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CONCEPTUAL PRINCIPLES OF THE SMART FACTORY

The globalized world is changing rapidly, and before the subjects of the scientific-industrial sphere, there are constantly new challenges, practical tasks, one of which is the need for constant development and self-improvement, which actualizes scientific research and substantiation of this problem.

In previous works [1, p. 77], the author noted that the smartization of production is an alternative to innovation, but it is more correct to consider smartization as a new level of intelligent innovation activity of enterprises.

Nowadays the economic growth is provided first of all due to scientific and technological progress as well as to the intellectualisation of basic productional factors at every sector of national economy [2, p. 157].

Intelligent production (Smart Factory) is an innovative flexible industrial production, the main features of which are: a) modularity (as opposed to the present unified, indivisible production); b) distribution or decentralized self-organization; c) a wireless communication system between all that is involved and used in production (raw materials, parts, equipment, equipment, etc.), including employees. Such production is not fantastic. Unfortunately, there are no solid scientific researches on the conceptual foundations and methodology of smartening of activity of enterprises. Vernadsky National Library [3] gives access to 2 abstracts of dissertations, in the texts of which there is the term "smart" (as of 16.01.2019), protected by technical specialties, none of the economic specialties, and no one that would contain the word "smartization". The word smart occurs 6 times in the dissertation abstracts, but most (5) foreign and only 2 have been defenced in the last 5 years.

"Smartization" of the manufacturing industry was conceived as the Fourth industrial revolution or industry 4.0, a paradigm shift, stimulated by the rise and progressive maturity of new information and communication technologies (ICTs) applied to industrial processes and products [4]. From a data science perspective, this paradigm shift allows to extract relevant knowledge from monitoring assets by adopting intelligent strategies and data fusion, as well as using machine learning and optimization techniques. One of the main goals of the science of data in this context is to effectively predict abnormal behaviour in industrial engineering, tools and processes to predict critical events and damage, eventually causing significant economic losses and security problems. In this context, the data-driven prognosis gradually attracts attention in various industries.

To this end, the principle categorization of the methods used to extract objects and methods of machine learning will be provided on the basis of its intended purpose: to analyse what caused the refusal (descriptive), to determine when the tracked asset will not pass (predictive) or to decide what to do in order to minimize its impact on industry (fixed). This triple analysis, along with discussing its hardware

and software implications, intends to serve as a step for future researchers and practitioners to join the community exploring this vibrant area.

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PROBLEMS OF INTRODUCTION AND STIMULATION OF INNOVATIONS AT INDUSTRIAL ENTERPRISES

In today's conditions of economic development, it is impossible to separate the concept of economic success and the introduction of innovations. These are two components of one whole. In all economically developed countries, there are different methods of promoting innovation at the state level. Depending on the definition of national priorities at the state level, a wide range of methods and tools for stimulating innovation activity is applied. This is an adjustment to the tax and patent licensing laws; technology transfer control; introduction of a system of contractual relations; application of forms of support between inter-organizational cooperation and small innovative business. According to statistics [1], we observe a weak level of implementation of innovations in industry (Table 1).

Year	Share of enterprises that implemented innovations, %	Number of implemented new technological processes, units	incl. low-waste, resource-saving	Number of titles of introduced innovative types of products, units	incl. new types of machines, equipment, devices	Share of realized innovative products in volume of industrial, %
2007	14,6	96	44	175	74	6,2
2008	11,5	95	51	167	63	7,4
2009	15,0	760	275	197	61	4,7
2010	18,0	877	38	191	62	3,1
2011	17,5	708	45	169	83	2,4

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