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Current Data Center Issues – The "Lease vs. Own" Question

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Businesses have considered leasing compared to ownership of real estate facilities forever. On the surface the question seems to be easily answered by quantitative analysis, but in practice it is not that simple and there are numerous examples of real estate users that prefer to lease facilities while their direct competition chooses to own. The question in the data center facility ("DC" or "DC Facility")[1] world is even more complicated due to numerous additional variables, the unique nature of each DC Facility, large capital requirements and level of special DC features.

While power, its cost and 'greenness', have been preeminent discussion topics over the past few years, the international financial crisis has shifted part of the focus in 2009 to a second subject – the capitalization of DC Facilities. For example, many users that normally buy or develop have reassessed capital investment criteria and are now in the market to lease. Some investors and owners have slowed or stopped development due to capital market issues. However there is a continuing demand for white floor space amid the uncertainty over capital. Those dynamics make the market interesting. Change yields results that have to be examined and that may create value.

We at Rackhouse (www.rackhouse.com) are real estate practitioners and represent users of DC Facilities. This paper presents a process we use to quantify DC Facility decisions, the results of which can be used in the comparison of prospects, lease vs. own decisions or other quantitative analyses.

A couple of caveats are necessary prior to discussing the DC Facility cost.

First, bricks, mortar and land, plus the cost to put it all together, are typically smaller monthly costs than servers, DC gear and power but real estate is often the "tail that wags the dog", especially in the establishment of a new DC Facility. It is often said that real estate doesn't matter because it is such a small component of the cost. However, identifying and then assembling all of the component parts of a DC is no small job. There are material cost savings that can be obtained from a careful real estate analysis and decision process. Conclusion: real estate is not the biggest cost item, but it, or components of the real estate package are the cornerstone around which the DC is constructed. A misstep in the real estate decision may result in compounded problems and costs over the life of the DC.

Second, it takes capital, and the need for capital to build the DC Facility begins with real estate. Today many companies are capital constrained or have increased their

[1] DC or DC Facility – For purposes of this paper, a DC or DC Facility includes land, the Base Building (which is real estate defined in footnote 5) and DC Improvements and Equipment (some of which would be considered real estate and some, equipment as defined in footnote 6).

ROE[2] requirements. Conclusion: cost savings may be accomplished by analysis focused on the cost of capital.

Finally, quantitative analysis cannot be relied upon in a vacuum. As the following illustration is presented it must be kept in mind that decisions are highly influenced by numerous qualitative factors as diverse as the availability and cost of power, carbon footprint, weather patterns and where the CTO lives.

Supply and demand in the DC real estate market is still balanced relative to other real estate markets because the supply is naturally constrained by the number of variables faced to develop a DC and assemble the necessary capital to do so.

I. Lease vs. Own Analysis Illustration

Two realities are present in every DC Facility decision which affect the quantitative analysis.

- The fact that an existing DC is available to be leased or acquired doesn't mean that it easily or economically will meet the user's requirements and
- Every DC is unique. Apples-to-apples comparisons cannot be made without detailed examination of the alternative facilities specifications and budgets.

With that in mind, Rackhouse has developed a process of comparing lease vs. own alternatives that has yielded positive results for our clients in the current market. It is illustrated in the following example. The numbers are fictitious and are used for purposes of the example only; however they do approximate opportunities in several current US markets. After prospective DC Facilities are identified the analysis requires five steps:

Step 1 – Understand the specifications of the DC and create a budget based on the current value of the DC,
Step 2 – Sort the parts of the DC into Asset Categories[3] and determine the Economic Life[4] for each,
Step 3 – Determine capital assumptions (and thus the cost of ownership), if applicable,
Step 4 – Determine the cost of leasing, if applicable and
Step 5 – Make calculations and compare alternatives.

[2] Return on Equity (ROE) – The annual return on shareholder equity targeted for investment and used to analyze investment decisions. Each company or situation will have its own application of the ROE. For purposes of this paper it is assumed that the example company will invest equity in the subject DC only if anticipated returns from that specific investment equal or exceed 15%.

[3] Asset Category – A group of DC assets with a common Economic Life.

[4] Economic Life – The period during which an asset is expected to be productive and will produce positive output. For example, Economic Life is the shorter of the length of time to the improvement's expected (1) replacement due to wear and tear or (2) technological obsolesce.

