**D****esign and Implementation of Animal Health Clinic website**

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The purpose of the project entitled as “Website for the Pet Care Clinic” is to creates an online presence and user interaction of The animal health clinic which is user friendly simple, fast, and cost – effective. It deals with prior booking, customer services and to promote the business. The main purpose of the system is, register and store client and their pets details and retrieve these details as and when required, and also to manipulate these details meaningfully.

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# 

# **1. Introduction**

This report provides the details of the design and development of a Website for a Pet Care Clinic. The website was design to support broad range of users for different form factors, to promote pet care clinic business and facilities and create a strong online presence of Animal health clinic, which is user-friendly, simple, fast, and cost – effective. The website deals with prior booking, customer services and to promote the business. The primary functions of the system are

* To register and store client and pet details,
* To retrieve these details as and when required,
* To manipulate these details meaningfully.

**2. Overview of Design and Implementation Objectives**

The Pet Care Clinic website is implemented with seven web pages, which present all the information to meet the specification requirements.

# Users can register for the clinic; register one or multiple pets under owner, book appointments online and request to repeat a previously issued prescription. Also, a user can browse information and send a general inquiry through the contact us form.

# **3. UX Design and Testing (Wireframe)**

The initial design phase required completing wireframe (visual mock-up) of the all seven web pages that includes content hierarchy, navigation tabs, colors, style and detailed layout. "Ninja Mock” online wireframe design tool (NinjaMock, 2016 [7]) is used to create the web pages to demonstrate final layout and responsiveness to the different screen sizes.

**Home page**

The home page has designed simple attractive and informative with full-page image. Parallax effect (Dalgleish, 2013) been used as it is trendy stylish and eye catching. Black and white color theme is chosen to use to keep the simplicity and user-friendly design approach.

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Projects:msc:docs:screenShot:wireframe:Screen Shot 2016-12-11 at 10.59.11.png  Figure 1: Home Mock Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-11 at 15.48.03.png  Figure 2: Home Mock Page (Mobile) |

**Services page**

Services page is designed as two Column layouts to display all the information clearly.

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Projects:msc:docs:screenShot:wireframe:Screen Shot 2016-12-11 at 10.59.54.png  Figure 3: Services Mock Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-11 at 15.47.37.png  Figure 4: Services Mock Page (Mobile) |

**Staff page**

|  |  |  |
| --- | --- | --- |
| **Macintosh HD:Users:Asha:Projects:msc:docs:screenShot:wireframe:Screen Shot 2016-12-11 at 11.00.17.png**  Figure 5: Staff Mock Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-11 at 15.48.20.png  Figure 6: Staff Mock Page (Mobile) |

**About us page**

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-11 at 11.01.23.png  Figure 7: About us Mock Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-11 at 15.48.43.png  Figure 8: About us Mock Page (Mobile) |

**Tour page**

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-11 at 15.46.33.png  Figure 9: Tour Mock Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-11 at 15.49.38.png  Figure 10: Tour Mock Page (Mobile) |

**News page**

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-11 at 15.46.50.png  Figure 11: Tour Mock Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-11 at 15.49.23.png  Figure 12: Tour Mock Page (Mobile) |

**Contact us page**

|  |  |  |
| --- | --- | --- |
| **Macintosh HD:Users:Asha:Projects:msc:docs:screenShot:wireframe:Screen Shot 2016-12-11 at 11.01.51.png**  Figure 13: Contact us Mock Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-11 at 15.49.07.png  Figure 13: Contact us Mock Page (mobile) |

# **4. Frontend Design, Development and Testing**

## **4.1 Frontend Design**

Base development framework, Bootstrap’s twelve-column architecture is used to apply layouts (Otto, Thornton, and contributors, no date [8]). Media queried been used to increase the responsiveness. Through out the webpages Java script and query are used to make the experience more interactive and enhance the usability.

Visual experience of the web pages,

**Home Page**

The home page includes the full-width main image with clinic name and contact info on top of image, welcome message and short description of services. The page is divided into two sections using an image with parallax scrolling(Dalgleish, 2013 [3]). Links to access major forms are displayed under services section. Page content order, image size and layout changes with the screen size and media queries is used to implement those functions.

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-12 at 21.59.49.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-12 at 21.58.17.png  Figure 15: Home Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-13 at 21.55.17.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-13 at 21.55.55.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-13 at 21.56.21.png  Figure 16: Home Page (Mobile) |

Forms,

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-21 at 14.16.54.png  Figure 17: Register form | Figure 18: Book appointment form | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-21 at 14.17.32.png  Figure 19: Repeat prescription form |

**Services page**

The initial design had tow ‘col-md-6’ column layout and changed to ‘col-md-pull-6’ and ‘col-md-push-6’ in order to change the position of the image in smaller screen sizes.

