

THE CONCEPT OF EMBEDDED SAFETY

Boris Ostapenko

National medical academy of postgraduate education P. L. Shupik

(стаття надійшла до редколегії – 9.02.2015 р.; прийнята до друку – 24.03.2015 р.)

© Ostapenko B., 2015

The paper introduces the concept of embedded safety as a method ensuring the functional efficiency and safety unity of scientific and technical activities. The author suggests the safety criterion of the dominating vector of the worldview intentions in the society and among professionals and the safety criterion of the scientific and technical project.

Key words: worldview, motivation, intentions, efficiency, safety, scientific and technical activities, efficiency and safety criteria.

КОНЦЕПЦІЯ ВБУДОВАНОЇ БЕЗПЕКИ

Борис Остапенко

Запроваджено концепцію вбудованої безпеки як метод забезпечення функціонального об'єднання ефективності та безпеки науково-технічної діяльності. Запропоновано критерій безпеки домінуючого вектора світоглядних намірів у суспільстві та у фахівців і критерій безпеки науково-технічного проекту.

Ключові слова: світогляд, мотивація, наміри, ефективність, безпека, науково-технічна діяльність, критерій ефективності та безпеки.

Introduction. Guiding people's intentions for the best of human dignity and social well-being requires the analysis of the starting point of individual and collective efforts. This is a dominating intention defining the qualitative outcome of any human deeds. People's motivations settle the agent's behaviour and the vector of the deliberate and consistent efforts. Taking into account the problem of motivation, philosophy and methodology of science and technology shows a responsible agent the direction and the decisive social outcome of the scientific and technical project. Therefore, the society acquires vital information for the efficient and safe development.

Developing the criteria for the public assessment of the specific scientific and technological projects, it is necessary to have a reference point, which is the efficiency and safety for the society. How can we correlate the efficiency and safety of the scientific and technological projects in human and social dimensions? It is often considered that efficiency possesses its meaning without the correlation with safety. The lack of safety compromises efficiency taken as the public good.

The **aim** of the paper is to develop the method of the synergetic safety embodiment in the technological functionality. In order to achieve it effectively, the safety objective should be connected with the functionality. It defines educational and scientific and technical methods for the specialists involved.

Some ideas concerning this research topic can be found in the works of V. L. Kulinichenko [5], Smith-Jentsch,

A. Kimberly [12], F. Fukuyama [3] as well as in some international documents [1; 4; 6; 10; 13]. But the concept of embedded safety and its main thesis belong to the author of this article.

The role of intentions. Intentions and the vector of the dominating worldview in the society have a crucial significance for the fate of civilization, strategic assurance and geopolitical positioning. The concept of the dominating worldview in the society represents the role of the active motivation direction that defines the character of the cumulative social efforts outcome. In spite of various motivations in the society, there is a dominating vector of the social agents' joint efforts. When the motivation is complex and multiple, it is possible to observe a qualitative civilization character that the society generates through its efforts. Being technogenic or collective, humane or destructive, win-win or win-lose, the character of civilization reflects the vector of the dominating motivation in the society [9].

The comparative analysis of civilizations demonstrates a striking difference the societies have in their dominating values, aims and cultural consequences. Contemporary societies of Switzerland and Afghanistan represent this distinctive difference in the character of the societies. Why do these differences exist if we have advanced information technologies providing access to the modern scientific, social and cultural information? It is known that the specialists of the Afghan origin living in Switzerland perform their work as good as their Swiss colleges. Why

do the societies, consisting of the human beings and the species of the same nature and potential, have such dramatic qualitative differences?

Defining the agent determining the character of the society and the qualitative cultural content of the resulting civilization may provide an effective reference point for human thoughts, social self-understanding and crafting policies. Some societies puzzle over their systematic social failure and lag behind own ambitions and the best performing civilizations. What brings such societies behind? Is it a historical past, a “doomed” country, a genetic or racial fatality, or a dominating attitude? It is the attitude that defines the qualitative outcome of the cumulative efforts of the society. That is the answer. The character of the culture the society generates is determined by the cumulative dominating worldview intentions. The resulting vector of the people’s efforts brings the society in the specific qualitative realm named the civilization [9]. Here come Swiss or Afghan societies and at the same time history, scientific and technological knowledge and global mobile access to the Internet.

