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UI creation using HTML5, CSS3 and Web Ergonomics

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ABSTRACT: The latest software allow businesses to automate a variety of routine tasks in order to increase corporate value. Application development and maintenance enables businesses to effectively manage all parts of software product development from start to end – from design and coding through testing, continuous improvement, and debugging. With the availability of a lot of modern web-development tools in the market, HTML5 and CSS3 are one of the easiest and most used language duos used. Ergonomics in a website is the method used to make the user feel easy and comfortable while navigating through your website. The website should be designed in such a way that the user should be guided through the website but at the same time, he/she shouldn't feel that he/she is being controlled. Here, we have briefly explained some of the papers that have been studied in the process. A case study of a car servicing is studied that requires the creation of a UI to reach out to their customers on the web. The website is then updated with ergonomics for better user-friendliness. The methodology of the same is then explained followed by the future scope of the study.

KEYWORDS: Web Ergonomics, HTML5, CSS3, User Interface (UI), Graphical User Interface.

I. INTRODUCTION

The most recent and updated applications empower organizations and business to automate most of their everyday processes and work so that they improve their efficiency. Managing business that uses a blend of commercial software, proprietary software, exclusive programming and managing the changes in hardware equipments is a cumbersome work. Application Development and maintenance helps the organization to manage all of that from designing, programming, checking progressive enhancements, and investigating of programming – in a powerful way. Keep up and modernize business-basic applications, improve their steadiness, dispose of vacation, diminish support costs, and get greatest worth from your applications, nonstop.

By utilizing HTML5 and CSS3, numerous organizations are creating and expanding web substance and web applications with a mean to make obvious and precise site pages and web frameworks that can access on various gadgets, internet browsers, and working frameworks. Web Ergonomics makes the UI more attractive to the user and easier to use and navigate.

The paper is organized as follows. Section II contains the different methodologies adopted in several case studies while developing any UI. Followed by Section III which explains the methodology used in the current case study of creating the UI for the Car Servicing business. Section IV concludes about the paper followed by the future scope of the study in Section V.

II. RELATED WORK

Several journals were studied to understand the process of UI creation and the methodologies used in the same.

1. Aparna Halbe, Abhijith R Joshi Dr (2015)¹

A web page is a computerized archive made utilizing Hyper Text Markup Language (HTML). A Web page is reasonable for World Wide Web (WWW), which runs on a web program and thus can be gotten to across the globe. Graphical User Interface (GUI) is an interface, which gives approaches to people to connect with the framework utilizing HTML controls.

In programming configuration, look and feel of GUI includes plan parts of the web page, the format of the web page, HTML controls utilized on the web page, and so on. Normally making of a web page starts by drawing GUI plan on a paper first. Web planners then, at that point plan the web pages utilizing web advancement apparatus on the paper. There has been a research where they found a new way to create a HTML page consequently from the GUI configuration drawn on the paper. It's anything but a GUI configuration having different HTML controls like radio button, checkbox, textbox, command button and label. A scanned picture of GUI configuration is given as a contribution to the framework. Then, at that point, framework sections the different HTML controls. The fragmented HTML controls are then distinguished. Recognized HTML controls are put away in XML database. All things considered, XML database contains the name and position of the segment on the GUI plan. At long last, this XML record is parsed to produce HTML page.

2. Avraham Leff, James T. Rayfield (2002)²

The Model/View/Controller design pattern is exceptionally helpful for architecting intuitive programming frameworks. This design pattern is segment autonomous, on the grounds that it is communicated as far as an intelligent application running in a solitary location space. Applying the Model/View/Controller design pattern to web-applications is in this way confounded by the way that current advances urge engineers to parcel the application as ahead of schedule as in the design stage. Resulting changes to that parceling require significant changes to the application's execution regardless of the way that the application rationale has not changed. This paper presents the idea of Flexible Web-Application Partitioning, a programming model and execution framework, that permits engineers to apply the Model/View/Controller design pattern in a parcel free way Applications are created and tried in a solitary location space; they would then be able to be sent to different customer/worker structures without changing the application's source code. Moreover, dividing choices can be changed without altering the application. They portray how the segment free Model/View/Controller design pattern can be utilized in the characteristically location-subordinate climate of divided web-applications. Repartitioning, under *fwap*, forces no additional expense; an application can in this manner be promptly tuned after arrangement dependent on input from real customer use.

