Parallel Democracy Model and Its First Implementations in the Cyberspace

Daniel Devatman Hromada *

Abstract

Parallel democracy model is a variant of traditional participative democracy approach aiming to provide a new method of convergence toward quasi-optimal solutions of diverse perennial political and social challenges. Within the framework of the model, such challenges are operationalized into variables for which the authority can associate possible value. The value which is assigned to the variable in a moment T of system's history is called an active value. Every couple {variable, active value} represents a functional property of a given society and the genomic vector of such properties can not only describe, but also determine the functioning of a society under question. In majority of occidental societies, the authority to assign values to variables is delegated to parliament which assigns values to variables by means of aggregated voting. The government or other institutional bodies subsequently execute actions according to such activated values. In almost all modern political systems, the value->variable assignment is done in sequential (serial) order for example by voting for one law proposal after another during a parliamentary session or a referendum. Any reform of the system —an update of multiple variables— is a costly process because a change of value for almost any variable requires a new vote which, in majority of societies, involves the relocation of vote-givers to a vote giving location during a period dedicated to voting. The progress of quasi-perennial storage systems and databases in combination with communication networks make it possible to aggregate and store information about numbers of votes related to potentially infinite number of variables. Therefore a method by means of which the values are activated and assigned to variables does not necessarily need to be sequential. Given the condition that the act of voting is identic to the incrementation of the chosen value stored on the medium, it is not necessary anymore that the decision-makers shall meet at one point in time in order to give their vote to the value they want to activate. Even the condition that they must meet in one place is weakened since the vote-giving place can be purely virtual. Kyberia.sk and kyberia.cz domains are domains where first tentatives to implement such a system were implemented «in vivo» for a limited set of variables. The aggregated voting of already registered kyberia.cz users determine the number of votes which a registration application of a new user needs to obtain in order to be accepted. Kyberia.sk senators can decide what motto shall be displayed at the top of the page —the option which receive the biggest number of votes becomes the active title. Since both variables are internal constants of kyberia's engine, no human intervention is necessary

* STU / EPHE / Paris 8, *hromi@kyberia.sk*.

TEORIA POLITICA. NUOVA SERIE, ANNALI III
2013: 165-180

after a value becomes variable's active value and the system automatically reconfigure its own code.

Keywords: Parallel democracy model. Participative democracy. Vote aggregation. Auto-configuration of social networks. Genome of political bodies.

1. From perennial challenges to properties of political system

One cannot speak about human society but ignore the innate nature of human beings. And because the innate nature of human beings changes only slowly in course of evolution of *homo sapiens sapiens* species, and because at least some features of this «nature of human beings» —be it loving, learning, laughing, looking or listening— seem to be constant and omnipresent among all human beings, it is not unimaginable that the very human nature causes and shall cause certain challenges to appear and reappear in any human and/or transhuman society imaginable and conceivable.

We label as «perennial» such challenges which cannot be ignored by any human society. In order to avoid useless metaphysical debates which could stem from such a definition, we rectify that in the rest of this article, following definition shall be adopted: «perennial challenge (PC) is a challenge implicitly or explicitly addressed by all documented societies of human history».

To be more concrete, we may consider questions of a form «shall X be Y in our polis?» as representatives of such challenges, no matter whether X means «death penalty, slavery, wine-drinking, meat-eating or prostitution» and no matter whether Y means «forbidden, permitted, or obligatory». Throughout the course of human history, such Xs and Ys were, in one form or another, represented in minds of all individuals forming a given society. The thing which changed, the structure which evolved, *was only the weighted network of associations among such X & Y representations.*

One of the main objectives of social sciences of the last century was to unveil[1] what was the structure[2] of such networks[3], i. e. what Xs were connected with what Ys, and to find the *raison d'être* for such connections in the underlying totality of such graph-like system. The political science, on the other hand, focus attention upon a different question: «who is the source of authority?», «who holds the power ?», «WHO associates values to X in this polis?».

The objective of this article is present the Parallel Democracy Model (PDM) within the scope of which the answer to this question is: «everybody» and to present its first naive implementations within the framework of virtual communities kyberia.sk and kyberia.cz.

[1] Bourdieu, 1984.
[2] Lévi-Strauss, 1967.
[3] Saussure et al., 1995.

2. From properties of political systems to typed variables and their values

A property of a political system is, within the theoretical framework of Parallel Democracy Model (PDM), defined by a couple {typed variable,active value}. A typed variable can be defined as «uniquely defined conceptual entity (the variable) and a set (called its type), consisting of all the values that the entity may take»[4]. An active value is such a member of the set of possible variable's values which is assigned to the variable in time T.

Intuitively, a variable can be imagined as a box with the label on the box being variable's name and the content of the box being the value of the variable. One can have many boxes with many different labels —one can have many variables. One can have boxes for shoes and one can have boxes for food— there are many types of variables.

