

Description of Models of Complex, Hard Forming Objects

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Abstract The study of structures of power is one of the main tasks of political science, sociology, and philosophy. The concept of "power" has many meanings, it is hard to quantify. Mathematical models of sociology are descriptive in nature and are applied to a narrow range of issues. These problems are the results, definition of ratings of various political parties, forces, forecasts of parliamentary voting, etc. Model is convenient to easily build formalized basis. You must first define the chain of command, the hierarchy within the government, senior and junior instance. Next, you determine the type and quality of society, managed by government. It can be imagined as civil society. This part of society does not have the authority of law. But one and the same individual can belong to the power structure, and to be a member of civil society. And also there is the response of society to management actions of the government. The reaction can be in the form of public opinion polls, rallies, strikes, etc. The article describes the different types of government. The author emphasizes on the superiority of social-oriented type of management, liberal. This article is the first step to modeling the complex process of governance. Complex objects are difficult to describe mathematically. Relations between people in society are a global problem of mankind.

Keywords Probability, Matrix States, Bifurcation, State

1. Introduction

Complex processes can not be described strictly mathematically. Physicist makes experiments to confirm his laws, formulas. In human society, it is difficult to experiment, almost impossible. Since human society is also related to the theory of complex, as the rest of nature. All the discovered laws of nature will be about 10% of the mysteries of nature, and even the elementary particles have their divisions in the infinite unknown. Physicists can not find a particle of God, but it is possible that part of God does not exist, and they are looking for what does not exist. The string theory of Brian Greene is more attractive.

What is the mission of man on the earth? Is it just the fear of survival determines its essence, unfortunately, in the backward countries it does? What is the place of humanity defined in the theory of complex? In this article, there is only the first approximation to the description of the human society in the form of the state. There will be other approach, more formal, more interesting. Why God had to create man? Who knows, a man may be casual, a waste product, just above the animal? Describing the life of human society in scientific language of physics and mathematics it is possible to achieve a specific goal in the management of the society. And this article pursues this goal.

The state, as well as the individual is born, develops, prospers, is in decline. In scientific language the life activity of a separate state can be described in the form of a formula, for example, as a function of $G(t, m, n, b, u)$, where G is an external function, which describes State in general.

2. Complex Theory, the first Approximation to the Description of the Nature of Society and the State Body

This function depends on the variables:

t - the time (age) the existence of the previous state;

m - Location of this state or coordinate;

b - IQ of the population, education;

n - The population, the people of this state;

u - describes the type of governance, management function. In today's world there can be roughly distinguished the following types of control:

u_1 - Socially-oriented type;

u_2 - Liberal;

u_3 - Semi-liberal, semi-oriented;

u_4 - Effective management of resources;

u_5 - One-sided raw material economy, poor management of resources;

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u_6 - Administrative command, non-market type of governance;

u_7 - Tribal type of control, tribalism. Prehistory of the state is a chain of past lives of the state, since the inception of the area. For example, the following sets:

$G_1(t_1, m_1, n_1, b_1, u_1)$ This function describes the valid Sweden,

$G_2(t_2, m_2, n_2, b_2, u_2)$ - U.S., $G_3(t_3, m_3, n_3, b_3, u_3)$ - France,

$G_4(t_4, m_4, n_4, b_4, u_4)$ - Kuwait, $G_5(t_5, m_5, n_5, b_5, u_5)$ - Saudi Arabia, $G_6(t_6, m_6, n_6, b_6, u_6)$ - Cuba,

$G_7(t_7, m_7, n_7, b_7, u_7)$ - Ethiopia and Afghanistan.

