**Critical Review of Azure Cloud Services vs. Physical Data Centres for Global Aid**

**Introduction**

* Global Aid, a non-profitable organisation focused on disaster relief managing options by using there data to help respond to emergencies in a faster more efficient way. They now have two options to choice from Azure cloud services or maintaining physical data canters. This report will help in this decision by in depth examination to determine which is best for the organisation.

1. **Scalability & Flexibility**

* **Azure Cloud Services**: Azure cloud services offer exceptional management to sudden spikes with data load and can adjust to current needs by scaling up or down based on what the origination needs at that current time so its very adaptable in real time because of the feature auto scaling which can adapt in real time.
* **Physical data centre:** opposite to Asure cloud, physical data centre have very limited scalability to handle sudden traffic/ spikes hardware must be updated or changes manually in order to adapt which if you are not on top of it can results bottlenecks in times of non-spikes and can be time consuming during spikes if the right hardware is not installed

1. **Cost-Effectiveness**

* **Azure Cloud Services**; Cloud services like Azure are cost-effective in the long term as its not a one of charge the method that’s used is pay as you go. User is only charged for the resources that are uses which is a big benefit because in disasters you will always have verbal amount of resources they need to use Azure also handles maintenance, upgrades, and security, based on the situation the organisation the cost will adapted automatically which cut unnecessary expenses
* **Physical Data Centres:** physical data centre requires a significant amount upfront costs to buy the equipment which all of them require maintenance such as cooling equipment upgrade from time to time and maintaining constant supply of electricity; having constantly to upgrade and maintain will cost a lot more than Azure services as well as you have no way to cut unnecessary cost as you need to buy all the equipment you think you might need and supply them with electricity to use when needed.

1. **Data security & Privacy**

* Azure Cloud Servies: Azure provides a very strong and advanced security system and privacy controls to the users wishes. It offers encryptions, access management and compliance with international law standards, especially during sensitive information Azures have a very advanced privacy features that makes sure sensitive information do not get leaked. It also monitors and prevents possible security threats 24/7 to make sure the data is safe at all times
* **Physical Data centre:** while physical data centre also have strong security measures they will require way more effort and expertise / specialist to manage with regulations that need to be followed at all times which can be challenging due to the chances of human error also they will be at threat of theft.

1. **Resilience and disaster Recovery**

* **Azure Cloud Services:** Cloud services are designed to be resilience and disaster recovery in mind. Azure has multiple data centres all around the world with back up and failover capabilities . in events of natural disaster in a location data can quickly recovered in the next/closest data centre this helps Global aid to maintain there operations at all times.
* **Physical Data Centre:** Physical data centres are much less resilient than cloud services. They are vulnerable to local disasters, such as floods, earthquakes, or fires. Setting up a resilient physical infrastructure requires a lot of money to implement and run. Even time of recovery is way longer than Azure Cloud.

1. **Real-Time Data Processing**

* **Azure Cloud services:** Azure excels in real-time data processing, which is vital for disaster response where every second count. It provides a range of tools and services for data analytics, machine learning, and artificial intelligence. These capabilities enable Global Aid to quickly process and analyse data, to make informed decisions during emergencies and alert citizens within the area**.**
* **Physical Data Centres:** While physical data centres can be configured for real-time data processing, they lack the flexibility and scalability of cloud services, physical data center require significant resources and expertise. Additionally, the time needed to deploy and scale these solutions can hinder rapid response efforts

1. **Global Accessibility**

* **Azure Cloud services:** Azure services provides global accessibility allowing teams to different teams and work together all around the world the global data bases / networks insures very low latency when communicating between each other. The quantity of data centers insures that the resources needed will quicky be delivered.
* **Physical Data Centers:** opposite to the Azure services it provides a very limited global reach which requires complex network which have a very high latency, the solution to this is a VPN . The lack of locations due to there global reach will limit how quicky they deploy resources in different locations.

1. **Environment impact:**

* **Azure Cloud Service:** Cloud computing has a mixer environmental impact. On one hand, cloud provides apps like Microsoft have made significant investmentin renewable energy to minimise there carbon footprint which aligns with Global Aid’s sustainability goal.
* **Physical data centers**: physical data centers are often less efficient compared to cloud services. They require much more power to maintain servers which also needs cooling. Many of the organisations are small so they are not financially stable enough in order to invest.

**Real-World Connection: Cloud Computing in Disaster Response**

Cloud computing has been successfully used in disaster response scenarios.

For example,, during the 2015 Nepal earthquake, cloud service were used to assist and coordinate an approach to best deal with the natural disaster by using there data and managing resources to find the most effective and quick response. However internet issues where highlighted as a concern during the response.

Another example is the use of cloud computing during the COVID-19 pandemic. During the pandemic businesses and organisations started leveraging cloud services to manage data and track the number of infections also provide resources and distributing them really fast

**Conclusion**

In conclusion Azure cloud offer more advantages through there global reach which can quickly response. The cost effective and saving methods makes sure Aid organisation to use there money in the most efficient way possible however we must consider the dependency on a strong internet connection and data privacy concerns the benefits of cloud services far outweigh the drawbacks, making them the ideal solution for Global Aid's needs.