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DIGITAL «TWIN», AS A SUCCESSFUL PATH TO COMPANY PROFITS

Аннотация*: в эпоху, когда все компании ищут безумную прибыль, никто не может позволить себе терять деньги, принимая во внимание тот факт, что огромные суммы уже вложены в различные промышленные проекты и предприятия. Также, чтобы избежать проблем на этапе производства или эксплуатации, нужно было придумать какое-нибудь «призрачное» предприятие, которое демонстрировало бы все возможные последствия и непредвиденные риски. Этим самым «призраком», помогающим сохранить прибыль ведущих компаний, является цифровой двойник.*

Ключевые слова*: цифровой двойник, прибыль, свойства, устройство, продукт, модель, производительность, перспектива, деталь, сегмент, прогноз, стоимость.*

Abstract*: in an age when all companies are seeking frenzied profits, no one can afford to lose money, taking into account the fact that huge sums have already been invested in various industrial projects and enterprises. Also in order to avoid problems at the stage of manufacture or operation, it was necessary to come up with some «phantom» enterprise, which would show all possible consequences and unexpected risks. This very «phantom», which helps to preserve the profits of leading companies, is the digital twin.*

Keywords*: digital twin, profit, properties, device, product, model, efficiency, perspective, detail, segment, forecast, cost.*

A digital «twin» is a software «twin», that is, a prototypal device that can model the technical properties, internal processes, and behavior of a real product under the influence of any interference and surrounding factors. It should be noted that an important feature of the digital twin is: setting input factors on it, using information from sensors of a real device operating at the same time as a real object or product. Data can be processed in real time as well as offline. After that there are comparative works: reading of information of virtual sensors of digital twin from sensors of real device, identification of problems and reasons for their appearance.

A digital twin is created at the planning stage of an object or production unit. Thus, in the «copy» of the project all features and nuances of the real model are laid down. And in the future the «twin» works in parallel with it or operates in parallel with its operation.

In simple terms, a digital twin is a computer model of a real object or production. It can be performed with absolute detail, which will include deep coverage of various characteristics of a real industrial unit. For instance, the twin is able to adopt the digital model of the product with incredible accuracy, take into account the specificity of material being operated, the manual and service data, and it can predict information about the behavior of the product in various conditions, including extreme ones.

So, the technology of the digital twin is used quite effectively in Gazprom Neft. At one of the enterprises, in Khanty-Mansi Autonomous District, the Russian company has begun the process of integration of the digital twin with the commissioning of the industrial complex of the Mining Management Center. The Center has combined previously developed solutions to improve the efficiency of individual production processes of production into a single environment, which receives data from different segments of the industry, which allows to manage the efficiency of all sectors of the enterprise in a comprehensive manner.

One of the most important components of the Mining Control Center is the digital twin of the process of mechanized liquid lifting. In other words, the mathematical model «drives» all elements of the production complex, from the well to the delivery

of oil: pumps, oil collection systems, reservoir element. Not connecting the parameters of operation of real equipment with the optimal mode, which shows the digital model, allows to automatically and in advance diagnose future possible breakdowns and accidents; to select optimal modes of operation, to assess the impact of one element on the whole structure, at this time optimal solutions to change and eliminate various problems.

According to experts, at the moment digital changes are directed mainly towards increasing the efficiency of existing processes, which is confirmed by the projects of the domestic company. Nevertheless, in the long term, breakthrough technologies can be expected. In Russia, there is a significant undisclosed potential for mining in traditional regions by involving reserves that are difficult to extract in the development. Application of current operating technologies – use of the digital twin of the enterprise contributes to increase of oil production.

In parallel with the introduction of the aggregate approach to the creation of digital twins, another significant vector is the desire of companies to teach a virtual model of production or item, not only to display the actual analogue in detail, but also to «think," predict and prevent risks.

It is possible to assume that domestic companies will develop in parallel with many world companies. Of course, so far many Russian enterprises are significantly lagging behind Western ones, because the country still has a large number of factories, where dozens of years use the same equipment and obsolete types of tools. Undoubtedly, their renewal will require not only significant monetary investments, but also changes in the policy of development of the management of companies. But leading companies in different segments of the domestic economy are already actively using this promising technology.

Thus, leading companies set development trends for smaller companies, and the cost of technological solutions in this activity, as well as the cost of various devices, decreases, which gives a relatively positive outlook for the bright future of the digital twin in Russia.

References

1. Vlasova M. // RBC, Digital Russia. – URL: http://digital-russia.rbc.ru/article-page_11.html

2. Goretkina E. Siemens PLM: focus on specification and the digital double // ISICAD. Your window to the world of CAD system. – URL: http://isicad.ru/ru/articles.php?article_num=19885

3. CADFEM, Digital Twin (DigitalTwin) – URL: https://www.cadfem-cis.ru/service/digital-twin/