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 09.48.18.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 09.42.49.png  Figure 20: Services Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 09.50.09.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 09.51.12.png  Figure 21: Services Page (Mobile) |

**Staff page**

Staff page has nested bootstrap columns to get the image of main staff member inline with other images. Also in small screens hide the main staff member’s image and load it as the first image of the rest.

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.01.42.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.02.11.png  Figure 19: Staff Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.11.15.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.11.52.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.12.29.png  Figure 20: Staff Page (Mobile) |

**About us**

Bootstrap pull and push methods are used to modify the image position with the screen sizes, and video has been hidden in smaller screens.

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| --- | --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.18.13.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.18.32.png  Figure 21: About us Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.27.08.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.27.38.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.28.05.png  Figure 22: About us Page (Mobile) |

**Tour Page**

Display pictures of facilities and services. The user can browse the images forward as well as backward while staying in the same gallery page. Implemented using ‘Lightbox Gallery' (Dhakar, no date [4])

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.45.22.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.47.54.png  Figure 23: Tour Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.49.08.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.49.47.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.49.28.png  Figure 24: Tour Page (Mobile) |

**News page**

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.56.11.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.56.26.png  Figure 25: Tour Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.55.08.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.55.30.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 10.55.47.png  Figure 26: News Page (Mobile) |

**Contact us page**

# The user can send a general inquiry without login to the system. Google map is display with the clinic location and opening hours display in table form. **Bootstrap-validator.js** (hz, 2016 [6]) **is used and customize to validate the input fields.**

|  |  |  |
| --- | --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 11.04.24.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 11.04.43.png  Figure 27: Contact us Page (web) |  | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 11.09.15.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 11.07.13.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 11.07.32.png  Figure 28: Contact us Page (Mobile) |

## 

## **4.2 Development**

**Bootstrap:**

Bootstrap (Otto, Thornton, and contributors, no date [8]) is a popular HTML, CSS, and JS framework for developing responsive, mobile first projects on the web.

Bootstrap’s grid-based layout approach is used in all the web pages to design the core layout of the pages. It’s twelve column layout offers a clear responsive design approach for different form factors.

**HTML:**

**HTML** or **Hypertext Markup Language** is the standard [markup language](http://en.wikipedia.org/wiki/Markup_language) used to create [web pages](http://en.wikipedia.org/wiki/Web_page).

 HTML describes the structure of a web page [semantically](https://en.wikipedia.org/wiki/Semantic) and originally included cues for the appearance of the document.

[HTML elements](https://en.wikipedia.org/wiki/HTML_element) are the building blocks of HTML pages. With HTML constructs, [images](https://en.wikipedia.org/wiki/Img_(HTML_element)) and other objects, such as [interactive forms](https://en.wikipedia.org/wiki/Fieldset) may be embedded into the rendered page. It provides a means to create [structured documents](https://en.wikipedia.org/wiki/Structured_document) by denoting structural [semantics](https://en.wikipedia.org/wiki/Semantics) for text such as headings, paragraphs, lists, [links](https://en.wikipedia.org/wiki/Hyperlink), quotes and other items. HTML elements are delineated by *tags*, written using [angle brackets](https://en.wikipedia.org/wiki/Bracket#Angle_brackets). Tags such as <img /> and <input /> introduce content into the page directly. Others such as <p>...</p> surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page (75, 2016 [1]).

**Sample Code,**

<Sample HTML code goes here>

**CSS**

**CSS or CASCADING STYLE SHEETS:** CSS used for describe the presentation of a document and to set the visual style of web pages and user interfaces written in HTML.

CSS is designed primarily to enable [the separation of document content from document presentation](https://en.wikipedia.org/wiki/Separation_of_presentation_and_content), including [layout](https://en.wikipedia.org/wiki/Page_layout), [colors](https://en.wikipedia.org/wiki/Color), and [fonts](https://en.wikipedia.org/wiki/Typeface). This separation can improve content [accessibility](https://en.wikipedia.org/wiki/Accessibility) (C® et al., 1999 [2]), provide more flexibility and control in the specification of presentation characteristics, enable multiple HTML pages to share formatting by specifying the relevant CSS in a separate .css file, and reduce complexity and repetition in the structural content.

Within the project, four different CSS style sheets are used rather using one big file. This approach helps to make development and organization easier and leads to cost and time effective maintenance.

CSS libraries used,

* lightbox.css (Dhakar, no date [4]).

**Sample Style Sheet,**

<Sample style sheet goes here>

**JAVASCRIPT:**

JavaScript is a high-level, dynamic, untyped, and interpreted programming language.It has been standardized in the ECMAScript language specification. Alongside HTML and CSS, JavaScript is one of the three core technologies of World Wide Web content production, the majority of websites employ it, and all modern Web browsers support it without the need for plug-ins.

Within this project, javascript is use to handle the back end operations such as user authentication, read, write and update the database entries.

JS libraries used,

* firebase.js

**Sample Script,**

<Sample js script goes here>

**JQUERY:**

Query is a cross-platform JavaScript library designed to simplify the client-side scripting of HTML. jQuery is the most popular JavaScript library in use today.

