

A project report on

OPTIMIZING A WEBPAGE AND BOOTSTRAP

Submitted in partial fulfillment for the award of the degree of

Computer Science and Engineering

for

CSE3002 – Internet and Web programming



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By

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**SCHOOL OF COMPUTER SCIENCE AND
ENGINEERING**

November, 2022



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DECLARATION

We hereby declare that the project report entitled “**OPTIMIZING A WEBPAGE AND BOOTSTRAP**” submitted by us, for the award of the degree of Computer Science and Engineering, VIT is a record of bonafide work carried out by us under the supervision of Dr. Muthumanikandan V.

We further declare that the work reported in this project report has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university.

Place: Chennai

Date:

Signature of the Candidate



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SCHOOL OF COMPUTER SCIENCE AND ENGINEERING CERTIFICATE

This is to certify that the report **entitled “OPTIMIZING A WEBPAGE AND BOOTSTRAP”** is prepared and submitted by **“Harsh Parwal & Parth Kumar Thakur”** to VIT Chennai, in partial fulfillment of the requirement for ‘J’ component of CSE3002 – Internet and Web Programming subject is a bonafiderecord carried out under my guidance. The project fulfills the requirements as per the regulations of this University and in my opinion meets the necessary standards for submission.

Signature of the Guide:

Name: Dr. Muthumanikandan V

Date:

ABSTRACT

The advance of technology requires that people need publicity and administrative advice of their business through the Web. It is there where the role of the web developer appears since this topic must make use of the appropriate tools that enhance their work. The style pages have been facilitating the elaboration of web pages for some years now. However, programmers have not created any framework to optimize the size of the interfaces automatically.

By doing so, navigation from any device without any anomaly. Currently, the massive use of mobile devices requires the optimization of the design of the graphic interfaces developed for computers to the resolution of mobile devices. One could say that this motivated the company Twitter in 2011 to create Bootstrap, a framework with the function of adjusting the resolution of websites that can be developed from a computer and then be displayed correctly in the different screen resolutions of mobile devices

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We thank our parents, family, and friends for bearing with us throughout the course of our project and for the opportunity they provided us in undergoing this course in such a prestigious institution.

Place: Chennai

Date:

Name of the student

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FIG 7.1 FUTURE MODEL ARCHITECTURE

LIST OF ACRONYMS

HTML – HYPER TEXT MARKUP LANGUAGE

JS – JAVA SCRIPT

VS CODE - VISUAL STUDIO CODE

WWW – WORLD WIDE WEB

CSS – CASCADING STYLE SHEETS

Chapter 1

Introduction

Bootstrap is a open source CSS framework for mobile's front end development. It contains HTML,CSS and JS based design templates. It is designed to develop a responsive enabled dev of mobile based application.The style pages have been facilitating the elaboration of web pages for some years now. However, programmers have not created any framework to optimize the size of the interfaces automatically. Currently the usage of mobile applications is on peak and it requires the optimization to create a GUI for mobile applications which was previously designed for windows computers. The essence of creating a responsive design is to have a website that is mobile-first and responsive, organized from navigation, content, and images that are scalable across multiple devices.

Website optimization is the process of using tools, advanced strategies, and experiments to improve the performance of your website, further drive more traffic, increase conversions, and grow revenue.

One of the most critical aspects of website optimization is search engine optimization (SEO). The technique not only focuses on getting various pages of your website to rank high in the SERPs for specific keywords but enables prospects to find your brand in the easiest possible manner. The other critical aspect here is on-page optimization. This technique ensures that prospects that land on your website has the best user experience compelling them to take the desired action and convert into a lead.

So, by optimizing your website, you can not only tap into an untapped market in the most effective and efficient manner (without paying for advertising) but open doors to more conversions and revenue gains.

The goals of a website will vary depending upon the type of business, the business' target customers, and the desired action of that audience: a purchase, filling out a form, or reading an article. The desired action of a website visitor can also be conversions, or the number of audience members who complete a certain action.

For instance:

- An online publication practices website optimization with the conversion goal of increasing the number of articles visitors read.
- An online store optimizes its website to encourage completion of checkouts and repeat purchases.
- An online software company optimizes its website to improve the rate at which visitors sign up for (or convert to) a free trial of the product.
- An insurance company optimizes its website to capture more potential leads for insurance coverage sales.
- A fundraising campaign optimizes their donation form to encourage more donations.

1.1 OVERVIEW

We will be designing a webpage that will be optimized not only for desktop but for other screen types also. The webpage will take less load time and a good response time over cloud. The website will retain users' attention and present it to all internet users in the most convenient way possible. We will evaluate the optimized webpage with and without bootstrap and graphics optimization. The results will be showed in form of mathematical terms and graphs. Our main objective of this project is to reduce the response time to improve performance and user satisfaction.

1.2 CHALLENGES

Designing new websites for mobile phones and other mobile devices presents a number of challenges for web designers. Since it requires adopting strategies for designing the user experience for the vertical resolution before scaling it up for desktops, laptops or other larger display devices, the options for the menu, elements, content, navigation and tools get sharply limited. This is specifically relevant for mobile first web designs. Updating existing websites for mobiles or redesigning for responsive or adaptive versions also come with similar challenges. So, let's find out some of the major challenges of this design process.

Usability

Websites that are designed or optimized for mobile fit the type of screen size on which a visitor views it. In the case of building responsive designs of desktop web versions for mobile devices, the concept is based on using media queries to selectively serve up styling as the viewport size decreases. However, for mobile-first websites, it is just the opposite with the added challenge of creating a finger-friendly design with fewer resources.

Clutter

Smartphones, though getting increasingly popular, are not as powerful as desktops or laptops. Designers have to cut all the clutter that is usually featured on desktop websites when designing or optimizing websites for mobile because here the screen size available is too limited. This means that you need to reduce some of the content and offer only the important information that showcases your products and services in the best possible way. Cutting down the clutter when designing a website for mobile is a huge challenge for startups and SMEs as doing it the right way is the key to success.