Step 1 – Understand the specifications of the DC and create a budget based on the current value of the DC.

Table 1 is a simple computation of DC Facility cost. Detailed specifications and a line-by-line budget should be developed based on the current value for each line item. The more detail and information, the more useful will be the analysis.

Table 1 – Cost – To be Defined by Specifications and Budgeted Cost for Each Line Item		
DC IT Load (in MW)		3.00
DC Cost / kW of IT Load	$	12,500
Total DC Cost	$	37,500,000

NOTE: Input cells are shaded.

Step 2 – Sort the parts of the DC into Asset Categories and determine the Economic Life for each.

Categorize DC Facility component assets into specific Asset Categories generally including land, Base Building[5] and DC Improvements and Equipment[6] with all assets in each category having common length Economic Lives. See Table 2(a) below. Note that in practice there will be a greater number of Asset Categories depending on the precision of the analysis and the prospect being analyzed. Next, in Table 2(b) the Economic Life for each Asset Category is determined.

Table 2(a) – DC Facility Cost Categorized by Asset Type and Common Useful Lives			
Asset Category	Asset Mix		Cost
Land	5%	$	1,875,000
Base Building	20%	$	7,500,000
DC Improvements and Equipment - Category A	65%	$	24,375,000
DC Improvements and Equipment - Category B	10%	$	3,750,000
Total DC Cost		$	37,500,000

NOTE: Input cells are shaded.

Table 2(b) – Economic Life Assumptions	
Asset Category	Years
Land	100
Base Building	25
DC Improvements and Equipment - Category A	10
DC Improvements and Equipment - Category B	7

NOTE: Input cells are shaded.

[5] Base Building – The real estate facility that houses a DC. For purposes of this paper the Base Building includes the building shell and other real estate assets.

[6] DC Improvements and Equipment – Improvements and equipment necessary for the build-out of the DC which are not components of, or provide necessary functions to, the Base Building. DC Improvements and Equipment include a range of DC gear and equipment, UPS equipment, generators, CRAC units, transformers, conduits and wiring, power distribution equipment, raised floor and related specialized improvements, all necessary to create a DC within the Base Building. Certain of the DC Improvements and Equipment will be considered as RE and have longer lives. Other components are equipment and have varying, but shorter lives.

Step 3 – Determine capital assumptions (and thus the cost of ownership), if applicable.

A 15% ROE criteria and an interest rate of 6.5% for debt are used in this analysis. For example, the fictitious DC Facility user in this example would not invest equity, given other choices, unless it can earn at least a 15% annual return on equity.

Likewise, the debt markets are important in determining the capital cost of ownership. In the current environment the loan-to-cost ratio has dropped significantly in most cases requiring the investment of substantial equity capital in owned assets. If financing can be obtained at all, the percentage of cost, or loan to value, is lower than one year ago. A 60% loan-to-cost ratio is assumed in Table 3(a).

Table 3(a) – Cost of Capital Assumptions

	Debt and Equity Ratio	ROE / Interest Rates
Percent of Equity and ROE	40%	15.00%
Percent of Debt and Interest Rate	60%	6.50%
Annual Blended Cost of Capital (%)	100%	9.90%

NOTE: Input cells are shaded.

Annual Blended Cost of Capital[7] is computed in Table 3(a) by taking the ROE and interest rate into account shown in above. In Table 3(b) the Annual Blended Cost of Capital and Economic Lives are used to create the Ownership Constant[8] which is applied to each Asset Category in Table 3(c) to estimate Annual Cost.

Table 3(b) – Ownership Constant

Annual Blended Cost of Capital from Table 3(a)		9.90%
Asset Category	Years for Amortization From Table 2	Ownership Constant
Land	100	9.90%
Base Building	25	10.82%
DC Improvements and Equipment - Category A	10	15.79%
DC Improvements and Equipment - Category B	7	19.86%
Ownership Constant		14.35%

[7] Annual Blended Cost of Capital – The blended cost of equity and debt, including the cost of equity measured as ROI and the cost of debt measured as interest.

[8] Ownership Constant – The Annual Blended Cost of Capital plus amortization over the Economic Life such that the Ownership Constant for an Asset Category is expressed as an annual constant amount.