Self-organization in human societies is a complex process, refers to a complex theory. The dynamic models that take into account the evolution and variability are most appropriate for the social systems. In addition to some of the internal structure there is a fixed value of the external environment with which the system exchanges information, energy, material, etc. Is the experience of the past to predict the future? What is the nature of human systems? Evolution is as a standalone process, which is determined by the interactions between different people at any one time. External constraints are taken into account by using different parameters. The initial conditions can be regarded as an expression of the influence of random or systematic external intervention such as "war" planning or natural disasters. The differences in initial conditions lead to the fact that the system can be in the domains of attraction of different modes, which is equivalent to the inclusion of different types of evolution, different variants of the story. There are a number of complex solutions and bifurcation phenomena. Let the control function $u(t, m)$ is given by the following

equation $u = g(t, m, n, b, u)$. You can put this task: to change the system from state $b(0) = b_0$ to the state

$b(T) = b_T$ in time T , so that the "cost" was minimal, I.e.

$$\int_0^T G(t, m, n, b, u) \rightarrow \min$$

This problem had been effectively carried out with the young Soviet state in 1931. "Universal education" was introduced, institutions were opened there.

In the developed countries optimal control function is based, as the civilian population actively participates in the government of his country, unlike in countries with dictatorial regimes. Bifurcation process can be avoided. Bifurcation processes have taken place in the Arab world,

where kings ruled. Bifurcation processes took place in Russia in 1917 when people overthrew monarch, the king. Every nationality, which is not Russian, whose territory was occupied by Russian Empire, dedicated their lives to struggle for Independence and freedom. For example, in 1931-32 there was an uprising [8] of Ostyaks and Kazym Nenets; the cause – to oust Russian, who lived in Ostyaks land – tundra. After 1933 the riots began in Kazim. There were about 20 uprisings against collectivization. Their lifestyle was changed, their territory was occupied by the Russian. In the years 1930-1938 all educated, progressive people, the cream of the nation were repressed and killed, the Kazakh people were beheaded. In these years, the bifurcation processes were intensive in Russia. The dictatorial regime was set in Russia, the chief nation, as it was thought, was Russian. Nevertheless, the main achievements of great rising socialist country were free secondary and higher education, free medicine. It was chosen as a historic choice. Then the second-largest major bifurcation process was the collapse of the Union in 1991. If you tell a philosophical language, it was "the negation of negation", in 1917 the king was overthrown, and 74 years after people dethroned General Secretary! But during the whole period there were different bifurcation processes. One of them was an uprising of Kazakh youth in 1986, then, in the Baltic States, Georgia, etc. Thus, in 1992 the different historical options for further development were chosen by small nations of Russia. The era of transition began. But people weren't ready to build a civil society, unable to defend their right to any piece of the national wealth, left with nothing. In developed countries, optimal control function is constructed, as the African, Asian nationalities. there a vibrant civil society has developed. The main factor of freedom is still the reason that these people weren't slaves of other nations, as The Scandinavian people - the special people to be proud of! In Asian countries management function has the stamp of slavery! Typically, mother country selected dumb people from the colonies to control the colony. These people did not shine patriotism and intelligence. They are suitable for the rough colony management.

And so there is a big difference between the types of control u_1 to u_7 . Especially type of control u_7 is dominated in the post-colonial African and Asian countries. Smart people choose u_1 or u_2 , u_3 .

Let's look into the future. Through 100 years we will live in one state, will serve as a control function $u(t, z)$, where the parameter z means the coordinate of the Earth in the galaxy relative to the center of the galaxy. Management function from the equation $u = g(t, z, n, b, u)$. The derivative function is taken over the management of the argument time t . There will be no monarchy or dictatorship; there will be people with high intelligence, who will have mastered the solar system, found an outlet in the galaxy.

Let's return to real life. Compare for example the three countries: Sweden, Cuba and Kazakhstan, with the types of control u_1 , u_6 , $u_7 + u_6$ [6], [7], [12], [13], [14]. In

Sweden, education - free of charge, social security is very high, high standard of living, the income gap between rich and other citizens is small. In Cuba the death rate 6.33%, is 32 place in the world, the industry is 25.5% in GDP, agricultural products takes 6.6% in GDP. In general, command and control type of administration is ahead of some countries in Latin America.