Setting the same aims and objectives doesn’t guarantee the same achievements and success. The performance of the people implementing the declared goals differs. But if the declared aims do represent the truth and the efforts applied are honest and adequate, the outcome will be positive and the aim will be achieved. Though, there are plenty of cases when the declared social objectives are only to win elections and hold the political and wealth power. The actual policies, economic activities and financial efforts directed toward specific personal or group interests exist in contradiction and even due to the officially proclaimed goals. Here the outcome will be “strangely different”. Much could be told to hide the truth and avoid revealing the actual motivation of the agents. The society may swallow the lie. The character of such society will be far from the officially declared values and goals as the societies are consciously uncivilized.

Being complex and comprising multiple intentions and various motivations, the society has a specific civilizational character that is the quality reflecting the dominating in the society vector of the worldview intentions. In the society the individual may find oneself under the scrutiny of corrupting mores and controversial laws. Nevertheless, people settle, exhibit and re-establish the debasing attitude. They have this degrading attitude towards themselves, their colleagues, their country and their lives. There are differences between individuals, whose cumulative choice defines the character of the society. While the examples of the atypical motivation exist in any society, the total result reflects the qualitative balance of “good and bad” that people choose to pursue.

In the early upbringing of human beings the will and the capacity or the lack of teaching the truth about the possible nature of human motivation, the virtues and

the sins people know and choose, establish the vector of the dominating worldview intentions that defines the civilizational character of the coming generations. A substitution of the knowledge of truthful cause-effect relationships in human behaviour for the misleading ideologies and pseudo sciences that draw individual and social attention and efforts to the wrong agents and mystified causes nullify even honest socio-economic and individual efforts. The outcome of such misled society will be a civilizational failure.

Education should take a solemn responsibility to deliver to pupils the truth about the human motivations, the choice between the virtues and the sins given to each individual and the responsibility for the chosen vector of the worldview intentions the person carries through a lifetime. It is a striking fact that the most thriving societies succeeded the best owing to the implementation of such approach in education. It does work. And it is therefore the method and foundation for any society to craft its civilizational fate for the best of human dignity [5]. The evasion of such approach brings up a generation of morally and spiritually blinded people whose society will fall in shame.

The implementation of education focused on the decisive agent of the fate and the society in the ideologically and culturally deformed communities represent a significant challenge. To succeed in overcoming the debasing inertia, the acknowledgement of the issue should be spread in the public informational domain, existing in the scientific community and supported by the academic professionals. Properly aimed education is the effective method to transform the lagging society into the successful civilization.

The educational system may be effective but the academic professionals have to define its actual aims. Another ideological lie will harm the society again and again. Some may benefit from it but not the majority and the society per se. That turns the fate even of the beneficiary under the scrutiny of the social disorder because the society built on the debase ideas is doomed to ruin. Moreover, the geopolitical competition threatens the spiritually disgraced society provoking the international, legal, economic and security deprivation and attracting the destructive intervention. A nation carried away by the false cause-effect views and mired in the dishonoured socio-economic practices loses credibility and legitimacy in the face of the international community. Therefore, talking about the effective educational system, we should stay focused on the goal to teach pupils the knowledge of virtues and sins, the skills of recognising their own intentions and the responsibility of each person for own choices and deeds in any circumstances. That would give the citizens the crucial knowledge to direct their lives and the society to the best quality human dignity.

Hence, the knowledge of the vector of the dominating worldview intentions is important for any human being and society aiming at directing own life for the best creative, prosperous and safe destiny.

The assessment of safety. Tackling the public and professional assessment of the efficiency and safety of political, scientific and technical projects, the reference point must be the analysis of the vector of intentions in its nature started in human mind and heart and settled as the worldview intention [3; 5]. The strategic outcome of the project is crafted by the vector of intentions of the specialists involved [1; 2; 4; 6; 7]. If hidden intentions are of asocial nature, ignorant to the virtues of other people and aimed toward own benefits by any means, the result of implementing the project officially designed for the public good will bring harm [12; 13]. Therefore, the first and foremost criterion to assess any socially significant project is to examine the vector of intentions carried on by the professionals responsible for the project.

The vector of intentions should be used as a backbone in the further analysis of the human and social value of the scientific and technical project. Talking on the epistemological efficiency of the specific scientific project and observing the technical value of the industrial venture, all assessments should refer the acquired information to the vector of intentions the involved professionals in charge perform [1; 12]. The scientific and technical values often shadow the existential and social meanings of the project. An excitement of innovation may blind the society with bright pictures of the new knowledge, new functions and new consumer demands [13]. The market becomes a ruler of thoughts. The society invests into building of expectations. The expectations thrust social and financial investments. The existential human and social outcome of the project becomes hidden from the public intellectual eyes.

