

Introduction

It is developed consciousness, language and culture that distinguish us crucially from animals and that is why we outnumber comparable to us creatures hundred thousand times.¹

Sergei Kapitsa

What drives human development? Many famous scientists attempted this question, however outcomes of their investigations are still relatively modest despite impressive achievements of hard science.

We can split atom nuclear and produce nuclear energy. A man was launched into space, we investigate planets of Solar system, have landed on the Moon. We discovered thousands of planets in other solar systems and are searching for space brothers. Big aircrafts deliver hundred millions of people to have rest at seashore. We decoded human genetic code and can treat transmittable diseases. We produce computers which control large plants and domestic appliances, robots which replace people in industry. Annual steel output exceeds one and a half bln of tons and grain output exceeds two and a half bln. We cannot do without a notebook and a car. Billions of people connect each other via Internet and mobile communication means.

Meanwhile we were unable to anticipate the severe financial and economic crisis of 2008 and still fail to perceive its profound causes.

Scientists have been attempting computer-aided simulation of human development for about 40 years starting from works by Professor Jay Forrester²; Herbert Simon, the US economist and Nobel Prize Winner, summarized these attempts with the conclusion that forty-year experience of simulating complex systems on computers that became larger and speedier from year to year taught us that brute force would not lead us along the royal road to understanding these systems; instead simulation would require us to turn to basic principles and it is they that would lead us to resolution of this complexity paradox³.

Humanity entered the ‘demographic transition’ epoch and it has been long now that developed countries fail just to sustain their population level, instead we are unable to control this process, unsure about its causes and cannot decide whether it is good or bad that population of these countries stopped growing.

It was a shocking revelation when PricewaterhouseCoopers⁴ forecasted that in the near future (by 2017) seven major countries, G-7, will yield the economic palm to developing economies including BRIC and by 2050 their economic weight (purchasing power parity GDP) will be twice as small as of the latter.

Meanwhile achievements of ‘knowledge economy’ and importance of innovative development are widely promoted though practically none of the forecasts interrelates knowledge and global economic growth quantitatively.

So what role does knowledge play in the processes mentioned above? Noting S.P. Kapitsa’s statement that humanity is first an information society that ‘originated directly at the dawn of

¹ Капица С.П. Парадоксы роста: законы глобального развития человечества. – М., 2012. – С. 19.

² Форрестер Дж. Мировая динамика. Пер. с англ. – М., 2003. (первое издание – 1978 год).

³ Cited from: Капица С.П. Парадоксы роста: законы глобального развития человечества. – С. 22.

⁴ Хоксворт Дж., Тивари А. Мир в 2050 году. Ускорение процесса изменения баланса экономических сил в мире: проблемы и возможности. – 2011. – С. 3, 7. http://www.pwc.ru/ru_RU/ru/globalisation/assets/World-in-2050-ru.pdf

human society millions of years ago rather than followed after computers and Gutenberg, hieroglyphs and language', the author investigates the role of knowledge in human development.

This investigation intends to discover and analyse main drivers of human development as a single system and the place of knowledge among these drivers.

Humanity as a subject of investigation is considered from its origin about 1.6 mln years ago up to about 2120, i.e. the time where relatively exact development parameters are still available. If developed tools allow, the investigation concerns not just humanity as a whole but major economies as well.

The investigation should discover quantitative interrelation between major parameters featuring humanity as a whole, in particular population figure, GDP, amount of knowledge, frequency and content of technology revolutions, as well as other parameters featuring industry, distribution and application of knowledge (number of scientists and engineers, number of publications and inventions, cost of these activities, the role of language, etc.).

The author applies various quantitative research tools and some elements of the systems approach. The investigation is prognostic in its nature so considered first are parameters responsible just for magnitude.

The investigation comprises three parts. The first analyses the foundation of human development including a review of works accomplished in this area, provides analysis from the systems approach perspective and clarifies some issues investigated in details earlier: population figures and cyclic mode of its development.

The second part investigates the role of knowledge in human development. It analyses laws of knowledge enrichment in time and methods for forecasting global GDP growth related to knowledge enrichment. Also considered are the issue of how thinking originated and stages of the past world development.

The third part considers actualization of knowledge recourse via intelligence. Since different countries are developed to a high degree inhomogeneously, this part analyses different countries and groups of them additionally to the world as a whole. Note that this part is prognostic in its nature.