

REVIEW ON: PROGRESSIVE WEB APP FOR ORGANIZATION SYSTEM

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ABSTRACT

The Nowadays, the number of smartphone users increased tremendously. As smartphones get used in large amount, the number of apps are also increased. But the problem with these native web apps is it cannot work properly when network is poor or unreliable. Also these apps require large memory space and they cannot work on offline mode. So for overcoming all these problems, the concept of Progressive Web Apps comes in frame which can work on any platform. The technologies we are using for it are Application Shell and Service Workers.

Keywords: Application Shell, native web app, network, Progressive web app, Service Workers.

I. INTRODUCTION

In today's world, smartphones are used everywhere. The number of smartphone users was 2.1 billion in 2016 which will grow around 2.5 billion in 2019. As number of smartphone users is large; the apps for android/iOS are also large in amount. But while installing these apps on android/iOS, many problems are occurring like low memory space in mobile, slow internet connectivity and many more. For overcome to all these problems Google has proposed a way to have one app on both android and iOS. This new technology is nothing but Progressive Web Apps (PWA). Progressive Web Apps are called future of Web Technology and Mobile Apps. Progressive Web Apps bridges the gap between websites and native apps. Progressive Web Apps provides the best user experience than websites and requires less memory space than native apps. Application Shell and Service Workers are the main elements in Progressive Web App. Also Progressive Web Apps are giving the more features like push notifications, splash screen and symbol on home screen. When Progressive Web Apps are launched from home screen, they mixed in environment. Progressive Web Apps are top-level, full screen and also work on offline mode. In future, Progressive Web Apps are the most forward look mobile apps. Hence, in this paper, we propose a system which gives an innovative approach for organization system along with Progressive Web App. In background of PWA the service worker is working which is a set of API that allows developer to programmatically cache and preloaded assets and manages the data through a concept called push notifications. Service Worker is a module which runs its own thread. It is responsible to provide generalized entry points by which PWA can process the background task.

The characteristics and features of progressive web apps are as follows:

- **Progressive** - Work regardless of browser choice, because they are built with progressive enhancement. Also it works for every user.
- **Connectivity independent** - It can be work on low network connectivity or even on offline mode also.
- **Responsive** - Fit in any form factor, mobile, tablet, desktop.
- **App-like** - Use application-shell for app like user experience.
- **Fresh**- Because of service worker, it is always up-to-date.
- **Safe**- Served via TLS to prevent snooping and ensure content has not been tampered with.
- **Discoverable**- Identifiable as applications because of W3C manifests and service worker registration scope for allowing search engines to find them.
- **Re-engageable**- Make easy re-engagement through features like push notifications.

In this paper we are putting focus on creating progressive web app for an Organization System.

II. LITERATURE REVIEW

By taking this topic for research and building the progressive web app for an organization system we come across lot of background work created and conducted by various researchers. As we are familiar with using mobile web apps on smartphone which are the subset of WWW and are really slow and support limited browsers on smartphones which could not handle full web support.

For many years mobile web apps look like a dirty and slow and going to die. Adaptive and responsive design came to make full websites look good on mobile with rich experiences. But now it looks like mobile web apps comes in form again. Companies are now working on bridge the gap between mobile web apps and web by using these progressive web apps. These companies are working and try to make mobile version of web faster. Native Apps on mobiles work fast comparatively mobile websites are slow. In 2016, this particular problem of Web and native App was main point of conversation during all the discussion and conference. Researcher around the world was planning to invent a new way of programming which will help to fill the gap between Web and Native Apps.

Following table summarizes the work done on progressive web app by researchers in all over the world.

Sr. No.	Title	Author	Year of publication	Problem in existing system	Solution to existing system	Future Scope
1.	Native Apps Vs. Mobile Web app	William Jobe	2013	Problems Occur in native apps	The solution for native app is mobile web app	-
2.	Beyond Native Apps : Web Technologies to the Rescue!	Ivano Malavolta	2016	Problems in native mobile apps	Different strategies for overcoming problems like hybrid web apps and mobile web apps	It will be investigate on the price that developers and users may have to pay for those features
3.	Progressive WEBAPP : Review	Rahul Surendra Mishra	2016	Native apps won't provide proper user experience	Progressive web apps with better user experience	It will be worth evaluating the efforts and overall performance benefits
4.	PWA : An Alternative Way To The Native Mobile Apps	David Fortunato, Jorge Bernardino	2016	Native apps can't run on all platforms	This paper gives the solution , evolutions for progressive web apps which runs on all platforms	It will be introduce the major advantages on developing of progressive web app
5.	Progressive Web Apps: The Possible Web-native Unifier for Mobile Development	Andreas Biorn-Hansen, Tim A. Majchrzak and Tor-Morten Gronli	2017	For developing native apps, cross-platform approach is required	This paper gives novel approach for Progressive Web apps	One can apply research questions from cross-platform
6.	Advanced Software-Technological Approaches for Mobile Apps	Andriy Luntovskyy	2017	Old approaches of developing mobile apps	This paper deals with new approaches for mobile app development like fat and thin clients	-

