

HUB NETWORK SERVICES

EXECUTIVE SUMMARY

The need for data centre capacity is growing for most large organisations. Driven by increasing data growth, meeting the increasing demands of their organisation has become one of the highest priorities for IT Directors, and is likely to become even more important in the next few years.

The consumer landscape is also changing, driving businesses towards producing an increased amount of Big Data applications and personalised content. This has a dramatic knock-on effect on the amount of data that needs to be managed.

With an increasing number of third party suppliers now providing data centre capacity as a service to meet this demand, the role usually played by an organisation's own data centre is reducing.

This paper highlights the advantages of moving from a Build your Own model, to a Buying Services model, while noting Best Practice to be considered by any organisation in the market for data centre services across the most key areas to review as highlighted by recent studies:

- Building Risks
- Migration Risks
- Resilience and Redundancy
- Cost
- Cooling
- PUE
- Scalability
- Control
- Physical Security
- Location



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HIGHLIGHTS

General:

- The key drivers for most organisations are security, availability and cost
- The increased sophistication seen in the modern data centre is reducing operational costs through increased efficiency
- The growth in data centre services offered by third party suppliers is seeing an increased number of state of the art data centres being commissioned.

Buying services:

- Significantly lower risks than building
- Benefits seen much faster
- You can buy as little or as much as you need, and increase at your own pace
- No or little capex required

Building your own:

- Increased risk of delays and cost overruns
- Capex may be spent 12 – 18 months before any results are seen
- ROI is likely to take 3-5 years or longer to be seen
- The new facility is unlikely to be used to its full potential for a lengthy period of time.
- Prime locations and the skills for the workforce will be difficult and expensive to find.



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OVERVIEW: BUY VS BUILD

The viability of building your own data centre has been reducing over the last few years, due in the most part to the complexity of modern data centre requirements and design. Coupled with the lack of resource and increasing number of third party options, organisations now face the choice between buying data centre services and building their own.

For many organisations this comes down to a financial decision between opex and capex, as most third party suppliers offer opex based pricing models, based on individual usage. In today's challenging economic climate, this has key benefits on optimising the use of yearly budgets, by reducing costs and ensuring maximum efficiency.

To elaborate, organisations using this model through third party suppliers are only paying for what they use, with the option of increasing the capacity required as needed. In comparison, a build your own data centre model involves creating enough space to anticipate for future need, removing the flexibility that a third party model can supply.

It is also worth noting that whilst organisations with extremely large data centre requirements could experience lower costs by building their own, this reduced cost may only produce minimal benefits, when the effort and resources required are taken into consideration.

Additionally, with the increasing number of third party providers opening new state of the art facilities, and the 3-5 year initial cycle to see any ROI, it can be argued that the significant risks associated with a build your own model far outweigh the potential cost advantages.



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BUILDING RISKS

Given the number of new professional data centre suppliers, and the capacity available as a service, building your own data centre only makes sense in a few specific situations. For most companies what is available on the market as a service is both cheaper, and built to a better standard than what they could produce with the same amount of budget.

As modern IT landscapes move into the age of Big Data, fewer and fewer companies will be able to justify the expenditure and effort of a private data centre solution. It would seem that only the very smallest and largest of companies will continue to operate this way in the foreseeable future, and who knows after that.

But the decision between build and buy does not just come down to cost. Another potentially deal breaking factor to be considered when deciding whether to build your own data centre is the scarcity of qualified resource with all the skills needed to deliver the solution to your requirements.

Equally, the sophistication of modern data centre design, efficiency of power usage and cooling are all significant factors which need to be addressed. The best locations for data centres, taking all of the above into account are extremely expensive, making the build your own model less and less attractive as it is reviewed.

If we take into account the complexities of finding the right site, the people to deliver the required expectations and the budget for a build your own model, then the risk of something going wrong becomes a big issue. When you consider the costs associated with these barriers, most companies simply cannot afford to overcome them in order to match the investment of third party providers.