Table 3(c) – Annual Cost of Ownership Before Tax			
Asset Category	Constant	Cost	Annual Cost
Land	9.90%	$ 1,875,000	$ 185,635
Base Building	10.82%	$ 7,500,000	$ 811,495
DC Improvements and Equipment - Category A	15.79%	$ 24,375,000	$ 3,849,230
DC Improvements and Equipment - Category B	19.86%	$ 3,750,000	$ 744,730
Ownership Constant	14.35%	$ 37,500,000	$ 5,591,090

Step 4 – Determine the cost of leasing, if applicable.

In order to determine the cost of leasing, the first task is to develop comparable specifications and a line-by-line budget for the subject prospect. As with Step 1, the process for a lease must include this discipline for results to be correct. Engineering and construction expertise is necessary. Care should be taken that the specifications and budget for each line item of the lease property opportunity are created and, if necessary, any cost to bring the lease opportunity to the required specifications should be included in the budget.

The cost of leasing is a fraction in the analysis. The denominator is the net rent and the numerator, the budgeted cost of the prospective DC Facility. For purposes of this example an annual cost of leasing equal to 12% is used. See Table 4.

Table 4 – Annual Cost of Leasing Before Tax		
	Monthly Cost	Annual Cost
Total Annual Cost of Leasing		12.0%
Annual Net Rent Before Tax (Numerator)	$ 375,000	$ 4,500,000
DC Budget (Denominator)		$ 37,500,000

NOTE: Input cells are shaded.

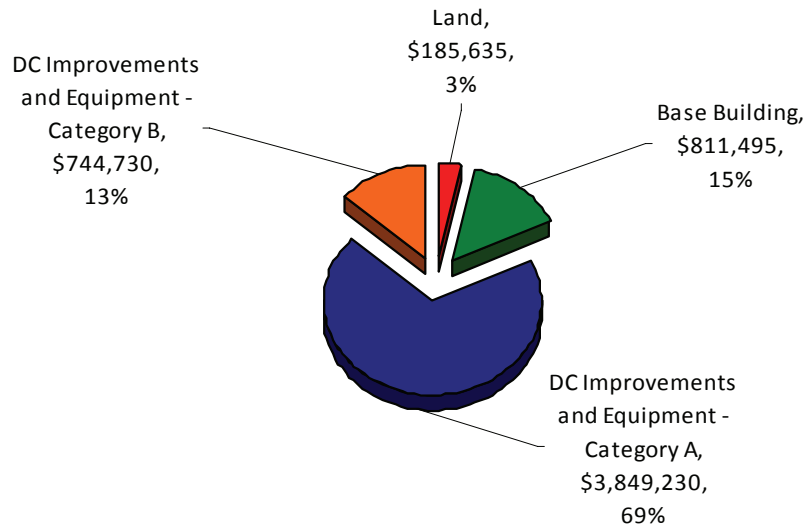
Step 5 – Make calculations and compare.

Final calculations should be made for each year of the analysis period which would be the lease term or the expected term of ownership. The annual cost for year one is shown below.

Table 5 – Lease vs. Own Comparison

Asset Category	Monthly Cost	Annual Cost	%
Land	$ 15,470	$ 185,635	3%
Base Building	$ 67,625	$ 811,495	15%
DC Improvements and Equipment - Category A	$ 320,769	$ 3,849,230	69%
DC Improvements and Equipment - Category B	$ 62,061	$ 744,730	13%
Cost to OWN Before Tax	$ 465,924	$ 5,591,090	100%
Cost to RENT Before Tax	$ 375,000	$ 4,500,000	
Year 1 Savings (Cost) Before Tax	$ 90,924	$ 1,091,090	

Table 6 – the Annual Costs of the Component Parts of a DC Facility



Further Analysis – How to Use and Adapt the Model

DC Facility analysis inevitably involves factors that have to be considered and tailored into the model and in every case the model should be expanded to include annual costs for each year of the term of the DC use. In practice numerous considerations will effect the ultimate decision, many that need to be included in the quantitative analysis and others that are qualitative in nature. Some frequently encountered examples are listed below.

1. Net present value ("NPV") calculations and consideration of cost items that vary or change over time – Compute the NPV for each alternative taking into account changing annual costs over the term. Examples of costs that will vary over time include lease escalations, amortization charges for new equipment added over the life of a lease, asset additions, varying ROE hurdles and interest rates.

