



PROGRESSIVE WEB APPLICATION FOR SALONS USING ARTIFICIAL INTELLIGENCE

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ABSTRACT

Progressive web application is the new way to provide features of both native apps as well as web browser and to provide security and is accessible for everyone over the web. We are collaborating PWA (Progressive Web Application) with AI (Artificial Intelligence) to provide better user experience to the customers. So our app not only can be used as normal app but also handles the whole salon management systems and helps customers to choose best salon in the location, best service and employee based on reviews and ratings provided by other customers. If customers are busy in something and can't make time to book appointment our AI assistant will do it for them. You can just tell the assistant to get the appointment for whichever service you need and other specifications, it works in the background, books appointment and notifies the customers once its done. The system makes the conversation as natural as possible. Maps embedded in web app can help to find the locations of the salons. So the main aim of the project is to provide platform for salon owners to grow business and help customers to choose best services and also secured and user friendly experience on our web app.

Keywords : PWA (Progressive Web Application), Artificial Intelligence, Machine learning, API (Application program Interface), chatbot, wordpress, digital ocean

INTRODUCTION

AI is one of the main factors that has great impact on our lives. It has changed the way people used to think, work and interact with technology. Hence by implementing AI and various other technologies we are trying to make salon application as much advanced as possible which will contribute towards making lives of people easier. Every week or month we need service from parlours/salons. So whenever we need service we go to the parlour/salon and wait for service or we can't get easily appointment from them so we can't easily justify which employee is good and which parlour/salon is perfect in that location. Even we don't know the cost of services and payment system. That's why we came up with the PWA. PWA is the combination of best of website and best of application. PWA for salons using AI and automated call appointment using an AI assistant. By taking this topic for research and building the PWA for salon system we came across lot of background work created and conducted by various researchers worldwide. So here is the literature review of the current systems.

FAILURES IN CURRENT SYSTEMS

Traditional systems of salon management are manual and insecure. Customers need to directly go to salons to get the services and are unaware whether the slots are available for them or not, what are the rates for the services. These early systems are pen-paper based systems. There are no counting systems which creates problems for both customers as well as owners [1].

PROBLEMS FACED BY SALON OWNERS :

1. Salon owners are unable to identify regular customers.
2. It becomes difficult to maintain records of their own staff, their working hours and leaves.
3. Have to note down, change or cancel bookings manually.
4. Difficult to manage payments and services regularly.
5. Owners have to keep daily reminders about the appointment details.
6. Attending one customer and give information to other can become difficult for the Salon Owners.

Problems faced by employees

1. It is difficult to keep track of the booking details.
2. Have to always contact/ message the customers via mobile to tell the appointment status mixed up with the shifts, leaves and holidays, as there is no proper way of managing them.

Problems faced by cashier

1. Finding prices with respect to services is difficult.
2. Manual billing issue.

Problems faced by customers

1. Customers have to visit the salon premises to make appointments (Specially the new clients).
2. Have to contact salon owners in order to know their booking status.
3. Have to wait a considerable time, to get the service done or till issuing the manual payment receipt.

Existing System

MIOSALON : This is a software which provides to manage salon functions efficiently.

Disadvantages

1. Requires internet to use.
2. To get enhanced features additional charges needs to be paid [2].
3. The systems saved details in shared database, therefore privacy of data cannot be assured.

URBANCLAP : This is a app which enables customers to get the access to salon services from wellness to beauty at home [3].

Disadvantages

1. We cannot make our own packages of services we want to access. We need to choose from the package provided by them.
2. There is no facility provided to contact the concerned person before bookings. We first need to make the booking and then only we get to contact the employee.
3. As the services are provided at home, after work cleaning house is again a major concern.

PROPOSED SOLUTION

Based on the failures of current systems and requirements of customers, we designed a web based application which provides user friendly experience and some powerful and unique features as follows :

LAMP Server : Our web application is hosted on LAMP [LINUX as operating system, APACHE as http server, MYSQL as relational database management system, PHP as programming language] which has additional advantages over WAMP [WINDOWS operating System] server. LAMP server provides more security than the WAMP server. Another advantage of LAMP server is that we can create highly dynamic website as compared to WAMP server which allows only basic and less dynamic HTML pages [4].

