Building Your Data Center Facilities Cost Model

FODERE
DATA CENTER GUIDANCE

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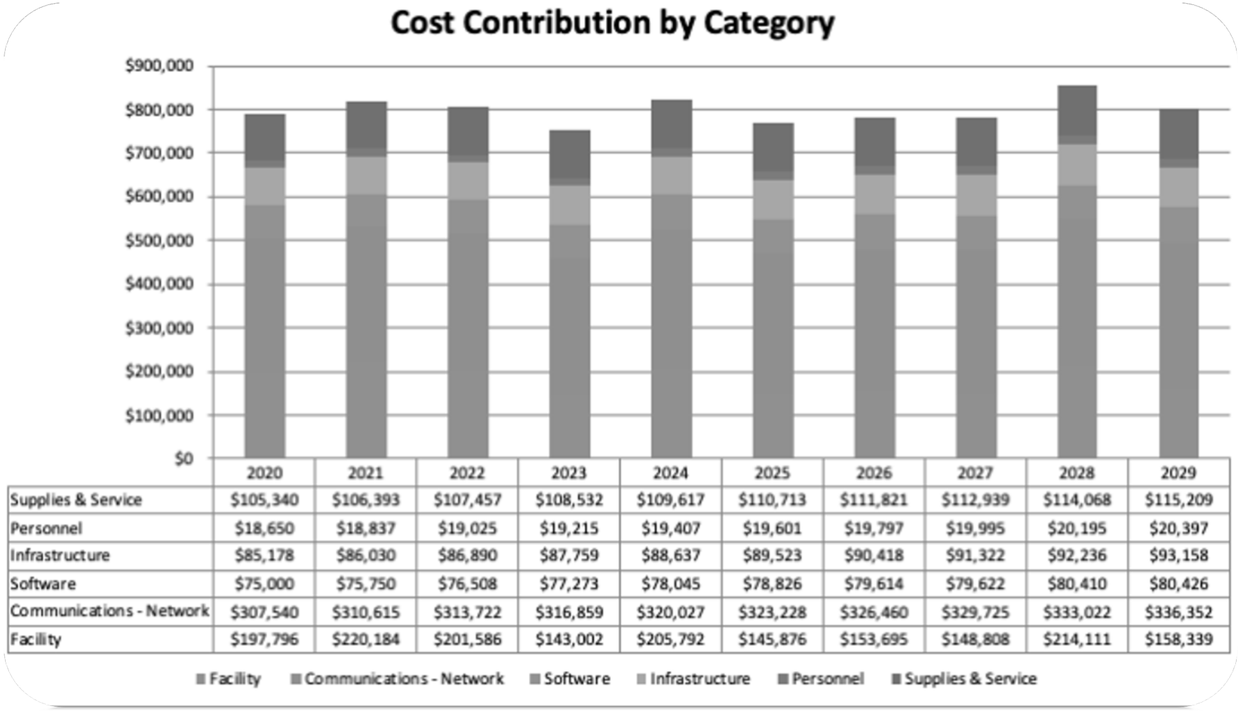

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Supplies & Service	$105,340	$106,393	$107,457	$108,532	$109,617	$110,713	$111,821	$112,939	$114,068	$115,209
Personnel	$18,650	$18,837	$19,025	$19,215	$19,407	$19,601	$19,797	$19,995	$20,195	$20,397
Infrastructure	$85,178	$86,030	$86,890	$87,759	$88,637	$89,523	$90,418	$91,322	$92,236	$93,158
Software	$75,000	$75,750	$76,508	$77,273	$78,045	$78,826	$79,614	$79,622	$80,410	$80,426
Communications - Network	$307,540	$310,615	$313,722	$316,859	$320,027	$323,228	$326,460	$329,725	$333,022	$336,352
Facility	$197,796	$220,184	$201,586	$143,002	$205,792	$145,876	$153,695	$148,808	$214,111	$158,339

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Speaker Introduction

Tad Davies, President

Since 1987, Tad has been focused on data center strategies and consults regularly with executive teams. He advises clients nationally on Business Centric strategy issues such as consolidation, colocation selection, build vs. buy, cost modeling and Facility Centric strategy issues such as risk assessment, new data center programming, owner's representation, and energy improvement. Tad is a board member of AFCOM's Data Center Institute.

Fodere (pronounced Fo-dare-eh) is a Latin word meaning "to dig". With each client engagement, we endeavor to dig deeply to find solutions that align with your business needs through thoughtful, collaborative, and constructively challenging dialog.

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3 things you will learn

What cost components should be included in a model

From where can I get this data

What might an actual model look like

Objective

Provide insight as to how you might build your own model or improve your existing model

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Cost Centric Issues

What are the all-in costs of operating this data center?

What are our projected data center costs in the future?

How does our investment in data center compare with our peers?