Best Practice therefore would suggest that third party providers are inevitably more aware of modern innovations in design, and will ensure that their facilities are updated regularly to maintain competitiveness. By working with a third party supplier, an organisation can reduce the risk of their data centre not meeting their requirements and save considerable costs.



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MIGRATION RISKS

Data centre migration can by its very nature be a risky process, but following best practice helps to reduce this risk. Experts in data centre migration bring their experience and good planning for any migration to the table to help reduce this risk, but there are still some concerns that need to be addressed.

Whether this is something that is done internally or through a third party supplier, proper planning should be put in place to deal with any potential problems as they arise. Most commonly these concerns are around service interruption and data loss.

This is where working with a third party provider can have a really positive impact, as you will have access to their wealth of experience as they migrate data centres on a regular basis. Internal moves on the other hand are far less frequent and as such can offer much higher risks.

Best Practice dictates that you should work with a provider or employee that can articulate a clear risk migration strategy. The migration strategy itself should include insight into the internal / external support required.

Additionally, if working with a third party supplier, they should be able to confirm their ability to offer the appropriate support, whether this is for assistance with an internal move or a move to their facility.



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RESILIENCE AND REDUNDANCY

Generally speaking a supplier will have an N+1 design providing redundancy in power, cooling and network Infrastructure, to give the maximum uptime. Separate diverse routes for power and networking tend to be more expensive to get right, but when delivered by a third party as a service, the costs are shared making this more attractive.

However it is important that you understand the design and SLAs being offered to truly see if this will be of benefit to you. Sometimes diverse routing is showcased in the design, but in reality by having the power or network join a single track or pipe to the cabinet, you do not get real redundancy. Therefore to ensure you are meeting best practice, the design of the data centre (whether yours or a third party) should have diverse routes to each cabinet.

Another factor that should be strongly considered when reviewing the design and SLAs is backup power generation and UPS (Uninterruptable Power Supply). Your supplier should be able to confirm exactly how long their backup systems will keep running in the event of a major failure.

Where mission critical data and applications are involved, it is always best practice to ensure that replication to a second site is in place. A second site should be operational and data should be constantly replicated to this location for business continuity purposes. As only a few companies can produce a solid business case for the budget to set up a second site, third party options are often strongly considered.

Given this reliance on a third party for part of an organisation's data centre needs, the value of keeping the original data / environment internal is arguably small, whereas a relationship with a third party for both the original data / environment and the replicated backups would likely make more financial sense.



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COST

In terms of costs, if we are to look at the Total Cost of Ownership (TCO) of a data centre over a 6 – 8 year period, we can see that whilst the front end costs are very expensive, the benefits themselves take a long time to be seen. For example, Return on Investment (ROI) often takes 3-4 years or longer to be seen.

When building a data centre time is also a factor that should be strongly considered when reviewing the overall costs. Many of the costs of a data centre need to be paid for well in advance of when the data centre will be operational. These include Design and Implementation costs, Site and Building costs and the IT infrastructure costs.

On top of this, the overall timescale from the initial search for location through to becoming operational can often take 18 months or considerably longer. Given all of the above, most organisations are seeing a reduction in the attractiveness of direct ownership and moving towards a third party provider.

COOLING

Cooling is one of the most crucial factors to consider, as this will have a significant impact on the operational costs of a data centre, as well as its operational efficiency. Modern data centres are designed with the most efficient cooling units possible, but you should also consider what needs to be cooled.

Best Practice strategy would be to ensure that the cooling units are focused on the servers, rather than the whole room. This is a much more energy efficient approach and has a very positive impact on operational costs.

The best strategies will include several different types of co-ordinated activity, including different techniques for the dissipation of heat as well as standard refrigeration. It is also now becoming coming to use “free air cooling”, that is to say using the cooler outside air as a refrigeration technique, as this lowers the requirement for electrical cooling and puts energy costs even further.



