

Developing multimedia actions for the Catalonia railway museum

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Abstract - The Catalonia railway museum, located in Vilanova i la Geltrú, participated in the European Project Semester for the second time in 2015. The objective for this project was to develop a new website about railway heritage. To improve the interactivity several multimedia tools were used. The website has to include information about the museum, railway heritage, conservation and education. To develop the website some previous work such as research, marketing and requirements was done. The website was developed and tested by using an online questionnaire. A QR Code was created to forward the visitor to the new website.

Keywords - Railway museum, railway heritage, website, questionnaire, QR code

I. INTRODUCTION

The Catalonia Railway Museum, which is located in Vilanova i la Geltrú, is the biggest Railway museum in Catalonia. The original idea to open a museum was from the Associació d'Amics del Ferrocarril de Barcelona. In 1972 they collected a wide range of steam locomotives to present them to the different European associations on the occasion of the 19th European Model Railway Congress.

The reason for choosing Vilanova as the location for the museum was that in 1967 the steam locomotive depot was closed. The depot already had a turn table, a water tank and an engine shed for retaining the vehicles. Another reason was the long railway tradition of Vilanova i la Geltrú.

In 1990 the museum opened officially with the collaborative effort of RENFE.

Nowadays, the museum is managed by the Fundación de los Ferrocarriles Españoles and is part of the Catalan Science and Technology Museum System. It has one of the most extensive collections of Railway locomotives in the world.

The ambition of the Museum is *“to convey the significance of industrialization for ways of life and work as well as showing the technical advances of the transport revolution”*[1]. The

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Museum *“is intended to be a vehicle of communication and contract with present and future generations”*[1].

Regarding this ambition and to the growth of the on-line community, the museum considered how to improve the visibility and the internet presence.

These days the internet is omnipresent. It is used in every situation to search for and examine information, for example, at work, on the move and at home.

To be in keeping with the times and attract new visitors and a new generation, it is indispensable to have and maintain a presence on the internet. The idea for this project was to develop an additional new website with special content.

Since the year 2010 the Museum collaborated with the Universitat Politècnica de Catalunya, BarcelonaTech, with the aim to develop shared projects in accessibility, interaction and technology. In 2014 the museum took part in the European Project Semester and the International Design Project Semester for the first time.

The purpose of last year’s project was to provide opportunities to improve the visibility of the museum. The goal was to create and implement suggestions to improve the visitor experience. To reach this goal the group did a thorough study about the current state of the museum. Finally, they developed a prototype of a smartphone application.

The task of this year’s group was to develop a website about the industrial railway heritage and to include multimedia files such as videos and photos.

Another objective was to create a QR Code for the museum to open the website directly on a device such as a smartphone. The website also has to include a connection to the official website and the social media networks that are used by the museum to enable visitors to obtain further information.

The aim is to expand the official website with the new website to improve the user’s experience by providing more information in English because the English part of the official website is quite short and not elaborated. The new website has to include additionally an education section, describes the participation of the museum in projects with students and it includes some documents such as the reports from the EPS/IDPS. Other added values of this website are additional information about railway heritage and railway conservation.

A further objective is to create a kind of communication network between museum partners by using a blog to improve relationships.

The most important thing in this project is to develop the basic structure of the website which will enable the museum

employees to maintain the website and to substitute and add content by themselves.

II. PREVIOUS WORK

Before starting to develop the website several preparations had to be done.

A. Research

In order to meet the objectives some research about the railway history, the industrial heritage associations and some notable museum websites was done.

The aim of the research was to detect potential communication partners and to obtain an overview about the existing market to open the opportunity developing the most attractive website possible. Therefore a kind of a benchmarking study was done. The museum websites were rated in the categories:

- quality and number of photos and videos, because the new website should include a high number of multimedia tools
- the number of social networks, regarding to the communication function of the new website
- structure, if it is clear
- balance between attractiveness and seriousness
- interactivities such as a blog or special activities

B. Marketing

One of the most important things for every company is to become popular. They have to assert themselves against a high number of competitors. The market grows constantly and the competition gets harder.

However, not only products require promotion websites also need promoting because if no one visits a website it is useless to have one.

The promotion of a website already starts before the development because selecting a strategy has a high influence on the website construction. It is incorrect to think that it is enough to put the website online and everything will work. A website has to be promoted in the same way as a product.