Speed

According to Kissmetrics, 47% of visitors leave a website if it takes more than 3 seconds to load. This is because users nowadays do not buy the idea that a website can be slow and it is one of the most critical challenges for web designers when designing or optimizing websites for mobile

1.3 PROJECT STATEMENT

A desktop based website is generally not much responsive and take a little more load time on other screen types (smartphones , tablets) . Also the desktop based webpage do not automatically adjust its screen resolution on other hybrid devices. The website will be not much mobile friendly without optimization and also it could lead to higher bounce rates and a lower Search Engine Results Page (SERP) ranking. Also the load balancing is the big challenge to decrease the load time of the website. The main result of load balancing is minimizing resource use.

1.4 SCOPE OF THE PROJECT

Our proposed system will work efficiently on low resolution devices as well as existing devices. Also our system will be more optimized and refined to work on cloud systems. Our system will load more quickly over cloud system which we will test on virtual machines to stimulate the results. The run time and load time will be minimised. We will try to balance the load . For the system and the resource allocation techniques so that the website would work more efficiently and fast.

CHAPTER 2

BACKGROUND

Introduction

Bootstrap is a open source CSS framework for mobile's front end development. It contains HTML, CSS and JS based design templates. It is designed to develop a responsive enabled dev of mobile based application. The style pages have been facilitating the elaboration of web pages for some years now. However, programmers have not created any framework to optimize the size of the interfaces automatically. Currently the usage of mobile applications is on peak and it requires the optimization to create a GUI for mobile applications which was previously designed for windows computers. The essence of creating a responsive design is to have a website that is mobile-first and responsive, organized from navigation, content, and images that are scalable across multiple devices.

Current bootstrap works till only 1200px , we have modified the script to work with high resolution to make it more interactive. It can even support 8k resolution devices efficiently. The only drawback of applying bootstrap for high resolution devices is that it decrease the performance of the website , in short it affects load time very much. So we have tried to optimize the page in such a way that it works with high res devices with less load time.

LITERATURE SURVEY

- The research examines the influence that website design has on the level of profitability experienced by e-commerce and website-based businesses. Within the context of this work, the merit is in the points that are made on the building of good websites from a GUI point of view. It offers a wide variety of tools that may be used to make a website look more appealing. The study only analyses the criteria that are required for prospective success and the influence that web designing has on those elements, hence it does not cover any novel approaches or adjustments that could improve upon existing methods. This is one of the paper's main flaws. [1]
- The article explores adaptable and responsive web development as a technique of interacting with the web that is newer and more advanced. In this paper, apps for actual web development are discussed side-by-side with CSS and other tools that are used in the process of developing these websites. The research that is presented in the paper with the methodologies that are mentioned in it suggests that programmers do not devote enough value to the performance of the websites, which results in poorer optimization. [2]
- A description of the current state of online marketing strategies is provided through the usage of website media in the research. It is about how people acquire information about tertiary institutions, including their perceptions of the institutions' online presence and their general thoughts on the offerings that they provide. The characteristics of keywords that need to be taken into account while

constructing SEO for websites are outlined in this article. The study was written for the tourist polytechnic in Palembang. Additionally, it contributes to the success of e-strategies. Despite the fact that the research produced favourable findings, it would be beneficial for future studies to present targeted keywords in order to raise the level of visibility. Customers are able to locate the business's website by using a wide array of search terms, as opposed to simply one keyword search. Additionally, the process of optimization only takes a short amount of time, and it takes some time for SEO to start having a noticeable effect. [3]

- The paper discusses the risk with profiling. Without first exploring the site, one can develop a technology profile and a particular site characteristic by evaluating SEO criteria. The expertise of the auditor and the calibre and extent of the audit conducted by the testing application are the two variables that determine the significance of profiling. It was discovered that the WWW1 site is responsive while visiting the websites and verifying the results of the profiling. It turned out that a diagnosis based solely on the responsiveness analysis performed with the S1 program was incorrect. [4]
- Out of the 150 questionnaires that were provided to the respondents, 118 were collected and used in the study, representing a 78.67% return rate. To determine demographic data about respondents and study questions, data were analysed using descriptive statistics like frequency, percentage, mean, and standard deviation. The results provide a concrete method for improving web optimisation. The results of this paper show that there is only one HTML file overall on the website for the chosen university. [5]
- The paper shows methods of search engine optimisation that can help improve dynamic website and query times. Results from the paper show a poor trend of search query performance for major website queries based on inaccuracy adjustments in general adaptive models. [6]
- Paper presents dataset on website optimisation for academic websites and general analysis of web performance. The limited dataset may make up for a skewed result for the paper. [7]
- The usage of MATLAB in analysis of data within a website has been displayed by the paper with promising results for an enhanced genetic algorithm-based method for scaling connected hybrid systems. Limited and restrictive applications. [8]
- The research developed a straightforward formula that calculates the lower bound of ϵ , the decrease in response time of webpage x caused by object delivery from edge nodes, and examined the impact of edge computing in each web category. The results show the effect of edge computing delay in response was high in almost all locations tested. [9]
- Web navigation optimisation algorithms are explored in the paper with application for further speeding up response time and improvement of web pages. Application of the optimisation may be limited and difficult to achieve in many scenarios. [10]
- It is a robust method that consists of many decision trees, making it highly accurate. While comparing the performance of algorithms, the time required to set up the key(s) has been ignored. [11]
- This paper shows how DES algorithm can be used for data encryption and can help in protecting user

data. Since vendors permitted to enter the program must meet certain criteria, competition is restricted. [12]