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PUE (POWER USAGE EFFECTIVENESS)

One of the largest elements of data centres costs is power. It is commonly agreed that in most cases, around 70% of operating costs can be attributed to power consumption. This means that finding ways to continuously review the operational efficiency and energy pricing is a must for any data centre owner. This can be a real headache, and many organisations simply do not have the time or resource to keep on top of this.

In addition, very few organisations have a handle on the impact of PUE costs. PUE measurements are not universally standard, and there are a lot of different ways of measuring the elements of the PUE equation. That said the variation is very slim when considering the overall cost.

To elaborate, a 0.1 point drop in PUE at today's prices is equivalent to a headcount reduction of 1.5-2 full time staff for a large data centre. When we consider the cost savings this could offer over the lifecycle of a data centre, we can see that this is a significant reduction. In the US, the average PUE, according to figures published by the American Government, is 2.0 and this is likely even higher in the UK.

Third party suppliers on the other hand now provide data centres with PUE ratings of c. 1.25, meaning a reduction of 0.9 points (12-20 full time staff) at today's prices. When we consider the significant rises in the cost of power recently, and what is likely to come over the next few years, working with a provider who offers a lower PUE measurement will magnify the sheer amount of savings that can be seen.

Additionally the possibility of an increased focus on CRC (Carbon Reduction Commitment) tax schemes is becoming more likely, as many environmentalists see the growth of data centres as a significant threat to public health through the additional CO2 produced. Best practice therefore suggests that lower risk and higher cost savings can be seen by working with a provider offering a lower PUE measurement.



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SCALABILITY

Perhaps one of the most important factors to consider when choosing a data centre provider or for building your own data centre is scalability. The design of a modern data centre needs to factor in the ability to scale up your requirements as needed, whether this is computing power, storage or network links.

The ability to respond to changing requirements is something that third party providers are becoming very good at. Their flexible packages allow for adding space and power density efficiently and on demand, removing the need for a private data centre, where all future requirements will need to be taken into account right from the project's inception.

This model of scaling up and down your requirements as needed allows for a more flexible and cost effective data centre solution than a privately owned centre. The Build your Own model requires a heavy upfront investment, with space left unused for a long period of time to ensure it is fit for future consumption.

Best Practice for third party supplier contracts advises that suppliers should be carefully chosen, and contracts reviewed for clauses on future expansion. Don't lock yourself into a long term inflexible contract where scalability comes at significant cost.

The best suppliers provide insight into scaling up or down your requirements in a clear and articulate manner up front. They will also know the additional impact of any expansion requirements, such as additional cooling and power. If you get this part right, then you will be less likely to need to move location in the future and will improve your overall ROI.



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CONTROL

Historically, many organisations have built their own data centre, due to a need for control over every aspect of their IT environment. Nowadays, the growing range of offerings in the market place with regards to security has evolved. Many third party providers now offer multiple options when it comes to security, from shared server environments to completely isolated and secure environments compliant with the highest government security standards.

Whilst not all providers will offer the same range of services and facilities, it is not difficult to find one that meets your individual requirements. Where complete control is a significant issue for an organisation, Co-Location offerings are seen as more attractive. These offerings allow companies to store their hardware in a third party datacentre, reducing their operational costs whilst ensuring high availability and compliance.

Best Practice would therefore suggest that finding a supplier and agreeing the right SLAs and KPIs that are easy to measure is the best option for companies that need to be in control of their data and computing environment.

PHYSICAL SECURITY

One of the highest priorities for any data centre should be the physical security and protection of assets. Any data centre should offer a range of security options to ensure maximum protection at all times. This can include biometric security, keypad, card readers and digital camera surveillance.

The more sophisticated data centre designs will also include motion sensors and thermal cameras which will have an impact on overall energy efficiency by switching off lights in unused areas and identifying hot spots. They also include tactics for making sure that mobile devices with recording capabilities are not permitted access to secure areas.

Best Practice guidelines tells us that it is important to note that technology is only one part of the overall security procedures that need to be in place. True physical security will also include ensuring that buildings are un-named, protected from raid raids by appropriate physical barriers, and hidden behind fences or gates for anonymity.