How does our data center compare with other delivery options from a cost perspective?

What metrics should our organization be tracking relative to costs?

How might we structure our reporting to gain further insights into our costs?

How can we use accurate information to make better short-term and long-term decisions?

Decide what you will be measuring

While this presentation will address facility costing, there are additional categories that can be compared to achieve a more comprehensive picture

Category	Information Uses
Facility	Benchmark versus: a) other DCs in your organization b) other enterprise DCs c) colocation offerings
People IT infrastructure Communications	Benchmark versus: a) other enterprise DCs b) Managed Service Providers (MSPs)
Applications	Same as above and SaaS providers

Determine model timeframe

Useful life of a data center is typically 15 years

Document annual costs along with at least 5-year and 10-year perspective.

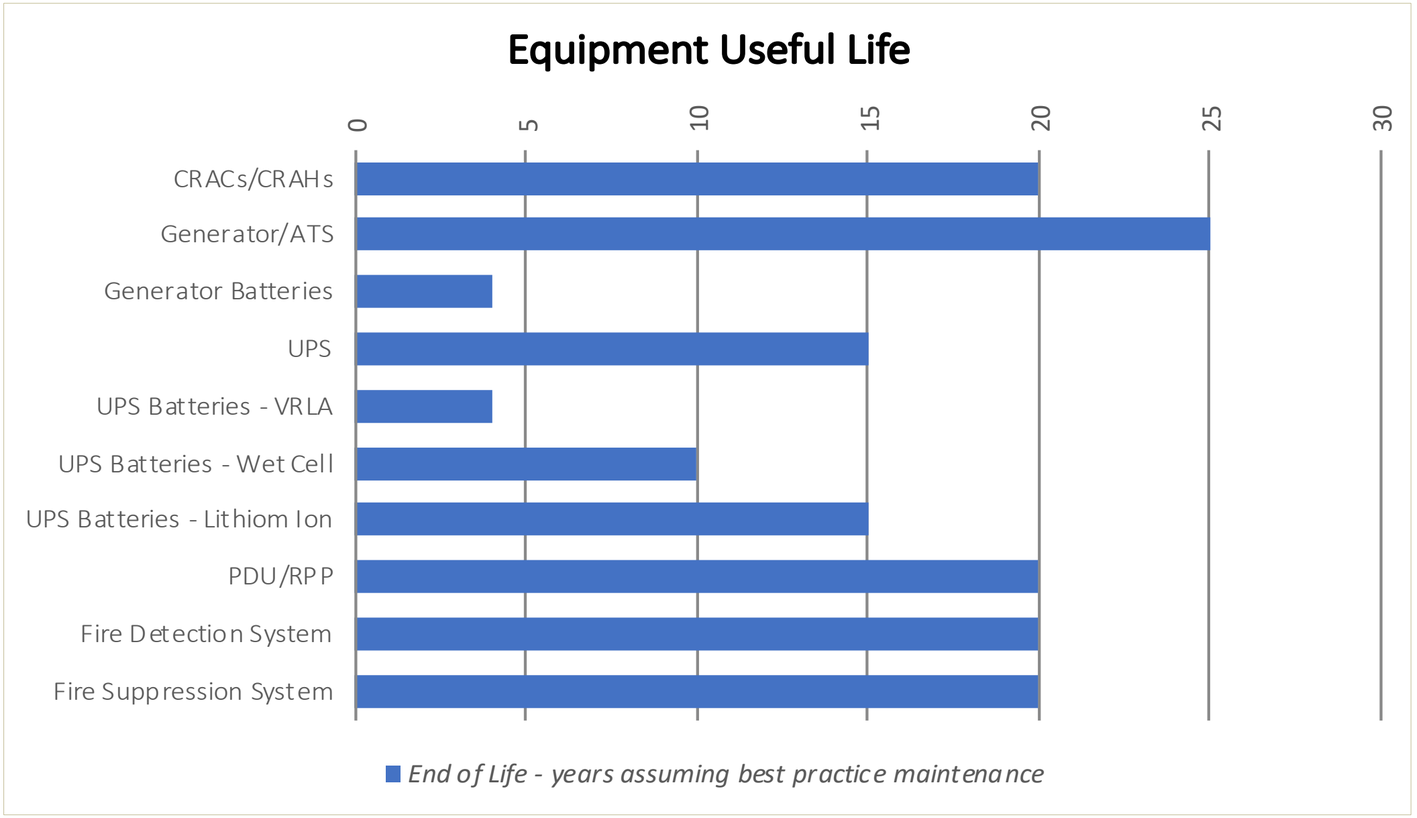
Determine equipment age

Determine current age of all data center assets

Determine replacement schedule

Factor in your situation and adjust industry metrics

Unusual circumstances: e.g. UPS going out of support



Leverage available talent and data

Talent. Enlist someone from your finance team

Recommend, or better yet produce, the information in a format that stakeholders inherently understand

Provide you guidance in what matters to your organization

Save you hours of work!