In Kazakhstan, the infant mortality rate among the Kazakh population is the largest compared with other ethnic groups, such as 1999 year – 66.6% of the total number of infants in the 2005 year – 70.8% . In social terms, the worst of all ethnic groups in Kazakhstan, the Kazakhs live. As the incidence of tuberculosis again Kazakhs occupy a leading place in the world. Income exceeds the income of the rich to the poor 30-35 once and for all because of management type

u_7 .

If the type of control u_1 taken as the first strategy, u_6 - as a second strategy, u_7 a third country's development strategy, you can specify a certain state transition matrix:

$$P_1 = \begin{pmatrix} 0.5 & 0.4 & 0.1 \\ 0.4 & 0.3 & 0.3 \\ 0.3 & 0.4 & 0.3 \end{pmatrix}, \text{ the sum of the elements of each}$$

row is 1.

The elements are the probabilities of transition from one state to another. The initial probability distribution of the vector of income:

$$r_1 = \begin{pmatrix} 5 \\ 4 \\ 3 \end{pmatrix}, \text{ then a single step we obtain the following}$$

revenue management:

$$m_1 = \begin{pmatrix} 0.5 & 0.4 & 0.1 \\ 0.4 & 0.3 & 0.3 \\ 0.3 & 0.4 & 0.3 \end{pmatrix} \cdot \begin{pmatrix} 5 \\ 4 \\ 3 \end{pmatrix} = \begin{pmatrix} 4.4 \\ 4.1 \\ 4 \end{pmatrix}.$$

For the coordinate of the country, we have income. If the strategy u_6 transition matrix is valid as follows:

$$P_2 = \begin{pmatrix} 0.3 & 0.3 & 0.4 \\ 0.4 & 0.3 & 0.3 \\ 0.3 & 0.3 & 0.4 \end{pmatrix}, \text{ Initial probability distribution the}$$

vector of income:

$$r_2 = \begin{pmatrix} 4 \\ 3 \\ 2 \end{pmatrix}, \text{ then a single step we obtain the following}$$

revenue management:

$$m_2 = \begin{pmatrix} 0.3 & 0.3 & 0.4 \\ 0.4 & 0.3 & 0.3 \\ 0.3 & 0.3 & 0.4 \end{pmatrix} \cdot \begin{pmatrix} 4 \\ 3 \\ 2 \end{pmatrix} = \begin{pmatrix} 2.9 \\ 3.1 \\ 2.9 \end{pmatrix}.$$

In the third strategy u_7 transition matrix of probabilities

of the states has the form:

$$P_3 = \begin{pmatrix} 0.3 & 0.3 & 0.4 \\ 0.3 & 0.2 & 0.5 \\ 0.2 & 0.2 & 0.6 \end{pmatrix}, \text{ initial probability distribution}$$

the vector of income:

$$r_3 = \begin{pmatrix} 3 \\ 2 \\ 1 \end{pmatrix}, \text{ then a single step we obtain the following}$$

revenue management:

$$m_3 = \begin{pmatrix} 0.3 & 0.3 & 0.4 \\ 0.3 & 0.2 & 0.5 \\ 0.2 & 0.2 & 0.6 \end{pmatrix} \cdot \begin{pmatrix} 3 \\ 2 \\ 1 \end{pmatrix} = \begin{pmatrix} 1.9 \\ 1.8 \\ 1.6 \end{pmatrix}. \text{ Comparing the}$$

three vectors of income we can conclude that the first strategy is still the best control, on the other can not be.

3. Conclusions

It is only the first step to modeling state in mathematical language. There is given different bifurcation phenomena in the history of a separate state. The author sympathizes with the liberal, socially-oriented type of management. Society must develop harmoniously, rather than anti-human ways of management. Then the minimized cost to society.

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