

# VVSHOP - The Vinho Verde Electronic Retailers Directory Revisited

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**Abstract.** VVSHOP is an Information System based on a unified system of different wine brands with Denomination of Origin from the Vinho Verde Region. VVSHOP System was developed and implemented in accordance with a set of concepts associated with the integration of different electronic retailers, e-tailers, located in different countries, in a directory available through the Internet, with different forms of interface, particularly through the maps provided by Google (Google Maps). The system allows for automatic processing of information associated with management of the wine producers and their brands, linking them to other existing in the back office system, and articulated by a set of applications that facilitate interaction among system components like the producers, the products, the entity that certifies Vinho Verde and their worldwide electronic retailers.

**Keywords:** Electronic retailers, e-tailers, e-commerce, wine brands, Google Maps.

## 1 Introduction

Wine is not a "globalized" product: it is produced within a region, and reflects its character and history; this connection is essential to differentiate the Vinho Verde from other wines produced worldwide.

The Vinho Verde Region produces wines with Denomination of Origin Vinho Verde and Regional Minho that are sold in over 100 countries. The Comissão Viticultura of the Vinho Verde Region (CVRVV) is the inter-professional entity responsible for certification, quality control, promotion and technical guidance to producers and commercial entities of the Vinho Verde Region. In addition to activities related to advertising, promotion and public relations worldwide, CVRVV operates a Web based platform (Internet, Intranet and Extranet), which monitors the main aspects associated with the production of wine from around the 200 000 parcels of vineyard owned by 20 000 wine and grape producers, which represents about 1 000 brands, from 600 traders. The investments made over time, created in the portal of the Vinho Verde Region ([www.vinhoverde.pt](http://www.vinhoverde.pt)), a set of services through a web based technology platform.

This article described how the VVSHOP evolved from an e-commerce platform for an Information System embodied in a directory that provides information about the wines of the Vinho Verde Region, information on-line retailers that sell in their electronic stores these products, regardless of their geographical location.

## 2 The Vinho Verde Universe of Electronic Retailers (e-tailers)

After a phase where B2C (Business to Consumer) was given more focus, it was realized that the gains are mostly in B2B (Business to Business) relationships, particularly due to savings in the procurement supply, improve relationship with business partners, price savings and access to new process business opportunities. One of the first successfully projects in B2C e-commerce has been in the wine business; the VirtualVineyard.com. In 1999 VirtualVineyard.com acquired wine.com, and became the first company that integrated in a web portal, content, commerce and community in a single site [1]. The evolution and the bets made by different types of wine-sector organizations in electronic commerce allowed wines to be sold on the Internet in the three types of platforms [2],[3].

- Product e-Marketplaces: dedicated only to wine ([www.beverageonline.com](http://www.beverageonline.com)).
- Vertical e-Marketplaces: dedicated to the agro-food sector ([www.tfir.org](http://www.tfir.org)).
- Horizontal e-Marketplaces: dedicated to different types of products (<http://www.hktc.com>).

The electronic retailer, e-tailer, is defined as a retailer of a product that uses the Internet channel to sell, making it more efficient the way the customer can buy the product [4].

At Global Verde project “The Global Information System of the Vinho Verde Region”, sponsored by CVRVV, a study was developed by the University of Porto (Porto Business School - PBS) called “Designing a Logistics Model for Vinho Verde Distribution via the Internet in USA and Germany markets”. In 14<sup>th</sup> October of 2005 a survey of information concluded that for the 73 brands that were already in VVSHOP existed electronic retailers in 13 countries from 3 different Continents - see Table 1, with special emphasis on the European continent [3]. Later in the end of 2006 it was determined that there were more brands with e-tailers in North America and South America (Brazil). With these study results, CVRVV during the Verde Global project changed its electronic base platform (VVSHOP) from e-commerce B2C, migrating it to a system of e-tailers. This project was intended also to boost exports, mainly in USA and Germany markets, through making this electronic platform available for distribution support in these countries [5].

