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SCIENTIFIC ARTICLE

THEME:

***DESIGN AND DEVELOPMENT OF WEB PORTAL ADAPTIVE
SANEC (ECUADORIAN SANCTUARIES) IN THE DIOCESE OF
IBARRA***

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Adaptive design and development of a WEB Portal for Ecuadorian Sanctuaries SANEC in the Diocese of Ibarra

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Resumen. *El acelerado crecimiento tecnológico tanto en diferentes tipos dispositivos móviles como distintos exploradores web obliga a que el diseño e implementación de portales y aplicaciones orientados a la web debe acoplarse a la nueva tendencia del comportamiento del usuario basado en la tecnología y plataformas nuevas en las que actualmente navega, ajustándose a los nuevos dispositivos con diferentes resoluciones y tamaños de pantalla de manera que su experiencia en el sitio sea agradable.*

Este estudio se orientó al cambio de paradigma en el desarrollo de Portales Web con la utilización de tecnologías tales como HTML5, CSS3, JQuery y el framework de desarrollo Bootstrap aplicados a la creación de un Portal Web Adaptativo para Santuarios Ecuatorianos en la Diócesis de Ibarra creando así un medio apropiado para difundir al mundo la riqueza religiosa, cultural, histórica y arquitectónica que poseen dichos Santuarios.

Palabras Claves

Portal Adaptativo, Rejilla, Santuario, Bootstrap, Framework.

Abstract. *The fast technological growth both on different devices types mobile as different web browsers requires that the design and implementation of portals and applications oriented to the web must be attached to the new trend of user behavior based on technology and new platforms on which currently navigate, adjusting to new devices with different resolutions and screen sizes, so the experience on the site be enjoyable.*

This document focuses on the study of this paradigm shift in the development of Web portals with the use of technologies such as HTML5, CSS3, JQuery and the development framework Bootstrap applied to the creation of an Adaptive Web Portal for SANEC (Ecuadorian Sanctuaries) in Ibarra's Diocese creating an appropriate way to spread to the world the religious, cultural, historical and architectural wealth possessed by Ecuadorian Sanctuaries.

Keywords

Adaptive web portal, Grids, Sanctuary, Bootstrap, Framework

1. Introduction

According to surveys conducted by the National Institute of Statistics and Census (INEC) eight of ten Ecuadorians who say they have a religious affiliation, are Catholic" (INEC, 2012). But most of these people don't know what a sanctuary is and often have misconceptions of what a sanctuary is itself, losing the opportunity to know the benefits and indulgences that can be received by visiting them. Otherwise, those who know are generally by tradition or proximity to where they live and remain unnoticed other important avocations that are venerated in other sanctuaries of the country, depriving themselves of a very enriching experience.

There is very little and scattered information available on the Ecuadorian Sanctuaries besides being inaccurate and even wrong, which harms the true appreciation of its value as holy places and generates a lack of spiritual benefits that people can reach on them.

The development of this adaptive web portal applied to SANEC has a great social and cultural importance for the benefit of the community within and outside our country, because there isn't other web site dedicated to publicize our religious wealth contained in these priceless holy places. Many people don't know what really are the Sanctuaries and the benefits of go to them; this website will provide valuable information that will help the community to know and understand more about the essence and the great religious, historical and cultural value immersed in the Ecuadorian Sanctuaries.

For this reason, it has been chosen to implement the solution in an adaptive web environment due to accessibility and intercommunication requirements which can be solved by use of the internet and the trend of current navigation in some types of mobile devices, in addition of be the best form to disseminate worldwide the information that sanctuaries require to be disclosed.

The basic concept of the Adaptive Web Design is "abandoning the fixed-width of our web. These should be fluid. Instead of designing our web based on fixed values (...), the fluid design is thought in terms of proportions."(Bustamante, 2011)

The importance of the basis on an adaptive web portal is that the same version of a portal can run on different devices with different platforms and operating systems. This implies the reduction of costs in maintain and fortify its position as support your SEO (Search Engine Optimization) strategy. In the case if is needed before the portal work for 3 different devices, you had to design three versions of the same portal, with the design and storage costs that it requires.

