period (e.g. symbiosis between a horse and its rider, ants and plants). In this manner, the synthesis does *not change interactions between parts into static solutions*. Due to the law of permutation, already two solutions have four combinations (2<sup>n</sup>) etc. When relations among parts are the same, results are also the same. A focus should thus be given on the record of different *relations* and with this connected different content of the system’s main intent and its results. Hence - *be attentive to relations (and their combinations)*.

*De facto cooperation* between the state and its citizens and/or public participation is *sine qua non* for different general decision-making. No state has such regulatory capacity that the classical hierarchical command and control would suffice for all problems. This has given rise to the new academic ideas of governance by the regulatory state (Majone, 1997), post-regulatory state (Scott, 2004), where the exercise of power is divided among a wide range of independent agencies and later among non-state and supranational actors, to “regulatory capitalism” (Levi-Faur, 2005), to responsive  $\mathcal{R}$  with enforcement pyramid (Ayres and Braithwaite, 1995), where responsiveness should be enabled in a society with a strong state, markets and strong civil society. These ideas are closely connected with “decentered state” (Black, 2001) that has moved from the old welfare state through the regulatory state to the new “enabling state” (Gilbert, 2005), where command and control apply across all social and economic life. ‘The “new” in “new regulatory state” signifies new ways of  $\mathcal{R}$ . These ideas emphasise active civil society, which can be enabled by the state; the latter should develop a system in which the people could give their voices.

## Public Interest is the Interest of the Public

Although the statement is “not new” at first sight, it carries a deeper truth. It is the interest determined not by regulators, but by the public that does not cooperate conventionally through public participation (which cannot solve the mentioned problem of unequal intensities), but as collective intelligence (CI) as the capacity of a human community to evolve toward problem-solving on a higher level that integrates collaboration and innovation (Por, 1996). CI is the general ability of the group to perform a wide variety of tasks (Woolley et al., 2010) that can – if used appropriately (which will be stated in the following parts of this text) – give the most unbiased and legitimate results that blow information asymmetry in its core. The technocratic implementation of policies still dominates, so politics and ethics are not the real part of the regulatory governance paradigm (Nakamura and Church, 2003). Due to the democratic deficit of the unelected public servants and their regulatory powers that embark on people’s rights, it seems the legitimacy gap is spreading in the frame of rising technology, complex environment and (global) problems.

## Public and Open Communication in a Multi-Layered Dialogue Interaction

The freedom of expression is related with the freedom to access the public information in a form of dialogue, which could be explained as a part of the Roman goddess *Dia*, as the symbol of light and with that of fertility, and as the part of logos, reason. The efficiency of the dialogue was confirmed by the Coase theorem:<sup>29</sup> legal rules are more efficient when people cooperate and/or bargain with each other; by this way, they will achieve higher efficiency regardless of legal rights. Consistent with the theory of games (Axelrod, 1984), the only conversation between the state and its citizens can ensure betterness and efficiency in the long run for the common benefit. There is a need to establish a way of communication and transparent relations between officials and stakeholders. Reasons for the success of massive data acquisition and opinions are still being investigated, but it seems the key

element is the mix of true and wrong answers, which are mutually exclusive, so there remain only correct ones (O'Reilly, 2010). In the right circumstances, groups are intelligent and often smarter than the smartest people. It is not necessary for groups to be dominated by extremely intelligent people, to be intelligent. A common and diverse collection of data can avoid the problems of cognition, coordination and cooperation if the conditions of diversity, independence and democratic decentralization are established. One should not overlook the long known, but still partially overlooked the fact that groups of individuals give statistically more reliable predictions than the knowledge of individual experts can provide. The idea is based on a scientifically validated idea (Dawes, 1979; Meehl, 2013; Page, 2008; Surowiecki, 2005) of crowdsourcing that is becoming more feasible due to the potential of information communication technologies (ICT). Rules and/or modes of operation can be better accepted when created by the representative sampling of data and statistical methods for the prediction of events. With the advancement of computational power, IT can be helpful here for powerful detailed analysis. The concept of data warehouse could be helpful due to the possession of a large amount of external and internal information by organisations; their challenge is how to determine data quality and use it for management and/or decision-making. Such data could be used for real-time information seen on interactive dashboards, reporting, predictive analytics, and as inputs for managerial decision-making.