Therefore different methods exist. They are divided into four categories: E-Positioning, E-Advertising, E-Networking and E-Publishing. These categories include several opportunities. To select the most effective method for the new website all these methods were compared.

It is, for example, impossible to use banner advertising, a method from E-advertising, because it is expensive to create a banner and there is no budget available. However it is a useful opportunity to do some cross marketing. This is an E-Publishing strategy and means to place the URL for example at merchandise, brochures and papers. For this a QR Code has been used. Another important and complete useful method is to use search engine optimization for example from google analytics to obtain a popular position on the search engines such as Google. Additionally the new website will be linked with the social media networks from the museum. Furthermore

it is a possibility to use online research, an E-Positioning method, and place the URL on topic related websites. Moreover the museum could participate in exchange projects. This means that other websites refer to the new website and the other way round. This recommendation method is used in E-Networking.

C. Requirements

The website has to be attractive for a wide range of users and to fulfill several expectations. The technical requirements had to be considered as well as the requirements from the stakeholders, consisting of the museum and the university, represented by the supervisors, the target groups and the team.

The target groups consist of tourists, train enthusiasts and history enthusiasts. To meet all their requirements every target group was examined and a table with solutions was created (Table I)

Additionally it was important to consider the different expectations of elder and younger people. While elder people are focused on a website which is easy to use and to read, younger people expect to have some interactivities included. However, the most important thing is to receive high quality content. Therefore a great deal of information had been collected and content for the website was composed.

TABLE I
REQUIREMENTS AND SOLUTIONS

Requirements	Solution
All browsers/ devices	Test on every browser/device
Search engines	Use SEO from google analytics
No errors	Test with webmaster tools
Fast loaded	Prevent big animations
Clear structure	Not too many nested scopes
Easy to read	Big font size, contrast
Informative	Short, got to the point, high quality
Connection to official website	Colors of official website, link to official website
Interactive	Multimedia tools such as: Plugins, applications, videos, photos
Modern, elegant serious	New template Right balance of used colors, positive font, qualitative content

D. Content

To incorporate high quality content many meetings with the supervisors took place. Information was collected and sometimes documents needed to be translated. This information was combined and adapted for the website. Furthermore pictures and videos were selected. Afterwards a positive way of illustrating had to be chosen.

III. WEBSITE

To ensure the possibility for the museum employees to maintain the website, the free and easy program "WordPress" was used to develop the website. Regarding the requirements it was decided to use the newest from the modern templates

“DIVI”. Afterwards it was possible to create the structure and the content of the website. To enable a Multilanguage website a translator is incorporated on each section. It is possible to translate the content into a huge number of languages. The website is divided in five parts. The first part is a contact bar including the social media networks used by the museum. The second part is the navigation bar which is structured in seven main sections including subsections to obtain a clear structure. Afterwards there is the place for the content of each section and at the end of the page is a link to the contact information. The website contains the following sections.

A. Home

The Home section is the first page the user sees and it is important to have something eye catching on this page. Therefore a big picture of the museum in high quality is used. A special feature of this section is the incorporated blog. It obtains for example some interesting facts about the museum or the train collection published by the museum employees. However, visitors can publish a comment as well but it has to be accepted by the administrator first.

B. Museum

This section is to receive important information about the Museum. It is divided into three subsections. In activities and news a calendar plug-in with special activities can be found. The map of the museum in building and spaces is interactive, to obtain information about each building the user has to click on the numbers and a short explanation with pictures will appear. The train collection includes some popular locomotives to enable an insight into the trains. However, to illustrate the whole collection links are given to the existing Pinterest account of the museum. The train collection is structured as a table and divided into three parts, the steam locomotives, the electric vehicles and the diesel vehicles. To make it more visual an animation for the pictures is used. They appear by scrolling down.

C. Heritage

The most important part of the website is the heritage part. This section is structured in three subsections, the general history, a comparison of the railway history in Spain and Britain and the conservation of railway locomotives. The general history contains information about industrialization and about the development from the wheel to the first locomotive. To demonstrate the development of the railway in Spain an interactive timeline plug-in is used. To obtain further information the user has to click on the date he is interested in. The British history is mentioned to illustrate the different speed of development in the countries. It is portrayed in a time line as well next to the Spanish history. The last subsection is the conservation part. It includes a text about the conservation of railway heritage and includes a map of the actions to receive the history of Catalonia’s railway locomotives.