2. Materials and Methods

For the implementation of the proposed solution for SANEC it had bear in mind the benefits of using free tools that provide ease of use without license limitation which provides significant savings in the cost of implementation, freedom of access to debug efficient and fastest possible errors and the broad support that can be found in communities dedicated to free software.

To create an Adaptive Web Design is necessary to create a portal which appropriately display in a lot of devices without having to move from side to side on the screen to view content and facilitate navigation tools to access the different functionalities of the portal.

Depending on the screen resolution in which site displays, the information displayed is prioritized; i.e. adapt and prioritize content to display on the website. It doesn't imply shrink the size of the original site, or just leave certain components as "not visible", but to design properly prioritizing mobile devices to go complementing the content up to the content of larger equipment such as desktop computers.

Architecture of the Web Portal

The portal implements a MVC architecture oriented to optimize performance on mobile devices. Because of these devices have less resources in memory and processing than desktop devices. This allows to see the generated view on the requesting device.

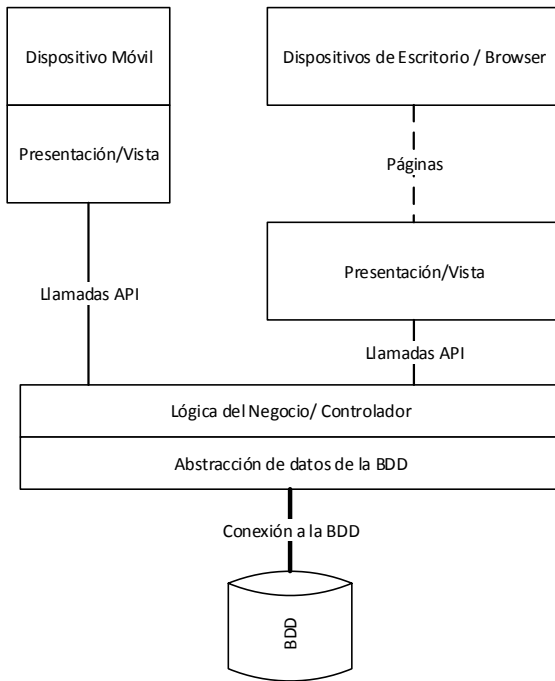


Figure 1. Architecture oriented to Mobile First

Source: this study, 2016

User Types

- *Guest User.* It refers to any person who visits the portal from any device casually, either by invitation or positioning result of SEO of the portal on searchers.
- *Registered User.* It's any person who visited the site, it has found of interest and would like to benefit from resources and special content for frequent user.

- *Headmaster User.* Is the manager of the Sanctuary, who has access to special menus that provides the portal oriented to Sanctuaries' managers. I.e. you can access to exclusive and relevant information to the work of managing your sanctuary.
- *Manager User.* It is the person, who has full control of all portal activities, such as from the creation of new dioceses in the portal, as well as new sites for Sanctuaries incorporated into the whole portal.