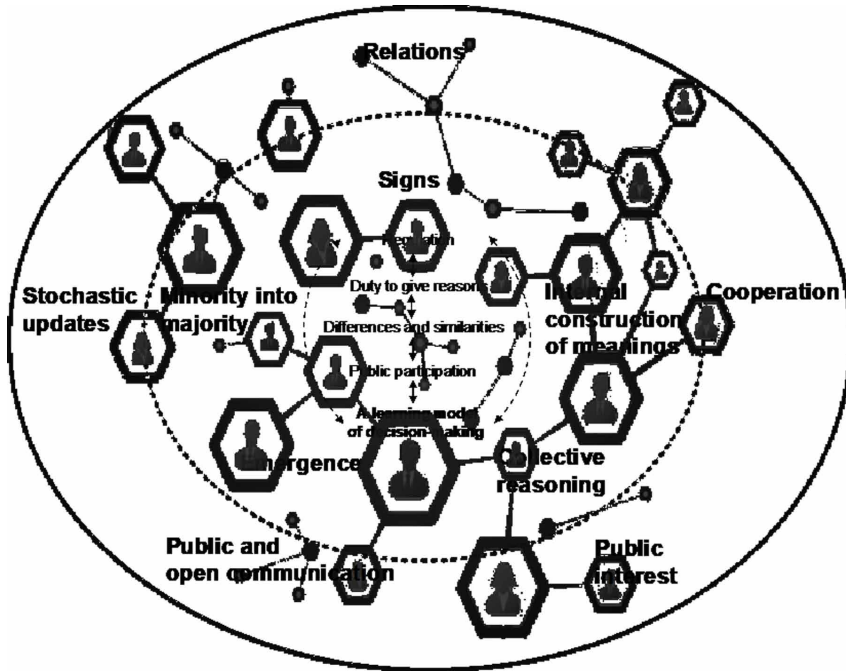
### Stochastic Update of Policies

In the information-rich world of information oversupply, *attention*, not information is the scarce good (Simon, 1996). Attention presented as the system's arrangement of parts collects information in focus and recognises it as such. If things and events cannot be predicted, they can be systematically monitored (even in the case of stochastic data), and different decisions applied at different thresholds. Decisions can thus be made based on stochastic indicators to have the most impartial and independent decision (attention is here given to unwanted thresholds). Jones and Baumgartner propose such use of stochastic, not attention-driven updating of policies: in politics, a good starting point is to ask how policymakers attend to and prioritize information. The trick is in the combining...Combining messages means both getting the sources right and getting the weights right...If a few indicators [instead of a single one] are simultaneously monitored, the result is a normal distribution of information. The best way [to prioritise information from many sources] would be to weight the information streams by importance and add them to make an index... If decision-makers act on the "news," rather than a basket of indicators, they will produce a distribution of outcomes that is not normal. Attention-driven choice guarantees nonnormal distributions of policy outputs (2005, pp. 330–336).

A result of structural coupling between the regulatory and environmental challenges can be presented as *visa reality* (Figure 3); the word "visa" is used as the acronym for the included values, interests, skills, and *acceptability*, reflected in a decision-making model (based on the determination and coordination of facts/evidence between the public institutions and the people) that operates as a transparent digital platform. It is based on the inclusion of stakeholders that can (mainly through mutual cancelling of different opinions) put aside the potential capture, corruption, rent-seeking, utility- or budget- maximising, unresponsiveness, carelessness and negligence of public institutions and similar conditions. By using the visa approach collective intelligence decisions are based on the permanent monitoring system of the environment, future hypothetical scenarios based on their thresholds, flexible public inputs and transparent result based on averaging.

Given the synthesis among elements and challenges "reality" can be systemically established when relations among the institutionalized *patterns* of behaviour can be monitored *and changed*. Such (regulatory) systems are flexible (responsive to change) and thus complex (consisting of vertical and horizontal parts), autonomous (independent of major or minor external influences), and a consistent (coherence of parts towards a common goal) set of information, its acquisition and administration to achieve (based on its specifically established state of affairs) final purposes based on the collectively predetermined and transparent thresholds and stochastic criteria. This visa reality is present in a model

Figure 3. Visa rationality/reality



that represents basic human elements put on a collective level, that can be reflected with the help of IT. The latter can be based on peoples' inputs, advance our knowledge on the extensive knowledge of correlations and patterns (which are invisible or even irrelevant to human decision-makers) that enable better decisions than an individual human could.

