

Intellectual capital is the most important resource in the knowledge economy. Its significant was acknowledged in the late 20th century, but, since 2010s, in the conditions of Industry 4.0, it received a completely new conceptual treatment. Equipping technical devices with artificial intelligence (AI) turned them from means of labor (equipment) into subjects of labor – intellectual machines. Thus, intellectual capital was no longer associated with human capital and became more universal. Intellectual capital in Industry 4.0 includes all subjects of mechanical, managerial and innovative activities, which could be humans and intellectual machines.

The consequences of the evolution of intellectual capital under the influence of the Fourth technology revolution are contradictory. On the one hand, advantages for all concerned parties are provided: increase of accessibility of goods and services and creation of hi-tech products for consumers; increase of labor efficiency and general effectiveness of business based on automatization – for entrepreneurship; growth of transparency, controllability, predictability and manageability of economy – for government. On the other hand, there appear certain problems that are connected to intellectual capital.

One of the problems is uncertainty of the structure of intellectual capital. Successful convergence of human intellect and AI might form a monostructure of intellectual capital, which simplifies decision-making for its state and corporate management, while their divergence (differentiation) envisages the polystructural character of intellectual capital, and requires a more flexible approach to regulation, and causes its increased risks.

Another problem is formation of a new model of the market of intellectual capital, in which competition between human intellect and AI takes place, causing negative social consequences. Even if human preserves the key managerial role in the structure of intellectual resources of entrepreneurship, there's a necessity for occupational retraining for the digital economy's personnel.

Thus causes another problem that is connected to development of science and education – they are given new functions of development of intellectual capital: training of digital personnel and machine learning. Other problems also include state regulation of intellectual capital: financial support for digital modernization, provision of quick social adaptation and regulation of competition in the market of intellectual capital.

This special issue considers all the above problems of intellectual resources in Industry 4.0 and provides their scientific analysis and methodological and practical recommendations for solving them.

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