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LOCATION

Choosing the right location for a data centre is critical. Locations become premium based on their ease of access and convenience of travel links. The ideal locations are close to rail, motorway and airport links, with zero flood risks. As part of a location search, power and network connectivity available should be taken into account as a priority. Land costs can vary based on location, but connectivity speeds will have a direct impact on customer and staff experience and end up raising costs higher than anticipated.

Best Practice tells us that in order to ensure real resilience, power and connectivity must be available from multiple suppliers. The need for physical security combined with these requirements mean that the number of potential sites to explore is limited and issues such as planning permissions must also be considered if you are looking to build your own data centre. All of this combines to suggest that buying services from a data centre which has already been through this process is much more viable than building your own.

CHOOSING THE RIGHT SUPPLIER

As you read through this document you have likely seen how buying services has become the better model when compared to building your own facility. The advantages of a service that scales to meet your requirements, reduces your Capex and provides a data centre with the latest design and technology are quite compelling. The question remains however as to what you need to know about suppliers to make your decisions about which one to choose.

The profile of the suppliers to engage with will depend on the nature and size of your unique requirements. For example, smaller organisations with relatively simple requirements can go for shared services with no special additional features; larger organisations on the other hand face a more complex choice.

To help out, whether you are a small organisation, or a large enterprise, remember to stick to Best Practice. To help with this we have provided a basic checklist of questions to ask yourself and / or your prospective supplier overleaf.



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QUESTIONS TO ASK YOUR SUPPLIER

- What is the price for the services offered?
- How does this compare with the option to build your own facility?
- How are they attempting to ensure best practice is followed?
- What standards do they strive to meet?
- How are they ensuring compliance?
- Has the supplier clearly articulated to you the consideration they have put into avoiding service interruption?
- Does the design of their data centre clearly demonstrate attention to security, PUE and consideration of individual customer requirements?
- What is the length of the contract?
- Does this meet your needs for stability?
- Are there break clauses to allow for review?
- Where will the data centre be located?
- What are the transport links to get there?
- What penalties are in place for SLAs (e.g. Service Interruption, Security Failure...) which are not met?
- What is their PUE measurement?
- How does this differ from yours?
- What security options are in place?
- Are these enough / too much for you?
- Have they taken into account future growth potential, with clear pricing indicated in any contract?



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ABOUT HNS / HOW WE CAN HELP

Incorporated over 15 years ago, HNS has a proven track record delivering reliable, cost effective Internet connectivity and co-location solutions. Around the globe, our customers rely on us on a 24x7 basis to keep their businesses connected and deliver services to their end users. Our philosophy is one of excellence and customer service. Our network and cloud infrastructure is built to support this ethos, with redundancy at every level.

We operate 4 main data centres, spread throughout the UK: Newport, London, Manchester and Bristol. These sites provide Tier 3 and 4 accommodation for many types of modern applications. Offering excellent geographical diversity and a redundant, carrier independent, network between these locations HNS is well placed to provide both highly resilient cloud services and server or rack co-location.

We provide 24x7x365 support through our UK based Network Operations Centre, where our Cisco and Microsoft certified engineers constantly monitor all parts of our network and the services we provide. We solve over 90% of all support calls on the spot. Customers can rest easy, knowing our expertise is available at any time of day or night.

HNS operates a redundant, BGP4 routed, MPLS-enabled network; AS39537 utilising the latest technologies from Cisco. Upstream transit capacity is purchased from select Tier-1 & Tier-2 carriers. Inter-site connectivity is achieved by using leased dark fibre or wavelength services. We have interconnects with major carriers such as Virgin Media and BT and pro-actively manage all our network links to ensure we deliver a high quality of service.

All our co-location services are housed within ISO 27001 data centres. This includes 24x7 CCTV monitoring and Multi point controlled access providing total confidence that your data is protected. We operate state of the art Cisco hardware, with the ability to withstand and mitigate denial of service attacks and can offer managed firewall options if required.

For more information about our data centre services and Co-Location proposition and how HNS can help, please contact us:

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