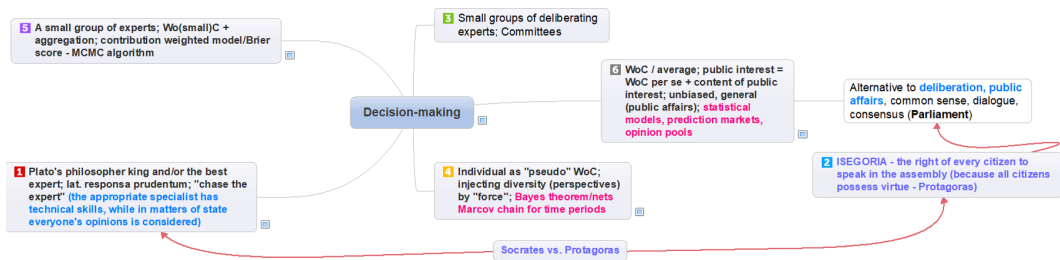
## COLLECTIVE DECISION-MAKING – COLLECTIVE INTELLIGENCE

The mentioned synergies in the form of new guidance from the previous section are present and/or reflected in a special, emergent property from the synergies among data/information, software/IT hardware and people/experts, *i.e.* in collective intelligence. When Charles Darwin had studied Adam Smith (Ridley, 2017) he could find Smith's idea of an invisible hand, that the individual's self-interest may benefit society more than direct actions intended to benefit society. From the institutional point of view, self-interest could not be at odds with the greater good if a model of collective decision-making (CDM) is organised in a way that exhibits the public interest at the end. Talcott Parsons used evolutionary principles in the idea that social systems may evolve to a state in which they can better deal with environmental pressures, where they can improve adaptive ability (Parsons, 1991), and where they further based on occupational differentiation cause the emergence of specialized organizations with "legitimate authority" under a system of normative order: '[f]or collective action in pursuit of such goals to be effective, there naturally has to be the integration of the system concerning their acceptance and concerning the distribution of responsibilities and burdens which it entails; this is the "consent" aspect of political organization' (Parsons, 1985, p. 182). A political organization and some form of CDM are the sine qua non for a nation's sovereignty. Evolution leads to the development of structures that can control their metabolic and behavioural processes within other similar structures based on hierarchy. For Parsons (1985) the functions of any system of action (pattern-maintenance,

integration, goal-attainment, and adaptation) are the link between the structural and the dynamic aspects of the system.

CDM was present already in Plato's Protagoras, where Socrates and Protagoras at the debate's end exchange their debator's positions: that all virtue is knowledge, and it can thus be taught, and that all virtues are one instead of many. Along with the experts and group of people (public assemblies) who have the freedom of speech (gr. *isegoria*) about which they debated, there are also other ways to "construct reality" through the committees, groups of experts, an individual that builds diversity into his decisions (by using Bayes theorem or Bayes nets, a Markov chain or other stochastic models) and the wisdom of crowds (WoC - the aggregation of independent, individual opinions with no social influence, where diversity is more relevant than accuracy; a result is based on Smith's invisible hand). Numbers from 1 to 6 in Figure 4 show the probable chronological order of realities' origins.

