



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 7, July 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.542



9940 572 462



6381 907 438



ijircce@gmail.com



www.ijircce.com

Dynamic Web Page Builder Using MERN Stack

Mrs. A. Rajeswari, Mohamed Afrath S, Naresh E, Gomathi Shankar P S

Assistant Professor II, Dept. of CSE, Velammal Engineering College, Chennai, India

UG Student, Dept. of CSE, Velammal Engineering College, Chennai, India

ABSTRACT: People are becoming increasingly interested in creating their own digital content. One most common way of doing so is building websites. Conventionally, creating a website needs some knowledge on coding. This makes even laymen fail showing their online presence through websites. The Crux of Dynamic Web Page Builder makes it easier for the users to build their websites by knowing what attributes their websites have. Not only can they render their webpages but also they can see the internal code of their web page which has been pushed to their GitHub repositories using the users personal token. A large number of form fields like textboxes, radio buttons, dropdowns are available. These are rendered modified using the meta data given through the JSON file. The web application provides html code for different types of form templates such as Feedback, Contact us, Shopping Cart; so that the users can concentrate on server side programming while we provide code for the desired form. We also provide chatbot for the newbies to learn about new form elements which is basic for developing a web page.

KEYWORDS: JSON, meta data.

I. INTRODUCTION

In computer science, Web Application Development is a way of developing a web application software that runs on a web server, unlike computer-based software programs that run locally on the operating system of the device. Web applications can be accessed by the user through a web browser with an active internet connection. These applications are programmed using client-server modeled structure. Web sites are also called web applications and they have similar functionality as a desktop application. Web pages can be designed either statically or dynamically. If a webpage in a website focuses only on design and not on functionality then such webpages can be designed statically. With the help of dynamic web pages , we can design static web pages and it also provides an enormous opportunity to build pages as per requirements at any time. Dynamic web page development speeds up the website building process and also we can customize the webpage by altering the requirements as per demand and trend.

II. RELATED WORKS

Jimdo: The AI Builder: Building a site with Jimdo is a good choice if you're looking for an assisted website builder. More than 20 million websites have been created on Jimdo, and there's a free basic plan you can try out. The paid plans include not only the web editor, but also images, content and a simple online store. However, you have to be aware that Jimdo is not as feature-packed as other website builders. However, it is a solid tool, and what it does, it does well. If you're a WordPress fan, you might be disappointed that the templates are much less flexible in Jimdo, and the blog is geared towards beginners more than experienced bloggers. Nevertheless, the Jimdo blog is a good module because it integrates into the website so nicely.

Some journal papers like Dynamic Forms UI: Flexible and Portable Tool for Easy UI Design [1], Creating Interactive User Interfaces by Demonstration using Crowdsourcing [3] provide dynamic forms and rendering based on metadata of various fields. In addition, the look and feel of the widgets can be easily customized using a UI in a code-free manner.

Research and Application of Data Exchange based on JSON [2] and Research on JSON and XML Data Transmission and Their Efficiency and Security, Science and Technology provide a lightweight data interchange technology. In order to solve the problems in the process of integrating data of various agricultural application systems, such as heterogeneity, redundancy and low degree of sharing, on Henan Rural Information Integrated Service Platform, a data exchange scheme based on JSON Technology is designed by JAVA programming language in this study, and which achieved data interchange between portal platform and other agricultural application systems.

These papers describe our preliminary work with respect to the stated goals. The major objective of this work is to build a tool that can be integrated in existing applications and frameworks.

Table 1. Literature survey

S. No.	Author (Year)	Advantages	Remarks
1	Rajvardhan Oak [1]	Rendering the JSON file with flexible UI design	Even though the JSON file is rendered with flexible UI design, the code for the rendered UI is not provided. In DWPD, the code can be pushed to the github repository and also many templates are available with their corresponding code.
2	Changxia Sun [2]	JSON file can be exchanged with high efficiency	
3	M Abirami,Kumaran [4]	Modifying the DOM using VDOM in ReactJS and rendering the UI components	

III. DESIGN AND IMPLEMENTATION

1. ARCHITECTURE

The architecture of Dynamic Web Page Builder consists of five main components. They are:

- Sign In and Authentication
- Upload and Parsing
- Render and Templates
- Chat Bot
- Git Manipulation and API Control

1.1 SIGN IN AND AUTHENTICATION

In this stage, the end user will be able to login using OAuth Authentication to get access to Pre built form templates and also be able to input JSON files for form generation. The OAuth authentication is secured well enough with Sign in Token based access which is used by GitHub.

