

## Value aspects of engineering performance in contemporary conditions of innovative technology dominance

M P Danilkova<sup>1\*</sup>

<sup>1</sup> Novosibirsk State Technical University, 20 K. Marksa Prospect, Novosibirsk 630073 Russia

E-mail: danilkova\_marina@mail.ru

**Abstract.** The article is devoted to one of the topical themes of modern philosophy of science and technology – axiological problems of engineering. They arise at the stage of high-tech modernization of modern society, in the conditions of the dominance of innovative technologies in the system of social relations. The acceleration of the growth rate of integration processes and the strengthening of the stream of innovations actualizes the need to form new value meanings and tasks in the organization and functioning of engineering activities. It is a sphere of increased responsibility and the most important tool for the transformation of the relationship between man and society, man and technology. A number of value trends are considered in the article, peculiar to the current stage of development of society, and their impact is considered on the nature of engineering activity. Factors are studied that affect the structure and dynamics of value orientations of engineering subjects. The need is justified by the “reformatting” of value installations in engineering activities, taking into account the new requirements for the management systems of the latest technologies and their social security. Attention is focused on the meaning of humanistic orientation, as an axiological basis of the value system of engineering activity. Engineering activity performs one of the key tasks of the humanistic transformation of social processes.

**Keywords:** engineering activity, technology, development, modernization, transformation

### 1. Introduction

At the present historical stage of social development, attention is increasing to the questions of applying the achievements of technical progress in changing the environment. As a result of human activity, constant reforming occurs not only physical but also social reality. Radical transformations in the social sphere determine the interest in the problems of the practical use of scientific achievements and the improvement of the quality of engineering developments. The effectiveness of the modernization of the entire system of social relations directly depends on the functioning of engineering activity, a special significance of which is due to its unlimited technological potential in the field of regulating the interaction of man and nature, man and society.

The appeal to this topic is also due to the fact that the processes of rapid expansion of the technosphere, the use of nanotechnology, research in the field of creating new types of weapons, artificial intelligence are now, paradoxically, threatening the existence of human civilization in the future. “The death of the whole world has become a real opportunity as a result of human activity” [6,

p. 56]. In the context of a deepening global crisis, issues of particular importance are those related to the value bases of engineering, as a sphere of increased responsibility to society.

In addition, modern transformations of the global order (first of all technological order) increase interest in engineering as an essential tool for implementing the transformation process as a whole. If in earlier periods of the formation and development of scientific and technological revolution, the most important tasks of engineering activity were related to the efficiency and quality of engineering developments, then at present, attention is focused on axiological aspects, especially on the issues of studying the dynamics of value orientations in the structure of engineering activity. We are talking about the transformation of value systems within the framework of solving the problem of the relationship between technology and morality in a situation of a constantly accelerating stream of social and technical innovations.

In the context of the identified problems, the purpose of this work is a socio-philosophical analysis of the value foundations of engineering activity, identifying factors affecting the dynamics and structure of the value attitudes of the subjects of engineering activities.

## **2. Main text**

At the present stage of social development, the functioning of engineering activity is determined by a combination of various kinds of determinants, among which social, axiological, anthropological are the most important. Consideration of the current state of social space is the starting point of this study. The formation of basic value systems in the engineering sphere takes place within the framework of social space.

First of all, you should decide on the terminology. The current stage of development of the post-industrial society is called informational or "knowledge society". In this context, these terms are used as identical, since the qualitative social transformations of a global scale are determined, undoubtedly, by the special significance of information and knowledge. As is known, in the opinion of the founder of the post-industrial society, D. Bell, the new stage in the development of society should have led mankind to progress at the expense of tremendous achievements in the field of science and technology, to build a "knowledge society". The scientist believed that this stage has already begun, since the characteristics of this society are obvious: "firstly, research and development are becoming more and more a source of innovation (moreover, new relations between science and technology arise because of the central place of theoretical knowledge) ; secondly, the progress of society is determined by the success in the field of knowledge, more and more unequivocally, measured by the increasing share of GNP and the increasing part of the workforce " [1, p. 288].