3. Tim Schattkowsky, Marc Lohmann (2002)³

Advancement of dynamic Web sites is frequently performed by groups comprising of graphic designers and software developers. Correspondence between these distinctive colleagues must be upheld with a straightforward displaying approach that considers their diverse academicals foundations. Dynamic Web sites can contain numerous modules that may return on various pages. Reuse of both business rationale and visual plan modules would be attractive. Moreover, a lot of time is generally devoured by the execution of information streams that are as of now characterized in the model. Quick advancement is empowered by giving roundtrip designing abilities support for programmed code age. We propose a basic subset of the UML adjusted to the difficult area through generalizations just as a technique for producing code layouts from such models. These layouts are customized to the assignments of each colleague. This empowers equal work and computerized reintegration of results.

4. Alexander Zibula, Tim A. Majchrzak (2013)⁴

With mobile computing gadgets getting pervasive, applications for them significantly expanded in significance. These apps make gadgets more adaptable. Sadly, creating them right now implies that every stage must be tended to independently. Then again, Web-based arrangements can be utilized that don't give a "local" look and feel. To research novel strategies for multi-stage application improvement and to survey HTML5, there is an application developed utilizing a few to-date advancement structures. The situation is a brilliant meter device, which is a functioning space of exploration in itself. Approaches in the field of multi-stage application advancement and delineate the mechanical foundation are presented. The curiosity of the used technologies underlines a requirement for future work. We need to monitor the turn of events and stay up with arising versatile Web innovations. Future inquiries don't just concern the specialized measurement. Ease of use and an incentive for clients likewise should be surveyed. It should be researched how applications will be utilized in the future, and how the strategies for application improvement could resemble. In any case, there still will be an assortment of specialized issues to be tackled. It is without question that the future improvement in this field will be energizing despite the fact that (or most likely on the grounds that) it is difficult to be anticipated.

5. Narti Kitiyakara (2002)⁵

Researchers have attempted different types of acceptance testing, from manual tests to completely computerized frameworks. The manual tests were unsuitable surrounding: they were subject to contrasting translations and costly to execute. The hand-coded tests decreased the expenses of running the tests however expanded the expenses of making them. The engineers, knowing how frequently it saved them from rolling out unexpected improvements to the application's usefulness, felt that they were beneficial, yet this worth was fairly stowed away from the client. It likewise left a lot of the understanding of the tests in the possession of the designers. This would have helped the client code the tests himself, however the idea of the apparatus implied that the tests would need to be composed after the accounts were finished, hence denying the engineers of the chance to run the tests on the current story. Avignon is an endeavor to give a palatable answer for both the client and the engineers. The utilization of XML/XSL has made the expense of carrying out Avignon very low, yet it gives the client a moderately simple approach to indicate his tests in advance with no vagueness.

II. METHODOLOGY

Creation of the UI began with determining the use cases for the website that is going to be using it. Process flow of the website for both the use cases considering their functionalities and tasks was designed. The screen flow of the UI was created followed by the website creation. Later, Web Ergonomics was implemented in the UI.

A. Determining the use cases

First we determined the different use cases that are involved in interacting with the portal. This way, the functions of the website can be easily determined respective to the use cases. According to the requirement, there need to be two use cases: Admin and Customer. Admin is responsible for managing the services offered and the customer can select the services and book them.

B. Creating a process flow for the website

The flow for the website will be different for different use cases respective to their functions in the website. So it is necessary to create separate process flows for each use case.

The process flow for the website creation consists of the steps explained briefly below:

1. Deriving the functionalities of the use cases:

The key functionalities that are implemented for the use cases are viewing the services available, selecting the services offered and finally booking the services. These functionalities differ based on the use cases as their tasks.

The tasks for the admin are as follows:

- i) Viewing the services offered: The admin is able to view the list of services offered in the system. With the privilege of viewing the services offered, he/she can also edit the services using the edit option available.
- ii) Changing the services offered: The admin has the privilege of editing the available services. Using this, admin can do the changes that shall reflect in the database. Admin can change the specifications of any/all the available services and also add new services.

The tasks for the customer are as follows:

- i) Viewing the services offered: The customer can view the list of services offered by the management in the system.
- ii) Select the required services: The customer can select the services that he/she wishes to avail. Using the checkbox against every service, the customer can select how many ever services he/she wishes and book.