Since the set of possible sets is infinite, infinitely many types of variables can exist. Only some of them are of particular practical interest for PDM, more concretely:

1. boolean – has two members {true, false}
2. integer – set of all integers
3. real – set of all real numbers
4. probability – set of all real numbers from the interval <0, 1>
5. text – set of all possible strings of symbols
6. legality – set of three members {permitted, obligatory, forbidden}
7. formule – set of all possible mathematical formulae.

As was indicated above, every property of a political system, when operationalized into a variable, represents a challenge with which every society and every polis has to deal, in one way or another. One can easily imagine a variable $[5]immigrants representing the number of immigrants which a given polis is ready to integrate during certain $interval of time. The variable $immigrants would be of type integer if ever it is defined in absolute terms; it would be of type real or probability if ever it is defined relatively to the size of the polis (i. e. 0.2 or 1.2 if polis is ready to increase its population up to 120% of its original size). A boolean-typed variable can code such a property of the polis which can either exist or not, e. g. $has_basileus in order to encode the possibility that the polis has (or has not) its βασιλεύς; $deathpenalty_exists in order to encode the death penalty is legal (or not) in the polis or $has_pdm in order to denote the difference between the polis which is fully PDM-compliant in contrast to the one which is not. Other variables already implemented in real-life scenarios will be mentioned in following paragraphs in order to clarify our point.

To every variable, an «activ» value is assigned in every moment of variable's history. It is possible to have «array» variables which are associated with more than one active value in a given moment, due to pedagogic reasons we shall not,

[4] Floridi, 2011.
[5] Every variable is denoted by a $ prefix.

however, deal with such cases in the current article, and if ever the need to assign simultaneously two values shall emerge, we shall assign them to two distinct scalar variables. Thus, within the following framework, a variable always contains one and only one active value in a given moment T of its history. We precise that a value which is assigned to the variable in the moment T is the active value, contrary to other members of the set specifying variable's type which are, in a moment T, just «potentially activable values».

Analogically to the box on which the label $shoe is engraved and which contains today my winter shoes, and which could, possibly, sometimes in the future, contain my summer shoes, one can imagine the variable $has_basileus to which the value «false» is assigned today (i. e. «false» is the active value) in the polis which lacks its basileus but to which, possibly, the value «true» shall be assigned tomorrow (i. e. «true» is potentially activable value). The rationale behind this analogy is simple: not to forget that values are assigned to the variable in a mutually exclusive way.

Simply stated, there shall always be one and only one pair of shoes in the box in one moment and whether they are the boots or the sandals will undoubtedly determine the extent to which I'll feel comfortable after I shall decide do put the content of the box on and walk out into the rain.

3. From properties represented by variables to systems represented by vectors of variables

We believe that a political system —be it a polis or a sultanate, a republic or an empire— can be described in terms of sets of its properties. As we have indicated above, properties are often closely related to a challenge with which a society has to deal, in one way or another. Such a challenge can almost always be conceived as a question whose form is «what value Y shall be assigned to variable X ?». For example, a very ancient challenge of «whether or not to accept aliens in one's polis» can be formalized as a variable $accept_immigrants of type boolean, or in a more evolved systems as a variable of type integer or real (c.f. above) which has the value 0 (i. e. no immigrants) as its limit option among multitudes of other options.

The way how every society deals with a given challenge yields a property of a given society and can be operationalized into variable. In every moment of system's history, a certain value is assigned to that variable and the sequence —or rather a vector— of such values can yield a description of the system under question.

We precise that a vector of length N is an ordered sequence of N values. Therefore, any element of a vector can represent a variable. Let's imagine, for example a simplistic vector of length 2 defined as a sequence of 2 boolean variables [$has_basileus, $has_parliament]. Under such an interpretation, the vector having values [1,0] represents the autocracy; the vector [1, 1] represents either a constitutional monarchy or such a presidential democracy where rights of president are so strong that he can be even considered to be the basileus; the vector

[0, 1] can represent a parliamentary democracy with basileus role non-existing or reduced to ceremonial purposes and the vector [0, 0] can represent a system without basileus nor parliament, e. g. an anarchy, oligarchy, mediarchy etc. We do not pretend that such a simplistic vector composed of 2 boolean variables could be of much practical use and we present it only as a paedagogic example whose secondary effect is to suggest that even a highly general and abstract functional level - described in the case of a modern society in the Constitution- could possibly be addressed by our formalism.

It is not completely *hors propos* to imagine a research program aiming to 1) enumerate all existing or known political systems 2) find invariants among them 3) operationalize those invariants into variables with a set of possible values and 4) subsequently describe every unique political system by unique vector of values. The output of such a «herculean task», if ever finished, would be a set of vectors —a dataset— describing properties of political systems during different moments of recorded history. It may be the case that purely mathematical or topological study of such vector ensembles (i. e. the vector spaces) would indicate, among other things, that only very small part of a search space «of all possible configurations of a political system» was already explored in course of human history, and that multitudes of theoretically stable political configurations are still to be *discovered*.