D. Education

The museum participated in several projects with different education institutions. This section is used to illustrate these

projects. For example in the subsection “higher education” the EPS projects can be found. Furthermore there is information about the projects with the primary school and the secondary school.

E. Applications

This section is a very interactive one. It includes several applications which were developed by students during some projects. These applications were created by using Justinmind, a software to create prototypes. To test these applications QR-Codes are given to transmit them directly to the smartphone. There is a “museum guide”, a “museum game”, a “museum and accessibility” application, a “museum visit for students” application and the “interactive visit”, which was developed by the last year’s group.

F. Contact

At the front of this page a map can be seen with a mark at the museum location. Additionally a picture of Ana Grande (*head of communication and education at the museum*) is incorporated and it is possible to contact her by using the given formula.

G. Links

This section is to receive the opportunity to obtain further information. It contains links to social media networks such as YouTube, Flickr and twitter. Additionally it includes links to the museum partners such as railway associations.

IV. QUESTIONNAIRE

To ensure the satisfaction of the target groups, the usability and the effectiveness of the website a test was performed. In order to carry this out, different possibilities of website testing were compared. It was decided to use an online questionnaire because it was easy to create and to distribute. This questionnaire consisted out of two parts, the first part contained several questions about the expectations and the previous knowledge of the respondents. The second part was about the website itself including questions on site loading time, structure and errors. Respondents were also asked if their requirements were met and if they have any suggestions for improvement. To distribute this questionnaire, a link was sent to various people such as students, computer and railway experts. Afterwards the results were used to rework the website.

V. RESULTS

The questionnaire was closed after two weeks and 26 respondents. The questionnaire portrayed that the requirements of 50% of them were totally fulfilled. The other 50% chose “agree” that means that their requirements were fulfilled to a high degree. A suggestion to improve the website was to select smaller images because they were not fast loading. Another point was to mention the opening hours in the home section.

VI. TRANSFORMATION

After finishing the website it had to be transferred from the WordPress link to a real URL. Therefore the museum paid for the domain www.railway-heritage.com and it was transferred by the group to this URL by performing the following steps.

1. export of the existing database
2. export of the “wp-content1” folder from the old server
3. installation of WordPress on the new web space
4. installation of the theme “Divi” on the new web space
5. replacement of the “wp-content” folder on the new web space with the “wp-content” folder of the old web space
6. import of the existing database in the new web space
7. rewrite of the “wp-config.php2”, to connect it with the new database
8. use of the relocate PHP function to replace the URLs of the new site

One problem at the transfer was the connection of the new site to the new database. There have been failures in the “wp-config.php” file, thus the connection to the server has not been provided. The main problem was that the new server is, in contrast to the old one, a localhost. Therefore the host definition was required to be changed.

VII. GOOGLE ANALYTICS

Google Analytics is a tool to examine the visitor’s behavior offered by Google. It enables the administrator of the website to obtain information on how many people are on the website at this moment, where they are from and what they are viewing. Furthermore it included a cookie to store a unique identifier to examine the process of a browser for example whether the browser returns to the website.

This is a useful method for the future to increase the number of visitors at the website because additionally it obtains information about the popularity of new content and the effects of posts on twitter or Facebook posts. To incorporate Google Analytics at the new website an existing plugin was used and the domain was added to the registered account from the museum.

VIII. QR CODES

QR Code is the short form of Quick Responsible Code, because it enables a fast access to the stored data source. The information is stored in the different modules of these codes. It consists of two regions. The first is the encoding region. This region incorporates all necessary functions for the data encoding such as error corrections, information about the version and the format.

¹ This file contains the whole content of the website

²This file is to connect the website with the database

The second one is the function patterns. They permit the quickly readability of the code by using different elements such as required patterns or detection position patterns. Those elements are quite important because they enable to assure the positive position and orientation of the symbol in the space.

Museums and tourist offices, and in general cultural locations, are using QR codes increasingly to provide further information for smartphone users by incorporating a link to a website. It is even common to use a QR code to transmit a sound file to listen to some commentary as a kind of a guide. Additionally it preserves the user to copy the URL to the mobile phone.

Regarding this increase, and to improve the interactivity of the Railway museum a QR Code (Fig.1) was created to forward the user directly to the new website.