2. After-tax calculations – Income taxes, property and personal property taxes and incentives or credits should be considered for each year.
3. Value of owned facilities and salvage value issues – Residual value or salvage value of real estate and equipment can be material, especially in ownership situations.
4. DC prospects and market conditions – It is common to find limited prospects in a given situation. Market conditions, length of leases, timing, the age of DC equipment, power availability, connectivity choices and myriad other factors will influence the number of prospective choices.
5. Operating vs. capital lease issues – FASB 13 and financial statement reporting requirements or preferences may impact decisions.
6. Specifications and budgets – Accuracy of specifications and budgets is extremely important. We have found that the assembly of a team made up of specialists in engineering, connectivity, and construction is a valuable investment as the accuracy of the model depends on good estimates of a DC's value.
7. Making apples-to-apples comparisons – Care should be taken to make comparisons on an "apples-to-apples" basis. Often a prospective DC will be inflexible with regard to specifications or terms. For example, a prospective lease may have a greater power density than required. In those cases the cost of facility and DC gear specified and modeled in the budget will increase the cost of that property vis-à-vis its competition giving the correct answer for the decision maker. On the other hand, if an alternative does not include features required by the user, they should be added to the specifications and budget such that that each property cost reflects all necessary budget items.
8. ROE – ROE is an important tool, especially in a time of capital constraints such as the markets we are seeing in 2009. The model uses ROE to measure cost of equity. In our experience many lease alternatives in the current market are attractive compared to the cost of ownership at current ROE hurdles and equity requirements for most DC Facility users.
9. Lease of a Hot Shell[9] with tenant funded tenant improvements – This is a common structure and requires an analysis that includes the cost of leasing the Hot Shell combined with the cost of ownership analysis for the improvements brought by the tenant.
10. Expenses – In most cases annual expenses will differ between lease and own alternatives. By way of example, management fees for a lease property may exceed the management cost of an owned property.
11. Managed services and IT costs – Often payment for services will be included in the rent or contract price for a DC Facility leasehold. Similar costs will be

[9] Hot Shell – In practice it is common to lease a building we at Rackhouse refer to as a Hot Shell. The Hot Shell is comprised of the site (land); a specialized, hardened building shell; parking lots and access roads; utilities, including power sufficient to run a DC to the building and fiber to the site and other assets specially designed to secure and accommodate a DC. Generally the Hot Shell can be thought of as a Base Building with DC Improvements and Equipment that would primarily be considered part of the "real estate" compared to "equipment". The Hot Shell is often the building that is constructed as a build-to-suit DC before specialized gear and equipment instrumental to the DC is added. It is also seen in the market as a purpose built speculative asset constructed and ready to build out for a specific DC user. Often a DC tenant will lease a Hot Shell type asset and build it out as a DC with leasehold improvements paid for with the Tenant's capital.

incurred directly in an owned facility. Analysis should include any differences between the two.

Putting it in Perspective – Annual Real Estate Cost as "Part of the Pie"

In consideration of the DC Facility decision, it may be helpful to draw the example to conclusion with a general presentation, including some gross assumptions, of how the real estate piece fits into a total data center cost illustration including power and server costs. The DC Facility piece is material. Following is an example that illustrates the materiality of information gained and value realized from the lease vs. own analysis:

Table 7 – Putting it in Perspective – DC Facility Cost as "Part of the Pie"