4. From descriptive vectors to normative vectors

What was said until now shall hardly be of big surprise for the expert in political theory. In one way or another, every political or historical theory from Aristotle to Toynbee addresses the same problem —to describe how, by what means and by what individual or social body have been set the values for variables determining the properties of a given society and what are the most common (cor)relations between different variable values?

The turning point occurs when one realizes that a formal framework presented hereby —i. e. the framework which allows us to formalize political systems into vectors of variables— can be exploited not only for descriptive&explicative purposes, but that it can be normative as well. In other terms: vector-like representations of political systems can help us not only to understand the systems under study; they can allow us to «run» them in an unprecedented way.

But before we shall explain how this turn from descriptivity to normativity can occur in case of political science, let's take some inspiration from biology. Less than a century after Darwin's theory of evolution suggested that there exists a material substrate of heredity, such a substrate was discovered by Watson & Crick, having the form of a DNA molecule. In modern science, this molecule is conceptualized as a genome which can be defined as an ordered sequence of genes. A gene can be defined as «*locatable region of genomic sequence corresponding to a unit of inheritance*»[6]. From the point of view of this article, a gene is simply a

[6] Pearson, 2006.

variable which can code different values, for example the gene $eye_color is of type {green, blue, brown, grey,... }. The values of different variables determine the biochemical «unfolding» of the development procedure whose output is an individual living being phenotypically expressed by different properties.

Ceteris paribus, one can imagine that a society —with its laws, functions, rituals, institutions etc.— is a phenotypical expression of a vector of values —the genome— which is normally implicitly encoded in artifacts, books of laws, or a distributed holographic information in the brains of the members of the society under study. In order to form a functional political body, every society has to integrate 1) a certain set of institutions which «execute» certain actions according to active values of the variables (e. g. tax collector will behave according to the value set in the variable $tax_rate) 2) a certain set of procedures which precise how & by whom the different elements of «society's genome» are updated.

Often, these procedures are self-referential in a sense that not only their very execution is governed by values encoded in society's genomic vector (i. e. input parameters) but the result of their action (i. e. the output) can be formalized as an update of a value (or a set of values) of other parts of the initial same genomic vector.

As an example of such a vector update which is determined by the values in the very same vector, we may take an example a micro-society encoded by a vector of length 2 composed of a variable $tax_rate_updator having two possible values {basileus, parliament} as its type and a variable $tax_rate having a real value from interval <0, 1> as its type. Subsequently, a procedure update_tax_rate can be defined which, when executed, consults the information source referenced by an active value of the variable $tax_rate_updator in order to set the value of the variable $tax_rate. Notice that the execution of the procedure can be fully automatic, for example by means of a procedure update_tax_rate()[7] since the only thing which is in reality going all on the time is assigning values to variables. We hope that at this point, it is evident to the reader that in such a case the vector [basileus, 0.07] would be the genome for a political system where only the monarch has a right to change the tax rate from 7% of one's income, while the genome [parliament, 0.23] would encode such the society whereby only parliament has the right to change the current 23% tax rate.

We hope that this small example makes it somewhat more clear that the formalism presented hereby can be exploited not only for descriptive purposes. Verily, the objective is not to offer «another formal descriptive framework» for social sciences, for this was already done in multitudes of papers. The objective is to indicate that in the world where many executive procedures like collect_taxes() can be fully automatized by computer programs or other artificial agents serving as tax collectors, the vectors we speak about can *determine the functioning of the society* and to do so in the strongest possible sense. To take our analogy from natural sciences somewhat further, we precise the inspiration for what will be presented in the rest of this article does not come from descriptive sciences

[7] Procedures are denoted by () suffix.

like genetics or biochemistry; on the contrary, our aim is inspired by constructive aims of genetic engineering.

5. From Serial Model to Parallel Model

Who can prove that from the earliest human societies until our present situation, the functioning of social bodies —be it the tribe of Pygmees, the macro-anthropos[8] of Classical Athens or European Union— have not been determined by some genome-like vector of values ? It is true that the representational medium of the genomic vector changes —from pure wetware (i. e. stored in brain or set of brains) of pre-literal societies through pillars of Ashoka the Great towards multilingual norms of the Union, stored and backed-up in parallel in dozens of books, digital corpora or even cities.

It seems, however, that one thing haven't really changed, and that is the method by means of which the variables of utmost importance are being updated in almost all existing societies. We label this method as the central dogma of the Serial Model (SM) and define it like this:

> «the Serial Model, values of variables which determine the functioning of the society are updated in a serial order, one after another».