1.2 UPLOAD AND PARSING

This module is chained with the Sign In module where the signed in user can upload their form structure as a JSON input file. The file input is being verified for its file type and syntax for upload. Then the parsing is triggered on the JSON structure. This JSON is serialized internally and gets populated as interim data.

1.3 RENDERING AND TEMPLATES

This part is coupled carefully with the Parsing module where the interim data being parsed is rendered to a preview section and their corresponding Code sections. Users can get a preview of satisfaction from this Module. This module is coupled with the Templates Sub module. This offers the user to make use of pre-built form templates.

1.4 CONVERSATIONAL CHATBOT

The user can also build a form of their wish on the go by simply interacting with ChatBot. This chatbot is integrated to the website that uses Primitive Natural Language Processing to follow up and ease the Form creation

process. After giving the desired tag and its attributes, the user can be able to copy the code for the rendered tag or even push the same code to GitHub.

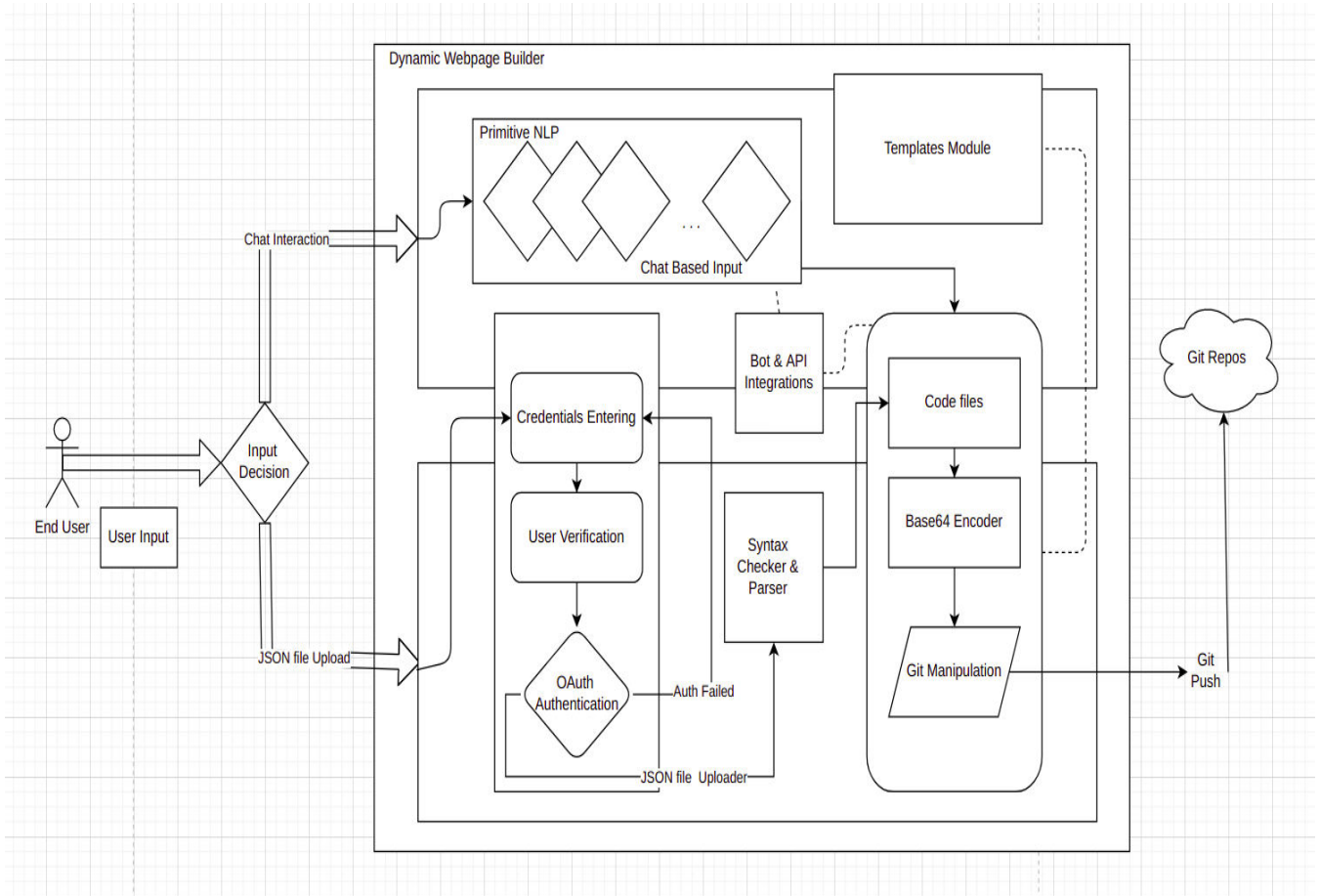


Fig 1. DWPD Architecture

1.5 GIT MANIPULATION AND API CONTROL

This is one dominant feature of the Project making it possible for the user to integrate their forms to be Version Controlled by GitHub. These APIs are fast, seamless and the forms are securely encoded with an underlying sequential Base64 Algorithm.

