E-Ticket Raising System

[TASK 1.1] Research and list atleast five benefits of cloud computing over a traditional on-premises infrastructure

Certainly! Cloud computing offers several benefits over traditional on-premises infrastructure. traditional on-premises infrastructure is underscored by several key factors that address modern business challenges and requirements. Here are some of the crucial aspects highlighting the significance of cloud computing:

1. COST SAVINGS:



* **No Up-Front Capital Expenses:** Using cloud computing removes the requirement for initial hardware and infrastructure investments. Alternatively, companies can lower total costs by paying for computing resources on a pay-as-you-go basis.
* **Economies of Scale:** Because cloud service providers run on a big scale, they are able to offer services at a cheaper cost than what individual businesses would have to pay for on-premises infrastructure.

1. Flexibility and Scalability:   
     
   **On-Demand Resources:** Cloud computing allows businesses to easily scale up or down in response to changes in their computing requirements. This flexibility is especially useful for companies where employees have different responsibilities.

3)Elasticity:

A ticket-raising system for a retail company experiences varying levels of traffic throughout the year, with peaks during holiday seasons. The system is hosted in the cloud, allowing the company to scale resources up or down based on demand. During busy periods, the company increases the number of servers and database capacity to handle the increased load. During quieter periods, they scale back resources to save costs.

4)Disaster Recovery:

A natural disaster, such as a hurricane, causes a data center hosting the ticket-raising system to become inaccessible. However, because the system has a robust disaster recovery plan in place, data is replicated to a secondary data center in another geographic region. The system fails over to the secondary data center, and customer support operations continue without any impact on service.

5)Fault Tolerance:

During a major shopping event, one of the servers hosting the ticket-raising system fails due to a hardware issue. However, because the system is designed for fault tolerance, the load balancer immediately redirects traffic to the remaining servers, ensuring that customer support operations continue without interruption. The failed server is automatically replaced, and the system returns to full capacity.

6)Agile:

A software development company is tasked with developing a ticket-raising system for a large telecommunications company. During the development process, the telecommunications company's requirements for the ticket-raising system frequently change. They realize they need additional features, such as integration with their customer database and real-time analytics for ticket metrics. Agile methodologies allow the development team to quickly adapt to these changes, with regular meetings and sprints enabling them to incorporate new requirements into the system without causing delays.

CASE 2:Describe the CapEx and OpEx models of financing IT infrastructure , providing examples of when each model might be preferred.

CapEx: CapEx involves purchasing and owning physical IT infrastructure, such as servers, networking equipment, and data centers. These costs are incurred upfront and are typically depreciated over time.

Preferred Scenario: CapEx might be preferred when the company has predictable and stable IT infrastructure needs, and when they have the financial resources to make upfront investments. It can also be preferred when the company requires full control over its infrastructure and wants to customize it to meet specific requirements.

OpEx: OpEx involves paying for IT infrastructure as a service, typically on a subscription or pay-per-use basis. This allows for more flexibility and scalability, as costs are incurred based on actual usage.

Preferred Scenario: OpEx might be preferred when the company has variable or unpredictable IT infrastructure needs, as it allows for more flexibility to scale resources up or down based on demand. It can also be preferred when the company wants to avoid upfront investments and prefers to pay for IT infrastructure as a recurring operational expense.

[Task 3] Differentiating Between Public, Private, and Hybrid Clouds

Cloud computing offers several deployment models, including public, private, and hybrid clouds. Each model has its own characteristics, advantages, and use cases. This report provides a brief overview and differentiation of these cloud models, along with a diagram representing each model.

1. Public Cloud:

Definition: Public clouds are owned and operated by third-party cloud service providers. These providers offer resources such as virtual machines, storage, and applications over the internet to the general public or multiple organizations.

-Characteristics:

- Resources are shared among multiple customers.

- Services are accessible over the internet.

- Customers pay for what they use on a subscription or pay-per-use basis.

Advantages:

- Cost-effective, as customers only pay for the resources they use.

- Scalable, with the ability to quickly provision additional resources.

- No need for upfront investment in hardware or infrastructure.

Use Cases:

- Startups and small businesses looking for cost-effective IT solutions.

- Organizations with variable or unpredictable workloads.

2. Private Cloud:

Definition: Private clouds are dedicated cloud environments that are exclusively used by a single organization. These clouds can be hosted on-premises or by a third-party service provider.

Characteristics:

- Resources are dedicated to a single organization.

- Provides greater control and customization compared to public clouds.

- Offers higher levels of security and compliance.

Advantages:

- Greater control over data and resources.

- Enhanced security and compliance.

- Ability to customize the cloud environment to meet specific requirements.

Use Cases:

- Organizations with strict security and compliance requirements.

- Industries such as healthcare and finance that handle sensitive data.

. Hybrid Cloud:

Definition: Hybrid clouds combine public and private cloud environments, allowing data and applications to be shared between them. This model provides greater flexibility and scalability.

Characteristics:

- Allows organizations to leverage the benefits of both public and private clouds.

- Provides a unified management interface for both environments.

- Enables workload portability between clouds.

Advantages:

- Flexibility to scale resources based on changing requirements.

- Ability to use public cloud for non-sensitive workloads and private cloud for sensitive workloads.

- Cost-effective, as organizations can use public cloud for bursty workloads.

Use Cases:

- Organizations with fluctuating workloads.

- Applications that require both public and private cloud environments.

In conclusion, public, private, and hybrid clouds offer different benefits and are suited for different use cases. Organizations should carefully evaluate their requirements and choose the cloud model that best meets their needs in terms of cost, security, compliance, and flexibility.

[Task:4] For each cloud model, list one real-world application or scenario where that model would be the most appropriate choice.

1.Public Cloud:

Real-World Application: A startup company developing a new mobile app chooses to host their app on a public cloud platform. The company has limited resources and wants to minimize upfront costs. They also anticipate a variable and potentially high volume of users, making the scalability of public cloud resources ideal for their needs.

2.Private Cloud:

Real-World Application: A financial services firm with strict regulatory requirements decides to build a private cloud to host its financial data and applications. The firm needs to ensure data privacy, security, and compliance with regulations such as GDPR and HIPAA. A private cloud allows the firm to have full control over its infrastructure and data, meeting its security and compliance needs.

3.Hybrid Cloud:

Real-World Application: A retail company uses a hybrid cloud model to manage its e-commerce platform. The company uses the public cloud for hosting its website and handling peak shopping seasons when traffic is high. It uses a private cloud for sensitive data such as customer financial information, ensuring security and compliance with industry regulations. The hybrid cloud model allows the company to scale resources up or down based on demand while maintaining control over sensitive data.