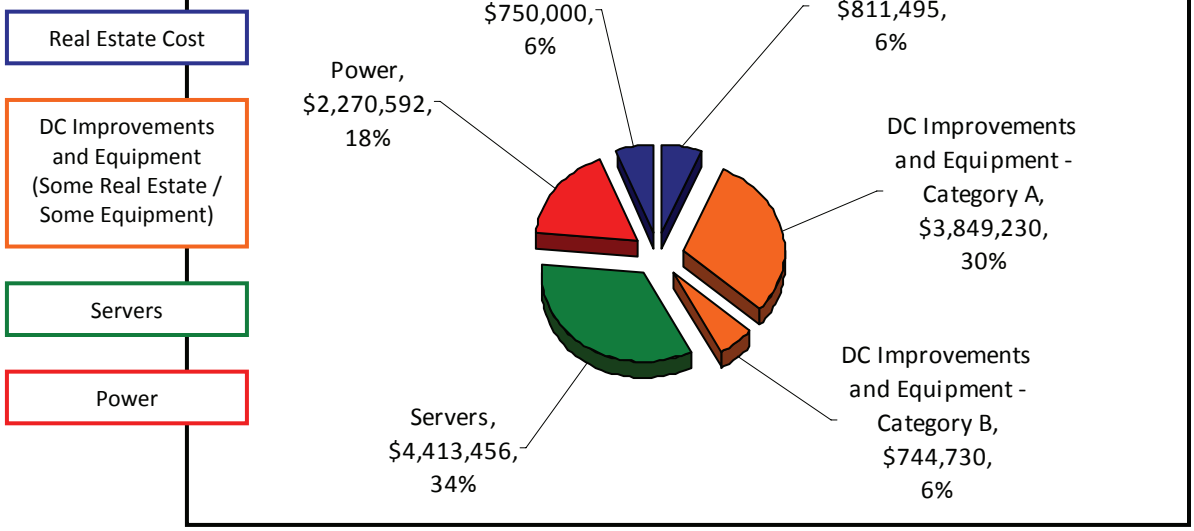
Assumptions	
DC IT Load (in kW)	3,000.00
Annual Facility Operating Expenses ("OPEX") / kW of IT Load	$ 250
OPEX (OPEX expense / kW * DC kW)	$ 750,000
Power	
Cost of power ($/kWH):	$ 0.080
Average Power Usage (%):	80%
Power Usage Effectiveness (PUE):	1.35
Annual Power Cost (kW*$/kWH*Average Power Usage %*PUE*(365*24))	$ 2,270,592
Servers	
Watts / Server:	500
Server Amortization (years):	3
Interest Rate	6.50%
Cost/Server:	$ 2,000
Number of Servers:	6,000
Price of Servers	12,000,000
Ownership Constant for Servers (Price amortized at 6.50%; 3 yrs.)	36.8%
Annual Cost of Servers	$ 4,413,456

DC Facility Cost Before Tax

	Monthly Cost	Annual Cost
Land	$ 15,470	$ 185,635
Base Building	$ 67,625	$ 811,495
DC Improvements and Equipment - Category A	$ 320,769	$ 3,849,230
DC Improvements and Equipment - Category B	$ 62,061	$ 744,730
Cost to OWN Before Tax	$ 465,924	$ 5,591,090
OPEX	$ 62,500	$ 750,000
Sub Total	$ 528,424	$ 6,341,090
DC Facility Cost / kW	$ 176	$ 2,114
Power	$ 189,216	$ 2,270,592
Sub Total - DC Cost Before Servers	$ 717,640	$ 8,611,682
DC Cost Before Servers / kW	$ 239	$ 2,871
Servers	$ 367,788	$ 4,413,456
Total DC Cost Before Tax	$ 1,085,428	$ 13,025,138
Total DC Cost / kW	$ 362	$ 4,342

NOTE: Input cells are shaded.

Table 8 – Example of Annual DC Facility Cost Assuming Ownership (Per the Above Example)



II. Conclusion

Each DC Facility decision is "one of a kind" because comparing and choosing between alternative facilities takes on a number of different complexities. We are frequently asked to assist with the process, and a well executed DC Facility analysis and recommendation is one of the more difficult tasks to perform in the real estate world.

Today the "lease vs. own question" is popular - many anticipate finding a distressed situation at a good cost based on the gloomy financial news de jour. Others have found that leasing opportunities in some markets are clear favorites when ROE objectives and large equity requirements are modeled into the cost of ownership. Even though real estate is not the biggest DC cost line item, nor is the cost of DC capital the hottest current topic, the potential savings from a good process are material.

The example presented above is an excellent process and illustrates the Rackhouse method of measuring the cost of DC real estate. It also provides a basis from which to discuss the market trend we are seeing in 2009 – the analysis of cost of capital as a part of a DC model. As capital markets change, and particularly if capital remains constrained, many users may review the lease vs. own decision and spend more time with financial models and calculators. The focus on DC Facility decisions may be well worth it.

III. About Rackhouse

Rackhouse (www.rackhouse.com) specializes in DC real estate. There are numerous pitfalls, more than in most real estate transactions. Traditional real estate companies are hamstrung by corporate bureaucracy, self-serving policies and lack of focus. Our clients deserve a hands-on real estate experience, choreographed by a group of professionals that only do one thing — represent organizations in search of reliable, off-site data center space. At Rackhouse, we don't work for building owners, we aren't property managers, we leave office and industrial real estate to someone else...and we never stray from our core focus.