- This system will give its users with a wider and more precise understanding of how they might improve their professional lives, but the proposed application is not interactive. [13]
- This paper shows hoe JIT practices can be used in supply chains, transport and logistics. The paper does not show the management of electronic and networking materials as it does for physical materials. [14]
- The paper clearly explains the strategies to make cloud computing easily accessible large IT companies. The paper doesn't explain how the usage of cloud computing can be made available to small IT companies. [15]
- This paper has explained how Cloud computing and Web 2.0 technologies are proving to be empowering agents for the implementation of KM projects. The paper has not mentioned anything about cloud computing being used in entrepreneurial projects. [16]
- The paper helps an entrepreneur in understanding what type of cloud should they target. The paper does not explain how one can target the type of cloud can become the it's consumers. [17]
- The paper helps an entrepreneur in understanding what type of challenges they can face while integrating cloud. The challenges listed have not been provided real acceptable solutions. [18]
- This paper shows how large amounts of data can be stored using various data centers. This paper does not deal with the problem of network sniffing in cloud services. [19]
- It shows how to deal with data traffic on cloud servers due to large amounts of data. This paper doesn't show how to deal with fault tolerance issues. [20]
- It is a robust method that consists of many decision trees, making it highly accurate. While comparing the performance of algorithms, the time required to set up the key(s) has been ignored. [21]
- This project justifies how they will be dealing with large amounts of data using cloud computing. These projects don't show how they will be dealing with the problem of large data traffic. [22]
- This paper shows how DES algorithm can be used for data encryption and can help in protecting user data. Since vendors permitted to enter the program must meet certain criteria, competition is restricted.

Restricted competition can lead to higher customer costs. [23]

- This project justifies how they will be dealing with large amounts of data using cloud computing. These projects don't show how they will be dealing with the problem of large data traffic. [24]
- This paper shows how to deal with traffic due to large amount of data. This paper doesn't show how to deal with the issue of data security. [25]

CHAPTER 3

PROPOSED SYSTEM

Our proposed system will work efficiently on low resolution devices as well as existing devices. Also our system will be more optimized and refined to work on cloud systems. Our system will load more quickly over cloud system which we will test on virtual machines to stimulate the results. The run time and load time will be minimised. We will try to balance the load For the system and the resource allocation techniques so that the website would work more efficiently and fast.

3.2 CHANGES INTRODUCED

1. Grid behaviour and prefix used

- HD+ $\geq 1600\text{px}$: .col-xga-
- Full HD 1080p $\geq 1920\text{px}$: .col-fhd-
- Retina 1440p $\geq 2560\text{px}$: .col-rt-
- 15" Retina $\geq 2880\text{px}$: .col-rt15-
- UHD $\geq 3840\text{px}$: .col-uhd-
- 4K $\geq 4096\text{px}$: .col-4k-
- 8K $\geq 8192\text{px}$: .col-8k-

2. Changes in index page

css : Inlined all of the CSS into the head of the document and added the HTML media="print" attribute to the external style sheet link for print styles.

Js : Added the HTML async attribute to all script tags and used the Brunch build tool to concatenate and minify.

Images : Resized images that were too large and compressed all images with the image compression tool.

Browser Caching : Leveraged browser caching by including an .htaccess file in the root of the website. The file contains expires headers, which sets long expiration times for all CSS, JavaScript and images.

3. Optimization of pizza site

We tried to optimize the pizza site to fix low FPS to produce consistent 60fps when scrolling the webpage. The website is both bootstrapped and optimized for its best performance even though it has a large amount of graphical data present. Changes which were made are discussed in the upcoming slides.

4. Reducing the pizza elements

We have reduced the amount of sliding pizza elements from 231 to 42 which sufficiently fills the screen with pizza.

5. Optimized css animation and improved efficiency

- Applied `translateX()` and `translateZ(0)` transform functions to the sliding pizza elements within the `updatePositions` function.
- Moved the calculation which utilizes the `scrollTop` method outside of the loop.

6. Fixing browser paint events

Removed height and width styles from the generated pizza elements and resized the pizza image to 100 x 100 to prevent the browser from having to resize the images.

7. Optimized animations

Added the `updatePositions` function as a parameter to the `window.requestAnimationFrame` method in the scroll event listener which optimizes concurrent animations together into a single reflow and repaint cycle.

8. Resized pizza

Moved the `newwidth` calculation inside the `changePizzaSizes` function out of the loop. Again, selected only the first `.randomPizzaContainer` element in the document.

3.3 ALGORITHMS/ TECHNIQUES USED

BOOTSTRAP

1. Adding `col-xga (1600+)`, `col-fhd (1920+)`, `col-rt (2560+)`, `col-rt15 (2880+)`, `col-uhd (3840+)`, `col-4k (4096+)`, `col-8k (8192+)` classes with all related options: `order`, `offset`
2. Adding options `none`, `inline`, `inline-block`, `block`, `table`, `table-row`, `table-cell`, `flex`, `inline-flex` for all three
3. Adding options `flex-`, `justify-content-`, `align-items-`, `align-content-`, `align-self*` for all three

1. Optimized loops

INPUT : CHANGES IN SCRIPT

OUTPUT : WEBSITE PERFORMANCE ENHANCEMENT

```
var items = document.querySelectorAll('.mover');  
for (var i = items.length; i--;)   
var phase = Math.sin((document.body.scrollTop / 1250) + (i % 5));  
items[i].style.left = items[i].basicLeft + 100 * phase + 'px';
```

2. Reducing the pizza elements

INPUT : CHANGES IN SCRIPT

OUTPUT : WEBSITE PERFORMANCE ENHANCEMENT

```
var cols = 8;  
var s = 256;  
for (var i = 200; i--;)   
var elem = document.createElement('img');  
elem.className = 'mover';  
elem.src = "../public/img/pizza.png";  
elem.style.height = "100px";  
elem.style.width = "73.333px";  
elem.basicLeft = (i % cols) * s;  
elem.style.top = (Math.floor(i / cols) * s) + 'px';  
document.querySelector("#movingPizzas1").appendChild(elem)  
;  
updatePositions();
```