Caesar gives a list to his scribe and orders him: «You go to Forum Romanum and first You engrave the first law into the Stone, after Thou shall engrave the second». The parliament meets, they discuss one proposal, than vote for it and only if the *proposal* is voted for by the majority, the genome of the state shall be modified; afterwards another proposal is being discussed and voted for. University's council meets and they discuss the order of the day, point after point, vote after vote. The temporal preposition «after» is crucial here.

But certain deviations from the Central Method exist even in the world governed by SM. Mostly they are due to mutual independence of institutions to which the «authority to update the certain parts of the vector» have been assigned. A *circulaire de ministére* can be distributed in the same moment as the new law is passed. A *coup d'état* can occur in the society if ever the president tends to assign to variable X a different value than his strongest general, or even if they both update different variables with such values that two resulting vectors (president-generated vs. general-generated) diverge in such a degree of orthogonality[9] that they cannot be considered as consistent anymore. Or, in a somewhat extreme but pedagogically useful case one can imagine a muslim scholar articulating a fatwa obliging the nudity at noon in the midst of a sultanate which have just accepted the sharia law. Theoretically, even under SM, such updates of different parts of the vector can occur on the very same day, even at the very same moment, because different agents can modify values of different variables contained within the genomic vector.

---

[8] Plato, 2009.

[9] Notice that orthogonality is a geometric term.

Traditionally, such cases were considered to be a «bug» of the political system and extraordinary amount of intellectual power was invested, in course of human history, to bug-proof different systems by adding new watchdog institutions, or by proposing new set of variables pretending to be hierarchically superordinate to already existing ones, as is the case for Constitution. The final result, however, is that the length of society's genomic vector —i. e. the number of variables to be set— grows, becoming less and less comprehensible for a common human being whom it was supposed to serve in its very beginning[10], hence bringing with itself still more or and more place for disharmony and (cor)ruption.

But what may seem to be a bug when interpreted through the prism of level of abstraction[11] of Serial Model can turn out to be a feature when another level of abstraction is involved in the interpretation. Such is the case for the Parallel Model whose central dogma can be stated as follows:

> «Within the Parallel Model, a new value can get assigned to any variable in any moment, and independently from the moment of assignment of a value to any other variable. Theoretically, the values of all variables can be changed in the very same moment or in any other moment».

Seemingly tautological and therefore useless, the preceding definition can nonetheless lead to an unprecedented sort of «transvaluation of all values»[12] in the political domain. While all the transformations in political domain —be it small-scale reforms or full-fledged social revolutions— have simply updated the values of few variables or of certain parts of societies' genomic vector, a possible transition from SM to PM is not the change of content. It is the change of the form and more concretely, it is being realized by transformation of the form of procedure of voting.

6. From Parallel Model to Parallel Democratic Model

We believe that a transition from SM to PM is possible because of 1) development of information-storage mediums which can be accessed for viewing and updating independently of temporal constraints, 2) development of communication networks which allow us to access or update informational content stored on such mediums independently of spatial constraints and 3) such an extensive presence of information&communication technologies (ICT) that, at the beginning of a so-called 3rd millennium, the critical mass of inhabitants of the planet Earth can access (e. g. google) or even update (e. g. wikipedia) certain pools of informational content.

In its very essence, the genomic vector —i. e. an ordered sequence of variables describing and governing the functioning of a political body— is a piece of informational content. Hence it can be stored on information storage mediums and accessed or updated by means of ICTs.

---

[10] Hobbes, 2011
[11] Floridi, 2011.
[12] Nietzsche, 1969.

To make the genomic vector, or at least its certain parts, of one's own polis accessible & updateable by all, or at least by the biggest possible number of independent human agents, is the goal of all those who strive for participative democracy. However, even the most radical proponents of participative democracy sometimes lack to realise that the way how society stores and aggregates information strongly influences the way how it can function as a political body.

We have already addressed the question of storing when stating that the genomic vector of a pre-literal society was stored in a distributed fashion in the brains of critical mass of members of such societies (older members often had a decisive word to say in case of «data check-sum error») and indicated that a completely new system of legal formulae and institutions could have emerged from religious rituals[13] only because of the advent of writing and later, printing press.

Contrary to writing, press or television, which allows many to get into passive contact with the information stemming from a unique source of content, modern ICTs allow many to get into active contact with the medium encoding the informational content[14]. Thanks to ICTs, the shared information can be not viewed but also updated by anyone.