In 12<sup>th</sup> September of 2006 the Vinho Verde Region had more than 1 000 active wine brands, from approximately 550 producers. In VVSHOP platform there were 125 brands of 54 producers with e-tailers in 14 Countries. In 31<sup>th</sup> December of 2013 the Vinho Verde Region had more than 1 200 active wine brands, from approximately 600 producers [6], for the same 14 countries, from a total of 36 counties in the VVSHOP were represented 558 brands of 124 producers - see Table 1.

As we will see later, one of the tools available in the VSSHOP back office is based on a software agent that helps to discover Vinho Verde e-tailers with relevant products pages, and detect over time which pages (URLs) are obsolete (broken URLs).

**Table 1.** - Countries and e-tailers with products from the demarcated Vinho Verde Region

	2005	2006	2013
Total de Marcas registadas na VSSHOP	73	125	325
Total Brands with e-tailers	36	90	294
Total Brands without e-tailers	37	35	31
Countries with Vinho Verde e-tailers	Brands	Brands	Brands
Germany	12	31	64
Austria	1	1	18
Brazil	3	11	10
Canada	2	2	2
Spain	1	2	44
United States	17	35	45
France	2	3	18
Netherlands		1	32
Norway	1	3	43
Poland	2	2	36
Portugal	16	18	121
United Kingdom	7	9	51
Czech Republic	2	2	30
Sweden	1	2	44

### 3 VSSHOP Support Architecture

The VSSHOP architecture is integrated with the information system that supports the Vinho Verde portal in its Intranet, Extranet and Intranet components, which is based on an integrated set of servers that support the Database Management System (SQL Server) where all the information is stored about producers, brands, labeling components, products, visitor data, statistics, etc. VSSHOP provides a directory in electronic format with producers, brands and products, linking them through a link to relevant e-tailers that sell products, which allows direct connection to its web store that has the product available to be ordered. Besides allowing the presentation of producers, VSSHOP presents their available brands, allowing visitors to select, from their Country of origin, the e-tailers that sell the desired products. The system also includes two assistants that helps e-tailers Database maintenance:

- A Java agent which periodically scans all registered addresses (URLs) to ensure that they have not become obsolete (broken).
- Another Java agent, a search "Robot", which according with directives received from the VSSHOP manager, performs automatic nighttime surveys (not to overload

the CVRVV network), by going to the two major general search engines through its APIs: Google and Yahoo. The next morning the VVSHOP manager has in the back-office a set of proposals for product pages and retailers, which the manager validates with a single click, incorporating the e-tailers directory.

Back-office applications support and enable the management of SQL Server tables (eg: producers, brands, products, e-tailers) and were developed based on "WAM", the generator of intranet Web applications built for the SQL Server Declarativa model [7]. VVSHOP is based on a relational database management system, which stores most of the textual information and keeps the necessary consistency of data relationship of the available information.

## 4 The Information in the VVSHOP Management System

The projects implemented by CVRVV, allowed the Management Information System to have absolute control over all processes associated with the certification of the Vinho Verde Region products. One of the projects developed, called "Labelling and Brands Portal", aims to optimize records associated with labeling to create a collective vision of wine brands with a strong image that uncover unique product characteristics of wine grape varieties that are grown in the Vinho Verde Region.

### 4.1 Private Interface (Intranet)

For the definition of the business model, for posterior development of the data model and construction of VVSHOP, the different business objects have been defined (producers, brands, products, types of products, labels, country, e-tailers, etc.), and established their relations and activities associated with the process of information registration in the back-office system that support the different applications in CVRVV. This system called VERDE GLOBAL: back-office manager v2.1 is available on CVRVV's Intranet. In Figure 1, we can see some of the options from the main screen of the VVSHOP back-office management application in its version 2.1.