Figure 1: Created QR Code

IX. CONCLUSION

The aim of the project was to improve the interactivity and the visibility of the museum by developing a new website about railway heritage. Therefore some research, marketing and previous work was done. To develop the website it was required to be well prepared to enable an attractive and effective result. The questionnaire illustrated that the precious work was worthwhile. Additionally it was an objective to create a QR-Code to forward visitors directly to the new website. This goal was reached by using an online generator. With the new website the museum has the opportunity to offer a new service to the visitors.

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REFERENCES

- [1] Guide Catalogue Railway Museum, page 16
- [2] A Study of Interaction Design in the Catalonia Railway Museum of Vilanova i la Geltrú [report] Brons, R., Hulzenga, M., O'Brien, P. and Ramírez, M. del Mar. IDPS project, EPSEVG, Universitat Politècnica de Catalunya Barcelona Tech, 2014
- [3] Museu del ferrocarril de Catalunya [Website] cited 20/04/2015
URL: <http://museudelferrocarril.org/>
- [4] FEDECRAIL [website] actualized 15/01/2015 [cited 18/03/2015]
URL: <http://www.fedecrail.org/>
- [5] TICCIH [website], hosted by Michigan Technological University, copyright 2015 [cited 18/03/2015] URL: <http://ticcih.org/>
- [6] European Rail Congress [website], Copyright Portobello Partnership LTD 2012 [cited 18/03/2015]
URL: <http://www.europeanrailcongress.com/summit.php>
- [7] European route of industrial heritage [website] actualized 15/04/2015 [cited 18/03/2015] URL: <http://www.erih.net/>
- [8] Heritage railway association [website] copyright heritage railway association 2015 [cited 18/03/2015]
URL: <http://www.heritagerrailways.com/>
- [9] Bringing industrial heritage to life [website] copyright 2005-2015 Ayrshire Railway Preservation Group [cited 18/03/2015]
URL: <http://arpg.org.uk/wp/>
- [10] Steam Heritage [website] copyright 2015 steam heritage publishing LTD [cited 18/03/2015] URL: <https://www.steamheritage.co.uk/>
- [11] touropia [website] 14 best museums in the world [online] updated 21/01/2014 [cited 26/03/2015]
URL: <http://www.touropia.com/best-museums-in-the-world/>
- [12] Rijksmuseum [website] cited 26/03/2015
URL: <https://www.rijksmuseum.nl/>
- [13] Museo nacional del Prado [website] copyright 2015 Museo del Prado [cited 26/03/2015] URL: <https://www.museodelprado.es/>
- [14] Cooper Hewitt [website] copyright by Smithsonian [cited 26/03/2015]
URL: <http://www.cooperhewitt.org/>
- [15] Louvre [website] [cited 26/03/2015] URL: <http://www.louvre.fr/>
- [16] webdesign loy [website] [cited 20/04/2015]
URL: <http://www.loy-webdesign.de/webdesign/webdesign.htm>
- [17] Online Marketing- die eigene Website bekannt machen by Silvana Borsutzky [online] published 07/2002 [cited 20/05/2015]
URL: <http://www.scoreberlin.de/usability-artikel/online-marketing/>
- [18] Catalonia railway museum and heritage [website] by Annika Zloch, Clarisse Broyon, Weronika Walczak and Bernhard Schopper published 2015 URL: <http://www.railway-heritage.com/>
- [19] Railway history [website] la historia de los ferrocarriles del Estado Espana [online] published 2009 [cited 09/04/2015] URL: <http://www.railway-history.de/renfehistoria.htm>
- [20] Geschichte der Eisenbahn by Torsten Berndt [pdf document] [cited 13/04/2015]
URL: <https://www.maerklin.de/media.php/de/pdfs/geschichtedereisenbahn.pdf>
- [21] Geschichte der Eisenbahn by Rolf Stephan and Tobias Aufmkolk [online] published 03/05/2012 [cited 13/04/2015]
URL: http://www.planet-wissen.de/natur_technik/eisenbahn/geschichte_der_eisenbahn/
- [22] Usability-Test - 16 Methoden zur Messung der Usability by Martin Beschnitt [online] [cited 21/05/2015]
URL: <http://www.onlinemarketing-praxis.de/web-usability/usability-test-16-methoden-zur-messung-der-usability>
- [23] QR Code© Le code-barres version 2D by Mickaël De Almeida [online] published 2012 [cited 28/05/2015]
URL: <http://www-igm.univ-mlv.fr/~dr/XPOSE2011/QRCode/description.html>