Figure 4. Social constructions of reality



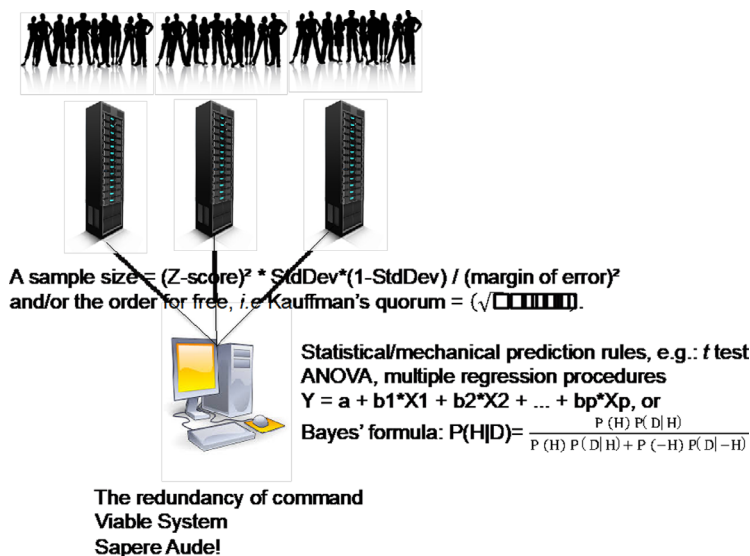
A model of decision-making is hence needed that would emphasize consensus-building tools over the "winner-takes-all" dynamic of majoritarian decision-making. In it, tight but independent relations among citizens and decision-makers should be present. Regardless of a majoritarian decision, a minority will probably do everything in its power to undermine an accepted decision, and at least for the most important cases the classical legal theory provides two solutions: there should be established a higher majority, or negotiation should take place. But there is also a third option, here named as *synomy* (from *syn*, 'together' and *nomos*, 'laws') and/or the wisdom of collective decision-making. This kind of collective decision-making does not disregard an opposing part: it tries to proportionately (up to obtained %) include the latter in a decision. Based on Figure 4 it can be inferred the visa approach is built in CDM. A model of CDM should be able to: process data obtained from the real world (based on [stochastic] indicators); allow measurements that uncover patterns between interactions; enable different and independent input values and follow how patterns change; make predictable scenarios based on the aggregation of data (people's opinions) and various algorithms. Decision-makers have overlooked a long-known but still somewhat neglected the fact that a group of individuals can make statistically more reliable predictions than could be done by individual experts. The idea is based on the scientifically validated idea of a team source (Dawes, 1979; Galton, 1907; Grove and Meehl, 1996; Meehl, 2013; Page, 2008; Woolley et al., 2010) that is more and more plausible because of the potential to use ICT. The emphasis is on the citizens' knowledge who, together with authorities' pattern policies. Under the right circumstances, groups are more intelligent than individuals. Already for Rousseau democracy can only be direct,<sup>30</sup> but it is less known he spoke also about the "extrapolated democracy",<sup>31</sup> similarly, as Aristotle did about the virtue of character.<sup>32</sup> While both talk about opposites that cancel out one another,<sup>33</sup> Aristotle specifically mentioned in the principle that the multitude is supreme than the few best, for where there are many, each individual, it may be argued, has some portion of virtue and wisdom, and when they have come together, just as the multitude becomes a single man with many feet and many hands and many senses, so also it becomes one personality as

regards the moral and intellectual faculties. This is why the general public is a better judge of the works of music and those of the poets because different men can judge a different part of the performance, and all of them all of it (Aristotle, 1998, p. 1281b).

The reason is still being investigated, but the key seems to be this: in a mix of right and wrong answers, the wrong ones tend to cancel each other out, leaving the right ones (O'Reilly, 2010).<sup>34</sup> Page enumerates four procedural conditions under which group solvers can outperform individual professionals,<sup>35</sup> who as a group are usually no superior to ordinary people. Each of individual predictions contains bits of truth mixed with various errors; the bits of truth add up to a larger truth (*aka* standing on the shoulders of giants), whereas errors cancel each other by negative correlation. The more diverse opinions are represented, the more complementary bits of truth can be combined. For this reason (and the above-presented challenge on majoritarian voting), the present representative democracy as one version of CDM is insufficient. If inputs are thus various citizens' voices that are all considered, there is a CDM based on collective wisdom or collective intelligence (Brabham, 2013; Briskin et al., 2009; Landemore and Elster, 2012; Surowiecki, 2005; Tovey, 2008). The latter in search for optimal decisions involves the great number of people, patterns, network, connections and diversity (instead of singular decision-makers, deliberation, division, disconnection and sameness). The power of collective wisdom "kicks in" because brains face limits to processing power (Marois and Ivanoff, 2005) and because it can help decision-makers systemically – through mutual cancelling – remove the shorthand and other behavioural biases (Ariely, 2008; Kahneman, 2013). In the present time, the knowledge, ideas and opinions could be synonymous with power, if they are e-collected, if a system-thinking approach is established, and used to generate the public opinion as to the aggregation of people's inputs, outputs, formulas and feedbacks that show the world through them. These predispositions are based on self-organisation as one of the basic elements of complex adaptive systems for which was established the tendency to evolve towards a state of equilibrium (Ashby, 1960; Foester, 1960; Gershenson and Heylighen, 2003); this is another reason against the majority rule that is insufficient to address and include a whole community in a final decision. Figure 5 presents this, i.e. it adds to the Figure 5 also the statistical equations and IT.