Great project for an Intern

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Data. Various sources

Annual budget for the data center

Facilities department

Finance department

Vendors (equipment vendors, maintenance providers, utility)

Purchasing

Your records

Data. Document from where it was generated

Use the same nomenclature for cost line items as your accounting/finance depts

Reference your accounting-assigned cost codes

Cost items being calculated - provide the formula/methodology used

Include all possible relevant line items - prompts the discussion of whether this category should be included

Leverage a cost modeling tool that's easy to understand

Excel

Leverage available talent and data

Cost Components

Escalation

Applying cost escalation or inflation as your model will encompass multiple years

Most simple method - an annual escalation value across the board

More detailed - apply above method and alter by line item for exceptions about which you have specific knowledge

Depreciation

For equipment in the cost model, consider how your organization depreciates assets

Cost Components

Electricity

Standalone data center – cost info is readily available

Data center is not separately metered. Consider this methodology: use PUE [Power usage effectiveness] to determine total DC electrical costs.

For the **data center "facility" load**, take the power reading from ATS(s) [Automatic Transfer Switch]. Assuming that the ATS serves just DC.

Additional areas/equipment supported that are not data center related? Factor them out [document your assumption!]

The ATS may have a meter for the data

Alternate data source – generator inspection reports for load during tests

Best to have several data points e.g. monthly for an entire year

Electrical (cont.)

Alternate Method for Building load calculation. If your PUE has been determined

Take IT load, using the UPS load. Again – factor out non-data center supported loads

Facility Power: UPS load x PUE x Utility Rate ($0.##/kWh) x 8,760 [hours in a year].

Electrical Usage Calculation

IT Power Usage (kW)	300	*from UPS*
PUE (Power Usage Efficiency)	x 1.65	*calculated per above*
	x 8,760	*hours in a year*
Total Annual Power Usage	=4,336,200	
Power Cost/kWh	$0.065	*your power rate*
Annual Power Cost	**$ 281,853**	

Cost Components

Diesel Fuel

Data source (a): your 3rd party provider of fuel

Data source (b): your generator service contractor may be your fuel provider

Factor out loads that are not related to data center e.g. life safety, other operations (e.g. call/service center, exec offices, cafe)

Determine typical $ spent annually based on testing [regularly-scheduled testing + minor and major PMs + load bank]

Consumption associated with unplanned run-time. Review a running 5-years to determine an average annual cost.

Year/year values could fluctuate significantly if an extended outage in one year occurred. Document!

Cost Components

Facilities Staff

Freestanding DC

Accounting is straightforward

Look at annual budget or better incurred costs over the last 2 – 3 years

Shared real estate model

Leverage Facilities Department help

Charged by your Facilities Department for actual work performed?

Collect that data just as you would for a 3rd-party contractor.

Assigned annual fee?

Some work performed by facilities staff, but no direct charges incurred? Ask for estimated costs.

Cost Components

Building

Freestanding DC

Have direct costs such as non-DC general building maintenance (e.g. lighting, HVAC, custodial services).

Consider exterior costs such as lawncare and snow removal. There may be other directly related services such as security

Shared real estate model

Does your organization use a per square foot charge that reflects an “all-in” cost covering a myriad of building services?

Is there a rent allocation for your DC?

Cost Components

Organize Costs by Facility-Centric Category and Major Asset

Major Category	Minor Categories	Sub-categories	Sub-sub-categories
Architectural	Work & Maintenance, Replacement Parts/Equipment	Access floor, cleaning, room integrity	Parts
Mechanical (inc. Plumbing)	Work & Maintenance, Replacement Parts/Equipment	CRAC/CRAH, heat rejection, CFD modeling, PM, major repairs	Parts, compressors, fans
Electrical	Work & Maintenance, Replacement Parts/Equipment	Switchgear, generator, ATS, UPS, PDU/RPP, IR scanning, PM, major repairs	Batteries, UPS fans/capacitors
Fire Protection	Work & Maintenance, Replacement Parts/Equipment	Detection system, suppression system, PM	Pre-action, air sampling, gaseous agent
Systems	Work & Maintenance, Replacement Parts/Equipment	Equipment monitoring, BMS, access control, cameras, PM	Licensing, testing


Cost Model

Thank You! | Q&A

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How can we help you?

Business Centric Services

Data Center Strategy Review

CIO and CTO Advisory Services

Build vs. Buy Analysis

Insource/Outsource/Colo Analysis

RFP Creation & Process Management

Financial Modeling

Facility Centric Services

Owner's Representative and Consultant

Data Center Health Check/Facility Analysis

New Data Center Conceptual Planning

Capacity Planning and Airflow Modeling

Maintenance Program Audit

Data Center Decommissioning

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