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(57) Abstract :
The invention discloses a computer-based model for energy-efficient data center management comprising a central control unit (101), server clusters (102), a predictive analytics module (103), a dynamic workload scheduler (104), an adaptive cooling unit (105), and a renewable energy integration system (106). The model employs artificial intelligence to predict workloads, dynamically distribute computational tasks, and optimize cooling mechanisms. Experimental validation demonstrated significant energy savings and enhanced reliability. The invention ensures sustainable, scalable, and efficient data center operations without compromising performance.

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