The screenshot shows the 'VERDE GLOBAL: Gestor de Backoffice v2.1' interface. It is organized into three main sections, each with a title bar and a grid of data entry forms:

- gestão comum:**
  - Entidades:** Fields for 'Entidade', 'Tipo de Agência', and 'Tipo de Entidade'.
  - Clientes/Variantes:** Fields for 'Cliente/Variante' and 'Cliente'.
  - Acesso à Loja:** Fields for 'Instituição' and 'Cliente'.
- vinho verde shop (e-tailers):**
  - Produtos:** Fields for 'Produto', 'Tipo de Produto', 'Sub-regiões', and 'Cidade'.
  - Lojas:** Fields for 'Restabelecimentos', 'Quem Verde Orde', and 'Países'.
  - Etiquetas:** Fields for 'Candidatos a Restabelecimentos', 'Candidatos a UPL', 'Produtos a Frequentar', and 'Lojas de Referência'.
  - Lojas web/e-commerce:** Field for 'Produtos'.
  - Acesso à Loja:** Field for 'Produtos'.
- vinho verde route (wineries):**
  - Entidades:** Fields for 'Entidade', 'Local', and 'Tipo de Local'.
  - Locais:** Fields for 'Local' and 'Local'.
  - Acesso à Loja:** Field for 'Local'.
  - Etilers:** Fields for 'Tipo de Pícea' and 'Estádio da Pícea'.
  - Lojas web/e-commerce:** Field for 'Vinhos'.

Fig. 1. VVSHOP components of the back-office system

The back-office manager allows access to products, product types, sub-regions (there are 9 sub-regions in the Vinho Verde Region), wine grapes, retailers (e-tailers) countries. The "Robot" manages URL addresses found by the software agent, in order to be validated.

The process of automatic discovery of e-tailers begins by specifying a "lote de pesquisa"/"search batch" in which the VVSHOP manager indicates manually, or through a search, which products the manager wants find on the web (see Figure 2).

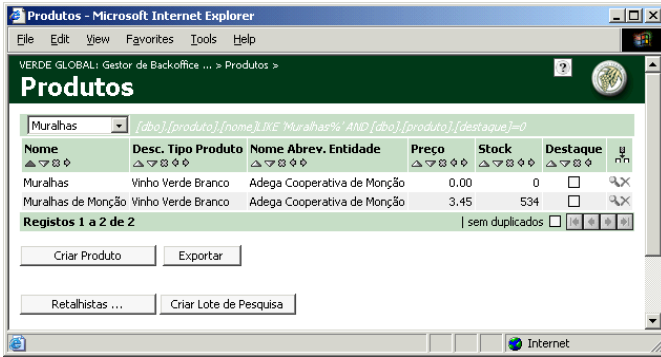


Fig. 2. VVSHOP searching products

Defining a search batch is easy and simple. By pressing the button "Create a search batch"/"Criar o lote de pesquisa" the manager specifies the search engine: Google or Yahoo, optionally a top internet domain restriction can be applied (in the example .com). After, products (brands) are added to the web search (see Figure 3). As we saw earlier processing takes place at night, the next morning the manager VVSHOP offers a list of candidates to the sales page of the product will be used (see Figure 3).

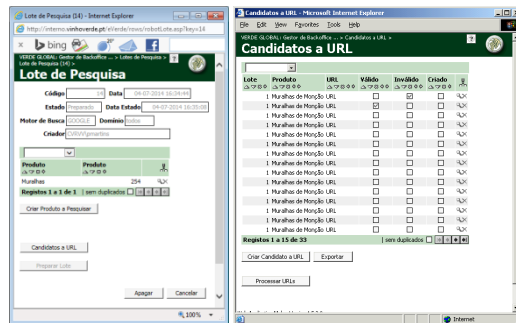


Fig. 3. Search batch (Lote de pesquisa) and list of URL candidates for e-tailers

By clicking on the URL column, the default internet browser opens the e-tailer (supposedly) page. In the above example, the first address found is invalid because it is a mere page with tasting notes (below to the left), but the second is valid because it allows the purchase of selected product (see Figure 4).



Fig. 4. Page from an e-tailer in VVSHOP

The system automatically discovers possible e-tailers from their web pages, inferring the country from the site IP address (see Figure 5).

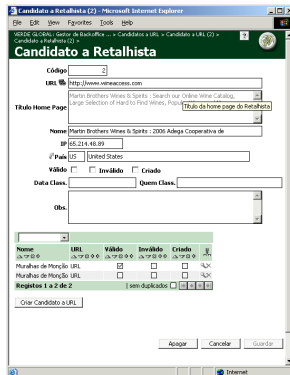


Fig. 5. Final page of an e-tailer in VVSHOP manager

URLs classification is made by pressing the button "Submit URL"/"Processar URL" in the option "URL candidate"/"Candidato a URL". A valid URL is automatically added to the e-tailers directory, the invalid ones are retained to be discarded in future searches.

