

# Best Practices for Data Center Costs and Design



What does it cost to build a modern data center – and what criteria should be in the building requirements? Making the wrong decision can cost you millions.



## Overview

Data center facilities rarely meet the operational and capacity requirements of their initial designs. The combination of new technologies (e.g., blade servers, which require substantial incremental power and cooling capacity), pressures to consolidate multiple data centers into fewer locations, the need for incremental space, changes in operational procedures, green IT initiatives and rising energy costs, and potential changes in safety and security regulations imposes constant facilities changes in the modern data center. The overarching rule in data center facilities is to design for flexibility, efficiency and scalability. Here, we combine many of the best practices in data center design, and attempt to put a financial value on them.

## Key Findings

New data center designs should focus on creating the most efficient use of floor space, and the power and cooling delivered to it.

Multizoned designs provide increased flexibility, and can reduce operating costs up to 20% by reducing overall mechanical/electrical requirements.

Selecting the right tier level(s) will be the key cost driver, as mechanical/electrical redundancy contributes to upward of 40% of the overall cost to build.

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## Recommendations

- ▶ Use the rack unit as the basis for estimating power and space requirements.
- ▶ Design for vertical density, ensuring optimal compute capacity per kilowatt.
- ▶ Design multiple power zones to increase flexibility and reduce upfront capital costs.
- ▶ Take a comprehensive view of location and site selection. Consider utility infrastructure, labor and real estate markets, and public incentives.
- ▶ Opt for single-story, industrial-type buildings, except for special design considerations (e.g., second-floor natural air cooling plenum).
- ▶ Evaluate the level of redundancy (tier level) and its cost with the cost of downtime, while considering multitier designs.
- ▶ Maintain/establish close communication, and liaison between the data center facilities organization and the IT organization.

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