Tanvi Saraf
D15B 60

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# Assignment 2

Q1 Desine Progressive web App (PWA) and explain its seignificance in modern web development Discuses key character that differentiate PWAs from traditional mobile Apps

→ A progressive web app is a type of web application that utilizes modern web applications to delivest on app like exprerience to users pwAs are deseigned to be responscive, fast, & enagaging & provide a seamless user experience across devices.

Significance in Modern web Development

1. Cross Platform compatibility: PWA's can run on any device with a web browser, regardless of the operating seysotem.

2. Offline functionality: One of the featurles of PWAs is their ability to work offline or with limited connectivit

3. Free Insotallation: Unlik traditional opps PWA dont require intallation from an app sotoue us: can simply access the PWA through web browsoer & add it home screen.

Q2 Key characteristics differentiating PWAs from Traditional mobile Apps.

1. Development Approach : PWAs are typically built using web technologies like HTML CSS and JS while traditional apps are built using platform specific languages (eg. Swift, Kotlin)

2 : PWAs distributed via the web & can be easily shared via URL whereas traditinal apps are distributed through app stores & require approval from the respective platforms store.

3. Overall, PWAs offer a compeling attenative to traditional at mobile apps providing a modern cost-effective & accerosible solution for delivering app like experience on web.

Installation : PWAs are accessed through web browsers and can be added as the home screen while traditional apps are downloaded and installed from app stores.

Q3

| Responsive web Design | Fluid web Design | Adaptive web Design |
|---|---|---|
| Uses flexible grids & layouts that adjust based on screen size | Utilizes fulid grids & layouts that smoothly expand or contract | creates a multiple versions of the site optimized for specific devices |
| Relies on css media queries to adapt styling based on screen size | May use media queries but emphazies fuidity of elements | uses server side detec then to some different layout & versions |
| one codebase that adapts to various devices. | Emphasaizes percentage based layout & fluid images. | Requires separate versions of the site for diff devices. |
| offers consistent user experience across devices | provides continuous user experience | Tailous the user experience for specific devices. |
| Easier maintenance with single codebase | Requires adjustment to ensure fluidity across devices. | Allows for precise cont rol over user experi- ence. |

Q.4 Explain the use of index DB in the service worker for data storage.

IndexedDB is low-level API for client-side storage of significant amounts of structured data. including files & . . It is useful for web applications that need to store large amount of data locally such as PWA's

Here's how IndexedDB can be used in a service worker for data so:

1 Caching Assets : one of the primary use causes of Inde in a service woakea is caching assets such as HTML, CSS, JS, files, images & other resources This allows application to function offline

2 Dynamic Data Storage : IndexedDB can also be used to satoue dynamic data generated by the web application

3 Background Synchronization : Seqaice woakers can periodically sync data with a server in the background even when the application is not been used.

4. Performance optimization : By storing frequently accessed data in indexed DB serice workers can improve perfor mance of applicatiers.

Q5 Describe the life cycle of service weakers, including registrations. installation & activation Phases

→ The life cycle of service workers involves several phases below is a detailed explaination of each phase.

1 Registration

- The first step using a service weaker is register it within the web application
- Typically done by including a registration script in the main Is file of the application
- The processes is initiated using 'nuvigate service worker register '()' method.

Installation.

- once service weaker is registered the browser begins the installation process
- During installation the browser downloads the service workers file specified during registration.
- On successfull installation the service worker moves on the activation phase

3 Activation

- After Service weaker is sucessfully installed it goes through the activation phase
- During activation. the new version of the service Woaker become active & takes control of certain event & n/w ~~see~~ requests the seope of registration.