For Surowiecki (2005) collective intelligence should avoid the problems of cognition, coordination, and cooperation and establish the conditions of diversity, independence, and a particular

Figure 5. Wisdom of crowds based on ICT



kind of decentralization that are necessary for the crowd to be wise. Woolley et al. have in two studies with 699 people, working in groups, found evidence of a collective intelligence factor that does not correlate with the average or maximum individual intelligence of group members, but with ‘the average social sensitivity of group members, the equality in distribution of conversational turn-taking, and the proportion of females in the group’ (2010, p. 686). Diversity is secured when consensus is “off the table”, when persons’ independent and impartial inferences, estimates or actions correlate. Diversity and independent opinions mixed can give better results than solely crowdsourcing as ‘the coordination of information via the telephone, as well as slightly less advanced technology that can still gather information from the crowd widely and effectively through information technology’ (Clark et al., 2016, p. 57). Owing to the law of large numbers logic the average of results should be close to the expected value and/or is higher than the scores of individual members. Complex, the lifelike behaviour is a result of simple rules unfolding from the bottom up, like life itself. Nowadays, collective intelligence can be supported by information technologies (IT) that store, manipulate, distribute or create an information based on communication, data management and management information systems. One of the most obvious ways IT can help ‘is by helping groups remember and share the lessons that individuals have learned separately’ (Malone, 2018, p. 233). The dispersion of simple and easy-to-use technologies that enable people to interact and design web-based applications with no or small programming abilities can lead to massive, previously unknown quantities of publicly-made content. Among the usual ways of reaching collective decisions is the charrette, focus groups, future search, the Samoa circle or the Delphi method, while on IT-based ways are the prediction markets (e.g. the University of Iowa’s Iowa Electronic Markets, the Hollywood Stock Exchange, FantasyScotus) supported with the various decision-making software based on collaborative decision-making, big data and machine learning (e.g. Decision Lens, LexPredict, Foldit, Climate CoLab).

## CONCLUSION

Data never speak for themselves – they are socially inflected and used according to different versions of reality. Organizations and their decisions are structured by the information they pay attention to as well as by formal roles and reporting relationships. There is thus a place also for different models of decision-making among which CDM could be an appropriate approach to deal with the more and more complex and dynamic environment. A challenge for the modern decision-makers of 21<sup>st</sup> century is to find elements that could not only legitimise the classical effectiveness and efficiency of regulators but the latter’s service-mindfulness, transparency and responsiveness to the people’s needs. Their needs are always established through some model of reality. Identifying organizational facts that are critical to making important decisions requires systematic practices to overcome both the decision maker’s cognitive limits and the unreliability of information. The prevailing classic approach of one decision-maker from the industrial era could be changed in the power of many to renew civic life and democracy. There is a possibility that patterns in a model used are merely random fluctuations. The “small-numbers” approach is more likely to reflect random success. Scientific evidence capitalizes on the predictability of averaged data by gathering many observations: if aggregation has an empirical plausibility of “random” or symmetrical distribution of errors on both sides, restricted domain (not all preferences are included in case of approval/plurality voting), and signals/votes are (more or less) independent, then we could not see “a miracle of majority, but of averaging” (it can be seen as a special mechanical form of negotiation). Independent participation based on collective intelligence can diminish the pressure of interest groups, lobbying or of other informal influences, and it can also strive towards the better alignment of all interests. Experience, age, wisdom, zeal, prudence and discretion can be connected with the duty to give reasons differently, *i.e.* through collective intelligence. Let it be enough wisdom to try it. IT can be helpful here to test *visa* reality towards new horizons.