3. Optimized css animation and improved efficiency

INPUT : CHANGES IN SCRIPT

OUTPUT : WEBSITE PERFORMANCE ENHANCEMENT

```
frame++;
window.performance.mark("mark_start_frame");
var items = document.querySelectorAll('.mover');
var top = (document.body.scrollTop / 1250);
for (var i = items.length; i--;)
    var phase = Math.sin( top + (i % 5));
    //items[i].style.left = items[i].basicLeft + 100 * phase + 'px';
    var left = -items[i].basicLeft + 1000 * phase + 'px';
        items[i].style.transform = "translateX("+left+")
translateZ(0)";
window.performance.mark("mark_end_frame");
    window.performance.measure("measure_frame_duration",
"mark_start_frame", "mark_end_frame");
    if (frame % 10 === 0)
        var timesToUpdatePosition =
window.performance.getEntriesByName("measure_frame_duration");
        logAverageFrame(timesToUpdatePosition);
```

4. Fixing browser paint events

INPUT : CHANGES IN SCRIPT

OUTPUT : WEBSITE PERFORMANCE ENHANCEMENT

```
var cols = 8;
var s = 256;
for (var i = 31; i--;)
    var elem = document.createElement('img');
    elem.className = 'mover';
    elem.src = "../public/img/pizza-slider.png";
```

```
elem.basicLeft = (i % cols) * s;  
elem.style.top = (Math.floor(i / cols) * s) + 'px';  
document.querySelector("#movingPizzas1").appendChild(elem);  
updatePositions();
```

5. Optimized animations

INPUT : CHANGES IN SCRIPT

OUTPUT : WEBSITE PERFORMANCE ENHANCEMENT

```
window.addEventListener('scroll', function() )  
    window.requestAnimationFrame(updatePositions);
```

6. Improved Efficiency (RESIZED)

INPUT : CHANGES IN SCRIPT

OUTPUT : WEBSITE PERFORMANCE ENHANCEMENT

changePizzaSizes(size)

```
    var dx = determineDx(document.querySelector(".randomPizzaContainer"),  
size);
```

```
    for (var i = 0; i < document.querySelectorAll(".randomPizzaContainer").length;  
i++)
```

```
        var newwidth =  
(document.querySelectorAll(".randomPizzaContainer")[i].offsetWidth + dx) + 'px';  
        document.querySelectorAll(".randomPizzaContainer")[i].style.width = newwidth;
```

changePizzaSizes(size)

```
    var dx = determineDx(document.querySelector(".randomPizzaContainer"),  
size);
```

```
    var newwidth =  
(document.querySelector(".randomPizzaContainer").offsetWidth + dx) + 'px';  
    for (var i = 0; i < document.querySelectorAll(".randomPizzaContainer").length;  
i++)
```

```
        document.querySelectorAll(".randomPizzaContainer")[i].style.width = newwidth;
```

```
changePizzaSizes(size)
    var dx =
determineDx(document.querySelector(".randomPizzaContainer"), size);
    var newwidth =
(document.querySelector(".randomPizzaContainer").offsetWidth + dx) +
'px';
    var elements =
document.querySelectorAll(".randomPizzaContainer");
    for (var i = 0; i < elements.length; i++)
        elements[i].style.width = newwidth;
```

CHAPTER 5

PERFORMANCE EVALUATION

5.1 PERFORMANCE ANALYSIS



FIG 5.1 INDEX PAGE
Page speed score before fix



FIG 5.2 Page speed score after fix

PIZZA SITE

We've gathered analytics data from the website's original version and the new version that we've implemented. As can be seen from the given images:

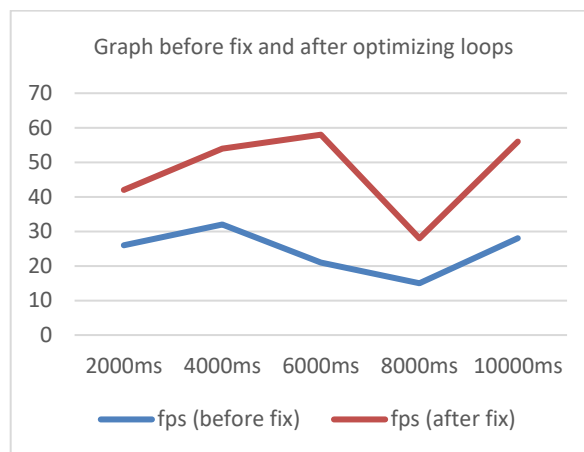


FIG 5.3 Pizza Site Before Fix and after optimizing loops

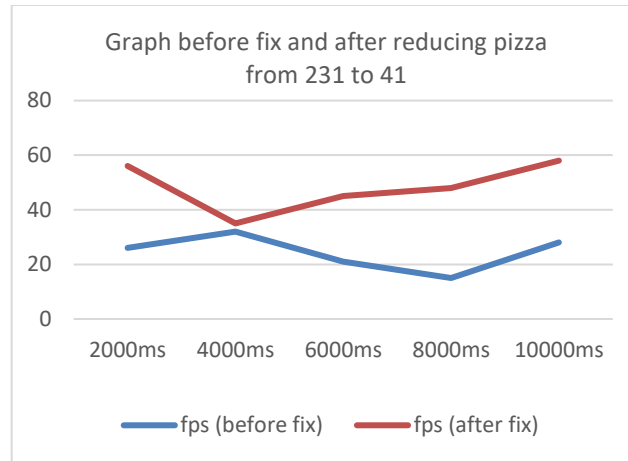


FIG 5.4 Pizza site before fix and after reducing pizza from 231 to 41

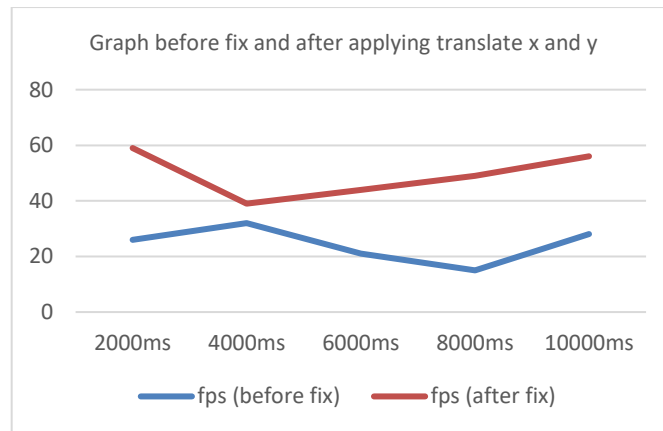


FIG 5.5 Pizza site before fix vs after applying translateX() and Y() axis transform functions to the sliding pizza elements

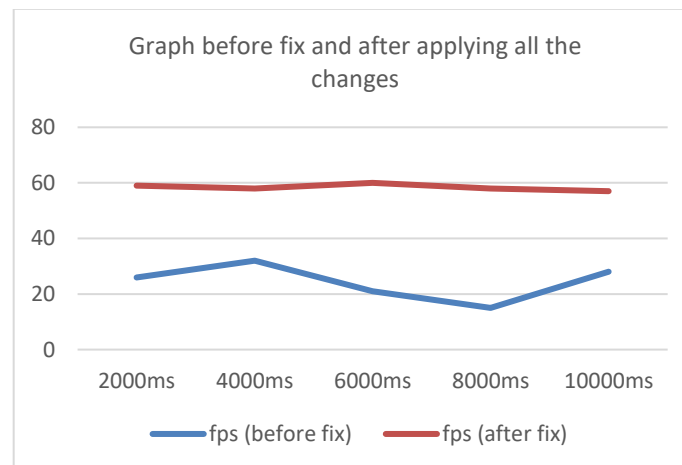


FIG 5.5 Pizza site before fix and after applying all the changes

As you can see, the latency both with and without bootstrap has been greatly decreased, increasing the performance of the website. We can see that in fig 5 the fps of the site increased from 30 to 60 , but we can see that it is not linear and stable so we

had to apply more changes. In figure 6 we can see that the graph has slightly formed a linear shape but has decreased the fps around 4000 ms after which it was linearly increasing , so to fix it we applied `translateX()` and `translateY()` axis to transform functions to sliding pizza elements. Now for making the performance overall stable we have applied few new changes which include moving a calculation utilizing the `scrollTop` property outside of a loop , removing height & width styles from pizza image tag and resizing the image and including `window.requestAnimationFrame` method within scroll event handler which made performance more stable and we were able to get constant 60 fps. Thus we have optimized our site to give constant FPS and run more stable.