#### 4.2 Private Interface (Extranet)

The Economic Agents (EA), holders of Wine Brands have access through CVRVV's Extranet, called INETSIV, to a set of options that allow them to obtain information in real time, including: the registration of their vineyards, their harvest data and wine production, the current account balances of its wines, laboratory reports with tests results (allows them to obtain wine certification), registration of brands and components that may constitute one or more garments that will "clothe" bottles, etc.

In addition to this, the "VVSHOP Products" option allows EA to view and update information about the characteristics of the products that are available in VVSHOP,

including a small description, tasting information, visual appearance (color), the temperature that should be served, vintage year and grape varieties. The EA does not have access to add URL of electronic stores associated with each product, as this update is solely responsibility of the VVSHOP manager. In Figure 6 we can see some Intranet screens that allow EA's update of product characteristics in Portuguese and English.

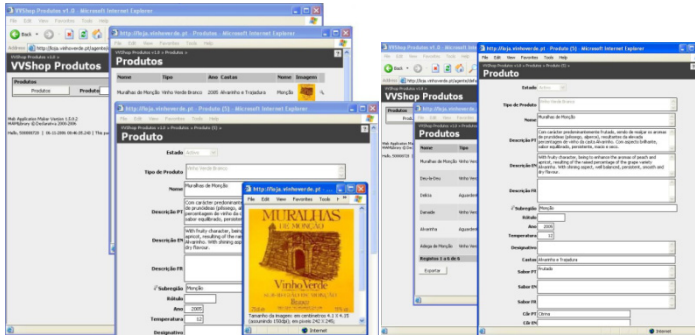


Fig. 6. VVSHOP Extranet components

## 5 The VVSHOP Public Interface

The goals are clear; the association of the protection of the denomination of origin in its environmental, cultural, and tourism aspects and link them to the wine product. This overview of the product is achieved by integrating all aspects of the certification of products into a unified system, hence the Verde Global project. As we saw earlier, the system that supports VVSHOP is a back-office that contains a set of transparent information elements to users who have mastered the management of all activities associated with the certification process. This system is customized to the EA through the Extranet, as well as to the user who runs the management activities through the Intranet.



Fig. 7. Interface to access the labeling of a brand on the Vinho Verde Portal

At the Web portal there is available relevant information to the public in Portuguese and English version. Access to brands data is available in VVSHOP, or through the portal, option search for a brand, as we can see in Figure 7, and it is possible to access the e-tailers if visitors select the link "Where to Buy" in the bottom of the page.

When the visitor accesses a product page, it is displayed information about the product (name, producer, description, color, temperature for drinking, vintage year and grape varieties). If the visitor wants to know more about the producer can click on the producer name to view detailed information about the Economic Agent.

The system determines the location of the VVSHOP visitor by its IP address, and the name of the country where he is appears on the screen beneath the message "Where to Buy"/"Onde comprar", it also appears the URL addresses of e-tailers that sell the product in that country. If the visitor wishes to find e-tailers from another country, he can change it in the popup menu that appears below the message "your country"/"o seu país". In Figure 8, we see a sequence of screens from the VVSHOP public information. We can see in particular the brand of the product and its features, the producer of the brand and a world map (Google Maps) with countries where e-tailers that sell that brand exist. If user clicks on one country that appears on the map all URLs of e-tailers in that country are listed.