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## ENDNOTES

- <sup>1</sup> It is very much in the spirit of cultural theory to treat the institutions themselves as the monitors which determine what is going to count as information...the proper way to organize a programme of studying risk is to start with studying institutional design (Douglas, 1994, p. 19).
- <sup>2</sup> Among other things stronger regulatory governance for the OECD will require evidence-based impact assessments to promote effective regulation in support of policy coherence; more attention to the voice of users who need to be part of the policy process; a renewed emphasis on consultation, communication, co-operation and collaboration across all levels of government; reviewing the role of regulatory agencies and the balance between private and public responsibilities for regulation, to secure accountability and avoid capture; and tools to evaluate and measure performance and progress and to communicate the costs and benefits of reform (2011, p. 15). The evidence-based management is the systematic, evidence-informed practice that incorporates scientific knowledge in the content and process of making decisions.
- <sup>3</sup> The word ‘professionalism’ itself (lat. *pro*, ‘forth’ and *fateri*, ‘confess’, i.e. to announce a belief) calls for public statements on what to do – but officials (as most people ad personam) mostly do not know what to do in the future.
- <sup>4</sup> There is a difference between transparency and visibility: the approach taken here is based on visible signs that can be seen only at the end of decision-making; citizens’ opinions are not transparent per se: the first must express them, while (collective) decisions are based on aggregation and extraction, so individual decisions are here not transparent per se.
- <sup>5</sup> System (gr. *systema*, “an arrangement”, from *synistanai* to combine, from *syn-* “together” + *histanai* “cause to stand” (Merriam-Webster, 2017b)) is an assemblage or a combination of correlated things or parts forming a complex or unitary whole. ‘A system is an interconnected set of elements that is coherently organized in a way that achieves something...a system must consist of three kinds of things: elements, interconnections, and a function or purpose’ (Meadows, 2008, p. 12). A system means a grouping of parts that operate together for a common purpose (Forrester, 1968, p. 1). Systems are seen as feedback processes having a specific and orderly structure.
- <sup>6</sup> The traps of non-systems thinking lie in two simple dimensions; firstly avoiding the inevitable interconnectivity between variables – the trap of reductionism, and secondly, working on the basis of a single unquestioning perspective – the trap of dogmatism (Reynolds and Holwell, 2010, p. 6).
- <sup>7</sup> Like ‘getting it right, being customer-focused, being open and accountable, acting fairly and proportionately, putting things right, seeking continuous improvement’ (Parliamentary and Health Service Ombudsman, 2017) or ‘maintain accurate, comprehensive and accessible records, place adequate controls on the exercise of coercive powers, actively manage unresolved and difficult cases, heed the limitations of information technology systems, guard against erroneous assumptions, control administrative drift, remove obstacles to prudent information exchange with other agencies and bodies, promote effective communication in your own agency, manage complexity in decision making, check for warning signs of bigger problems’ (Commonwealth Ombudsman, 2017).
- <sup>8</sup> Regulation is here understood as the ‘diverse set of instruments by which governments set requirements on enterprises and citizens. Regulations include laws, formal and informal orders and subordinate rules

issued by all levels of government, and rules issued by non-governmental or self-regulatory bodies to which governments have delegated regulatory powers' (OECD, 2012, p. 25), or as 'the totality of all mechanisms of social protection and control (Jordana and Levi-Faur, 2004, p. 3).

9 Ordinary people are capable of reasoning dependably about political issues by the use of judgmental heuristics, even if they have only a limited knowledge of politics and specific issues...both the well educated and the less educated use heuristics in political reasoning, but that the well educated tend to employ different heuristics and take into account more factors in their consideration of issues (Sniderman et al., 1993).

10 Article 296 TFEU demands that legal acts shall state the reasons on which they are based and shall refer to any proposals, initiatives, recommendations, requests or opinions required by the Treaties. This Article imposes a duty to give reasons not only for administrative decisions, and not only for all legislative, delegated and implementing acts but also for non-legal, informal acts. 'This is [still] noteworthy since many national legal systems do not impose an obligation to furnish reasons for legislative acts, or do so only in limited circumstances' (Fuller, 1969, p. 97).

11 To Friedman 'the question whether a theory is realistic "enough" can be settled only by seeing whether it yields predictions that are good enough for the purpose at hand or that are better than predictions from alternative theories' (1953, p. 41).

12 Fuller's internal morality of law consists of the eight formal principles (1. Generality; 2. Publicity; 3. Prospectivity; 4. Intelligibility; 5. Consistency; 6. Practicability; 7. Stability; and 8. Congruence) that are as "the extended procedural version of natural law" concerned with how a system of rules for governing human conduct must be constructed and administered if it is to be efficacious and at the same time remain what it purports to be.

13 In principle, institutionalization may take place in any area of collectively relevant conduct. Sets of institutionalization processes take place concurrently. There is no a priori reason for assuming that these processes will necessarily "hang together" functionally, let alone as a logically consistent system (Berger and Luckmann, 1991, p. 80)

14 Although men usually do not know when/why one principle or value should be used instead of another, they always – based on a context of a matter – give more weight to one vis-à-vis another: '[w]hen principles intersect ... one who must resolve the conflict has to take into account the relative weight of each' (1978, pp. 24, 27).