Progressive Web Application : Progressive Web App is the service which provides features similar to both Apps as well as Websites. Apps can be downloaded directly from the store and icon is available on screen and thus apps can be accessed easily whereas websites can be directly accessed via link and do not require

any sort of permissions. Progressive Web App is combination of app and website and thus provides benefits of both. Some of the features of PWA are :

1. Responsive on Laptops, Tablets as well as Mobile Phones.
2. Works well even if the internet quality is low or internet is not available.
3. User can easily navigate through pages just like apps.
4. Can be shared via URL.
5. Don't ask for any access permissions, thus your sensitive data is safer while using it[5].

ARTIFICIAL INTELLIGENCE : Artificial intelligence is one of the key factors for the industrial revolutions. It is changing the way people used to think, work and the way people used to interact with technology. For the salon based industry, artificial intelligence provides the power of automation by online booking, the power of personalization, it helps to make predictions and decision making, which earlier were dependent on the humans. With the increasing use of artificial intelligence, machine learning, and smart technology it has made human life easier by providing product personalization and offering knowledge-based beauty routines to their customers. AI has provided technologies like chatbot, voice assistant, product recommendation, etc that is helping in advancements in the salon industry.

AI based bookings : Customers can login to our website and can search for the salons. Once they select the salons they can either directly book an appointment by using booking form provided or they can use CHAT BOT provided in website to book appointment any salon for whatever service they need [6].

Chatbot : A Chat bot is a software which allows to carry out natural conversation by using either textual or auditory methods. Chat bots can be considered as intelligent assistants of human beings. Today many industries are relying on chat bots to provide advanced and user friendly experience to customers. Customer's retention and engagement has been main goal of any business to grow. Thus chat bots are used in many business tasks like scheduling appointments and managing calendars, booking tickets, voice assistants etc. Chat bot provided in the website has pre-defined set of questions as well as the database of Salons and their required information[7]. For example when customers want to book appointment in Lakme Salon, they will first click on the Chat Bot provided and then chat bot will ask for the details related to bookings and once the booking is done, the mail related to bookings will be received by the salon owners. User experience and engagement of customers can be improved by embedding chat bot in website. There are various platforms available for building customizable chat bots such as IBM WATSON, Microsoft bot framework, Dialog flow, Amazon Lex, chatter bot, chat fuel etc. Chat bots can be of two types :

1. Recognition based on keywords. In this type chat bot recognizes whatever user types and tries to give appropriate response based on keyword matching. Keywords customization option is available to admin.
2. Based on context.

This types of chat bots use advanced level Artificial intelligence and machine learning. This bots are with self learning and self improvement capabilities. These chat bots are also known as smart chat bots.

Voice assistant : We all feel more confident when we speak in our language. Besides this most of the people face problems during typing certain words during searching. Hence the idea behind the voice assistant is avoid typing and use your voice to search anything you want from the website. Voice search also known as voice

assistant uses algorithms like voice recognition, speech synthesis, and natural language processing to provide appropriate results[8].

Speech recognition system : The speech recognition system works by taking human voices as input, analyzing each sound, and using various algorithms to find the best word fit in that language and converting them into text. The speech recognition system uses NLP (Natural Language Processing) and deep learning neural networks. NLP is used to analyze, the human voice understand and derive proper meaning from it. The next step is that the software makes predictions based on the programming, and makes a hypothesis about what the user might be saying. After predicating about users likely said the software translates the conversation into text[9].

Another important technology used for voice recognition is NLP (Natural Language Processing)

Working of NLP : NLP is designed to simulate how human beings speak and respond accordingly. The vocabulary of an NLP consist of approx 60 thousand words. Because of the 60 thousand words, it can generate 215 trillion possible words combinations with just words, hence it becomes very impractical to search entire vocabulary for a word. To avoid this NLP is designed to search the smaller list of selected tagged keywords. Because of the tagged keywords, the software can easily narrow down the vocabulary into very less word. For example if you say phrases “check my balance” the tagged keywords used by NLP are “check”, “balance”.

