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Datacenter Deployments

(Private Cloud Architecture CA2)

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# Task

You are the Cloud Architect for the Irish branch of an International Pharmaceutical company who are considering outsourcing their DataCenter (out-of-date facilities/hardware supporting the private cloud environment).

In terms of base hardware, this amounts to 5 X Dell R610s; each server runs a base hypervisor of ESXi with 10 Microsoft Windows 2016 Server VMs, 6 X Cisco 3750 Switches along with 3 X MD1000 SAN units each providing 50 TB storage. (PLUS all the support facilitates a DataCenter requires.)

Produce a comparison report on the options available (including keeping in-house), identifying the key metrics that require consideration, outline potential solutions, compare and contrast these offerings & make a final recommendation.

# Introduction

This report will consist of the options and the types of solutions that is available for an organization which is considering outsourcing their datacenter. There will be a comparison on the opportunities and factors that organizations may look at when deciding what they will do with their datacenter. The comparisons that will be compared in this report is either keeping the data inhouse or to store the data at an outsourced datacenter. This report will take into consideration the situation of the task given and there will be an evaluation as to which option that organization should pick and why they should pick that option.

# Outsourcing a Datacenter vs. Keeping Inhouse

When it comes to whether an organization wants to outsource their datacenter or keep it inhouse, a lot of factors run through the head of an organization before they finalize their decision. All of these factors must be considered before making that final decision.

## Costs

Costs are a big factor when considering whether to outsource your datacenter or not. When outsourcing your datacenter, the costs of the maintenance can be predictable as vendors can provide organizations with a fixed cost solution or the vendor may have a cost which may fluctuate as you use resources.

Keeping inhouse on the other hand arguably involves spending more money due to the maintenance on the datacenter and the personnel that have to be paid to look after them. There will be a huge cost on the price of IT equipment and other resources that it may need. There is also an extra cost involved to do with power/energy consumption.

## Scaling

The scaling option that outsourcing a DC allows organizations to scale out as they use the resources in the datacenter and to scale back in when they are not using as much resources. The scaling is very useful as an organization may grow over a period of time and will need to scale out their resources.

Keeping inhouse doesn’t have the luxury of scaling out or scaling in at any time. Once all of the resources or hardware is used up, the organization will need to spend money on more equipment to deal with the demands the resources needs. This is a huge disadvantage as buying further resources will increase the amount of money spent and if the demand on resources drops, the organization is left with the hardware and extra resources that they no longer need.

## Personnel

Outsourcing your datacenter allows knowledgeable experts from the vendor offer the organization their skills and support at no extra cost. These skills and support involve keeping your data safe, keeping a backup of your data and making sure that there is a high availability to the data. Outsourcing also frees up personnel in your own organization with employees not now dedicated to maintaining the servers and VM’s. These employees can be now more involved in big projects for the organization.

Keeping Inhouse does tie employees down to maintain the servers and hardware to ensure there is high availability and that no problems arise and escalate. Due to the fact that there are employees working on this maintenance this means that there are more costs involved with paying salaries.

## Location of Data

Location of data can be one of the prime factors an organization may choose to outsource their datacenter. Organizations that are in cities that are prone to natural disasters (e.g. earthquakes, tsunamis) will definitely decide to outsource their datacenter to a city or country in which a natural disaster is a lot less likely to happen. Organizations will have their datacenters in these types of countries as they will be minimizing the likeliness of the datacenter being destroyed or being disrupted.

Having the location of your data inhouse can be very beneficial for organizations due to the instant accessibility that they have to the data and they are always in control of it. If any problems arise with the data, troubleshooting can be instantly done to solve the problem. This is an issue that may pop up in outsourcing datacenters as a ticket regarding a problem will need to be generated and there won’t be a fix to the problem until everything is assessed. This may take a long amount of time as there may be a lot of back and forth communication between the organization and the vendor.

## Security

Security is considered a big risk when opting to outsource or keep inhouse. This is due to giving sensitive data of your organization to an outside party (vendor) and trusting them to keep that data safe. The data that is being kept by the vendor is being transferred from the datacenter to the organization every day and although there will be security measures in place (VPN, encryption etc.), your data is still susceptible to hackers gaining access to it. The risk of a hacker gaining access to the data will always be there and security violations can cost your organization a lot of money.

Although data security may be more secure when keeping inhouse due to encryption, not passing sensitive data over the cloud and not letting an outside party have access to the data, there is a lot more involved with security when keeping inhouse. This security involves physical security. When keeping inhouse, your data is the most important asset to your organization and you need to keep the data as safe as possible. This will involve physical security such as CCTV, gates for access, access on doors (access cards), security, sensors and alarms. Having this much physical security to keep your data safe means it will cost a lot more money to keep your data safe inhouse instead of outsourcing it.