What's more, multiple updates of multiple informational contents can be realised in the same moment. This is of crucial importance for implementation of PM. It is debatable in what extent one can have a legal system which swiftly adapts to ever-still-accelerating transformations of external world if one bases himself solely on a printing press where every law is widely known only after 1) the authority stated the law 2) the statement of the law is published by means of a costly process of book preparation & printing 3) the book has to be distributed and attain its target. It is, however, non-debatable that in the end, the local lawyer whose practice could be substantially transformed from the very moment he receives the new collection of laws, shall have few possibilities to influence the edition of the next volume of the book. He can view but he cannot update. And even if he could update —for example because he is lucky, virtuous or corrupted enough to be the member of parliament— his overall contribution to society's welfare is more than doubtful since even with the best will possible, he shall be, more often than not, obliged to attribute values to variable which do not concern his domain of expertise.

Voting is the most fundamental form of opinion aggregation which is implemented in many social bodies in order to assign a certain value to a certain variable or the set of variables. In its most common, SM-consistent form, the voting act requires that a voting agent to cast his vote at a voting place during a temporal interval dedicated to voting. Vote concerns only one variable (in case of the most simplistic yes/no referendum) or a bundle of variables (in case of passing a complex law in the parliament). Subsequently, votes are aggregated by the voting committee (in case of elections) or an automatic vote-aggregating device (in case of parliaments) and according to the result of the aggregation, the value

[13] Coulanges, 2010.
[14] McLuhan, 1965.

of the variable concerned by the voting is assigned (or not) a new value. Only afterwards can the body of vote-givers proceed to another vote.

Let's now imagine a voting scenario for PM: One can imagine, for example, a tribe inhabiting a village located in an environment so hostile, that in every moment of existence of the village, at least two thirds of adult men are patrolling at different spots on the circumference of the village. It happens from time to time that some warriors die in the battle and sometimes their chieftain dies as well. Given a security constraint that forbids the majority of men to meet at one spot and vote, thus leaving the perimeter of the village unprotected, what method could assure that the village shall always have a chieftain respected by the biggest number of his comrades ?

One can imagine the following answer: to every man of the tribe, a distinct color is associated, be it the color that only the man himself can mix. It does not really matter whether the knowledge of color's preparation was revealed to a given individual during a certain rite of passage or whether it was transferred to him by his father —what matters is, that any adult member of the tribe can use a distinct color as his *unique identification token*. In the middle of the village, there is a group of totems. One of the most central totems is divided into sections, for example stripes colored in different colors. The old legend states that once a man is able to mix his own distinct color, the spirit of the village shall allow him to do two things: Firstly, he can paint his stripe on the totem, hence creating his own section. Secondly, if ever he meets a man worthy of his respect, he can paint one and only one line into the stripe colored in the same color as is the tattoo on the forehead of such a respectable man. And if ever, after engraving such a line into the chosen section of the totem (let's say green), one finds out that the chosen section contains more colored lines than any other section, one's duty is to go and seek as much comrades as one can find in order to tell them that the village's new chieftain is a man with a green tattoo on his forehead...

In this example, the totem represents a variable. When considered as a set, the group of all colors of different sections of the totem $chief represent the type of that variable. When taken individually, every colored section of the totem represents a possible value of the variable. Lines on different sections represent votes which a given possible value had obtained and the section which had obtained the biggest number of votes —i. e. a stripe with the biggest number of distinctly colored lines on it— represents the «active value» of the variable $chief. The act of writing a line correspond to the act of voting and the act of counting the lines within all the sections and the subsequent choice of the section which contain the maximum number of lines can be interpreted as aggregation of votes.

There are several crucial aspects to notice in the above «totem» scenario. *Primo*, in spite of the fact majority of voters never meet sat the same spot at the same time, they succeed to aggregate their votes because they use the surface of the totem as the information storage medium. *Secundo*, the aggregation can be possibly executed after a cast of every individual vote and thus just one vote can overthrow the current chieftain. *Tertio*, the totem in itself does not change after a new chieftain is elected, no information is lost and therefore a chieftain which had just lost his chieftain status can quite easily regain it by obtaining two fresh

votes —one which will put him into a tie situation with the present chieftain and another one which shall put him into the lead again, hence starting a sort of «cat&mouse» game between two chieftains. *Quatro*, any man can express his respect towards many possible chieftains by drawing lines into multiple stripes - it is not forbidden to give vote to more than candidate. One can also express his respect to one candidate today and for another tomorrow - one can change his mind. *Quinto*, it is forbidden to give more than one vote to just one candidate - once the respect was expressed by drawing a line, it cannot be reinforced. From this point of view, all candidates are equal. *Sixto*, since no line is deleted from the totem, the votes of vote-givers which have already passed away can influence the result of the aggregation process until the moment when the totem-variable $chief falls into oblivion, for example due to the rising influence of other totem-variables which demand the attention of inhabitants of the village. *Septo,* given that any voter has a unique identification token no further knowledge about the attributes of the village (e. g. size of its population) is necessary.