15 The basic difference is between the instrumental and value rationality: the first correct errors on a path to its goal, while the second can change also its presumptions. Argyris' named the usual instrumental error-and-correction process as single-loop learning, and an alternative response that questions governing variables themselves, as double-loop learning: 'double-loop learning is the detection and correction of errors where the correction requires changes not only in action strategies but also in the values that govern the theory-in-use' (Argyris, 2006, p. 10).

16 According to the second paragraph of Article 3 of Slovenian Constitution '[i]n Slovenia power is vested in the people. Citizens exercise this power directly and [only in a secondary sense] through elections, consistent with the principle of the separation of legislative, executive, and judicial powers.

17 Article 44 of Slovenian Constitution (Participation in the Management of Public Affairs) states that 'every citizen has the right, following the law, to participate either directly or through elected representatives in the management of public affairs'.

18 Formal demands to legitimise general decisions (e.g. [regulatory, social] impact assessment, cost-benefit or risk analysis) can be only formal (placebo) labels of legitimacy (a Potemkin village) that in the absence of clearly elaborated explanations, enhance illegitimacy.

19 If people want e.g. better regulation it cannot per se be found in reality; the first is imagined, and the second is accommodated to this goal.

20 A closed network of molecular productions that recursively produces the same network of molecular productions that produced it and specifies its boundaries, while remaining open to the flow of matter through it, is an autopoietic system, and a molecular autopoietic system is a living system (Maturana, 2002, p. 8).

21 Between cognitive and normative expectations even "facts" that are relevant for the legal system are not facts for everybody...they have to be certified facts (Luhmann, 1991, p. 1430).

22 To the thinking soul images serve as if they were contents of perception (and when it asserts or denies them to be good or bad it avoids or pursues them). That is why the soul never thinks without an image (Aristotle, 2016). An image can be quite independent of its real significance; lawyers who regulate, and citizens who abide, should be acknowledged with Le Bon's pivotal work on crowd psychology that warns against the new "word-labels" for old images: '[w]hen crowds have come, as the result of political upheavals or changes of belief, to acquire a profound antipathy for the images evoked by certain words, the first duty of the true statesman is to change the words without, of course, laying hands on the things

themselves, the latter being too intimately bound up with the inherited constitution to be transformed... One of the most essential functions of statesmen consists, then, in baptizing with popular or, at any rate, indifferent words things the crowd cannot endure under their old names' (Bon, 2001, p. 64).

23 The inferior reasoning of crowds is based, just as is the reasoning of a high order, on the association of ideas, but between the ideas associated by crowds, there are only apparent bonds of analogy or succession (Bon, 2001, p. 33).

24 Social action, like all action, may be...(1) instrumentally rational (Zweckrational), that is, determined by expectations as to the behaviour of objects in the environment and of other human beings; these expectations are used as "conditions" or "means" for the attainment of the actor's own rationally pursued and calculated ends; (2) value-rational (Wertrational), that is, determined by a conscious belief in the value for its own sake of some ethical, aesthetic, religious, or other forms of behaviour, independently of its prospects of success (Weber, 1978, pp. 24–25).

25 The representations that express society, therefore, have altogether different content from the purely individual representations, and one can be certain in advance that the former adds something to the latter (Durkheim, 1995, p. 15).

26 In the complex network of interests new parties emerge. There are varying levels of expertise, different forms of power, lack of continuing relationship, differing decision-making procedures, unequal accountability, without standardised procedures (no formal guidelines, influence of government rules and regulations), broad range of issues (new issues emerge, the importance of technical information, strongly held values) and disputes (Carpenter and Kennedy, 2001).

27 It is likely that Jean-Charles de Borda was the first to watch the election from the point of view of agreeing on individual opinions, so that the end result - a social choice - is clearly linked to the opinion [...] Borda's main idea was in showing, that the rule of the majority [...] is unsatisfactory as a method of aggregating individual opinions [because] [...] the majority system gives each voter [only] one vote (Nurmi, 2013, pp. 11–12). In plural democracy, debates have shifted from a binary weighting to more options. With three options, there are already 6 possible views: ABC, ACB, BAC, BCA, CAB in CBA. With four options, there are 24 options, five with 120, six with 720, etc. Multiple choice voting can diminish the influence of other people or organizations (parties) who "vote against" or "vote for". Already with five options in favour is hard to claim that the other 119 possibilities are wrong. In the Borda system (Emerson, 2007), candidates are ranked according to voter preferences from the number 1 (for the first-ranked candidate) on; in a modified Borda system, the number of points given to candidates for each ranking is determined by the number of candidates in the election (the first ranked receives as many points as there are candidates). If, for example, there are five candidates, he will receive five points each time when any voter puts him in the first place, four for the second place, three for the third, two for the fourth and one for the last, fifth place. If there are  $n$  candidates, they will receive  $n$ -points for the first place,  $n - 1$  for the second,  $n - 2$  for the third, etc. If a voter does not classify all candidates, his points are reduced accordingly to  $m$ ,  $m - 1$ , etc. (if he scores two out of five candidates, the first receives two points and the second one).

