**Assessment 3: Report**

**ANS 1: -**  The main distinction between a SaaS-based service offered by a school and one that is locally hosted is that SaaS, also known as software on demand, enables data access from any enabled device with the aid of the cloud. Vendors host and maintain the servers, databases, and code that make up an application in this web-based software architecture, though.

SaaS applications allow for secure access by numerous users, who each often pay a monthly access charge. Although all client information is maintained in the same database, only the individual client has access to their data. Customization can be limited; however, system settings and profile customization are also possible. With this pay-as-you-go option, consumers can use the program as needed without having to install it or buy a license.

It functions via a cloud delivery model. An ISV may hire a cloud provider to host the programmer in the provider's data center, or a software provider may host the application and accompanying data using its servers, databases, networking, and computing capabilities. Any device with a network connection will be able to access the programmer. Web browsers are often used to access SaaS apps.

A single copy of an application that was designed expressly for SaaS distribution is made available to consumers via a network in the software as a service (SaaS) paradigm. All clients share the same application source code, and once new features or functionalities are made available, they are distributed to all users. The client data for each model may be stored locally, in the cloud, or both locally and in the cloud depending on the service-level agreement 1.

Speaking of the nearby school that serves as a corporate data center in contrast to SaaS, hosted refers to software that a customer buys and owns. This frequently necessitates a pricey up-front purchase and will include software installation with the hosting facility. However, over time, especially when compared to SaaS, it does tend to cost less.

Customers of a locally hosted software solution are given individual attention and have access to their software instances, databases, and servers. It gives the software owner a client-hosted option that is very customizable. Since hosted software is controlled by a business, updates can be made whenever it's convenient (as opposed to automatically, as with SaaS), and customizations can be made without affecting other users. This implies that if a consumer chooses not to receive ongoing maintenance, they may continue using the most recent version they bought.

Due to frequent data backups, hosted software is regarded as secure. However, depending on the installation hardware chosen, its reliability may be constrained.

Because there are some significant differences between a SaaS and a locally hosted server, there are additional important factors that a company must take into account when deciding whether to switch from a locally hosted service to a SaaS service.

1. The Support model: - You just get the bare minimum when you pay for a hosted service. The supposition is that you can proceed from there after paying the CPU. This means that you won't obtain much assistance in comprehending how to use the product most effectively and efficiently. Although a SaaS solution can differ in this regard, they almost always offer ways for you to use the platform to its fullest potential. For instance, consumers can get assistance from the support staff whenever they need it, which will normalize their log data and lower storage expenses. Instead of just paying to host and utilize a piece of software, you are paying for a whole service when you subscribe to a publication.
2. The Learning Curve: - A piece of open-source software called The Learning Curve features learning curves of varying degrees. The software can be extremely user-friendly and straightforward in some situations, but sophisticated and specialized in others.

The most significant advantage of SaaS solutions is that, in comparison to hosted systems, the techniques for preventing vendor lock-in are simpler and more accessible. If a third-party solution is a SaaS product, it is much simpler to construct system abstractions around it. You will do well to work with open standards and portability in mind. The majority of the time, a SaaS provider's exclusive features provide you with the means to complete such portability tasks.

The case for SaaS over locally hosted services is now made.

**ANS 2: -** The main distinction between a university infrastructure that is locally hosted and one that is offered by an IaaS provider is that the university moves your organization's servers from your backroom to a rack in a data center to use hosted infrastructure. Making the transition from an on-premise server (or servers) architecture to the hosted infrastructure model might be strategic in a company with aging servers or in an organization that is developing and has constantly expanding IT demands. As a result, redundancy and performance will significantly improve, and there will be a greater return on investment. You gain reliability by hosting your infrastructure on the cloud because it would be prohibitively expensive to build that reliability at your premises. Additionally, a cloud computing system known as infrastructure as a service (IaaS) distributes virtualized computing resources over the internet. IaaS, along with platform as a service and software as a service (SaaS), is one of the three primary categories of cloud computing services (PaaS). IaaS offers each resource as a separate service component, allowing it to scale up or down quickly in response to demand and reducing the need to purchase physical servers and other data center hardware. While the user installs configures and controls software, such as applications, middleware, and operating systems, a cloud computing service provider manages the infrastructure.

This is the distinction between university infrastructure that is locally hosted and university infrastructure that is provided by an IaaS provider.