This being said, it is now time to present the combination of PM with ICT-sustained participative democracy which results in a Parallel Democracy Model:

> «Parallel Democracy Model (PDM) is a framework allowing auto-configuration and self-adaptation of social bodies according to aggregated collective will of individuals who compose these bodies (e. g. virtual avatars in case of virtual networks considered as such social bodies)»[15].

PDM aims to address several fallacies inherent to the most common variant of the SM known as «parliamentary democracy». In case of PDM, there is no need for individuals to meet in the same moment in order to influence the functioning of the society. However, they still have to meet in one place —which can be of purely virtual nature. Many different variables related to the functioning of the social body are presented in this place simultaneously (i. e. in parallel) and in perennial fashion (i. e. from eternity to eternity). In the most free variant of PDM, any individual is free not only to vote for one or more possible values of a variable (i. e. add a line on a stripe), but also add a new possible value to the variable (coloring a section of the totem with a new stripe), hence extending its type or even add a new variable (i. e. erection of a new totem). The act of voting is operationalized as the incrementation of the vote counter associated to a possible value on the storage medium. Among other features, the most extreme variant of PDM makes it even possible that the vote of a person already dead can influence political reforms to come.

7. Description of first tentatives to implement Parallel Democratic Model

Kyberia.sk is a virtual community founded by the author of this article in year 2001. During following years to come, it had succeeded to change from a community of hackers, artists and philosophers into a mainstream social net-

[15] Hromada, 2012.

work, nonetheless guarding its local nature and complete economical and political autonomy from the surrounding real-life environment. In 2008 it won the prize for the best Slovak Internet community and in 2009 it forked from Slovak cyberspace to Czech cyberspace and parallel project was launched on kyberia.cz domain, exploiting somewhat more evolved variant of the initial engine, which had meanwhile become open source and was published[16] under AGPL license.

From the very beginning, one of the academic objectives of the Kyberia project was to furnish a certain virtual «in vivo» incubator for experiments with community-modeling. One such tentative was realized in year 2003 when kyberia's version introduced in a feature called «K». K, which was originally meant to abbreviate the term «karma» and later «kredit» became a sort of currency which is 1) distributed on a daily basis and in a certain amount to every registered user of kyberia 2) can be transferred by its owner to another data node (i. e. a submission, forum, blog, user, whatever). Further extensions like K-wallet were added in subsequent version 2.3 of kyberia's engine, thus making kyberia's K-based transaction system very similar to normal economical system. Since the economical aspects of kyberia are of minor importance within the scope of this article, let's clarify that an act of giving a K to a given node is very similar to what had later been implemented on facebook in form of «I like» button.

What is of importance, however, is that the version 2.3. of kyberia's engine have been 1) the first to introduce a tentative to implement PDM in order to alleviate the administrative burden placed on the shoulders of kyberia's administrators 2) the K-giving system was exploited as a method for casting votes. The variable which was chosen as the first one to be subjected to PDM is a variable $page_title whose type is text, and whose «activated value» can be seen by any visitor of the page at the top of the page, in the browser's title bar (as of 15/11/2012 the $page_title is assigned the value «Remember, remember, the velvet November»).

Let's inspect closer how the value of this variable is assigned. There is a certain specific region of kyberia.sk called «Agora» where only users who were granted the status of a «senator» can give K. Within this «nodeshell» there is another «nodeshell» called «system configur»[17] where the system seeks for variables and their values - in terms of the «totem scenario» from part 6 of this paper, it can be illustrated as that part of the village where the totems are erected. And within this «node» there is a node «title content»[18] which, for the automatic scripts of kyberia's engine, represents the variable $title_content. Into this variable node, any senator can add his own «child node» whose content is the «possible future value» of $title_content. The act of adding such a «child node» into the node representing the variable $title_content is similar to the act of drawing of a new stripe on the totem; the only difference being due to variable's type: cardinality of type of all possible text strings is much bigger (infinitely bigger, in fact) than a finite number of possible chieftains in the village example presented above.

---

[16] *https://github.com/Kyberia/Kyberia-bloodline.*
[17] *http://kyberia.sk/id/5604218/.*
[18] *http://kyberia.sk/id/5604239/.*

What follows is quite simple: the senators simple give Ks to one or more nodes whose content represent the possible value. They mark their line on their stripe of interest. Subsequently, every night at 2:23 AM, an automatic procedure update_title() is executed which looks which child node of the «title content» variable has obtained the biggest number of Ks, takes its content and assigns it as a value of the variable $title_content which is internal to kyberia's code. Such an «active value» will be then visible to all visitors of kyberia.sk domain in the top part of their web browser.