2. Creating screen-flows for the website:

Use cases need to navigate to different screen/web pages. The screen flow designed helped in creating the UI effectively.

i) Admin

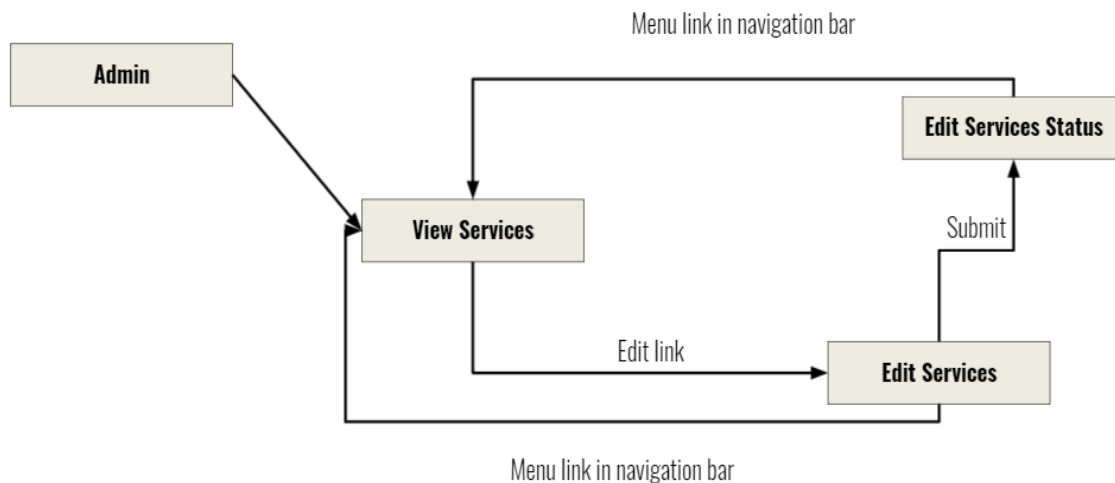


Figure 1: Admin Screen Flow

ii) Customer

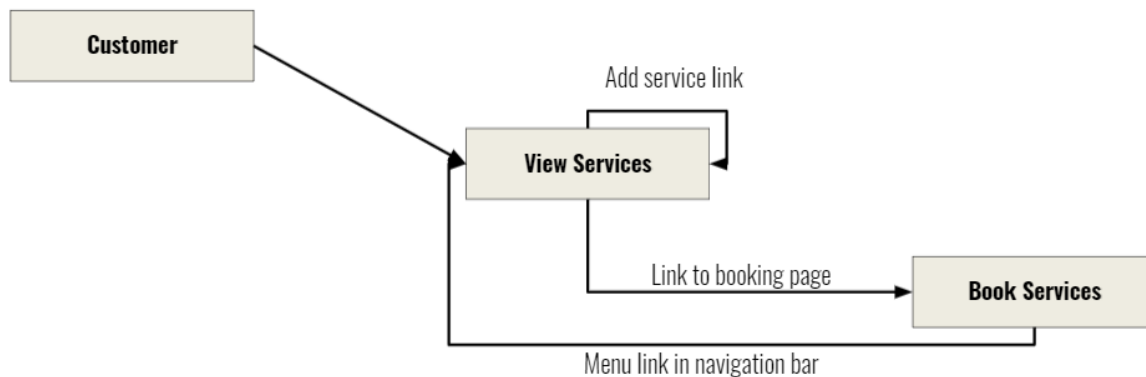


Figure 2: Customer Screen Flow

C. UI Creation

Based on all the functionalities, tasks of the use cases and the screen-flow, the UI is created using HTML5 and CSS3. The created website serves the requirement of the car servicing company to reach their customers online to make bookings easier and track them online.

D. Implementing Web Ergonomics

To improve our UI, we studied the web ergonomics and determined where and how our UI lacks it. Using web ergonomics several features were added and changes were done to the UI. Using the Law of Proximity, the list of the services offered, the links in the navigation bar and more were placed together to make sure that they were viewed together and for the user to understand the functionalities. The Similarity Law was implemented in the names of the services offered, the buttons in the web page so that the user understands that they are of equal importance. Respective sizes for the font and other features were implemented. This lets the user know the relative importance of each element in the web page.

III.CONCLUSION

Customer satisfaction, engagement, usability and a reduced bounce rate can be achieved by mapping the customer experience and their interaction with the application. Utilizing HTML5 and CSS3 supports cost effective multi-platform development, provides consistency across multiple browsers and a better user experience.

Implementing web ergonomics improves productivity, quality, customer engagement and mental insight. It lets the user feel guided and free to navigate through the UI.

An online service booking portal was designed for Car Servicing station. The UI is designed backed up with a database. The website was implemented with an ergonomic approach to improve the UI/UX and reduce the bounce rate.

IV.FUTURE SCOPE

The project can be further developed by integrating the database and the UI using ASP Dotnet programming in C#. The integration of the database using ASP Dotnet platform gives higher performance with much lesser code. It also supports cross platform in web application development. This helps in easier maintenance of both the UI and the database.

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