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MPL Assignment - 2

03/05

Define progressive web App (PWA) & explain its significance in modern web dev differentiate PWAs from traditional mobile Apps?

- A PWA is a web application that combines the both web & mobile apps to deliver a seamless. PWA works offline, load quickly & provide an app like experience in mobile.
- Platform Independence
- Improved Performance
- Offline functionality
- No app store dependencies
- Engaging user Experience.

Key Characteristics -

Installation: Installed from browser, traditional mobile apps are downloaded from mobile apps

Platform dependencies

Offline Support

Updates

Performance

PWA are faster due to caching & lightweight assets.

Define responsive web design & explain its importance in context of PWA; Compare & contrast responsive, fluid and adaptive web design.

- It's an approach that ensures web pages adapt to diff. screen sizes & orientations using flexible grids.
- Ensures a consistent user experience across different devices
- Eliminates need for multiple codebases for diff devices
- Enhances usability by making content reachable screen.

Features	Responsive	Fluid	Adaptive
Definition	uses CSS media queries to adjust layout dynamically	uses % for elements to scale	uses predefined layout for diff. screen size
Flexibility	Highly flexible	completely flexible	fixed at specific breakpoint.
Performance	Efficient but requires more CSS adjustment	Smooth scaling	May cause layout shifts
Best use case	website & PWA for all screens	App requires seamless scaling	website with predefined layout

Q3) Describe the lifecycle of service workers including registration, installation & activation phase

Ans → Lifecycle phase,

1) Registration

```

if ('serviceWorker' in navigator) {
  navigator.serviceWorker.register('sw.js')
  then(i) => console.log('Service worker registered')
}

```

2) Installation

→ Occurs when the service worker is first downloaded.
 Eg: self.addEventListener('install', event => {
 event.waitUntil(
 caches.open('v') then cache => {
 return cache & all
 }
 });

Activation:

→ Runs after installation & ensures old caches cleared if necessary.

```
Eg: self.addEventListener('activate', event => {  
  event.waitUntil(  
    caches.keys().then(keys => {  
      return Promise.all(keys.map(key => caches.delete(key)));  
    });  
  });  
});
```

Fetching and updates.

→ The service worker intercepts network requests.

```
Eg: self.addEventListener('fetch', event => {  
  event.respondWith(  
    fetch.match(event.request),  
  });  
});
```

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

→ Indexed DB is a low-level NoSQL database, in the browser that allows web apps to store & retrieve

Use of Indexed DB in service worker.

Offline storage: Saves user data when offline & syncs it when online.

Persistent data: Unlike local storage indexed is async.

Background Sync: Service worker can use indexing to store data & sync it later.