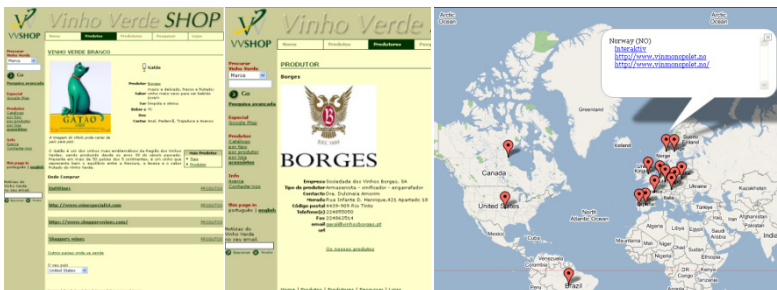


Fig. 8. Some components of VVSHOP public information

After a visitor clicks on a link in one of the e-tailers that appear in the list associated with a product, VVSHOP forwards him to the page of the company that sells the product, appearing immediately information about this product on the e-tailer page.

## 6 Team and Work Plan, System Impact and Future Work

VVSHOP evolved over time, starting from an e-commerce platform and ending as a directory of e-tailers. The resources involved in both phases of VVSHOP are quantified in a global manner and involved the participation of a number of experts in several fields; information systems (analysts, database administrators, programmers, technicians and communication operators), Web designers, marketing managers, a lawyer, viticulture and enology technicians. Apart from the specific development of



VVSHOP solution it is necessary to keep in mind that much of the work effort of VVSHOP system is transversal to other systems in CVRVV.

The development of the e-commerce store VVSHOP began in 2001 and in 2006 was migrated to an e-tailers system. The EU structural funds allowed projects Verde Global and e-Verde, by contributing to the financial effort that has been made in terms of amount of work (2 men/day) described and quantified in Table 2.

**Table 2.** Tasks and work effort in VVSHOP system

Tasks	2 men/day
Preparation, coordination, development and monitoring of project	20
Specifications design	15
System development	120
Integration into the architecture of the portal	5
Graphic design and its integration into the portal	5
Strengthening the technological structure	2
Charging and VVSHOP data migration	15
Technical monitoring the tests and put the system into operation	5
Training of users (Intranet) and producers in VVSHOP (Extranet)	3
Project design of mobility and new design	10
Total days (2 men work/day)	200

The initial system development forced to be hiring specialized companies. Since 2008 the system has been maintained by CVRVV's department of information systems, with support from the marketing team. 2012 was the year that a project began for upgrading VVSHOP design for mobile interfaces to increase user satisfaction and have more individual impact [10]. It is expected that by the end of 2014 the mobile version of VVSHOP will be available as well as a new version with a new interface design.

VVSHOP is one of the tools used in marketing campaigns on international markets, especially the USA, Germany, UK, Brazil and Canada. Producers like to see their products represented by VVSHOP when they sell or want to sell them in these markets.

The visibility of VVSHOP has increased from year to year in terms of number of visitors. The data obtained from the SurfStats in the end of 2006 VVSHOP had 38 606 visits, and in the end of 2013 VVSHOP had 232 906 visits which means an enormous growth. When development of VVSHOP started, it was established a set of priorities that passed by performing a careful analysis of visits and related data. In future projects, it is anticipated the possibility of creating a working group that could extract more information from visitor's profiles associated with big data tools, as well as the implementation of a system that automatically makes available to CVRVV's marketing relevant information to develop e-marketing campaigns.

## 7 Conclusions

The e-commerce system of VVSHOP was important at the time where there were not many online wine shops. With the emergence of many electronic stores to sell wine,

the solution to transform VVSHOP on an e-tailers system allowed to keep the existing information. On the other hand, the e-tailers system is a comprehensive and global solution because it is not limited, either in terms of number of brands and products represented in VVSHOP, or at the entrance of any electronic retailer, regardless of their geographical location.

The ease of updating information and the automation in some VVSHOP features allow the system to be used without difficulty, and do not require a great deal of maintenance. With the goal to meet the needs of different users involved (wine producers, computer technicians, managers and visitors), it is necessary to maintain the current system with a design according to the dynamics of the region, because although the product from the Vinho Verde Region are of regional origin products are global, present in many countries worldwide. The growth of B2C over the Internet will increase the number of e-tailers that sell the products online, which means that VVSHOP will also increase brands and their corresponding e-tailers, and the system is ready to receive that information. The best proof that VVSHOP is a successful project is the fact that the system is operational after more than 10 years from the date it has been developed, which allowed us to revisit the system in this work.

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