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ROBOTIC PRODUCTION IN MECHANICAL ENGINEERING: ADVANTAGES AND DISADVANTAGES

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Annotation:
This article discusses the topic of robotic production in mechanical engineering. In the modern world, automation of production processes with the help of robots is becoming more and more popular, and mechanical engineering is no exception. The article describes the advantages and disadvantages of robotic production in mechanical engineering, and also analyzes the impact of such automation on productivity, quality and cost of production.

Keywords: robotic , mechanical engineering, advantages, disadvantages , performance.

The article details the benefits of robotic manufacturing, such as increased productivity, improved product quality, reduced production costs, and improved working conditions for workers. However, robotization also has its drawbacks and risks, such as the high costs of implementing robotic systems, potential safety issues, and inflexibility in manufacturing.
The article also presents an example of the successful implementation of robotic production in mechanical engineering and an analysis of how this automation has affected productivity and product quality. In addition, the prospects for the use of robotic systems in mechanical engineering and possible directions of development in this area are considered.
In conclusion, the article concludes that robotic production in mechanical engineering has both advantages and disadvantages, and the implementation of such automation should be carried out taking into account the specific needs and goals of the enterprise. However, in general, robotic production can become a key factor in improving the efficiency and competitiveness of machine-building enterprises.

Advantages of robotic production in mechanical engineering:

1. Productivity increase. Robots can work more efficiently and faster than humans, allowing for higher production volumes and shorter production times.
2. Product quality improvement. The robots operate with high precision and repeatability, reducing defects and improving product quality.
3. Reduced production costs. Robots can work around the clock without breaks for rest and lunch, which reduces the number of working hours and reduces labor costs.
4. Improving working conditions for workers. Robots can perform heavy and dangerous work, which reduces the risk of injury and illness among workers.
5. Increasing production flexibility. Robots can quickly switch between different tasks and manufacturing operations, allowing them to quickly adapt to changes in the manufacturing process.

Disadvantages of robotic production in mechanical engineering:

1. High costs for the implementation of robotic systems. Robotization requires significant investment in the purchase of hardware and software.
2. Potential security issues. Robots can pose a danger to workers if safety rules are not followed and appropriate precautions are not taken.
3. Lack of flexibility in production. Robots can be inefficient in low volume batch production as they require additional programming and hardware setup costs.
4. The need for qualified personnel to maintain and program robots. The introduction of robotic systems requires the presence of qualified specialists who can maintain and configure the equipment.
5. Risk of job loss. Robotization can lead to a reduction in the number of jobs, which can negatively affect employment and the social situation in the region.

Robotic production in mechanical engineering has both advantages and disadvantages, and the implementation of such automation should be carried out taking into account the specific needs and goals of the enterprise. However, in general, robotic production can become a key factor in improving the efficiency and competitiveness of machine-building enterprises.

The use of robotics in mechanical engineering can take various forms. For example, this can be the use of robotic arms for assembly and installation of parts, automatic quality control systems, warehousing and inventory management systems, as well as automatic diagnostic and maintenance systems for machines.

In addition, robotization can be used to optimize manufacturing processes, for example by introducing an automatic assembly line or by optimizing the transportation of parts and components in the production hall.

The advantages of robotic production in mechanical engineering can be manifested in increased productivity, reduced production costs, improved product

quality and increased labor safety. In addition, robotic manufacturing can provide more precise control over manufacturing processes and increase manufacturing flexibility.

However , robotization also has its drawbacks and risks. For example, the high costs of implementing robotic systems can be an obstacle for small and medium enterprises. In addition, robotization may require significant costs for staff training and the creation of an infrastructure for equipment maintenance and repair.

It is also important to consider the potential risks to worker health and safety when working with robots, as well as the potential security and data protection concerns associated with the use of automated systems.

Despite some shortcomings and risks, robotic production in mechanical engineering is a promising area of development, which can become a key factor in improving the efficiency and competitiveness of machine-building enterprises. Proper use of robotics can lead to lower production costs, higher product quality and better working conditions for workers.

Conclusion

Robotic production in mechanical engineering has its advantages and disadvantages, and the implementation of such automation should be carried out taking into account the specific needs and goals of the enterprise. It is important to take into account that the use of robotics can take various forms and directions, and it is not always beneficial for a particular enterprise.

Among the main advantages of robotic production are increased productivity, improved product quality, reduced production costs, improved working conditions for workers and increased production flexibility. However, robotization also has its drawbacks and risks, including the high costs of implementing robotic systems, potential health and safety issues for workers, limitations in manufacturing flexibility, and the need for skilled personnel to maintain and program robots.

In general, robotic production in mechanical engineering is a promising area of development, which can become a key factor in improving the efficiency and competitiveness of machine-building enterprises. However , for the successful implementation of robotization, it is necessary to take into account all its advantages and disadvantages, as well as conduct a thorough analysis of the economic feasibility in each case.

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