However, the study of modern social reality allows us to identify some of its specific patterns that differ from those described earlier. On the one hand, the social predictions of the scientist were justified, and indeed, the formation of society took place, based on scientific and information technologies. On the other hand, at the beginning of the new millennium, a different reality is emerging, which is characterized not only by significant scientific and technical transformations, but also by fundamental changes in the ways and forms of human communication, social connections and relationships, and the increased human impact on the biosphere. This situation contributes to the formation of a new reality, called the technonosphere, as a holistic education, where gradual integration occurs social, technological and natural processes [4].

Under current conditions, it must be stated that humanity has faced previously unknown circumstances and the uncertainty of future social development strategies. That is why, the question of achieving social progress remains open until. We can only say with confidence that the reality of today's high-tech world is: "that she was not tired of showing us that was and remains unpredictable for our logic and for our scenarios" [7, p. 23].

The real assessment of the social situation testifies to fundamental changes in the nature of the relationship between man and technology, science and society, "science and society interfere with each other" [14]. In such complicated conditions, when technologies become a powerful transforming force that changes a person and ways of his life, the center of gravity is transferred to engineering, she is able

to assess the consequences and risks, both at the stage of creation and at the stage of using the latest scientific technologies.

However, it should be noted that the processes of reforming social relations do not so much depend on the level of development of scientific technologies, but on the presence of a stable system of moral values in society. The disappointing consequences of the total crisis, the destruction of basic values, make us turn again to the elaboration of humanistic development strategies. That is why engineering activity should be considered as one of the most important factors determining the vector of development of modern society. Value orientations such as humanism, morality, and social responsibility will form the basis of the engineering value system. It is not by chance that in the era of the domination of scientific technologies, the issues of ethics and social responsibility of an engineer come to the fore [3, 5, 8, 9, 13, 15].

At the moment, the identified problems require immediate resolution, due to radical changes in the geopolitical, economic, socio-cultural environment. A serious threat to the existence of mankind arises in a situation of domination and the prevalence of technology in all areas of human activity. We are talking about the use of nanotechnology in genetic engineering, biomedicine, the creation of multifunctional technological systems that greatly enhance the technological capabilities of man. The accumulated destructive technological potential makes it necessary to focus on the fundamental value principles that constitute the core of professional ethics, such as morality, humanism, responsibility. The presence or absence of a moral horizon in engineering activity is directly related to solving the problem of the effective and safe use of new technologies for future generations. In the context of globalization and acceleration of modernization processes, the axiological choice of further strategies and models of technological and social development must be made today.

The study of the dynamics of value orientations in the engineering field is impossible without an analysis of the influence of external social value trends. To a large extent, the modern specialist, including the engineer, is under the influence of social conditions. Today, they do not contribute to the development of creativity, responsibility and other value systems. This is justified by the deepest decline of traditional values and the dismantling of the axiosphere of society as a whole. "The crisis of the value system, the degradation of sense-setting can be triggered by the ambiguity of the attitude towards the past and the uncertainty of the future. Tomorrow should be not only imagined, but also understandable, predictable and manageable. Moreover, it is not enough just for tomorrow, you need to look further, focus on goals that are far behind us in time, understand the remote consequences of our actions" [10, p. 29].

The reality is that the quality of transformative processes does not contribute to the development of practical recommendations and ways to overcome social challenges. As a subject of engineering activity, a person becomes a hostage of those value systems in which he falls. He finds himself in a complicated sociocultural space where he needs to constantly make decisions outside narrow professional boundaries, choose between material and moral, individual and collective, etc. In this context, the personal qualities of the engineer are of great importance.