At the same time, the successful monitoring of the vector of intentions should not diminish the importance of the scientific and technical analysis of the project [11]. The professionals have to provide a thorough observation of the potential and benefits of the scientific and technological innovations. The avant-garde innovations providing a breakthrough and leadership in science, technology and wellbeing are especially valuable. The avant-garde knowledge in science and technology should be examined with the additional diligence not to overlook the breakthrough potential that may be hidden behind the established paradigm. It is necessary to avoid diminishing the professional expertise of the projects because of the unspecific, unproved and unsupported accusations of the potential danger of the project. The conclusion of the expertise on the project should be argued professionally and specifically [7].

Speaking on the criteria of the efficiency and safety, it is important to emphasize the methodological role of the category "worldview intentions" for defining the social preferences concerning the meaning of the efficiency and safety. Different vectors of the worldview intentions would bring different assessment of the value of the same project. It could be considered as socially

desirable, or vice versa, unnecessary. It depends on the reference point and different worldviews dominating in the society. Even more, the society may be hindered by the lack of proper information while misled by the deliberate disinformation. The outcome could be destructive for the society to the point of complete disintegration. Here is the importance of the precise, responsible and always combined scientific, technical and social analysis of any sound project along the reference point of the dominating worldview intentions settled in the society. Thus, the vector of intentions of the professionals responsible for the project would be rigorously assessed in conformity with the vector of the dominating worldview of the society.

Here comes the importance of the qualitative characteristics of the dominating worldview in the society, its intention and vector. If dominating is the individual material consumption and profit, the cumulative vector of the social efforts and methodological paradigm frame the criteria of the efficiency and safety by the profitability momentum. The strategic social wellbeing would be settled behind or completely dropped. Therefore, the efficiency and safety would have a very specific qualitative character giving any scientific, technological and social project free hands to extract the maximum profit by all means. Sooner or later, the society will face a clash between the established criteria of the efficiency and safety, which is for the efficient profit and safety of the individuals in power and the efficiency and safety of the society per se [8]. The flight of the finances and individuals in power offshore resolves the safety challenge they may encounter within the society directed by this vector of the worldview intentions.

Despite being specifically differentiated, the criteria of the efficiency and safety are linked in correlation. At best, the efficiency is embedded in the safety while the safety is entrenched in the efficiency. At worst, on the contrary, the efficiency doesn't hold the safety while the safety disengages the efficiency. Therefore, the correlation of the efficiency and safety has a symbiotic nature that is the social, functional and structural interdependency. Where does the exquisite symbiosis of the efficiency and safety start? The symbiosis starts within a professional's mind directed by the humanistic and social orientation of the vector of one's worldview intentions. The worldview intentions of the professional's mind entrench the safety into the efficiency and embed the efficiency in the safety.

Therefore, the correlations of the efficiency and safety could achieve the level of the symbiosis when directed by the humanistic and social vector of the worldview intentions, reflecting the successful upbringing of the human being and educating the professional to the best of the human dignity. The corruption at any level of the upbringing and education as well as the corruption of the dominating worldview intentions in the society compromise the safety and, consequently, the efficiency preventing the professional from establishing the symbiotic

relations of the safety and efficiency in his mind and on a drawing board. Hence, the decisive role of the dominating worldview intentions in the society confirmed.

The concept of embedded safety. The concept of embedded safety developed in this paper reflects the correlations between the efficiency and safety. The concept has a methodological value for the professional education and social and human development. The concept argues for the defining role of the dominating vector of the worldview intentions on the character of scientific and technical activities prevailing in the society; asserts the decisive role of the dominating worldview on the commanding criteria of the efficiency and safety evaluation; confirms the inextricable correlation between the efficiency and safety; emphasizes the dependence of the society's civilizational position on the nature of the dominating intentions; legally asserts the safety of science and technology [1; 2; 4; 6; 7; 10; 11; 13].

The concept of embedded safety establishes the vital assessment criteria of the existential and social safety of the scientific and technical projects by the analysis of the vector of the professionals' worldview intentions; sets an important objective for the educational and academic systems to develop the humanistic and social worldviews of the students and professionals; reveals the symbiotic correlations between the efficiency and safety when implemented at best.