1. Voice assistant embedded in website will help customers to browse through any information of website just by giving voice instructions. This will also help to enhance user experience. Customers just need to say a word and wherever that word is present in complete website would be displayed.
2. Voice Recognition Tool is powered by Machine Learning algorithms.
3. It recognizes more than 100 languages.
4. It has JavaScript Speech Recognition library.
5. You can also define and add some custom commands inside of your website.

Online payment : 1. Customers can book appointment and can directly make online payment.

2. The online Payments plugin allows user to accept payments through payment gateway on your WordPress site easily.

GPS : Maps embedded in website will help users to easily find location of salons . By using suitable software in their devices users can locate the positions of nearby salons and can also find directions.

Beauty tips : Beauty tips section consists of various tips posted by salon owners as well as other users. This section would be useful for salon owners for the publicity of their salons as their name would be displayed along with beauty tips. Along with beauty tips users can also suggest some products and can provide link to that product and earn through affiliate marketing.

SOFTWARE SPECIFICATIONS

WordPress : After researching about requirements of our project and different content management systems we decided to use wordpress for developing our website Word- press has following advantages :

1. Wordpress is easy to use and less time consuming.
2. Wordpress sites are more receptive than other sites.
3. Huge number of themes and plugins are available to make highly customized site.
4. Wordpress provides high ranking to sites in Search engine optimization.

There are some disadvantages as well but can be minimized by using certain methods.

Security : Security is biggest concern in wordpress sites. Hackers can easily attack through plugins, But setting up environment carefully can minimize the threat.

Storage space : Storage space can also be major concern but buying necessary subscription plans according to requirements can help minimizing this problem as well.

METHODOLOGY

The main aim of this project is to create a PWA for salons using AI in order to make booking appointments quick and easy for the customers. To develop this project we proceeded in following order :

1. Study problem statement and requirements of project thoroughly.
2. Our second step was to choose a technology in which we would build website.
3. After studying and analyzing advantages and disadvantages of different content management systems and requirements of project we decided to make website using WP.
3. After deciding the technology we purchased domain for our website from Godaddy.com and named it as findyoursalon.me.
4. Our next step was to create our own server to host the website. We decided to use Linux instead of windows as linux has its own advantages and more security.
5. We created account on digital ocean platform which enables to create LAMP (Linux, Apache, MySQL, Php) server by purchasing a droplet and registering domain name in that

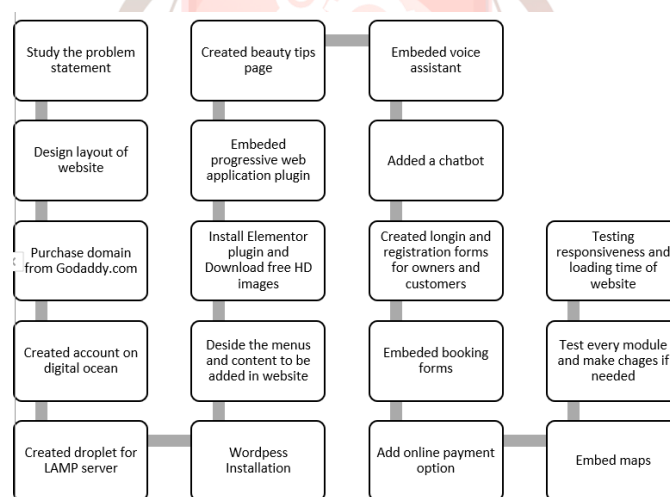


Figure 1: Flowchart for progressive web application droplet.

6. Once the server was ready we installed wordpress and loaded files in it and created wordpress credentials to build website.
7. Further we started developing our website.
8. We decided and designed the layout and sitemap for the website and decided the menus and content to be added in it.
9. Our first step was to install Elementor plugin as it makes building of website easier.
10. Next we downloaded royalty free HD images related to our content from different websites.
11. We started creating and designing pages one by one and added content in it.
12. Next we embedded Progressive web Application plugin in it in order to make easier for customers to get icon of application on main screen and accessing it than actually downloading the application from playstore.