	Development					
7.	Assessing the Impact of Service Workers on the Energy Efficiency Of Progressive Web App	Ivano Malavolta, Giuseppe Procaccianti, Paul Noorland	2017	Old Mobile web apps lag behind native apps in user experience	Assessing impact of service worker on PWA which provides better user Experience to PWA	Push further with the level of automation
8.	Building Progressive Web Apps Using Polymer Library	Harry Alvin Waidan Kefas	2017	The problem in the web applications now a day is the user experience when the connection is unreliable.	This paper indicates The development of PWA by using polymer library approach	-
9.	Analysis of Cache in Service Worker and Performance Scoring of Progressive Web App	Abhi Gambhir, Gaurav Raj	2018	Native apps have a large gap between websites and apps	PWA is developed for bridge the gap between websites and apps	-
10.	Architectural Pattern of Progressive Web and Background Synchronization	Kashish Behl, Gaurav Raj	2018	As native apps cannot work in offline mode	This paper gives the architectural pattern to develop PWA which can work in offline mode	It will provide cost savings by reducing the amount of memory required

Table 1: Literature Review

III. SYSTEM ARCHITECTURE

There are various ways by which this all in approach of progressive web app model goes, but one of the most common way of making PWA is by using Application Shell. This is not a compulsory requirement, but does come with several benefits.

- **Application Shell :**

The application shell architecture uses the user interface so that it can work offline and generates its own contents by using JavaScript. When user goes on frequent repeat visits to same app then it gives you the meaningful pixel positions so that screen can be loaded fastly without the network. This is how we can increase the performance gains.

- **Service workers :**

Service workers are the main part of Progressive Web App which runs in background separately from the web pages. All the response to events, network requests made from client and server are managed by service workers. The Service workers are generally kept for a short time. It only wakes up when it gets an event and runs only as long as it needs to process it.

The API which we are going to use in Service Workers is generally limited when we compare it with the full functional JavaScript. This is standard for workers on the web. The DOM Structure of a web page is not accessible by a Service worker. It cannot access the DOM but can access things like the network request, fetch API and Cache API. The Indexed DB API and `postMessage()` are also available to use for data persistence and messaging between the service worker and pages it controls^[1]. Push events sent from server can invoke the Notification API to increase the engagement of user. A service worker can intercept network requests made from a page and return a response retrieved from the network, or retrieved from a local cache, or even constructed programmatically.

Effectively, it is a programmable proxy in the browser. The main part is that, regardless of where the response comes from, it looks to the web page as though there were no service worker involvement. Service Workers are used to increase the performance of Web app. Service workers can make sites work offline or help in speed up the content by, intercepting network requests to deliver programmatic or cached responses.

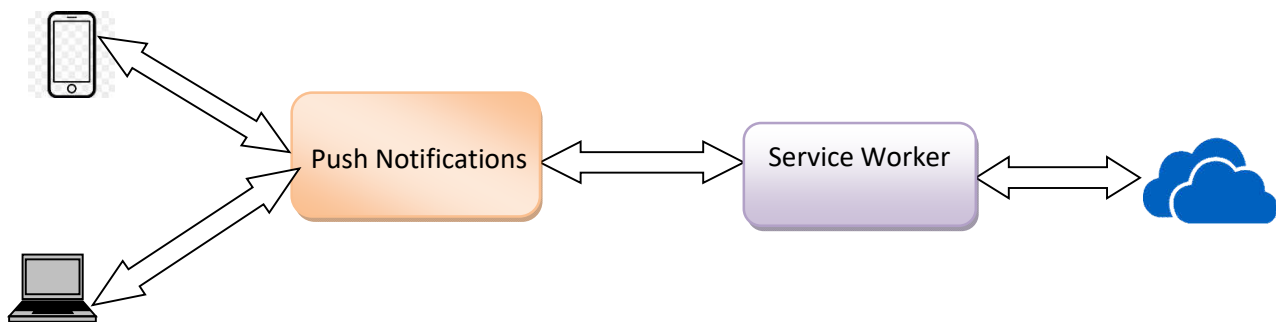


Fig: 1 System Architecture Of PWA For Organization System

IV. CONCLUSION

Progressive web app is a middle approach for native app and web application. It reduces lots of problems of user about poor network connectivity and rich interface just like native app. The app loads quickly, even when the user is having low network connectivity. PWA can send push notifications to the user and has an icon on the home screen and loads as top-level, full screen experience. Progressive web apps are an interesting forward look into the future of mobile apps. It will become an important factor in the world of apps.

V. REFERENCES

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