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Analysis of strategies in the implementation of Data Centers, an approach to the reduction of environmental impact.

Content

Nowadays, Data Centers have been consolidated as part of the essential technological infrastructure for organizations, since they contribute to the availability, continuity and quality of digital services. However, the impact that this infrastructure has on the environment is considerable, according to Daunert (2023) Data Centers are responsible for 4% of CO2 emissions each year and it is expected that the figure will increase up to 14% annually by 2040, unless significant measures are taken. The objective of this research was to integrate existing standards, regulations and sustainable strategies for the implementation and operation of data centers, prioritizing the reduction of environmental impact. For this purpose, a literature review was carried out, which allowed the integration of 11 primary studies on this topic, resulting in the selection of studies that provided evidence on practices aimed at reducing the environmental impact in this type of infrastructure. After analyzing the literature, the following findings were identified, where the factors in the implementation of data centers that influence the increase of the carbon footprint are: the expansion of technological infrastructure, inefficient cooling systems, dependence on conventional energy sources, location and environmental conditions. Standards and regulations were identified that establish technical criteria to improve energy efficiency, operability and sustainability, such as ANSI/TIA-942, DIN-50600, ISO/IEC-22237 and ANSI/BICSI-002. As well as some strategies that have proven effective for the sustainable design of data centers, such as the use of renewable energies, modular design or passive cooling strategies. The application of these strategies not only reduces the environmental impact of data centers, but also improves their operational resilience and aligns them with the social responsibility and sustainability objectives of organizations.

Summary

The article analyzes sustainable strategies for implementing data centers through international standards, TIER classification and best practices to reduce their environmental impact and improve the efficiency of their use.

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