13. Further we created one more page called beauty tips and added it to menu so that customers can read those tips in free time as well as we provided option to add their own beauty tips along with their name. This feature would be beneficial for salons for their publicity as their name along with their tips would be displayed when they add any tip.

14. After that we embedded voice assistant in website which would make website even more user friendly and responsive.

15. Our next step was to add chatbot to website. We researched about different types of chatbots available and their functionalities and chose to embed one which would fulfill need of our website and then created the required database by adding sets of questions.

After that we created login and registration forms for owners of salons as well as customers.

16. Our next step was to collect data from different salons regarding their services, service rates, employers and also gather pictures of their Infrastructure.

17. Further we created sections for each salon added their information and images to their own section and gave access of that particular page to salon owner by using client portal module so that owners can make necessary changes in their own page as per their requirements and updates.

18. Next we embedded booking forms in each section and added gathered contact details for bookings into the form.

22. Next we added online payment option.

23. Our next step was to embed maps in each section according to the obtained address details of each salon.

24. Our next step was to test every module and complete website and make necessary changes if required.

25. Lastly we Tested the responsiveness and the loading time of website.

In this way we approached towards solving the problem statement.

UX/UI : The main 4 components of the UI/UX design is :

1. Visual design : It includes the look of the website.
2. Information architecture : It includes the structure of the website.
3. Usability : It checks the ease to use the website (user-friendliness).
4. Interaction design : It includes how well customer engage in the design of the website.

The UX/UI plays every important role in the progress of the businesses or helping businesses to reach a particular goal. The main advantage of the UX/UI is that it enhances the overall look of the website, it provides user-friendliness, it helps to easily navigate through the website which leads to customer satisfaction which ensures an increasing number of customers and higher conversation rate for a merchant website. Nowadays the users have a lot of alternatives to a single product. Hence to grab the attention of the customer toward your websites UX/UI design is very important[10].

RESULTS

GTMetric is a tool that tracks the performance of the website. GTMetric's page report summarizes the page performance based on the key indicators like loading speed of the page. It helps you to analyze the page with Google PageSpeed and also according to the Yahoo! rulesets. It provides services such as :

1. Load Test

This basically helps check the loading time of the websites.

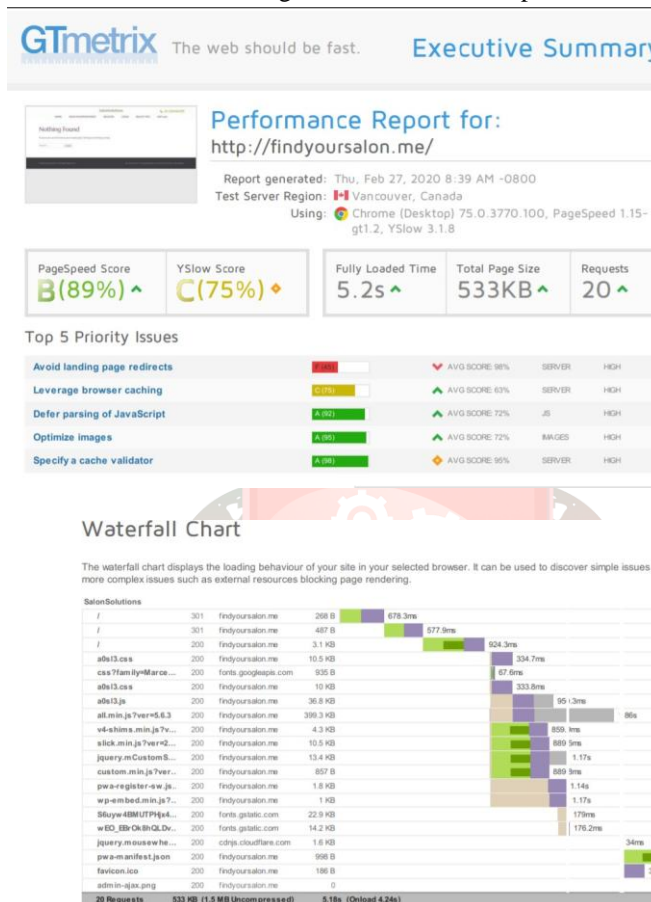
2. Grade of website

This is a grading mechanism which is provided after the analysis of website.