## Availability

Vendors who outsource datacenters need to comply with Service Level Agreements (SLA’s), therefore they have a massive pressure put on them to keep up with the SLA for uptime. This high availability SLA will force these vendors to maintain their datacenter to the highest possible level of standards to ensure a high uptime of their services. If the outsourced datacenter was to be destroyed, it is possible that the data is backed up on another datacenter in a different location.

When keeping inhouse, an organization doesn’t need to comply with SLA’s but incase anything goes wrong in the datacenter (natural disaster, fire), all of the data will be lost unless there is an off-site backup datacenter. If there is no off-site backup, then all of the data lost is gone and will be unable to be retrieved.

## Conclusion

When it comes to outsourcing a datacenter, vs keeping inhouse, it all depends on the type of organization and their business needs. Both of these solutions have their benefits and weaknesses. Some of the previous factors mentioned may have a bigger impact on some organizations over the other, but when the ultimate decision comes between picking either, the factors need to be thoroughly evaluated.

Some may instantly go for outsourcing the datacenter due to the price it costs to keep your own datacenter and the little maintenance that is involved with this setup. This can really benefit your company as it relieves some of your IT resources and energy consumption in your company.

And then on the other hand, some organizations may want to keep the legacy way and keep up how were running the datacenter themselves. Companies which handle very sensitive data may choose to stay inhouse primarily down to the security factor and it being more secure than outsourcing data and providing that sensitive to another party.

# Other Options

## Hybrid Infrastructure

Although inhouse and outsourcing the datacenter are the primary options to choose from, this doesn’t mean that they’re the only options. One option that may be available for organizations is to take a hybrid cloud approach. A hybrid cloud approach is when an organization uses public cloud, private cloud and inhouse as their infrastructure.

## Advantages

### Public Cloud

The public cloud offers organizations as much resources as they want on-demand. The public cloud is very flexible in terms of scalability and cost is based on the usage of the resources.

Reliability and availability is also very high on public clouds as the services that they’re distributing spans across multiple datacenters.

### Private Cloud

With the private cloud, your data and your applications will remain behind your firewall and is only accessible to your own organization

Since private cloud services is being used, there will be higher customization and control towards your servers on the cloud.

### Hybrid Cloud

All of the previous advantages in public cloud and private cloud all come together in the hybrid cloud. Vendors offer their customers the privacy and security of a private cloud and the scalability of a public cloud, all while it has the infrastructure and characteristics of your own datacenter. Customers have the ability to spin up multiple environments very fast with no pressure on maxing out their resources.

## Disadvantages of Hybrid Cloud

Long term saving is one big benefit with the hybrid cloud, but the initial deployment of the solution is very expensive. Also, with some hybrid cloud deployments, there may be a need to deploy hardware on-premise which also adds to the cost.

Although hybrid cloud is secure, there will still have to be a lot of precautionary measures that will need to take place before fully deploying to the hybrid cloud. Since sensitive data will be handled during the process of moving to the private cloud, IT experts will need to make sure that there is maximum security on the data.

# Recommendation

After reviewing 3 possible solutions in which this organization could choose to deploy in, I would highly recommend that the best solution to deploy would be a hybrid cloud architecture deployment. The hybrid cloud solution is by far one of the best options a pharmaceutical brand can choose to deploy. The following reasons explains why a hybrid cloud approach should be considered.

## Data Privacy

Pharmaceutical companies hold a large amount of sensitive which may include information of patients or even classified information on drugs. The data in which a pharmaceutical hold is very important and the need to keep this data safe is critical. The hybrid cloud can be a viable option as it will allow the company to store its core data and sensitive data in the private cloud and other data in the public cloud. There may need to be some communication or partnership with security experts to ensure that the correct data is stored in the public cloud and the private cloud.

## Scaling

Pharmaceutical companies can take a big advantage of the scalability opportunities that the cloud environment can offer them. Project resources can be scaled up or down easily based on the project needs. There will always be projects going on in pharmaceutical companies, whether it be R&D projects, IT projects, the scalability option will always be there for them. This is a feature that they would not be able to do with inhouse or colocation deployments without buying extra hardware for more resources.

## Costs and Maintenance

Choosing a hybrid deployment will provide a lot less maintenance to a company due to everything getting shifted over to the cloud. This will free up all of the space the hardware is being used and will also free up employees that have to maintain that hardware. Since the hardware is being freed up, this will reduce the energy consumption within the company. Although the costs related to cloud deployments may fluctuate and may be hard to predict due to scaling in and out the resources used, it takes a lot less time to add or remove these resources and no extra hardware is needed.