5.2 OUTPUTS

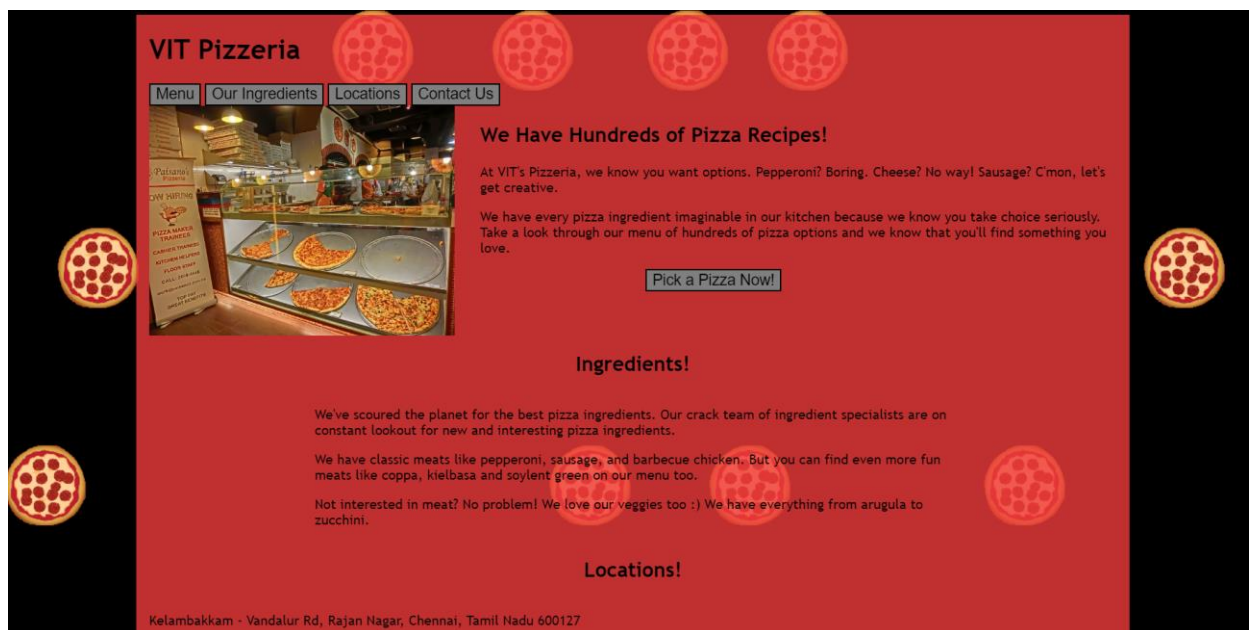


FIG 5.6 VIT PIZZERIA

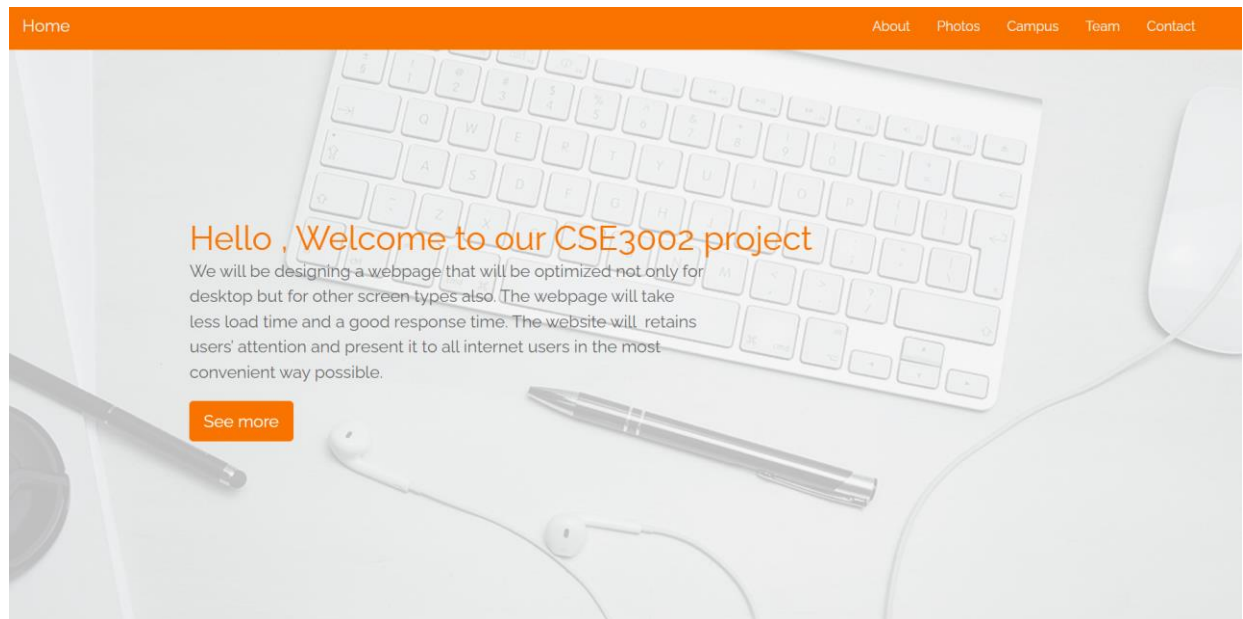


FIG 5.7 HIGH RESOLUTION WEBSITE - 1

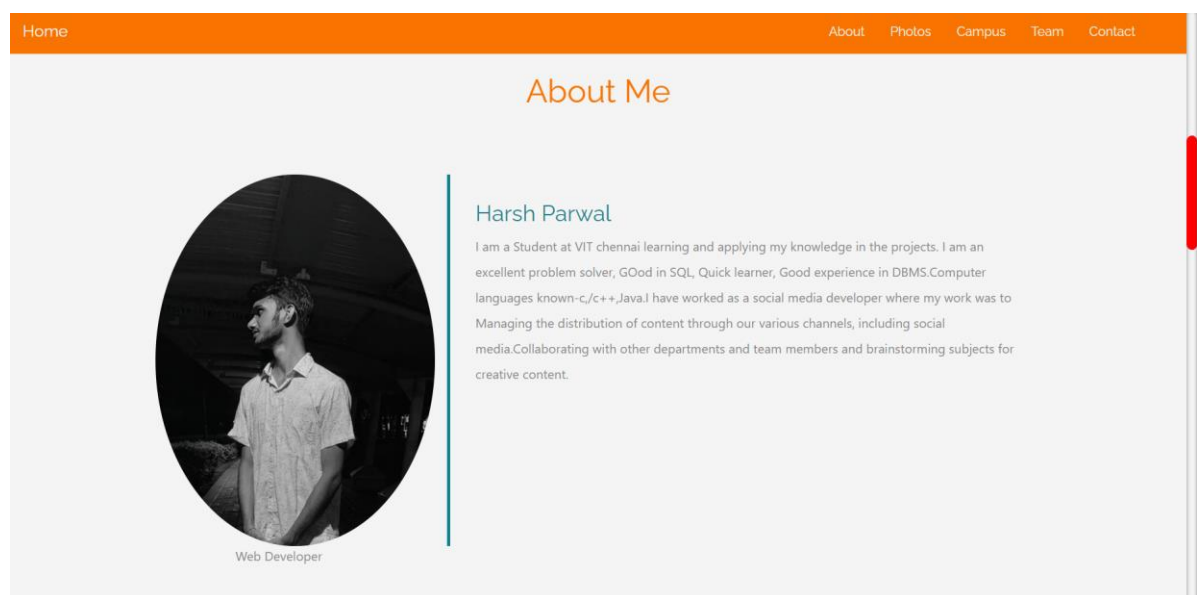


FIG 5.8 HIGH RESOLUTION WEBSITE - 2

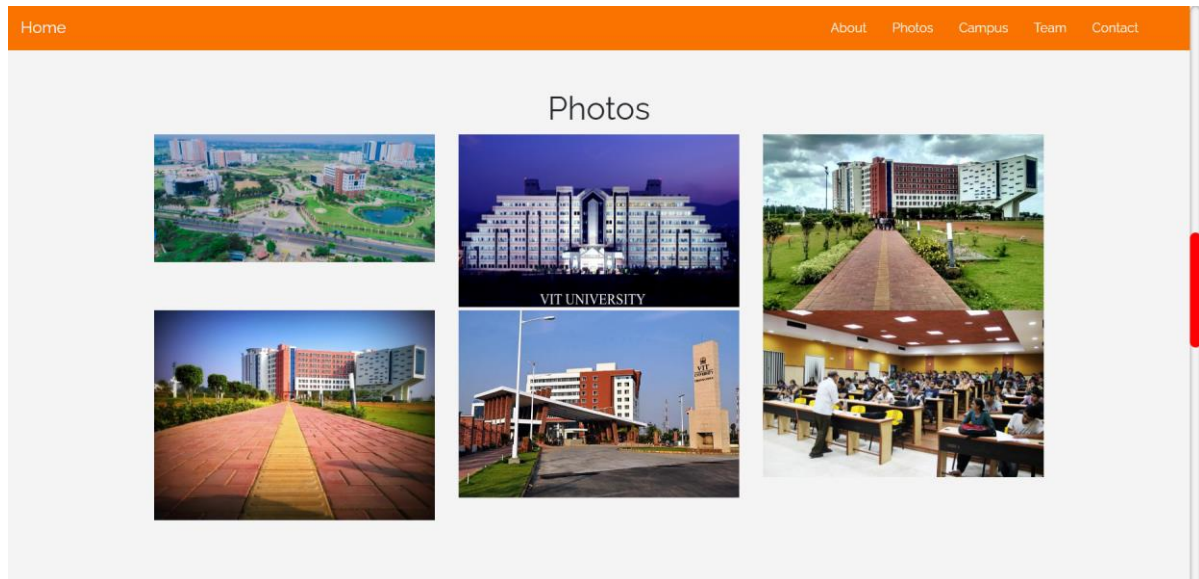


FIG 5.9 HIGH RESOLUTION WEBSITE - 3

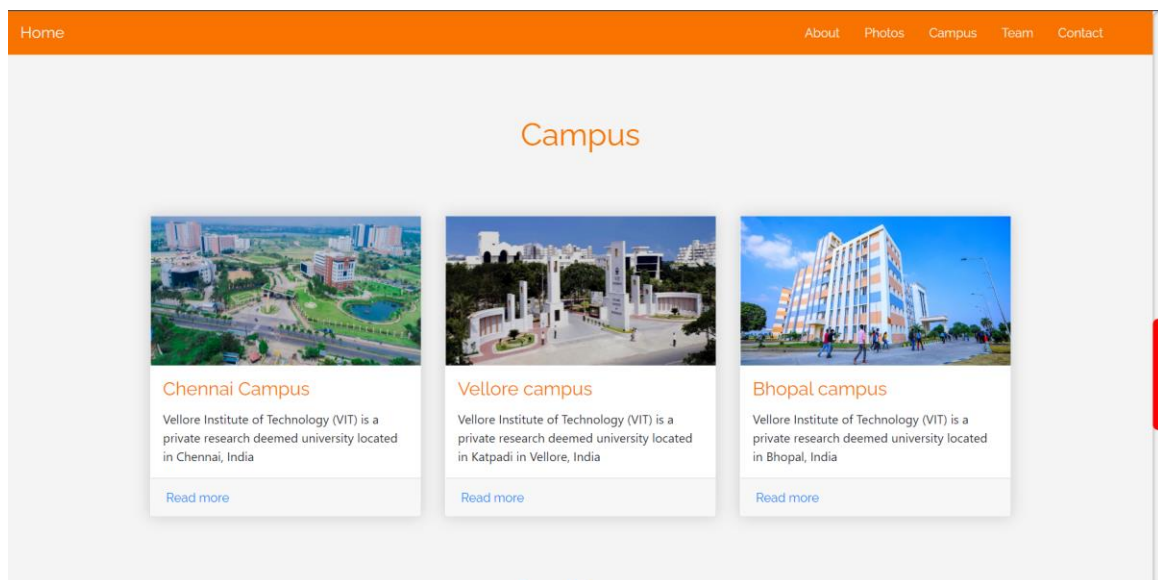


FIG 5.10 HIGH RESOLUTION WEBSITE – 4



Harsh Parwal

Student

I love web development! We will be designing a webpage that will be optimized not only for desktop but for other screen types also. The webpage will take less load time and a good response time. The website will retain users' attention and present it to all internet users in the most convenient way possible.



[Interactive website based on high res](#)

Modified bootstrap script for high resolution.



[VIT's Pizzeria](#)

Who wants a performant pizza?

© Developed by Harsh Parwal

DCL: 10ms, onload: 295ms

FIG 5.11 INDEX PAGE

CHAPTER 6

FUTURE WORKS AND CONCLUSION

As we have designed 3 websites with high resolution and other two performance based websites. We've gathered analytics data from the website's original version and the new version that we've implemented. We can see from the graphs provided in previous chapters that the website is optimized to work on 60 fps and we have optimized the graphic content of the website to increase performance of the website by decreasing load time and increasing run speed. Also in high graphics website we have optimized bootstrap in such a way that it will work up to 8k devices with high resolution. Thus we can conclude that our website is optimized for performance and also can support high graphics up to 8k.

We have not tested how our website will work on cloud when multiple devices will try to access the website where concepts of cloud computing can be used. A good load balancing is equally required with the optimized website so that the website performance does not degrade. For future work we can test our website by accessing it by different virtual machines at the same time and try to fix load balancing factor.