2. METHODOLOGIES

API Fetch: The Fetch API has a `fetch()` is an inbuilt JS method for fetching resources from servers or API endpoints. This takes a compulsory argument, the path or the URL of the resource. It has been guided by the ECMAScript Standard promise for Request and Response. It defines the CORS and HTTP Header semantics.

Base64 Conversion: Base64 is a subtle encryption algorithm being carried out for representing and transferring Web Page document contents as binary data over the mediums that allow printable characters. This Base Encoding is more predominantly adopted in email attachments like Images, videos, etc.

React Component Rendering: ReactJS library gained its popularity and fame not only because of it being lightweight, but also for its effective component rendering capabilities. Applications built using ReactJS usually have a single root DOM node, which becomes easier for rendering. React components get rendered by an underlying `ReactDOM.render()`. This function becomes more effective because ReactJS uses VDOM.

React WebHooks: Hooks are functions that let you “hook into” React state and lifecycle features from function components. A Hook is a special function that lets you “hook into” React features. For example, `useState` is a Hook that

lets you add React state to function components. We'll learn other Hooks later. Some of the predominant Hooks used are

- useState()
- useEffect()
- useRef()

III. IMPLEMENTATION

The implementation of Dynamic Web Page Builder can be done by using token based auth, API controlling, Natural Language Processing (NLP), JSON parsing and git manipulation.

3.1 TOKEN BASED OAUTH

Token-based authentication is a protocol which allows users to verify their identity, and in return receive a unique access token. During the life of the token, users then access the website or app that the token has been issued for, rather than having to re-enter credentials each time they go back to the same webpage, app, or any resource protected with that same token.

OAuth is an open-standard authorization protocol or framework and a type of token based authentication that describes how unrelated servers and services can safely allow authenticated access to their assets without actually sharing the initial, related, single logon credential. In authentication parlance, this is known as secure, third-party, user-agent, delegated authorization.

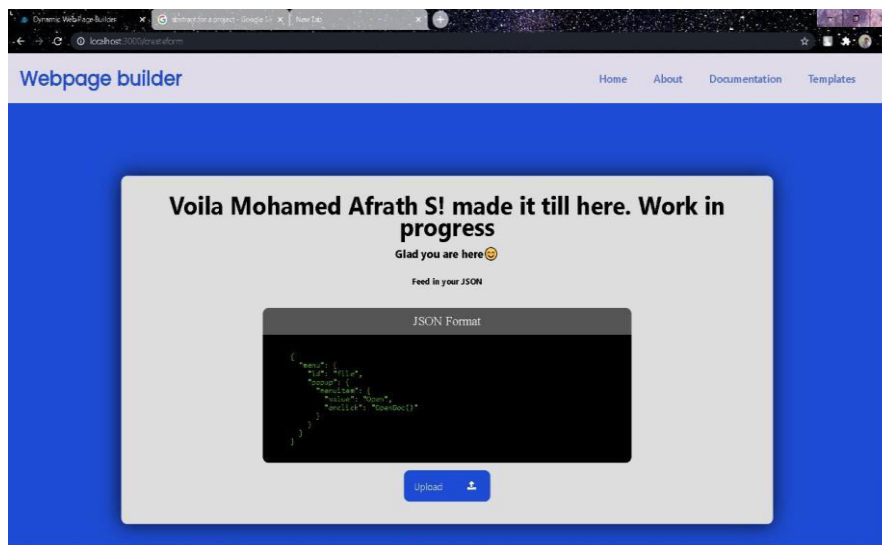


Fig 2. JSON upload page

3.2 API CONTROLLING

While API being a set of definitions and protocols for building and softwares, it also establishes the content required from the user and the system. A few API used throughout the Projects are,

- GitHub API for Push, Commit and Staging Code versions to repositories.
- RESTful API for Client Server Architectural HTTP Communication.