28 In a majoritarian manner, it would be the same as the claim that one who prefers a father (50,1%) more than mother (49,9%) completely disregards the latter. But no, s/he loves her almost equally. It would be a great mistake to regarding this fact. Why do we clearly understand that e.g. bread is more than flour, but in the decision-making we still behave as we ate only flour?

29 The Coase theorem suggests that private bargaining is capable of solving potential externality problems where (a) the property rights are clearly defined, (b) the number of people involved is small, and (c) bargaining costs are negligible (Coase, 1960).

30 Sovereignty cannot be represented for the same reason that it cannot be alienated; it consists essentially in the general will, and the will cannot be represented; it is itself or it is something else; there is no middle ground (Rousseau, 2002, p. 221).

31 There is often a great deal of difference between the will of all and the general will; the latter regards only the common interest, while the former has regard to private interests, and is merely a sum of particular wills; but take away from these same wills the pluses and minuses which cancel one another, and the general will remains as the sum of the differences (Rousseau, 2002, p. 142).

32 In all cases the mean relative to us is best; for that is as knowledge and rational principle prescribe. And in all cases that also produces the best state. And this is evident from induction and argument. For opposites rule out one another; the extremes are opposed both to one another and the mean because the mean is each one of the opposites concerning the other: the equal is larger than the smaller but smaller than the larger. So it must be the case that virtue of character is concerned with certain 35 means and is itself a certain mean state (Aristotle, 1992, p. 16).

33 This is known as the mutual cancelling regression analysis (a statistical process for estimating the relationships among one or more independent variables and dependent variable). Classical majority voting is similar to correlation analysis that tells us only the interdependence among two variables, while

regression analysis tells us about the impact of one or more variables on the dependent variable. In this version of democracy, independent variables are citizens, who without knowing on others' votes, vote as individuals in their private lives, while these votes are then processed to show their mean state.

34 E.g. Michaela and Juliana have predicted places on which Maggie (6), Cole (5), and Brody (1) will achieve in an upcoming event. Michaela/Juliana classified them on 6/10<sup>th</sup>, 3<sup>rd</sup>/7<sup>th</sup> and 5<sup>th</sup>/1<sup>st</sup> place. Errors are squared so that negative errors and positive errors do not cancel one another out; Michaela's error is  $(6 - 6)^2 + (3 - 5)^2 + (5 - 1)^2 = 0 + 4 + 16 = 20$ . Juliana's error is  $(10 - 6)^2 + (7 - 5)^2 + (1 - 1)^2 = 16 + 4 + 0 = 20$ . Their average error is 20, while they collectively predict Maggie/Cole/Brody will take 8<sup>th</sup>/5<sup>th</sup>/3<sup>rd</sup> place  $(8 - 6)^2 + (5 - 5)^2 + (3 - 1)^2 = 4 + 0 + 4 = 8$ . *Their collective prediction is more accurate than either of their individual predictions.* If more guessers were added, their predictions will be even more accurate. More on prediction diversity see (Page, 2008, pp. 197–235).

35 These four conditions, i.e. the problem has to be hard, the people have to be smart, the people have to be diverse, and the group size has to be bigger than a handful and chosen from a large population—prove sufficient for diversity to trump ability. They're not the only conditions under which the result holds, but if they're satisfied, diversity trumps ability. *The Diversity Trumps Ability Theorem:* Given Conditions 1–4, a randomly selected collection of problem solvers outperforms a collection of the best individual problem solvers (Page, 2008, p. 162). Also for Surowiecki there are four conditions that characterize wise crowds: 'diversity of opinion (each person should have some private information, even if it's just an eccentric interpretation of the known facts), independence (people's opinions are not determined by the opinions of those around them), decentralization (people are able to specialize and draw on local knowledge), and aggregation (some mechanism exists for turning private judgments into a collective decision) (Surowiecki, 2005, p. 10).

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