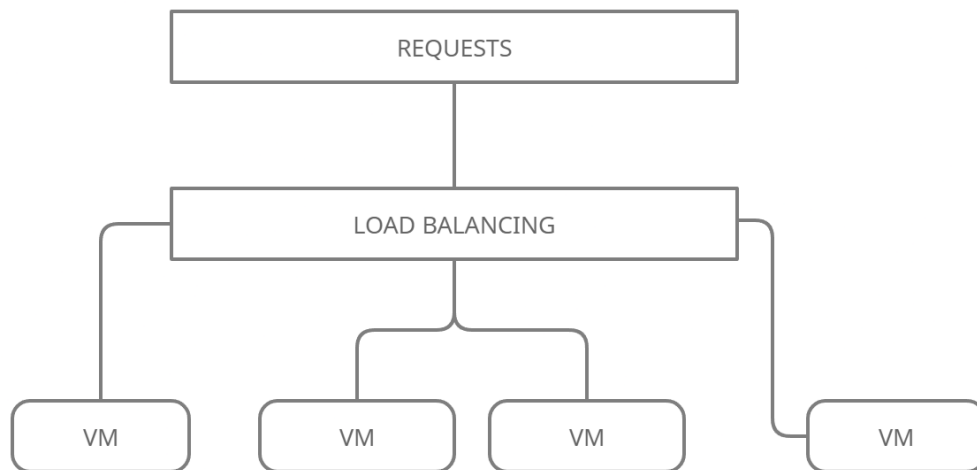


FIG 7.1 FUTURE MODEL ARCHITECTURE

REFERENCES

- [1] López-Gorozabel, Oscar & Cedeño Palma, Emilio & Pinargote-Ortega, Jenmer & Romero, Walter & Pazmiño-Campuzano, Marcos. (2021). Bootstrap as a Tool for Web Development and Graphic Optimization on Mobile Devices. 10.1007/978-3-030-68080-0_22.
 - [2] Fernando Almeida, Centre for Innovation, Technology and Entrepreneurship, INESC TEC, Porto, Portugal. José Monteiro
 - [3] Transportation Issues for Supply Chain Management.
 - [4] Load balancing techniques in cloud computing environment.
 - [5] Higher Polytechnic Institute of Gaya, ISPGaya, V.N.Gaia, Portugal. The Role of Responsive Design in Web Development
 - [6] Król, Karol & Zdonek, Dariusz. (2020). Website optimisation for search engines concept of website profiling. Scientific Papers of Silesian University of Technology Organization and Management Series. 2020. 10.29119/1641-3466.2020.144.23.
 - [7] Simisaye, Ahmed & Adeleke, Osisanwo & Toluwanimi, Ariori & Olatope, Oyedokun & Abiodun, Oladipupo. (2022). Analysis and Usability of Selected University Library Websites in South-west Nigeria. 5. 1238-1260.
 - [8] Sadeeq, Mohammed & Zeebaree, Subhi. (2021). Semantic Search Engine Optimisation (SSEO) for Dynamic Websites: A Review. 5. 148-158. 10.5281/zenodo.4536804.
 - [9] A Performance Comparison of DataEncryption Algorithms.
 - [10] IBM Research Division cloud computing initiative.
 - [11] Suzanti, Ika & Mufarroha, Fifin & Fatimah, Khusnul & Fatah, Doni & Sukri, Hanifudin & Dafid, Ach. (2022). IMPLEMENTATION OF WEBSITE PERFORMANCE EVALUATION WITH SIMILARWEB ON ACADEMIC WEBSITES. Jurnal Simantec. 10. 85-92. 10.21107/simantec.v10i2.14234.
 - [12] Meenakumari, R & Muthusamy, Suresh. (2021). An improved genetic algorithm-based optimal sizing of solar photovoltaic/wind turbine generator/diesel generator/battery connected hybrid energy systems for standalone applications An improved genetic algorithm-based optimal sizing of solar photovoltaic/wind turbine generator/diesel generator/battery connected hybrid energy systems for standalone applications. International Journal of Ambient Energy. 42. 1136-1143.
 - [13] Perception of Network and Protection Concerns In Cloud Computing.
 - [14] Kamiyama, Noriaki & Nakano, Yuusuke & Shiomoto, Kohei & Hasegawa, Go & Murata, Masayuki & Miyahara, Hideo. (2016). Analyzing Effect of Edge Computing on Reduction of Web Response Time. 1-6. 10.1109/GLOCOM.2016.7841607.
 - [15] Cloud Computing and Information Technology Strategy.
 - [16] Tiwari, Shraddha & Gupta, Rajeev & Kashyap, Ramgopal. (2019). To Enhance Web Response Time Using Agglomerative Clustering Technique for Web Navigation Recommendation. 10.1007/978-981-10-8055-5_59.
 - [17] A Performance Comparison of Data Encryption Algorithms.
 - [18] The Data Encryption Standard: Past and Future.
 - [19] G. Eason, B. Noble, and I. N. Sneddon, "On certain integrals of Lipschitz-Hankel type involving products of Bessel functions," Phil. Trans. Roy. Soc. London, vol. A247, pp. 529–551, April 1955. (*references*)
 - [20] J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68–73.
 - [21] I. S. Jacobs and C. P. Bean, "Fine particles, thin films and exchange anisotropy," in Magnetism, vol. III, G. T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350.
 - [22] IBM Research Division cloud computing initiative.
 - [23] Knowledge management in the age of cloud computing and Web 2.0: Experiencing the power of disruptive innovations.
 - [24] Adoption of cloud computing as innovation in the organization.
 - [25] Cloud Computing: Possibilities, Challenges and Opportunities with Special Reference to its Emerging Need in the Academic and Working Area of Information Science.
 - [26] K. Elissa, "Title of paper if known," unpublished.
 - [27] R. Nicole, "Title of paper with only first word capitalized," J. Name Stand. Abbrev., in press.
 - [28] Y. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, "Electron spectroscopy studies on magneto-optical media and plastic substrate interface," IEEE Transl. J. Magn. Japan, vol. 2, pp. 740–741, August 1987 [Digests 9th Annual Conf. Magnetism Japan, p. 301, 1982].
 - [29] The Data Encryption Standard: Past and Future.
 - [30] M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.
 - [31] A Smart Discussion Forum Website.
- Setiawan, Agus & Harahap, Zulkifli & Syamsuar, Dedy & Kunang, Yesi. (2020). The Optimization of Website Visibility and Traffic by Implementing Search Engine Optimization (SEO) in Palembang Polytechnic of Tourism. CommIT (Communication and Information Technology) Journal. 14. 31. 10.21512/commit.v14i1.5953.