The modern socio-cultural situation offers the engineer to independently choose the conditions that ensure the development of their diverse abilities. However, this requires him to be more active, constantly improve his professional skills, and finally, master new knowledge that goes beyond his basic training. Ultimately, it modifies his activity. The presence of a wide range of value meanings and goals, the absence of any restrictions in the preference of one or another value reference point presupposes the existence of diverse possibilities, means and methods of human existence. That is why, expanding the usual boundaries of professional activity, the engineer must be prepared for moral responsibility for making concrete decisions. Such a task is feasible only for a morally healthy person with a stable system of spiritual and moral values. There is not the slightest doubt that in the conditions of commercialization of the entire sociocultural space, the implementation of these tasks is obviously complicated.

However, not everything is so hopeless. At the present stage of development, given the enormous influence of technology and the scale of their social consequences, the social responsibility of engineers takes on a special meaning and significance. It is filled with new content and is expressed, firstly, in an

effort to foresee undesirable and negative consequences for a person, potentially embedded in the results of engineering research, secondly, in the possibility of creating conditions for ensuring quality management and control at all stages of the technological process.

Nevertheless, this is only the first step towards the modernization of engineering activities, and, basically, it relates to the level of development of scientific technologies. The next most difficult stage is rethinking the value aspects of engineering, and this is a higher level transformation. The fact is that the most important value principles of engineering activity are directly correlated with the problems of the reorganization of society as a whole, in a broader context. It is clear that with the development of scientific and technical knowledge, the technological component of engineering activity will be constantly improved, but the nature of its value orientations will be dominated by the dominant value system. When the moral principles and ideals of humanism form the basis of "social matter", then the use of the results of scientific and technological achievements will be turned to the good of man and society. Otherwise, if the "human face" is not given to economics, politics, science and technology, and moral principles are not taken into account, then a very unfavorable social scenario awaits us [11].

Only one way out is to build a society based on humanistic values, different from material and consumer ones. One of the solutions to this difficult task is the formation of new value approaches to engineering, as an essential component of the modern transformation process. The fact is that the hierarchical system of value installations in the engineering sphere is undergoing significant changes. The study of its dynamics suggests that in it, as well as other activities, material, utilitarian values and goals tend to take a leading position, pushing into the background the generally significant. Included in the integral system of social activity, the engineering sphere is under pressure from a number of negative trends characteristic of modern consumer society. This is another, reverse side of the newest stage of development of society [2], [12].

As one of a series of unforeseen consequences of a rapid technological breakthrough, a consumer society radically changes the vector of development of social processes. Modern engineering activity is affected by the socio-economic conditions of modern reality, in which material values and consumer orientation prevail. Declared as supreme values, they substantially reform the goals and objectives of scientific and technical activities, and act as a destabilizing factor at the initial stage of the formation of the humanistic foundations of the "knowledge society." Under these conditions, the likelihood of significantly increasing the fact that some scientific and engineering projects will remain unfulfilled as inconsistent with the demands of modern consumer society.

It follows that the source for solving these problems should be sought in the reassessment of basic concepts in the axiological sphere, in eliminating the causes that have changed the vector of development of value orientations, in correlating the generally significant value ideas in accordance with the new social reality.

### **3. Conclusion**

Taking into account the above, we emphasize that the appeal to the valuable aspects of engineering activity is fully justified, especially in the conditions of modern times. The current state of affairs indicates that the deepest gap has emerged between economics and politics, science and ethics, man and the social environment, which undoubtedly contributes to the destabilization of social processes, in general. Significant transformations and the increasing commercialization of social space lead to the urgent need to revise a person's attitude to the results of his activities in all areas, especially in the application and use of innovative technologies. Due to the specifics of engineering activity at this stage of development of the "knowledge society," the humanistic orientation should be the foundation of the value system in this area, recognizing man as the highest value.

It is obvious that the implementation of these requests is a key point in solving the problem of managing high-tech systems and their social security. Only by relying on the humanistic principles on which new strategies of the scientific and technical development model are based can social progress be achieved.

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