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ANALYSIS OF INDUSTRY 4.0 TECHNOLOGIES AND ITS APPLICATION IN THE AEROSPACE  
INDUSTRY.

**Abstract**

This paper provides an overview of the potential applications of Industry 4.0 technologies in the aerospace industry. From that the creation of a Virtual Reality visualization for an automatic interplanetary space station to Mars is derived as well as a representation of simulation results on the stage separation and the temperature distribution on the surface of the heat shield of the landing module. The evolution of production processes in the world shows that certain relatively short-lived historical processes based on the massive introduction of new technologies and approaches into production — the so-called industrial revolutions — are among the main drivers of progress, significantly affecting productivity. Virtual and Augmented Reality, the Internet of Things, Artificial Intelligence, and Digital Twins are examples of technologies of the fourth industrial revolution in the aerospace industry. These technologies are defined in different international standards governing "Smart Manufacturing" and the Internet of Things. However, they have not yet become widespread in the practice. There is a need to analyze the possible effects of using these technologies. The use of Virtual Reality in the design of aerospace products makes possible to perform geometric modeling in a virtual three-dimensional space without using methods of projections (display on a flat screen). Collaborative remote working on complex projects in a shared environment can greatly reduce coordination procedures and time for interfaces between different parts in a big assembly. Virtual and Augmented Reality can also be widely used to visualize numerical simulation data. In addition, VR can be used as an environment for physical experiments. Work remotely controlling laboratory installations and observing the course of experiments through the VR devices allows one to participate in experiments conducted in collective centers scattered around the world, as well as to conduct observations in dangerous conditions, such as in outer space. Combining mathematical and digital models into a single whole with actually exploited physical objects gives the technology of Digital Twins. The whole paradigm of Digital Twins as an aspect of the fourth industrial revolution brings a new level of information support to the life cycle of the aerospace product. The virtual copy of the product becomes a new type of operational documentation and functions in parallel with its prototype during the whole period of its operation. We can conclude that modern Virtual Reality tools are used for visualization rather than design. The development of virtual design tools in Industry 4.0 is an urgent task.