05/05

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D15B-31

PWA ASSIGNMENT-2

Q1) Define Progressive Web App (PWA) and explain it's significance in modern web development. Discuss the key characteristics that differentiate PWAs from traditional mobile apps.

→ A progressive web app (PWA) is a type of web application that utilizes modern web capabilities to deliver an app like experience to users across various platforms such as desktops, smartphones and tablets.

Significance in modern development:

(1) Cross-Platform compatibility: PWAs work seamlessly across different devices and platforms

(2) Improved performance: PWAs are optimized forspeed & perfomance, allowing for faster loading times + smoother ux.

(3) Offline functionality: PWAs can cashe essential resources & content, enabling users to access the app even when they're offline or experiencing poor network conditions.

Key Characteristics -

(1) Cross-Platform Compatibility: PWAs are built using web technologies & can run on any device with a modern web browser, while traditional apps are typically developed

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separately.

(2) Installation: PWAS canbe installed directly from the browser without the need to go through an app store, whereas ~~thorse~~ traditional mobile ~~apps~~. applications need to be downloaded

(3) Offline Support: PWAS can work offline or with limited network connectivity.

Q2) Define responsive web design + explain its importance in the Context of Progressive web apps. Compare + contrast responsive, fluid, + adaptive web design approaches

ans- Responsive web design is an approach to web development that aims to create websites that adapt seamlessly to various screen sizes + devices

Importance of Responsive web design:-

(1) Cross-Device compatibility — PWA, are designed to work on different devices including desktops, smartphones + tablets.

(2) Enhanced user experience - By dynamically adjusting the layout + Content basedon screen size, it helps to provide a Consistent ux across devices.

	Responsive web design	Fluid web design	Adaptive web design
(1)	Adapts website layout & content based on viewport size using CSS media queries	Utilizes flexible layouts & fluid grids that smoothly adjust screen sizes	Creates multiple versions of a website for specific device size, serving appropriate versions
(2)	offers flexibility in design adjustments across various viewport sizes.	Prioritizes proportional resizing, ensuring smooth adaption	Provides flexibilty through predefined layouts for different services
(3)	Responds to viewport size changes through CSS media queries	Utilizes fluid grids to adjust layouts smoothly without detection	Detects the user's device & serves the appropriate version accordingly.

Q5) Describe the lifecycle of Service workers, including registration, installation & activation phases

→ The lifecycle of service waters comprises three main phases, registration installation phase, Here the script is passed & executed triggering the 'install' event. Within this event listener, developers typically cache static assets & resources necessary for offline functionality.

- Upon successful installation, the service worker enters the activation phase. During activation, it becomes active + capable of controlling web pages.

- Overall, the lifecycle of service workers enables web applications to leverage features like caching, push notifications & background sync.

Q4) Explain the use of indexedDB in the Service Worker for data storage.

→ IndexedDB is a low-level API provided by modern web browsers for client side storage of structured data.

(1) Persistent Storage - IndexedDB provides persistent storage, meaning the stored data remains available even after browser is closed + reopened.

(2) Asynchronous API - IndexedDB operates asynchronously allowing database operations to be performed without slacking the main thread.

(3) Structured data storage - IndexedDB stores datain a structured format, typically using object storesto hold Javascript objects.

(4) Data caching : Service workers can use indexedDB to cache data fetched from the network enabling offline access to resources suchas HTML, CSS + Javascript files + even dynamic data from APIs.

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