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ARTIFICIAL INTELLIGENCE AS A TOOL TO IMPROVE THE EFFICIENCY OF GREEN TECHNOLOGY MANAGEMENT SYSTEMS

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Today, environmental issues are becoming increasingly important in the context of preserving natural resources and reducing negative environmental impact. One of the key areas in this regard is the use of green technologies aimed at reducing emissions and optimizing energy use. In this context, artificial intelligence (AI) plays a significant role in helping to improve the efficiency of green technology management systems.

Artificial intelligence, or AI, is technology that enables computers and machines to simulate human intelligence and problem-solving capabilities [1].

Driven by advancements in artificial intelligence (AI), green technologies are upending traditional models with sustainable alternatives that minimize environmental impact while meeting humanity's needs. From renewable power generation to precision agriculture and intelligent urban planning, AI is the catalyst fueling a diverse array of eco-friendly innovations [2]. Below is a more detailed description of some aspects of improving the efficiency of such systems.

1. Optimization of energy consumption. AI can analyze real-time energy consumption data to identify inefficient patterns and recommend actions to improve them. Machine learning algorithms can predict energy demand, allowing for better planning and management of energy systems. AI can automate tasks related to energy management, such as controlling lighting and heating/cooling.

2. Reducing greenhouse gas emissions. AI can help optimize transportation routes, which will reduce CO₂ emissions. Machine learning algorithms can predict the risks of methane and other greenhouse gas leaks, allowing preventive measures to be taken. AI can help develop and implement carbon capture and storage systems.

3. Efficient use of water resources. AI can monitor the state of water resources, predict droughts and floods, and recommend actions to prevent them. Machine learning algorithms can help design and implement drip irrigation systems that save water. AI can help clean up and reclaim contaminated water resources.

4. Sustainable agriculture. AI can monitor crop health, predict yields, and recommend optimal watering and fertilization regimes. Machine learning algorithms can help to develop and implement precision farming systems, which will save resources and minimize

environmental impact. AI can help control pests and diseases of crops, which will lead to a reduction in the use of pesticides.

5. Development of green cities. AI can help develop and implement smart city systems that optimize the operation of lighting, transportation, heating, and air conditioning systems. Machine learning algorithms can help predict and prevent air and noise pollution. AI can help in the development and implementation of waste management and recycling systems.

While the use of artificial intelligence (AI) in green technology management has significant advantages, it also comes with some disadvantages:

1. Implementation costs. Developing and implementing AI-enabled management systems can require significant investment, especially in the early stages. This can be an obstacle for many companies, especially SMEs.

2. The need for qualified personnel. Effective use of AI systems requires specialized professionals in computer science, data analytics, and engineering. The lack of qualified personnel can complicate the implementation and effective use of such systems.

3. Data security issues. Processing large amounts of data in AI systems can create data security issues. It is important to ensure reliable protection of data confidentiality and integrity to avoid possible security breaches.

4. Ethical and liability issues. The use of AI in the field of green technologies can raise ethical issues, especially when AI is used for automated decision-making. It is important to consider the moral and ethical aspects of managing such systems.

5. Insufficient accuracy of algorithms. At the moment, some machine learning and deep learning algorithms may have limited accuracy, especially in the face of variable and unpredictable conditions. This can lead to inaccuracies in forecasting and managing green technologies.

While these shortcomings need to be addressed and resolved, it is important to remember that the great potential of artificial intelligence in green technology management can bring significant benefits to the efficient use of resources and environmental preservation. The use of artificial intelligence in green technology management systems makes them more efficient, cost-effective, and environmentally friendly. Continuous monitoring, forecasting, and optimization ensure optimal resource utilization and reduce the negative impact on the environment.

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