The crucial factors for a company using cloud computing, aside from cost, are cost savings and elasticity. Platforms for the Service, such as servers, software, and management, are paid for by the provider and can be changed in small, flexible steps to suit different demands. Users or subscribers pay for the features they require, and services are dynamically adjusted. Applications hosted in the cloud can be accessed from anywhere and set up in a matter of hours, days, or weeks.

The following are the main points:

1. Deployment – Public cloud and private cloud are the two deployment strategies for cloud services for service level models (IaaS, PaaS, SaaS). The public cloud model offers a service through the internet that users may sign up for and access using a large number of pooled cloud computers in data centers. All of the service's end users share the infrastructure, which includes the servers, and all points of access are publicly accessible from anywhere.
2. Scalability – scaling-based models Because cloud providers combine processing power into servers, they can offer services that are massively scalable and have no partial capacity. Thanks to hypervisors that maximize computer resources, an increase in client demand are immediately matched with responsive computing capacity. There is nothing wrong with a customer being forced to purchase more servers as demand increases due to a server's restricted functionality. The customer can utilize the service without charge or delay during the initial server configuration where the system has already been provisioned.
3. Reliability – When a service is dependent on a large number of cloud servers, it is less likely to experience performance problems or outages because of demand surges. The model then offers protection from single points of failure. Because multiple other servers are providing redundancy, even if one server goes down, the service that is donating resources won't be affected.
4. Cost Efficiency – Because cloud servers are responsive, cost-effective, and scalable, users can save a lot of money by using these services. Customers won't be obliged to pay upfront for the capacity they might not use and will only be charged for what they use, saving them the costs associated with bringing individual servers online. On the other hand, any setup fees associated with turning on cloud servers are expenses for the cloud provider. This is the most common scenario; by providing standard services, many cloud services reduce the work and cost for their customers.

**ANS 3: -** Therefore, to avoid security breaches and a lack of server support, ECA should choose a full IaaS model with some SaaS apps. This is because, when compared to other models, IaaS and SaaS have deployment, reliability, scalability, and cost-effectiveness, while SaaS can be the support model and learning curve. Educational institutions have been forced to find alternatives to optimize the expenses and operational efficiency of their data technology platform due to the changing nature of the educational environment.

With alternatives to existing software and infrastructure, cloud computing has emerged as a significant technology that could enhance value for the university's entire IT requirement.

A cloud provider oversees the application's back end (particularly the hardware). The client or user just pays for the services they consume (memory, time and bandwidth processing, etc.). Virtualization has a strong relationship with many cloud innovations. Scalability, resource sharing, time-sharing, and device simulation and emulation are all examples of services. Companies that provide cloud computing can pool cash that can be distributed among numerous consumers, are primarily in charge of demand payment, and grow quickly.

The four Cloud Computing Deployment models can be defined as follows -

1. Public Clouds: A cloud services provider manages the cloud infrastructure, which is accessible to the general public or large business organizations. The public cloud includes services like Amazon Web Services (AWS), Microsoft Azure, IBM SoftLayer, and Google Compute Engine.

2. Private Clouds: The cloud infrastructure that is only accessible by the organization itself and not by the general public or other businesses.

3. Hybrid Clouds: combines proprietary software, one or more public cloud infrastructures, and private cloud to enable product interaction. Businesses can transfer workloads more flexibly between cloud providers as needs and costs change with a hybrid cloud strategy. Community Clouds: Staff or small groups working in a shared cloud environment (such as companies or directors of trading companies). Although there are many different Community organizational concepts, society's members often uphold equivalent safety, privacy, accomplishment, and enforcement standards. Society's members might try to use an autonomous system to keep an eye on those applying for membership.

The latest changes and challenges in higher education are best addressed with cloud scalability and elasticity. Higher education institutions, which frequently include campuses and universities that are spread out geographically, encourage a specific culture of collaboration among faculty, students, and administrative staff. Today, about 70% of higher education institutions in North America have adopted cloud-based data exchange technology across their institutions and have moved their management operations there, or are in the process of doing so. By switching to cloud computing, educational institutions will save money on IT infrastructure, reduce tension in computer labs, and have an easier time implementing new technologies. Cloud computing is therefore incredibly beneficial for any educational institution.

So, ECA should opt Full IaaS model with some SaaS apps over to other models.