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Assignment - II

Q.1] Define progressive web app & explain its significance in modern web development. Discuss its key characteristics.

⇒ A PWA is a type of web application that utilises modern web technologies to provide user with a native app-like experience directly through their web browser. PWA's are designed to be fast, reliable and engaging, bridging the gap between traditional web app & native mobile application.

Main characteristics of PWA:

① Accessibility:
PWA are accessible through a URL & do not require installation from an app store.

② Responsiveness:
PWA's are built using responsive design principle, ensuring that they adapt & display correctly on different screen sizes & orientation. This provide a consistent user experience across devices.

③ Offline functionality:
PWA's can cache content & store data locally, allowing users to access certain feature & content even when they are offline.

(iv) Security :
PWA's are served on HTTPs, ensuring the data transmitted between the user's devices & the server is encrypted & secure.

(v) Performance
PWA's are designed to be fast & light weight, reducing loading times & improving all performance. They leverage such as lazy loading, preloading & caching to deliver a smooth & responsive experience, even on slower network.

Q.2] Define responsive web design & explain its importance in the context of PWA.

=> Responsive web design is an approach to web dev. aimed at creating website that provide an optimal viewing & interactive experience across a wide range of devices & screen sizes. It involves using flexible layout, fluid grids & media query.

In the context of PWA, responsive design is o crucial because it ensures that the app can adapt seamlessly to various devices. PWA can deliver a consistent & engaging user experience across different platform.

Teacher's Sign.: _____

(I) Responsive web design.

It uses fluid grids, flexible layouts & media queries to adapt the website's design & content based on the user's device characteristics.
The layout & content of the website respond dynamically to change in screen, size & orientation.

(II) Fluid web design.

Focuses on creating layouts that adjust proportionally based on the user's screen size rather than fixed pixel value. Element such as image, text & container resize fluidly to fit the available space maintaining a consistent proportions.

(III) Adaptive web design

It involves creating multipy version of a website tailored to specific device categories or screen size. The website detects the user's device characteristics and serves an approximate version of the size optimized for that particular device.

Q.3 Describe the life cycle of service worker, including registration, installation & activation phases.

=> 1. Registration

The registration phase begins when a web developer includes Javascript file containing its code. The service worker is registered with the browser using the 'navigator.serviceworker.register()' method. This typically happens in the main JS.

2. Installation.

After registration, the browser starts the installation phase once the service worker script has been downloaded successfully. During installation the browser fires the 'install event'. This is where service worker can cache static assets & perform other initialisation task necessary for offline functionality.

3. Activation

After installation, the services works enter the activation phase during activation the service worker can clean up old chaches initialization necessary data & start intercepting. Network request once activated the services worker k control various aspect of the web application such as managing & handling

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

→ Indexed DB is a client-side storage mechanism that allows services workers to store structure data locally within the browser. It enables web application includes those ultilisation service works to store & reteive data efficiently providing offline funtionity to enhancing performance by reducing the need for constant network request

Indexed DB is particulaely useful in services workers for task such as caching dynamic content, managing user performance & supporting offline capabilities!