

MPL Assignment 2

04/05

Q.1. Define ~~the~~ Progressive Web App (PWA) and explain its significance in modern web dev. Differentiate PWA from Traditional mobile apps.

Ans. A PWA is a web application that combine both web and mobile apps to deliver a seamless experience. PWA work off offline, load quickly and provide an app like experience on mobile.

- Platform independence
- Improved performance
- Offline functionality
- No app store dependency
- Engaging user experience

Key Characteristics

- (i) Installation: Installed from browser while traditional web apps are installed from mobile app store.
- (ii) Platform dependencies
- (iii) Offline support
- (iv) Updates
- (v) Performance

PWA are faster due to caching and lightweight assets

Q.2 Discuss responsive web design & explain its importance in context of PWA. Compare and contrast responsive, fluid and adaptive web design approach.

Ans 2. It's an approach that ensures web pages adapt to different screen sizes & orientations using flexible grids.

- ① Ensure a consistent user experience across different devices.
- ② Eliminate the need for multiple codebases for different devices.
- ③ Enhances usability by making content reachable on screen.

Comparison between Responsive Web vs Fluid vs Adaptive Web

| Feature | Responsive | Fluid | Adaptive |
|---------------|---|---------------------------------|---|
| Definition | Uses CSS media queries to adjust layout dynamically | Uses % for elements to scale | Uses predefined layout for different screen size. |
| Flexibility | Highly Flexible | Completely flexible | Fixed at specific breakpoints. |
| Performance | Efficient but requires more CSS adjustments | Smooth scaling | May cause layout shifts |
| Best Use case | Website and PWAs for All screens | Apps require 'Seamless scaling' | Website with predefined layouts |

Q3. Describe the lifecycle of service workers, including require installation and activation phases.

Ans lifecycle phases:

① Registration

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

② Installation

Occurs when the service worker is first downloaded

```
eg. self.addEventListeners('install', event => {{  
  event.waitUntil(  
    caches.open('v') then cache => {  
      return cache & All  
    }  
  });
```

③ Activation

Runs after installation and ensures old cache cleared if necessary

```
eg. self.addEventListeners('activate', event => {  
  event.waitUntil(  
    cache.keys(), then (keys => {  
      return Promise.all(keys.filter(key => key !== 'v'))  
    }  
  );  
}
```


④ Fetching and Updates

The service worker intercepts network requests

Eg. self.addEventListener('Fetch', event => {
event.respondWith(
catch.match(event.request)

});

});

});

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

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

Use of Indexed DB in service workers.

① Offline Storage - Saves user data when offline & sync it.

② Persistent Data - Unlike local storage, Indexed DB is asynchronous.

③ Background Sync - Service workers can use Indexed to store data and sync it later