Definition of Use Cases

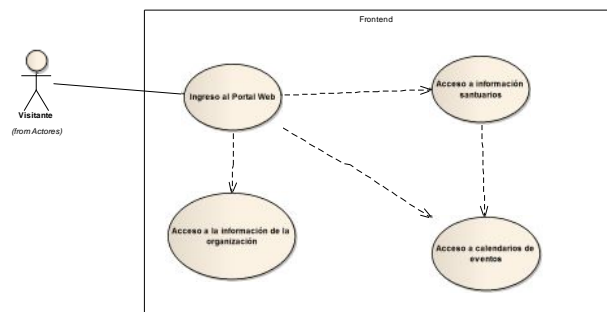


Figure 2. Diagram of the case of the guest user

Source: this study, 2016

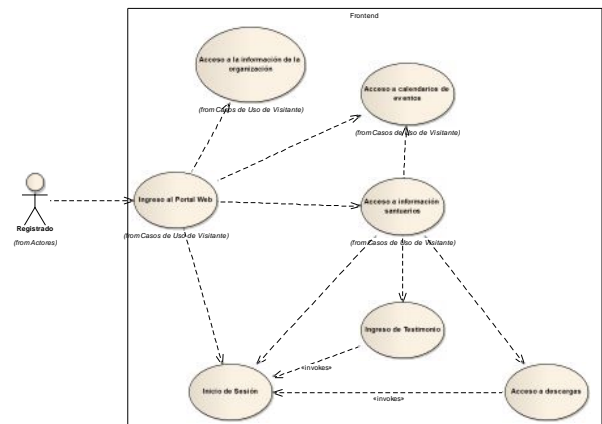


Figure 3. Diagram of the case of the registered user

Source: this study, 2016

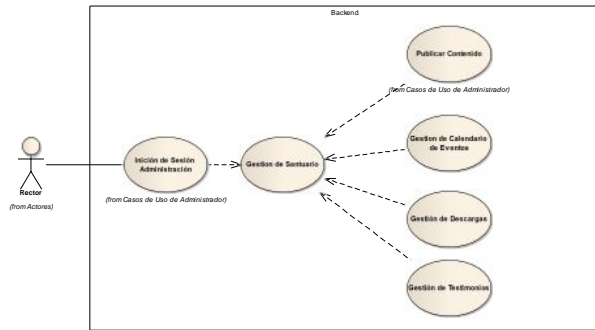


Figure 4. Diagram of the use case of the headmaster user

Source: This study, 2016

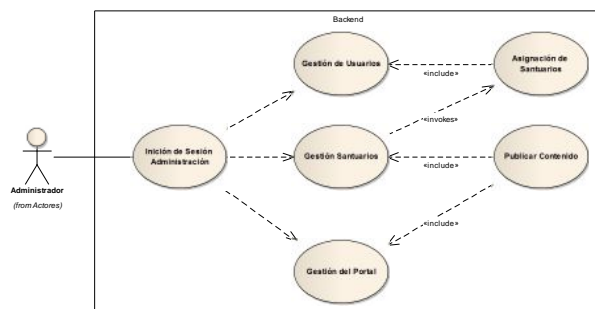


Figure 5. Diagram of the case of the manager user

Source: This study, 2016

2.1 Tools

Adaptive web design bases its development from 3 technologies that have been developed to create an adaptive web, such as HTML5, CSS3 and JavaScript, but JavaScript isn't essential for the development of adaptive content.

Framework Bootstrap

Bootstrap is an open source framework Front-End that offers a set of tools designed to help the creators and designers of portals or websites to create high quality projects. It allows easy navigation because their components can prioritize, adapt and scale the contents of the sites

depending on screen resolutions in that are displayed and regardless of the type of device or operating system in which is required.

"Bootstrap is an approach to web design aimed at making websites to provide optimal viewing for an experience easy to navigate and with a minimum of resizing, panning. It is scrolling across a wide range of devices" (Arias, 2013)

HTML 5 Markup Language

HTML (HyperText Markup Language) is a standard markup language by the W3C, an organization dedicated to the standardization of technologies related to the web. Use text labels that allow order and allow some documents linked in the same content interpreted and displayed by a browser. HTML5 is the new version of HTML that incorporates new elements and attributes.

CSS3 Styles Sheets

The Cascading Style Sheet or CSS appeared as a very useful development that helps improve the presentation of Web pages because they allow separate the elements of design and content, making the development and maintaining sites more efficient.

"CSS is a standard of the World Wide Web Consortium or W3C widely recognized and used because of two important aspects offered: save time in designing websites and get powerful effects, supported by most browsers" (Grocer & Montero, 2014, p. 44)

JavaScript

It's a programming language which is known as scripting language. "Being a scripting language, programs

that perform will not need to be compiled. Scripting languages are interpreted languages" (Ribes, 2013).