3.3 PRIMITIVE NATURAL LANGUAGE PROCESSING

Natural Language Processing (NLP) refers to AI method of communicating with an intelligent systems using a natural language such as English. Processing of Natural Language is required when you want an intelligent system like robot to perform as per your instructions, when you want to hear decision from a dialogue based clinical expert system,

etc. The field of NLP involves making computers to perform useful tasks with the natural languages humans use. The input and output of an NLP system can be Speech, Written Text.

3.4 JSON PARSING AND GIT MANIPULATION

The JSON input is fed to the server via a file upload. This JSON data is parsed from the Web Server using `JSON.parse()` method in JavaScript. This is done by constructing JavaScript values or Objects. These Objects can have any levels of Objects and Arrays nested within themselves. These Objects in turn can be transferred to the server during AJAX communication if needed. A sample json file format

```
{
  "ActionDisplayName" : "Apply",
  "Attributes" : [
    {
      "Name" : "Username",
      "Size" : "1000",
      "Type" : "Search"
    },
    {
      "Name" : "Upload",
      "Size" : "1000",
      "Type" : "File"
    }
  ]
}
```

Git Version control is a system that records changes to a file or set of files over time so that you can recall specific versions later. The End-user here is provided with a facility to keep track of the current Snapshot of the Code generated for the corresponding user desired form. The Git Software with its Staging, Pushing and Committing manipulations are carried out for the project workflow.

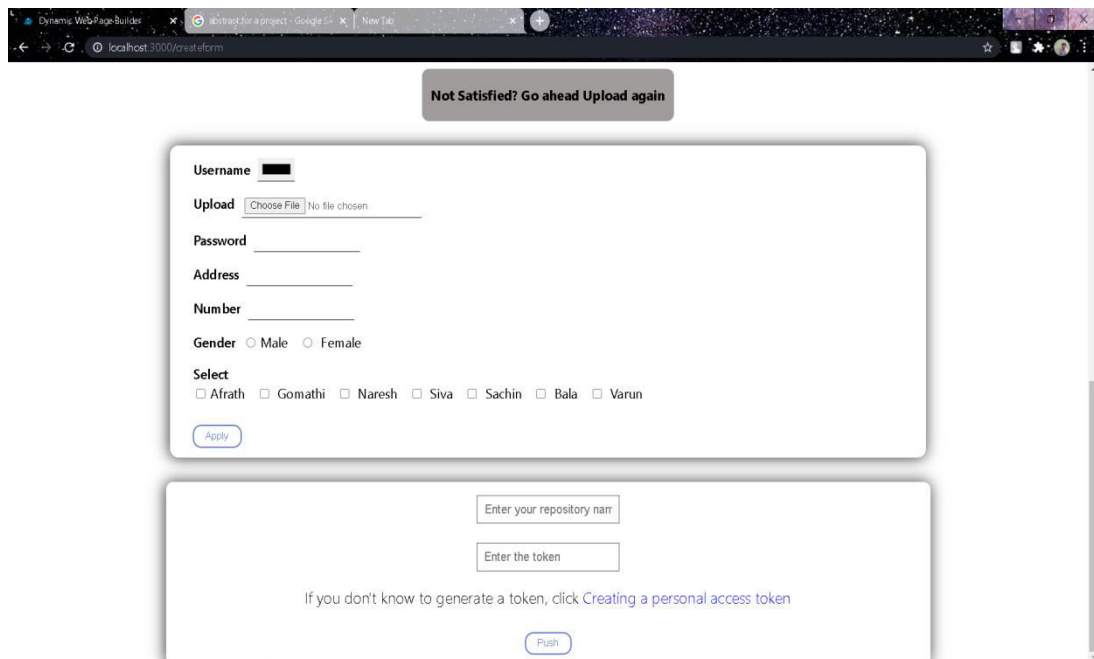


Fig 3. Parse and render page

IV. PERFORMANCE METRICS

The overall performance of Dynamic Web Page Builder is analyzed with **Lighthouse** in Google Chrome browser. Web performance is all about making websites fast, including making slow processes seem fast. Does the site



load quickly, allow the user to start interacting with it quickly, and offer reassuring feedback if something is taking time to load (e.g. a loading spinner)? Are scrolling and animations smooth? This article provides a brief introduction to objective, measurable web performance*, looking at what technologies, techniques, and tools are involved in web optimization. Accessibility is the practice of making your websites usable by as many people as possible. We traditionally think of this as being about people with disabilities, but the practice of making sites accessible also benefits other groups such as those using mobile devices, or those with slow network connections. Search engine optimization (SEO) is the process of improving the quality and quantity of website traffic to a website or a web page from search engines. Quantity of traffic - Once you have the right people clicking through from those search engine results pages (SERPs), more traffic is better. To increase the quality and quantity of website meta tags are added with the appropriate keywords related to the website. The overall performance analysis of DWPD is below as a bar graph.

