## 3. A paragraph on what PasS, SaaS and IaaS are and the differences between them.

IaaS stands for infrastructure as a service. IaaS is what a Cloud provider provides you with the virtual machines and comes with some open sources to install. It allows organizations to have an unlimited storage potential of the Cloud. It is often used by companies that already have a mature on-premise solution and offer disaster recovery services.

PaaS stands for platform as a service. It is usually for developer use and provides you hardware and software tools to help you build your own application. PaaS is a variant of SaaS. PasS's client runs their own copies of the application and using the Cloud provider's infrastructure.

SaaS stands for software as a service, also referred to as service on demand. It is a product ready for consumer use such as Office 365 or Google Docs. It allows users to benefit from the functionality of particular software without having to worry about storage or other issues. It is hosted on the Cloud servers and requires no installation on client computers in most cases, and the software can easily be accessed by multiple users using a web browser.

The main difference between them would be how you can use the Cloud for your business. IaaS provides you the most flexibility when it comes to hosting custom-built applications, and providing a general data center for data storage. PaaS allows you to focus on application development instead of infrastructure management because it often built on top of an IaaS platform to reduce the need for system administration. SaaS provides you ready-to-use, out-of-the-box solutions that meet a particular business need, and most modern SaaS platforms are built on IaaS or PaaS platform.

## 4. A paragraph on the differences between ETL and ELT. Also, list the pros and cons of each in a chart, and specify when you'll use which.

ETL is the Extract, Transform, and Load process for data. In ETL, data moves from the data source to staging into the data warehouse. ETL can help with data privacy and compliance by cleaning sensitive and secure data before loading it into the data warehouse.

ELT is Extract, Load, and Transform process for data. ELT leverages the data warehouse to do the basic transformations. There's no need for data staging. ELT can perform sophisticated data transformations and can be more cost-effective than ETL.

For ETL:

| Pros | Cons |
|---|---|
| 1. ETL has pre-structured nature of the OLAP data warehouse. After transforming the data, ETL allows for speedier, more efficient, more stable data analysis. | 1. ETL takes longer to load the data because it has to wait for the data to be cleansed or otherwise modified. |

| Pros | Cons |
| --- | --- |
| 2. ETL provides a more secure way to perform certain transformations because it transforms the data before putting it into the data warehouse. | 2. ETL is slower when comes to data availability, users need to determine the data they need first and then transform them. |
| 3. ETL has existed for over two decades, which means that there are many well-developed ETL tools and platforms available to assist with data extraction, transformation, and loading needs. | 3. ETL is high-maintenance. It relies on the user to initiate manual updates first. |

For ELT:

| Pros | Cons |
| --- | --- |
| 1. ELT has more flexibility and ease of storing new, unstructured data. | 1. ELT isn't ideal when the task requires speedy analysis. |
| 2. ELT is faster for data availability, it allows for all of the data to go into the system immediately, and users can determine the exact data they need to both transform and analyze from there. | 2. ELT is less secure for performing transformation of importation information of data because it requires you to upload sensitive data first. |
| 3. ELT is low-maintenance. It is cloud-based, so it utilizes automated solutions instead of relying on the user to initiate manual updates. | 3. ETL is relatively new compared to ETL, so the tools and platforms are not fully-developed yet for data engineers to use. |
| 4. ELT loads data quicker. It cuts down on the time it takes to load the data into its final location. | |

When to use which:

| ETL | ELT |
| --- | --- |
| 1. When a company has relatively smaller data sets that require complex transformations. | 1. When a company has massive amounts of data. |
| 2. When a company requires detailed planning, supervision, and coding by data engineers and developers. | 2. When an organization with the resources to handle the processing power is needed. |
| 3. When a company has a continuous, ongoing process with a well-defined workflow of data. | 3. When a company that needs all its data in one place as soon as possible. |