An ignorant novice may consider it to be a waste of time to have such a seemingly complex machinery in order to do such a simple change as that of assigning a new value to a title of the website. But the fact is, that the «behind the scene» machinery is not that complex —just a simple *cron* script containing 40 lines of simple php code— and is very universal: ANY global parameter of kyberia's code —be it the number of Ks distributed to users on a daily basis, a K-cost of adding a new node or the number of K-s can has to obtain from other senators in order to become a senator— can be easily integrated into PDM by simply adding it to the «system configure» node located in Agora of kyberia.sk.

Since conservative operators of the Slovak kyberia feel certain reluctance to integrate more variables into PDM, more extensive «in vivo» experimentation is pursued within the scope of much smaller, nonetheless much more liberal domain of kyberia.cz. There, not only the title of the page (as of 21/12/2012 the $page_title = «mèδεις ageôμετρètος eisitô μου tèή stegèή»), but 3 other variables can be set as well, the most interesting among them being the variable PDM_CONSTANT_REGISTRATION_K indirectly addressing the challenge «shall immigrants be accepted into our polis?» which was already described, in the initial parts of this article, as the challenge which has to be addressed by any human society.

As a sufficiently big community, kyberia also has to address this challenge. Both czech and slovak kyberias shere the feature that there is only one way how one can become their member: 1) one has to apply for registration and 2) one's application has to obtain a sufficient number of approval votes from any already registered user (as is the case for kyberia.cz) or a senator (kyberia.sk). The number of needed registration-approving votes is addressed by the variable PDM_CONSTANT_REGISTRATION_K. Currently, the «active value» of this variable is 3 within the scope of kyberia.cz domain, meaning that the registration application of a new user shall be approved only after it had received at least 3 K-votes. If such is the case, an automatic register_user() procedure will execute necessary database transactions transforming user's registration application into a full-fledged user node; subsequently the user is informed by email that he can enter the domain.

It is possible that if ever the size of the kyberia.cz shall grow, more and more users will propose or vote still higher and higher values of the above-mentioned variable, in order to somehow regulate the influx of possible immigrants. On the other hand, it can also happen that the variable shall be assigned the value «zero» —in such a case a registration application could be approved even if it haven't received any K-vote. Such a case could be quite dangerous, however, since it could

lead to uncontrollable influx of alternative egos which are a true problem for every virtual community and for which the kyberia.sk has found a partially successful solution by setting the acceptation threshold to 5 senator approval votes.

8. From PDM to political engineering

Let's look closer at the above-mentioned variable determining how many votes are needed in order to approve a registration application of a new user. We believe that it can illustrate the importance of good choice of variable's value in relation to the survival of a community or a society.

As was already mentioned, if the value is too low, anyone can easily become the member of a community. In case of virtual communities, the system like facebook, which does not put almost any constraints on user selection, can easily become a playground for toxic egos causing the overall quality of content to go down. In case of real-life societies, such completely open societies can easily became a haven for black-passengers or outlaws. But if the constraint determining the acceptation of a new member is too strict —i. e. the number of votes needed is too high— the system can easily get into situation where less and less immigrants succeed to get approved. This can potentially lead to the death of the community or society, especially in case of significant user outflux (e. g. «locking out» of kyberia and investing computational resources of one's brain into the construction of google+ identity).

We believe that in the history of humanity, it was not uncommon to see highly advanced societies perish just because the $immigration_rate variable have been assigned a non-optimal value or because it was wrongly balanced with other set of variables contained in society's genomic set, e. g. those variables which determined the immigrant's subsequent integration into society. The problem is, of course, that in situation where no honest man can pretend to know in advance what is the optimal value of a single variable, it is practically impossible to attain any kind of optimality in cases complex sets of variables. The problem, in its very essence, is that humans beings are unable to find agreement of what «optimality» means in case of sociopolitical bodies.

For a computer scientist it is evident that there exist certain problems for which we shall *never* know the solution, nor know whether we shall *ever* know their solution[19]. In the world where the aims to attain «the common good» and to spread «the human dignity»[20] had indirectly led to biggest demographic and ecologic disasters of recorded history, one would tend to adopt a sceptical attitude expressed by a belief that the problem of global optimality of political bodies is an unsolvable problem.

It was many times advised that instead of falling into scepticism, it is wiser to observe in amazement[21] the wisdom of Nature. Be it the ontogeny of a human

[19] Turing, 1936.
[20] Mirandola, 1486.
[21] Plato, 1986: 155d.

baby or a phylogeny of species, the Nature maybe does not find the global solutions to «life, universe and all» but succeeds to discover stunningly elegant and simple local optima by means of very simple heuristics like «trial and error» and evolution.

We believe that the reason why Nature succeeds to do so is because it unceasingly permutes and mutates diverse information-carrying vectors, and that it always find new ways —new mutation operators— to do so. As all experts in the domain of evolutionary algorithms (EA) know, a very method combining the idea of 1) information conservation 2) information replication and 3) information mutation can offer us sufficiently satisfactory solutions for stunningly wide range of problems.

