

This web application consists of a single HTML page, making this a static website.

## Design phase

### On-premises vs cloud

I have considered three main factors to choose between on premise and cloud. These factors are cost, security & performance.

#### Cost

A crucial point in cloud computing vs on-premise cost comparison is an initial investment in hardware and infrastructure.

Costs can be high for on-premise with ongoing costs of maintenance, storage space, power consumption and dedicated IT support. Infrastructure also requires regular investment to stay up to date.

With cloud computing the Capital expenditure (CAPEX) is practically non-existent, as no hardware is needed, nor any physical infrastructure to hold servers. No need of IT staff to maintain the network.

Maintenance or upkeep costs are kept to a minimum as there is no physical hardware or infrastructure to maintain.

Also cloud services have pay as you go mechanism which helps us scale up and down to suit market demands, however for on-premise since the hardware is fixed it can be underutilized wasting money for unused hardware.

#### Security

Highly-secure data encryption is essential for any online business and with cloud computing, it's all included in the package.

One might think on-premises would be the safer option for protecting sensitive data, because critical data is kept in-house and no third-party has access to your information but, almost all the massive data breaches we've had over the last decade have been from traditional on-premise IT infrastructures.

#### Performance

Cloud computing is generally used on as-needed basis, users only pay for what they use and can scale up or down to suit customer and market demands. For on-premise since the hardware is fixed it can be overutilized causing performance issues.

#### Decision

Based on these factors I have decided to go with cloud computing services.

### Which cloud computing service ?

We have a plethora of cloud service providers in the market. For ease of comparison I have chosen **free** subscription plans of AWS, MS Azure and GCP into consideration.

		AWS	MS Azure	GCP
	App name	S3	Static web apps	Cloud storage
<b>Cost</b>	Subscription	Free	Free	Free
<b>Storage and compute</b>	Max storage	5GB	.5GB per app	5GB
	Time	12 Months	Always	Always
<b>Security</b>	Protocol	HTTP	HTTPS	HTTPS
<b>Performance</b>	Regions	All nodal points	All nodal points	US region only

## Decision

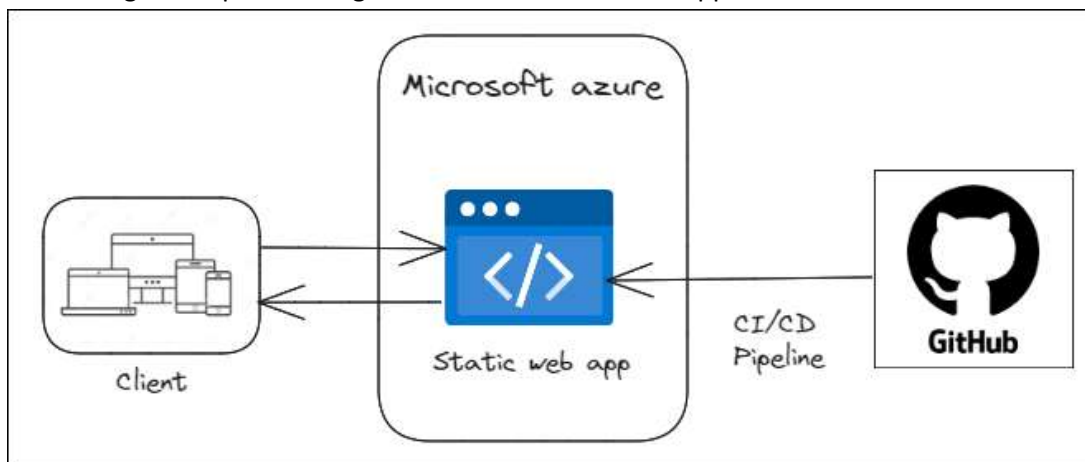
Among these three, MS Azure is the best fit because it provides **better security** than AWS by allowing HTTPS transfers and it provides **better performance** than GCP with nearest nodal point in Asia. Since this is a static web app with little storage, .5GB is sufficient to store the web resources.

## Code repository and source control

I have chosen GitHub as my code repository. This is an open source cloud repository(SaaS) and provides the flexibility to maintain the repository as public or private. GitHub also provides wide range of modern features like collaborative coding, automation and CI/CD, project management etc. all these feature help in maintaining and delivering quickly. **Git hub automatically creates a CI/CD pipeline for azure static web app deployment.**

## High-level architecture

Below diagram depicts the high-level architecture of the application



## UI design

The UI consists of text input elements, their labels and a submit button. The UI must support PC and mobile devices

## Wireframe

Below is a mock diagram of how the screen will look

Sign Up

Employee Name:

Company Name:

Submit

[Help document](#)

## Development phase

The requirements and strict security needs of the application are considered during development process. We will discuss them in detail below

### Requirement

The website must support PC and mobile devices.

Additionally optimizing 'title' tags, using 'meta' description and 'meta' keywords is one of steps for search engine optimization. I have included these additional changes to support SEO.

### PC and mobile screen support

For the website to support varying screen sizes I have used <meta> elements 'viewport' attribute

```
<meta name="viewport" content="width=device-width, initial-scale=1.0">
```

### Search engine optimization support

SEO is a major aspect for the **marketing of an application**. This helps the website to rank higher in the search results of a search engine, and helps boost the **income**.

'description' attribute of the <meta> element provides the description of the page that search engines can pick up to show during the result

```
<meta name="description" content="Sample website">
```

'keywords' attribute of the <meta> element provides a list of comma-separated keywords relevant to the page, which are used by the search engine to categorize the page

```
<meta name="keywords" content="TTEC, Sample Website">
```

### Web security

Web application security is critical to protect web servers and web applications from attack by internet based threats.

### HTTPS protocol

Hypertext Transfer Protocol Secure is an extension of the Hypertext Transfer Protocol. It uses encryption for secure communication over a computer network, and is widely used on the Internet. In HTTPS, the communication protocol is encrypted using Transport Layer Security(TLS).

### XSS (Cross site scripting) attacks (or) HTML injection

It is a security vulnerability that allows an attacker to inject HTML code into web pages that are viewed by other users. This threat can be prevented by using 'http-equiv' attribute of <meta> element.

```
<meta http-equiv="content-security-policy" content="default-src 'self'; style-src 'self' 'unsafe-inline';">
```

### Reverse tab nabbing

Reverse tab nabbing is an attack where a page linked from the target page can rewrite that page. This threat can be avoided by using 'rel' attribute of anchor(<a>) element.

```
<a href="/documents/HelpDocument.pdf" rel="noopener noreferrer" target="_blank">Help document</a>
```

## Launch phase

### Web hosting

As discussed earlier MS Azure is our cloud service provider which provides computing services through **'Static web app'**. This provides **free** hosting with HTTPS protocol by creating necessary SSL certificates along with free domain name, available across all nodal points (with nearest locations in Chennai and Pune).

### Deployment

Deployment is the process by which all the project related artifacts are made available for use.

### CI/CD pipeline

GitHub creates a '.yml' file automatically to support CI/CD pipeline with MS Azure Static web app. With this, any changes done to 'main' branch gets deployed automatically to the host.

### Documentation

The documentation helps keep track of all the aspects of an application, and it improves the quality of the software product.

There will be a help document available for this app which can be accessed from the UI. This document will be stored and accessed from the code repository.