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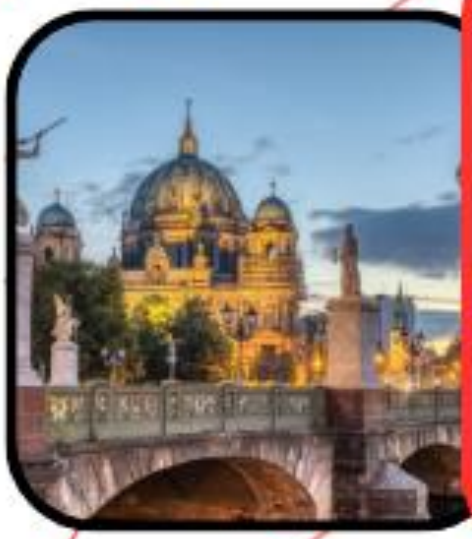

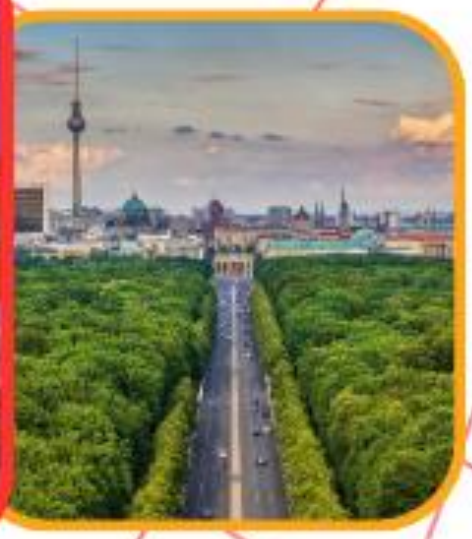

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THE DEVELOPMENT OF NEW ENGINEERING THINKING IS THE FOUNDATION OF FORMATION CREATIVE PERSONALITY

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Abstract. This article presents scientific and philosophical concepts regarding the brief historical development of modern technology and techniques, their philosophical and methodological interpretation, and their role in shaping engineering thinking. Special attention is given to the role of philosophical and technical thinking in the formation of modern science and engineering thought.

Keywords: Computer science, thinking, engineering, project, perception, philosophy, science, methodology

The 21st century is regarded as the era of globalization and information technology. In this context, it can be said that engineers are the key figures in the scientific and technological revolution and the driving force behind scientific and technological progress.

Currently, the growing influence of science and technology on societal development, the emergence of global problems, the steady growth of productive forces, and the increase in the world's population have led to the formation of a new engineering mindset. At the core of this phenomenon lie the spiritual and moral values of society and the individual, as well as universal humanistic criteria. Undoubtedly, it is axiomatic that the opposite of any progress is regression. Academician N.N. Moiseev, while examining the global problems of the modern world and the specific contradictions in their study, introduced the term "ecological and moral imperative."

Its essence lies in prohibiting research on the creation of any means that deteriorate the state of the environment and lead to mass destruction of the population. At the same time, a key feature of the new engineering mindset is the necessity to forecast and anticipate the integrity and interconnectedness of global processes - their ecological, social, and moral consequences. Today, despite the diversity of technical and engineering specialties, they share a common element that unites all types of engineering activities - undoubtedly, this is technology and its practical orientation. Unlike thousands of other professions in human activity, the engineering profession has its own specific norms and requirements - the ability to have a complete, holistic view of the object being designed, to master the "language" of drawings, formulas, and diagrams, as well as to combine scientific and artistic styles of thinking. The constructive, creative nature of engineering activity has transformed this profession into an attractive pursuit for millions of young people and individuals in general.

It is no coincidence that all objects and items surrounding a person are created by human hands. Every object, every structure is the result of the labor of many people and, above all, a product of their intellectual activity.

The renowned contemporary scientist V.I. Vernadsky predicted that the future world would be a world of reason and thought - the noosphere, a realm of intellect and perception. In the current era of global, worldwide development - in the process of materializing thoughts, ideal images, and concepts - the engineer is becoming a central figure, a key personality. From an etymological standpoint, the word "engineer" comes from the French "ingenieur," which in turn derives from the Latin "ingenium," meaning innate natural aptitude, quick-wittedness, and inventiveness. Today, the demand for technology and industrial products is growing. The distinctive feature of engineering work is manifested in the strengthening of its interconnection with science.

Engineering activity is inherently creative in nature. This activity also involves tasks aimed at finding ways to practically apply laws discovered by natural sciences in a specific form and embodying them in new technologies and techniques. This process constitutes the most critical and complex sphere of engineering. During the creative process, an engineer materializes and concretizes the results of their work. To achieve their goals, engineers study the laws of nature uncovered by natural sciences, discover and refine various modifications of these laws in their scientific and practical activities, and apply them in practice. The same material outcome can be achieved through various technical methods; for instance, parts processing can be carried out using different approaches - mechanical, chemical, or laser treatment. These circumstances demonstrate that engineering creativity, in a broad sense, allows for freedom in choosing specific technical and technological solutions.

The specific nature of this process leaves its imprint on engineering thinking. An engineer's creative activity possesses its own distinct structure and composition, and this characteristic determines the stage of technical creativity or development.

Our great ancestors made significant contributions to world civilization through their scientific heritage in engineering, philosophy, and medicine as early as the 9th-11th centuries. For example, world historians of natural sciences have recognized the 11th century as the "Age of Beruni." His renowned works include "Geodesy," "Mineralogy," "India," and "Canon Masudicus" (an encyclopedic book on astronomy). In his work "Geodesy" (which involves determining the boundaries of areas to measure distances between settlements), Beruni emphasizes that philosophical thinking forms the foundation of scientific creativity, creative thinking, and cognition. This demonstrates that he placed great importance on the role of thinking in understanding the intellectual world for young researchers.

In particular, Galen (a Roman scientist, naturalist, and physician who lived from 130 to 200 AD) wrote a book in which he stated: "A virtuous physician must

also be a philosopher, that is, he must love wisdom and strive for it. For the Greeks, philosophy, or wisdom, consists in knowing the truth of all that exists in the universe. If a person is inquisitive and demands accuracy, he can speak about the full meaning of any branch of science. To do this, he must necessarily be a philosopher who has mastered the foundations of all knowledge, since his entire life would not be enough to fully study all branches of science."

From the above, it can be concluded that engineering activity and engineering thinking represent one of the actualized branches of general creative activity, manifesting as the human-technology and technology-human-environment systems, as well as the philosophy of the dialectics in nature-human relationships. In this sense, a philosophical worldview fulfills its methodological role in shaping an engineer's personality and their creative potential. Understanding the laws of nature and society, and comprehending the secrets of nature, is an expression of a person's self-awareness and understanding of their own essence.

The article presents scientific and philosophical concepts regarding the brief historical development of modern technology and engineering, their philosophical and methodological interpretation, and their role in shaping engineering thinking. Special attention is given to the influence of philosophical and technical thinking on the formation of modern science and engineering mindset.

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