Overall performance analysis

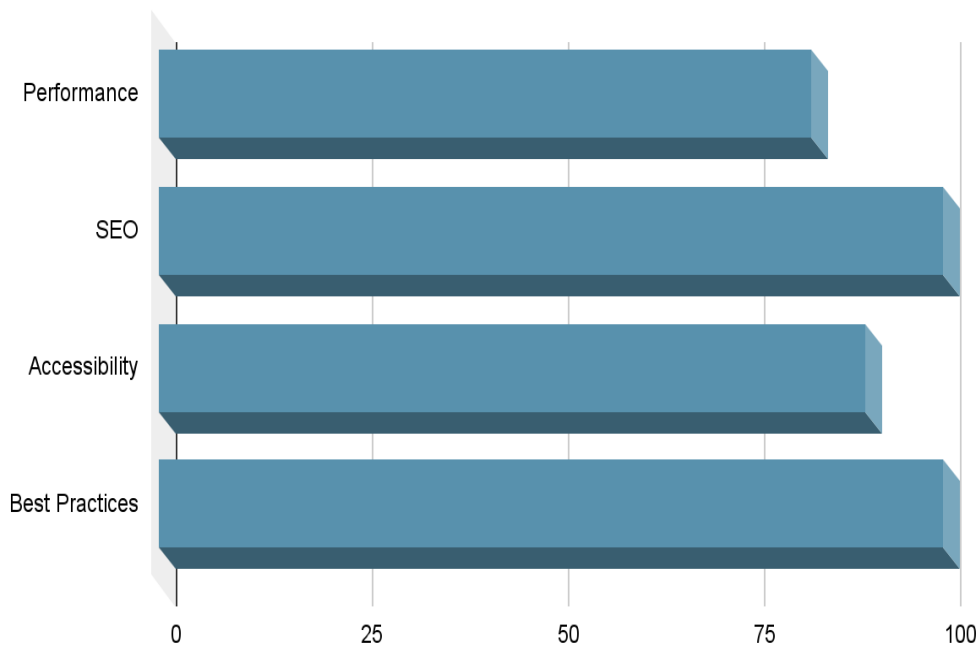


Fig 4. Overall performance analysis

V. CONCLUSION

Dynamic Web Page Builder helps users to create a dynamic web page by uploading a json file with a great performance. DWPD sure will have a peculiar bandwidth of users and sure will serve its purpose of development easing the way the user uses it. It will help beginners to develop their own page dynamically. Customization of the webpage can be done at any time. Dynamic web page designing makes the application user-friendly. Designing dynamic web pages consume less time but while static doing it is not so. In the future, the next version of the project will be bundled with features like form and repository live link sharing and even the URLs can be shortened beforehand. The release will rollout with various API integrations for Sharing forms through Social media sites and creating dedicated portals for forms.



REFERENCES

- [1] "Dynamic Forms UI: Flexible and Portable Tool for Easy UI Design", Rajvardhan Oak, Mrunmayee Khare, Advait Gogate, Gargi Vipra, 2018.
- [2] "Research and Application of Data Exchange based on JSON", Changxia Sun, Xia Zeng, Chengzhong Sun, Haiping Si, Yanling Li, April 14 2020.
- [3] "Creating Interactive User Interfaces by Demonstration using Crowdsourcing" Rebecca Krosnick, 2018.
- [4] "Webapp Service for Booking Handyman Using MongoDB, Express JS, React JS, Node JS" K Saundariya, M Abirami, Kumaran R Senthil, D Prabakaran, B Srimathi, G Nagarajan, 2021.
- [5] "Research on JSON and XML Data Transmission and Their Efficiency and Security, Science and Technology", Ran Yuan, 2014 .
- [6] "A detailed analysis of data consistency concepts in data exchange formats (JSON & XML)", Gaurav Goyal; Karanjit Singh; K.R. Ramkumar, 2017.
- [7] "Comparative research of developing technologies of website", Sun Jian-hong; Li Jun-sheng; Shang Yanling, 2009.
- [8] "A Dynamic, Cost-Effective Multi Website Solution for University", Sun Jian-hong, Li Ying-fang, 2009.



INNO  **SPACE**
SJIF Scientific Journal Impact Factor
Impact Factor: 7.542



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 **9940 572 462**  **6381 907 438**  **ijircce@gmail.com**



www.ijircce.com

Scan to save the contact details