This article tries to suggest had that the evolution of different configurations of political bodies can be not only described in terminology not so distant from the terminology used by experts in EA; we also indicate that act of making explicit the variables which determine the functioning of a given society —as is the case in PDM— could accelerate the research of a locally optimal political configuration. In our opinion the advantage lies in PDM's vote-aggregation ability to harness «wisdom of crowds»[22] better than a «classical» crowd-sourcing algorithm located at the very core of different variations of the Serial Model. We may be, of course, wrong in our conclusions but our «in vivo» social experiment with kyberia communities haven't furnished us any reason to support a belief that systems based on SM-aggregation should be uncritically accepted and PDM-like variants *a priori* excluded. Verily we believe that the only obstacle to wider expansion of PDM seems to be SM's strong «social inertia» and not a flaw inherent to PDM itself.

As there is no order without conservation, there is no evolution without mutation. If in case of political bodies mutation can be operationalized as a modification of variable's value then it follows that methods of opinion-aggregation can be interpreted as mutation operator if ever the execution of such method results in update of variable included in society's genomic vector. Simply stated: as members of different virtual communities, as citizens of the polis aiming to apply the principles of participative democracy or simply as holders of the passport of the Union, we all have a possibility to contribute to the final output of a variable-updating operator.

Whether we want it or not, we are all co-engineers of the political body which envelops us as mother's *matrice*. Our actions contribute to mutations of the vector which is generating *cette matrice* and this *matrice* subsequently influences our future actions and choices. In majority of cases, this dialectics between the agent and his sociopoliticohistoricoecolognomical environment is implicit and hidden behind stratas of constitutions, laws and institutions. The objective of the model hereby proposed is to make more explicit at least certain parts of this dialectics.

Our hope is that by making things —values, variables, vectors, models— explicit, we make them accessible to conscious reflexion. By making them acces-

[22] Surowiecki, 2005.

sible to conscious reflexion, and by subsequent transforming of these structures according to this very reflexion, we let consciousness to co-construct our shared world, hoping that consciousness and reason shall help us to reduce to zero the probability of participation on the construction of the world about which it already stated: «this is not the world I love»[23]. Hopefully, by reducing the possibility of waking once into such a world, we shall gradually raise the feeling that the corner of the universe we slowly learn to inhabit... is our home[24].

Reducing and raising, incrementing and decrementing, encoding and decoding, analysing but also uniting —such are the tools of a conceptual engineer. Since in this article we had implemented these tools for purposes of political science, we find it appropriate to end this excursion by proposing a following definition of Political Engineering:

> «Political engineering is the science and an art of adjusting the values of variables which determine the functioning of a political body»

and we terminate with the conclusion that it is left to engineer's own choice whether (s)he wants this adjustment to be done in accordance with external environment, or with internal intentions.

Bibliography

Bourdieu, P. (1984). *Distinction: A Social Critique of the Judgement of Taste*, Harvard, Harvard University Press.

Coulanges, F. de (2010). *La cité antique: Étude sur le culte, le droit, les institutions de la Grèce et de Rome* (1893), Cambridge, Cambridge University Press.

Floridi, L. (2011). *The Philosophy of Information*, Oxford, Oxford University Press.

Hobbes, T. (2011). *Leviathan* (1651), Empire Books.

Hromada, D. D. (2012). *Initiation to Parallel Democracy Model.* Presented at the Fabrique de la Loi, Ecole des Sciences Politiques, Paris.

Kauffman, S. (1996). *At Home in the Universe: The Search for the Laws of Self-Organization and Complexity*, Oxford, Oxford University Press.

Lévi-Strauss, C. (1967). *Structural Anthropology*, New York, Doubleday Anchor Books.

Lévi-Strauss, C. (2005). *Interview with Claude Levi-Strauss*, Television France 2: *http://www.youtube.com/watch?v=bT8sFygU8fY.*

McLuhan, M. (1965). *The Gutenberg galaxy: the making of typographic man*, Toronto, University of Toronto Press.

Mirandola, G. P. D. (1971). *Oration on the Dignity of Man* (1486), Gateway.

Nietzsche, F. (1969). *Umwertung Aller Werte Band 1.* Deutscher Taschenbuch.

Pearson, H. (2006). *Genetics: What is a gene?*, in «Nature», 441, 398-401.

Plato (1986). *Theaetetus: Part I of The Being of the Beautiful*, Chicago, University of Chicago Press.

Plato (2009). *The Republic, Cambridge, Cambridge University Press.*

Surowiecki, J. (2005). *The Wisdom of Crowds*, New York, Anchor.

Turing, A. (1936). *On computable numbers with an application to Entschiedungsproblem*, in «J. of Math», 58, 345-363.

[23] Lévi-Strauss, 2005.

[24] Kauffman, 1996.