Cloud Computing

Cloud computing is best described as "a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction" National Institute of Standards and Technology (NIST)

Types of Service Provision

Services are hosted remotely and accessed over a network through a customer's web browser, rather than being installed locally on a customer's computer

There are **3 different types of service provision**. These three elements are together referred to as the **cloud computing stack**

1. **SaaS** (software as a service) refers to the provision of software applications in the cloud
2. **PaaS** (platform as a service) refers to the provision of services that enable customers to deploy, in the cloud, applications created using programming languages and tools supported by the supplier
3. **IaaS** (infrastructure as a service) refers to services providing computing processing power, storage space and network capacity, which enable customers to run arbitrary software (including operating systems and applications) in the cloud

Stats of the cloud model

The cloud model enables customers to access, from any computer connected to the internet a multitude of IT services rather than being limited to using locally installed software and being dependent on the storage capacity of their local computer network

This model of IT service provision is on that is **growing exponentially**

It is estimated that one third of all revenue generated in the software market today relates to the delivery of cloud computing services, and the value of the UK cloud computing market reached around **10.5 billion pounds in 2016**, up fro 6 billion in 2010

40% of European companies already use email from the cloud, 35% use security solution and 30% percent use databases, office productivity and collaboration tools

Cloud Formations

4 types of cloud formations:

1. **Public Clouds** - available to the public at large
2. **Private Clouds** - single customer whose primary concern is data security
3. **Hybrid Cloud -** very sensitive data stored locally, less sensitive data stored in the cloud. Cloud Bursting - using cloud server and storage to meet peak demands
4. **Community Clouds** - limited number of customers with similar IT requirements share an infrastructure provided by a single supplier

Advantages of Cloud Computing

1. **Access to resources** - processing power of multiple remote computers
2. **Mobility** - services accessed form anywhere as they are web-based
3. **Scalable** - easy to increase or decrease the amount of service
4. **Data Security and Storage** - for most companies, data security and data storage offered by data centres is far superior to that which can be afforded in-house

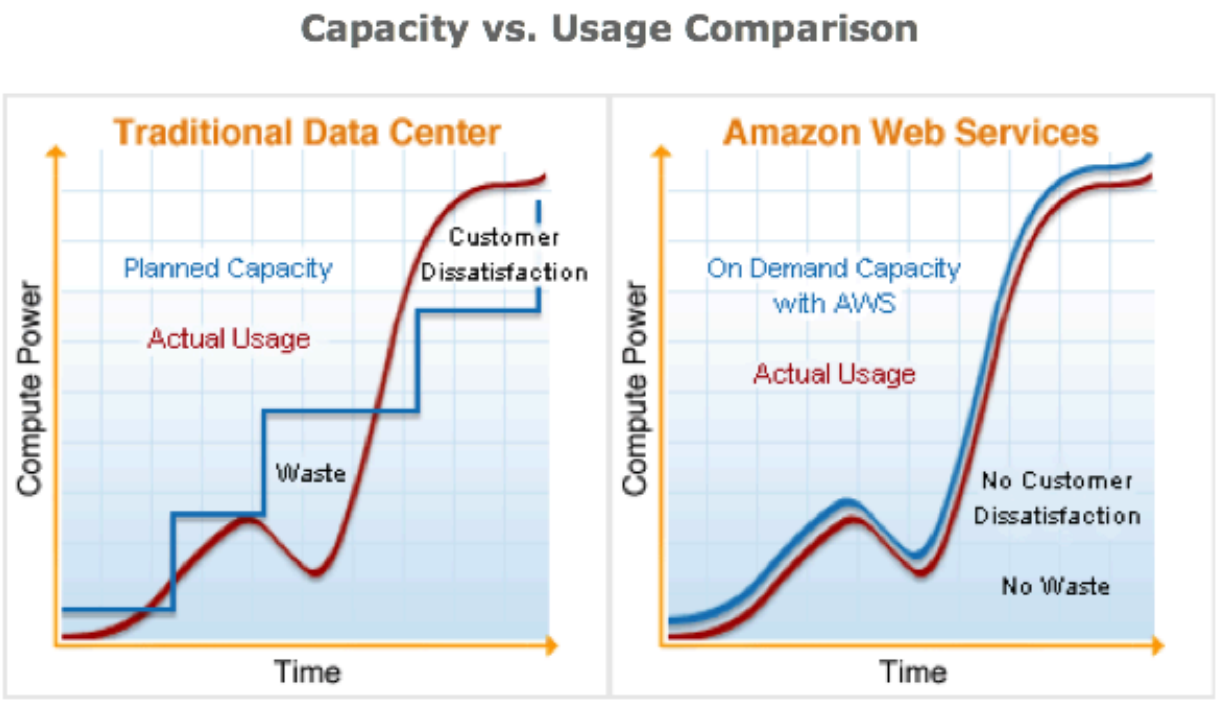
5. **Cost Saving** - rental agreement so no large upfront expense- Also, need to maintain less in-house expertise
6. **Maintenance and Support -** the supplier handles backups, upgrades and updates remotely and without visiting the customer's site
7. **Environmentally Friendly -** fiercely debated. Around 60% savings of carbon emissions and in the case of small start-ups up to 90% savings in eco waste
8. **Free trials -** it is easy for the supplier to offer a free-trial to 'lure' new customers and then terminate at the end of the period. This is referred to as "freemium" in some quarters

Disadvantages of Cloud Computing

1. **Internet Reliability** - lack of internet access or slow access can be a major problem
2. **Dependence on the Supplier -** dependent on the supplier for both day-to-day access in addition to updates and maintenance. What happens if the supplier has financial difficulties? What happens if your supplier sub-contracts out some/all of your service?
3. **Data Protection and Data Security** - Who 'owns' your data?

Cloud Computing ROI

Amazon Web Services Capacity-utilisation curve



8 business Metrics ROI

1. **Increase Margin and Cost Control** - Cloud computing offers the opportunity for cost, revenue and margin advantages
2. **Access to business skills and capability improvement** - Cloud computing enables access to new skills and solutions through cloud sourcing on-demand systems
3. **Risk and compliance improvement** - Cloud computing green capabilities can be leveraged through shared services

4. **Speed and Rate of Change** - keeping up with technological benefits transfers to the service provider. Increased flexibility in scaling IT up or down
5. **Optimising Total Cost of Ownership** - Cloud computing bridges the design-time and run-time divide and optimises service performance
6. **Rapid provisioning** - IT can be expanded as new enterprises emerge
7. **Dynamic Usage** - With either fixed usage volumes or variable functional usage, new innovative consumption model enabled by cloud computing allow a business to consider using IT in a flexible and agile way
8. **Enhanced capacity utilisation** - Cloud avoids over and under-provisioning of IT services to improve smarter business services