## Availability

Cloud vendors rely on keeping their promise on availability due to SLA’s. The availability that vendors provide need to match the company’s needs. Some vendors offer different types of availability, (e.g. Azure offers 99.9% availability which is 8.76 hours of downtime a year or 46 minutes a month. AWS offers 99.99% availability which is 51.6 minutes of downtime a year or 4.3 minutes a month.) vendor option will need to be looked at before choosing to deploy with them. If the SLA is breached due to a natural disaster it is up to both parties, the company and the vendor, to form a plan in case a natural disaster was to happen.

# Conclusion

I investigated 3 solutions that can be used by a pharmaceutical company and I gave my recommendation of a hybrid cloud architecture. My recommendation was based on the research of all of the main factors that should be considered when choosing what deployment is best for business. The deployment type will not be the same for every type of company as the business needs and resource needs will vary between different type of companies. I feel that the hybrid was the best deployment option for a pharmaceutical company based on the scaling capabilities of the cloud and the privacy added with the private cloud.

# References

1. Stephen J. Bigelow. 2018. What should I look for in cloud storage availability?. [ONLINE] Available at: https://searchcloudcomputing.techtarget.com/answer/What-should-I-look-for-in-cloud-storage-availability. [Accessed 25 November 2018]
2. Sunil Gupta - Netmagic. 2014. 10 Reasons to Choose an Outsourced Data Center - Netmagic. [ONLINE] Available at: https://www.netmagicsolutions.com/blog/why-choose-an-outsourced-data-center. [Accessed 25 November 2018]
3. Colocation America. 2018. Strategies for Comparing In-House and Outsourced Data Center Security. [ONLINE] Available at: https://www.colocationamerica.com/blog/strategies-for-outsourced-data-centers. [Accessed 25 November 2018]
4. Colocation America. 2018. Colocation vs. In-House Data Center: What's Better for Your Business?. [ONLINE] Available at: https://www.colocationamerica.com/blog/colo-vs-in-house-data-center. [Accessed 25 November 2018].
5. Advantages & Disadvantages of Data Center Outsourcing - FWS. 2018. Advantages & Disadvantages of Data Center Outsourcing - FWS. [ONLINE] Available at: https://www.flatworldsolutions.com/IT-services/articles/advantages-disadvantages-data-center-outsourcing.php. [Accessed 25 November 2018].
6. Jeff Clark, 2012. Risks of Outsourcing Your Data Center - The Data Center Journal. [ONLINE] Available at: http://www.datacenterjournal.com/risks-of-outsourcing-your-data-center/. [Accessed 25 November 2018].
7. Steve Wexler. 2018. The Hybrid Data Center: Bridging Legacy & Cloud | CIO. [ONLINE] Available at: https://www.cio.com/article/3190856/networking/the-hybrid-data-center-bridging-legacy-and-cloud.html. [Accessed 25 November 2018].
8. Pete Johnson. 2018. Cloud vs. data center: How to know what’s right for your organization | Network World. [ONLINE] Available at: https://www.networkworld.com/article/3264647/hybrid-cloud/cloud-vs-data-center-how-to-know-what-s-right-for-your-organization.html. [Accessed 25 November 2018].
9. What Is Hybrid Cloud? | Benefits & Advantages of a Hybrid Cloud | NetApp. 2018. What Is Hybrid Cloud? | Benefits & Advantages of a Hybrid Cloud | NetApp. [ONLINE] Available at: https://www.netapp.com/us/info/what-is-hybrid-cloud.aspx. [Accessed 25 November 2018].
10. iseek. 2018. 7 benefits of a Hybrid Cloud solution - iseek. [ONLINE] Available at: https://www.iseek.com.au/cloud/7-benefits-of-a-hybrid-cloud-solution/. [Accessed 25 November 2018].
11. VEXXHOST. 2018. Advantages and Disadvantages of Deploying a Hybrid Cloud - VEXXHOST. [ONLINE] Available at: https://vexxhost.com/blog/adv-disadv-of-hybrid-cloud/. [Accessed 25 November 2018].
12. Russell Senesac. 2018. Getting Your Arms Around the Hybrid Environment - The Data Center Journal. [ONLINE] Available at: http://www.datacenterjournal.com/getting-arms-around-hybrid-environment/. [Accessed 25 November 2018].
13. Nick Ismail. 2018. How cloud computing can transform the pharmaceutical industry - Information Age. [ONLINE] Available at: https://www.information-age.com/cloud-computing-pharmaceutical-industry-123462676/. [Accessed 25 November 2018].