Major two jQuery usage within the project are form validations and parallex scrolling.

JS plugins used,

* Stellar.js- To provide parallax scrolling effects to Home, News and Contact us page (Dalgleish, 2013 [3]).
* Bootstrap-validation.js (hz, 2016 [0]).

**FIRE BASE:**

The Firebase (*Firebase Realtime Databaseplat\_iosplat\_androidplat\_web*, 2016 [5]) is a cloud-hosted realtime database. Data is synchronized in realtime to every connected client and stored as JSON. For this project to handle the backend, Firebase is used mainly because of its real-time feature. Even thought, with the growth of the business, if client wants to develop a mobile app the same database can be used.

**Key Capabilities,**

* **Real time-** Instead of typical HTTP requests, the Firebase Realtime Database uses data synchronization—every time data changes, any connected device receives that update within milliseconds. Provide collaborative and immersive experiences without thinking about networking code**.**
* **Offline-** Firebase apps remain responsive even when offline because the Firebase Realtime Database SDK persists your data to disk. Once connectivity is reestablished, the client device receives any changes it missed, synchronizing it with the current server state.
* **Accessible from Client Devices-** The Firebase Realtime Database can be accessed directly from a mobile device or web browser; there’s no need for an application server. Security and data validation are available through the Firebase Realtime Database Security Rules, expression-based rules that are executed when data is read or written.

## **4.3 Testing**

Two testing cycles has been conducted in order to ensure the website meets all the requirements and bug free.

**Features to be tested**

* UI testing - Verify all the web pagers are display accordingly and responsively.
* Cross browser testing and compatibility- verify website is display and functioning on IE8 or newer.
* Functional and backend testing – verify website is responding correctly to the positive and negative inputs.

### 4.3.1 Unit Testing

Unit testing is done during the development process to make sure that code meets its design and requirements and behaves as expected and tested that individual units are working correctly.

### 4.3.2 Testing phase one

**UI testing**

To make sure all the User interface and user Interfaces display as designed and required. And verify all the web pagers are display responsively.

Sample UI test case,

|  |
| --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 13.36.30.png Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 13.37.45.png |

Defects found,

<Screen shots>

**Functional and Back End testing**

Functional testing performed to verify whether the website functionalities working according to the design specification and verify the site is responding correctly to the positive and negative inputs.

Sample functional test case,

|  |
| --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 13.07.06.png Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 13.09.13.png |

Defects found,

<Screen shots>

**Cross browser testing and compatibility**

Cross browser testingis performed toensure legacy browser support. All the test cases have been run agenised all the required browsers (IE8 or higher, chrome and firefox).

Defects found,

<Screen shots>

**Back End testing**

Database testing is presented to ensure the data enter through the front end is stored in the correctdatabase table and retrieve the data stored in the database correctly.

Sample back end test case,

|  |  |
| --- | --- |
| Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 13.59.20.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 13.59.44.png | Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 14.00.12.png  Macintosh HD:Users:Asha:Desktop:Screen Shot 2016-12-14 at 14.04.58.png |

Defects found,

<Screen shots>

**System Testing**

System testing is performed to ensure that website is working as required as a whole product. End to end test scenarios has been run to achieve this target.

Sample test scenario,

1. Go to the pet care clinic website.
2. Navigates to the “Services” page.
3. Navigates to the “About us” page.
4. Watch the “About us” video.
5. 3. Navigates to the “About us” page.
6. Navigates through to the gallery imagers.
7. Navigates back to the “Home” page.
8. Click on the 'Register your pet' link.
9. Insert valid inputs.
10. Click on the 'Register' button.
11. Log into the database.
12. Navigate back to the system.
13. Click on the "log out" link.
14. Click on the "log in" link.
15. Enter previously entered Email and Password.
16. Click on the "Log in" button.

Defects found,

<Screen shots>

### 4.3.2 Testing phase two

After fixing the bugs identified in phase one, phase two testing started by verifying bug fixes. And then regression testing is performed to confirm that the bug fixes are not affected to the existing functions and features.

**Defect verification**

Toconfirm that the defect is no longer present in the website after fixing it.

Sample defect,

Closed defects,

<Screen shots>

**Regression testing**

In this case all the test cases and scenarios has been run during the regression cycle.

Test results,

# **5.Critique of design, development and decisions**

**Accessibility**

Pros and cons and tools used

Reflection on process

# **6.Conclusion and Further Work**

With the strong online presence, more clients will be attracted to the clinic and they can have fast and accurate service because of the new website. Thus, it will reduce paperwork and human involvement to the admin process.

As per further development, an admin page can be added to the system, which can only be seen by admin users to view and respond to the user requests and inquiries. Also, a shop can be implemented where users can buy pet products and none descriptive drugs for their pets. Furthermore, a mobile app can be developed, as people prefer mobile app instead viewing websites on mobile.

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