In conclusion, the concept of embedded safety implements the general criteria for the qualitative assessment of the human transformative activities. They are the safety criterion of the dominating vector of the worldview intentions in the society and among the professionals in charge and the safety criterion of the specific scientific, technical and social project.

Conclusion. The power of the avant-garde science and technology rises in the XXI century to the level of the systematic breakthrough knowledge and leading ingenuity whilst the apocalyptic potential demands professional, social and political responsibility and sufficient public awareness on the efficiency and safety correlation. The modern creative potentials of the avant-garde science and technology mired by their existential risks demand a systematic approach in the scientific and technical processes performed by the society that entrenches the safety into the efficiency and embeds the efficiency into the safety. It determines the academic and social agenda to educate and motivate people to be self aware, capable to understand the vector of their own motivation and learn the reference point of the absolute values of human dignity.

The topic of the paper has further research perspectives in the specialized scientific and technical practises, fulfilling the specific needs and resolving the known issues in the experimental science, technological innovations and sustained social development.

1. *Commission Staff Working Document. Document accompanying the Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions on the mid term review of the Strategy on Life Sciences and Biotechnology. [COM(2007) 175 final]. Brussels, 2007. – http://ec.europa.eu/biotechnology/reports_en.htm (accessed 18.02.2012).* 2. *Euro NCAP. A history of the future of safety. – <http://www.euroncap.com/history.aspx> (18.02.2012).* 3. *Fukuyama F. Our Posthuman Future: Consequences of Biotechnology Revolution / F. Fukuyama. – N.Y. : Farrar, Straus and Giroux, 2002. – 256 p.* 4. *Global Status Report on Road Safety. Time for Action. – World Health Organization, 2009. – http://www.who.int/violence_injury_prevention/road_safety_status/2009/en/index.html (accessed 18.02.2012).* 5. *Kulinichenko V. L. Avant-garde Technologies: Risk Management // VIII World Conference on bioethics, Editor: Marcelo Palacios / Secretaria SIBI. International Society of Bioethics. / V. L. Kulinichenko, B. I. Ostapenko. – Spain, Gijon, 2013. – P. 171–180.* 6. *Manufactured Nanoparticle Health and Safety Disclosure // Community Environmental Advisory Commission (CEAC). – City of Berkeley, 2006. – 4 p.* 7. *Nanotechnology. The European Policy. Regulatory Aspects. – http://ec.europa.eu/nanotechnology/policies_en.html (accessed 27.09.2013).* 8. *Ostapenko B. I. The Concept of Linkage of Efficiency and Safety / B. I. Ostapenko // The Materials of I International, Interdisciplinary Science-Practical Conference “Formation a New Worldview as Foundation for Strategy of Sustained Development” dedicated to the 150th birth anniversary of the first President of the Ukrainian Academy of Sciences Vladimir Ivanovich Vernadsky (14–16 March 2013). – Lvov : RVV NFTU, 2013. – P. 113–114.* 9. *Ostapenko B. I. Worldview Attitude of Transformational Activities of People / B. I. Ostapenko // Multiversum. Philosophy Almanac. 9 (107). – K., 2011. – P. 213–226.* 10. *Safe on the Road. Volvo Buses Web site. – http://www.volvobuses.com/SiteCollectionDocuments/VBC/Global%20-%20ILF/Downloads/ brochure_safe_on_road.pdf (accessed 20.02.2012);* 11. *Second Regulatory Review on Nanomaterials // Commission Staff Working Document. [SWD (2012) 288 final]. – Brussels, 2012. – 15 p.;* 12. *Smith-Jentsch, Kimberly A. Investigating Linear and Interactive Effects of Shared Mental Models on Safety and Efficiency in a Field Setting. / Kimberly A. Smith-Jentsch, John E. Mathieu, Kurt Kraiger // Journal of Applied Psychology – Vol. 90(3). – May 2005. – P. 523–535.* 13. *Types and uses of nanomaterials, including safety aspects // Commission Staff Working Document. [COM(2012) 572 final]. – Brussels, 2012. – 111 p. – [http://ec.europa.eu/nanotechnology/pdf/second_regulatory_review_on_nanomaterials_-_staff_working_paper_accompanying_com\(2012\)_572.pdf](http://ec.europa.eu/nanotechnology/pdf/second_regulatory_review_on_nanomaterials_-_staff_working_paper_accompanying_com(2012)_572.pdf) (accessed 17.12.2013)*