It's very useful to improve the appearance, functionality and presentation to the user without do heavy the applications or sites because "JavaScript provides dynamism to the web pages, with the performance of a code in the own browser without intervention of the web server itself" (Rodríguez, 2014, p. 52).

jQuery

It's a JavaScript library conceived as free and open-source software, created in the beginning by John Resig and formally presented in January 2006; from then until today is Java Script's most used library by most developers.

Development methodology XP (Xtreme Programming)

Extreme Programming is one of the methodologies considered agile in the software development. Combines the best practices proved of software engineering systematically to solve problems of delivering quality software quickly (Fuentes, 2015, p.116).

This methodology is a guide to help in the process of software development to create a high quality result and within the prescribed time, and its importance is key because it provides stability, control and organization in an activity that, unchecked, could become chaotic (Canedo dos Santos and Dias, 2014).

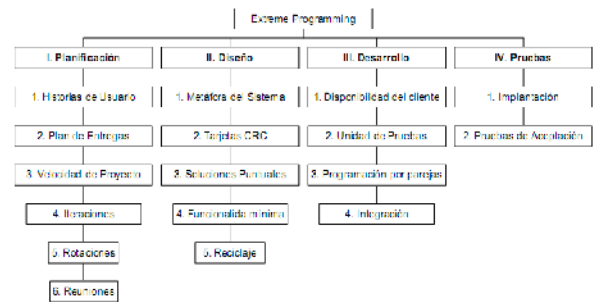


Figure 6. Phases of the development methodology XP

Source: Own

Project Scope

- Adapting the portal content to the type of device of visitors.
- Providing relevant and updated information about the Sanctuaries for dissemination to visitors of the portal.
- Providing information about SANEC as an organization for knowledge of the community.
- Giving a space to visitors to share their experiences of devotion to the avocation of an Ecuadorian Sanctuary. All publications made by visitors will be previously approved by the portal administrator.
- Providing information of Ecuadorian Sanctuaries for free downloads in order to disseminate this material to the worldwide community.
- Providing a calendar of upcoming events and activities that will be developed in the Sanctuaries.

- The portal will count with a control of user authentication to provide the different functions according to the type of user accessing.
- For SANEC'S members will include a module which have specific tools for use as a document repository support for their pastoral work.
- Creating individual sites inside the portal to the Sanctuaries of Ibarra's Diocese.
- The project includes a virtual gallery of photographic material both the main as the individual sites of each sanctuary.

3. Results

The web portal for SANEC was developed to be displayed and adapt to different types of web browsers. Its structure and design is based on tools to optimize the resources of both devices in which it is displayed and a short time.

To visit the site is necessary a web browser on any device.

Option 1: In the address area type:

www.santuariosecuador.com

Option 2: Search on Google Ecuadorian Sanctuaries; the architecture that developed the portal makes optimal search engine indexing. On this portal among the first choices as a result of the search will appear.

In this way we enter the Adaptive Portal SANEC whose content is adjusted to the type of device and resolution in which navigate, as we can see in the following examples:



Figure 7. iPhone 6 in horizontal position

Source: Own



Figure 8. iPhone 6 in vertical position

Source: Own



Figure 9. Android device in horizontal position

Source: This study, 2016



Figure 10. Android device in vertical position

Source: This study, 2016

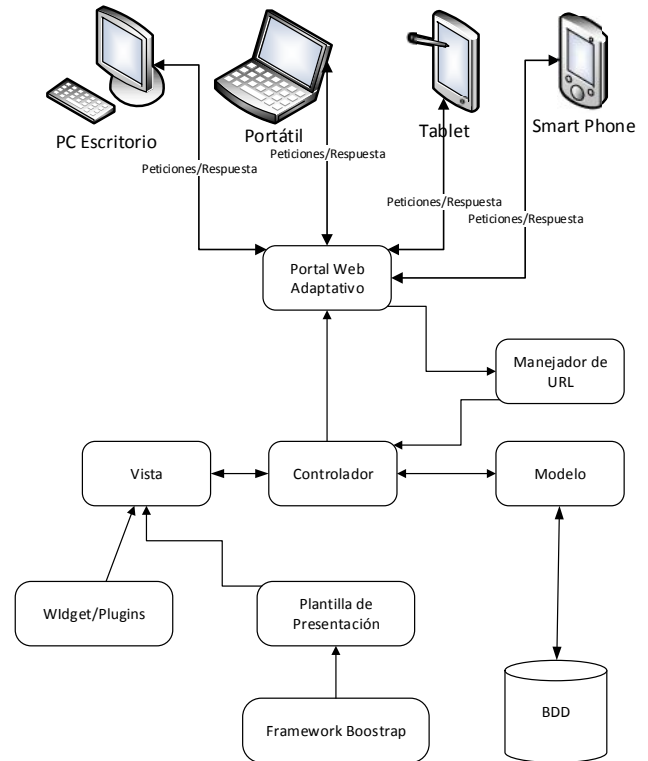


Figure 11. Architecture of the SANEC's Adaptive Web Portal

Source: This study, 2016

The portal was design and architecture to adjust its content to the device type and browser where required. This is possible by applying following architecture in which different devices that perform requests to our portal shown, which by a URL handler requests the controller response needed, it communicates with the model which performs an abstraction of the necessary data from BDD and sends the response to the controller which passes communicate with the view, which is made up of widgets, and presentation templates that have adaptive features. With all this a view is returned to the controller so that it sends the response to the client. This allows free the server from certain tasks would reduce their burden, giving significant advantages responding to further requests.

Following are presented some examples of functionalities of SANEC's (Ecuadorian Sanctuaries) Adaptive Web Portal in Ibarra's Diocese

New user registration

The visiting user can at any time create its own account for free by selecting the Register option located at the bottom of the main slide.

For this select the Register option. Will open the following form:

Figure 12. Form to create a new account

Source: Own

All fields are required. Once filled fields select Send. The portal will check the information, create the account and send an activation email to the address you have registered on the form. That mail shows an activation code. Just click the link displayed and ready. The account will be active and ready for use.

Access to Manager Area

The Administrator user has full control of activities and content of the portal as well as the content of individual sites of each Sanctuary.

To enter the administrator module must enter the following in the address area of a web browser:

www.santuariosecuador.com/administrador

The administrator data will be logged, the email and the password. If the data is correct, the portal will open the next administrator module:



Figure 13. Main menu of the principal Administrator's window

Source: This study, 2016

4. Conclusion

The design and development of Adaptive Web has great potential, because it seeks to provide a better user experience, giving more freedom with their applications and encourages the development of better and a wide range of applications and technology solutions.

The orientation of the adaptive design to mobile devices aims to balance the utility vs. usability. This is based on thinking first on mobile devices. The developer must think about the best way to present the information to prioritize the site's content vs. providing greater ease for navigation.

The adaptive web design has great commercial potential. Because most of the sites and web applications don't have these characteristics, which is why companies looking to upgrade their technology, thus being a niche market for programmers and web developers.

The adaptive web design improves search engine optimization, because from any device that accesses the site, it displays the same portal, this generates a higher visit count and therefore a better placement in search engines.

5. Recomendations

The concept of Adaptive and Responsive goes beyond the page layout, web portals or applications, so it is recommended to use it for other services such as email or newsletters etc.

It is important to include teaching of Responsive Web Design in students since the start of their career as a paradigm shift of application development and web portals, in order they can create new and diverse technological solutions according to the demand for new devices and new technology.

Adaptive Web Design aims to manage in a completely different way as regards animations and video management on the Web, so it's recommended to encourage further research in this field and encourage the use of formats for video and image chord the demands of new technology.

The information available from each Sanctuary of the Diocese of Ibarra is limited and scattered, so it is recommended to maintain a single repository of information is through the use of Web Portal SANEC or in a central file of the Diocesan Curia.

For the creation of web portals or adaptive applications it is advisable to use free tools, due to its versatility for coding and procurement cost savings

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