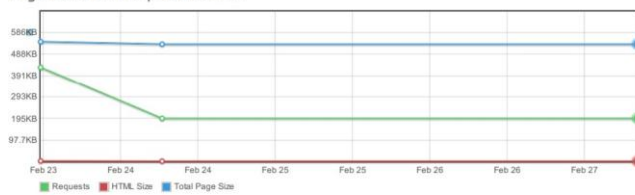
3. Page Speed

This checks the time required by individual pages to load and also the time required to load a complete website

Figure 2: Performance report for website



Page sizes and request counts



PageSpeed and YSlow scores

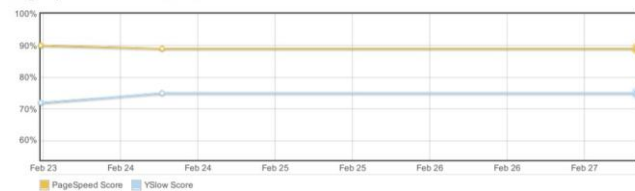


Figure 3: Graph for page speed of website

Figure : Recommendations for website

RECOMMENDATION	GRADE	RELATIVE	TYPE	PRIORITY
Avoid landing page redirects	F (100)	▼ AVG SCORE: 98%	SERVER	HIGH
Leverage browser caching	C (75)	▲ AVG SCORE: 63%	SERVER	HIGH
Defer parsing of JavaScript	A (92)	▲ AVG SCORE: 72%	JS	HIGH
Optimize images	A (95)	▲ AVG SCORE: 72%	IMAGES	HIGH
Specify a cache validator	A (98)	◆ AVG SCORE: 95%	SERVER	HIGH
Minify JavaScript	A (99)	▲ AVG SCORE: 90%	JS	HIGH
Minify HTML	A (98)	◆ AVG SCORE: 98%	CONTENT	LOW
Minify CSS	A (99)	◆ AVG SCORE: 96%	CSS	HIGH
Enable compression	A (99)	▲ AVG SCORE: 88%	SERVER	HIGH
Avoid bad requests	A (100)	◆ AVG SCORE: 98%	CONTENT	HIGH
Enable Keep-Alive	A (100)	◆ AVG SCORE: 99%	SERVER	HIGH
Inline small CSS	A (100)	◆ AVG SCORE: 96%	CSS	HIGH
Inline small JavaScript	A (100)	◆ AVG SCORE: 95%	JS	HIGH
Minimize redirects	A (100)	▲ AVG SCORE: 89%	CONTENT	HIGH
Minimize request size	A (100)	◆ AVG SCORE: 95%	CONTENT	HIGH
Optimize the order of styles and scripts	A (100)	▲ AVG SCORE: 94%	CSS,JS	HIGH
Put CSS in the document head	A (100)	◆ AVG SCORE: 100%	CSS	HIGH
Serve resources from a consistent URL	A (100)	▲ AVG SCORE: 90%	CONTENT	HIGH
Serve scaled images	A (100)	▲ AVG SCORE: 70%	IMAGES	HIGH
Combine images using CSS sprites	A (100)	▲ AVG SCORE: 93%	IMAGES	HIGH
Avoid CSS @import	A (100)	◆ AVG SCORE: 98%	CSS	MEDIUM
Prefer asynchronous resources	A (100)	◆ AVG SCORE: 100%	JS	MEDIUM
Specify a Vary: Accept-Encoding header	A (99)	◆ AVG SCORE: 96%	SERVER	LOW

CONCLUSION

Thus Progressive Web application for Salons provides Customers as well as Salon owners platform to use online appointment management and helps to leave the traditional booking systems and avail new technological methods to make lives automated and easier. Today digital marketing has become really important to establish any business. This app is also helpful for owners to establish their business in market. Chat bots makes the process even more easy and interesting. So the main aim of developing user friendly and highly responsive web app is fulfilled in the project. However, enhancements are to be made

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