

# Storing Archival Emigration documents to create virtual Exhibition Rooms

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**Abstract.** This paper is concerned with an information system built in the context of a municipal archive aiming at supporting the preservation of physical documents and at facilitating the information extraction and dissemination. Saving individual records, like emigration documentation, is important for end-users and History or Social Sciences Researchers as they can know more about each individual and they can learn about the society. The emergence of the Internet provides to anyone access to the desired information in anywhere and anytime. From this, many information sources like Libraries, Museums and other similar institutions began storing documents digitally. Thus, the information stored in digital format, may be brought forward on Web pages displaying it to the end-users and enabling them to learn and interact with the available information. So, this paper aims to present the **SGPE** web-based information system in order to assist in the recovery of the emigrant's documents.

**Keywords:** Emigration Documents, Learning Spaces, Exhibition Rooms, Database, Web-based Application

## 1 Introduction

Virtual Exhibitions Rooms like virtual classrooms, virtual seminars, virtual museums, improve learning experience by supporting learning at leisure time, i.e., at flexible locations and time [1].

Traditional Learning Spaces are physical locations, normally within schools and universities, on cultural institutions, exposing objects with information (material or immaterial things [2]), arranging them in order to convey a message to the visitor or the attendants [3][4]. These spaces contain generally groups of people (usually students) debating about a specific subject and someone (usually a

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professor) who leads the debate, organizing behaviors through formal methods of education, to impart knowledge to the group.

However, a great part of people's knowledge is not acquired through formal methods of education and learning in a classroom, but during their leisure time outside the classroom, using their laptop, smartphone or any device to socialize with other people, as well as in snack bars at breakfast on lunch time, travelling on a train, in moments of leisure with their family, in a simple walk and also in visits to museums, libraries and the like [5]. Therefore, any physical space that features knowledge sharing can be considered a learning space (LS); exhibition rooms are a kind of LS.

In short, the previously cited features allow a range of people (not only students) to use these learning spaces to generate and acquire knowledge. Thus, the term e-Learning should not be applied in this context to avoid misunderstandings, because it is usually used to describe LS just for students enrolled in distance education, which is not our purpose in this paper [6].

Following this thought, we consider a Exhibition Room as a website where the information is arranged in such a way that the visitor learns with it, differently of the virtual museums similar to real museums but offering a 3D virtual tour [7][8]. As the classic British Museum<sup>4</sup> online illustrates, these web version of exhibition rooms just mirror the physical and traditional museums.

To achieve these virtual Exhibition Rooms, data about the target domain should be stored in a way that later it can be processed and displayed to the learner in the better possible way.

Documents that refer to History and Cultural heritage should be stored in a secure way for many reasons. Some of them are related to natural disasters, theft, as well as to later use of the community and who want to have access to these documents.

The domain covered in this paper is about the Emigration documents. The purpose is to stored in a relational database to subsequently use the information to bring some benefits to the community and to the Archive, like the creation of Exhibition Rooms.

This context created the opportunity to evolve traditional exhibition spaces, as reading and show rooms, to virtual spaces on the web in order to enable new learning approaches.

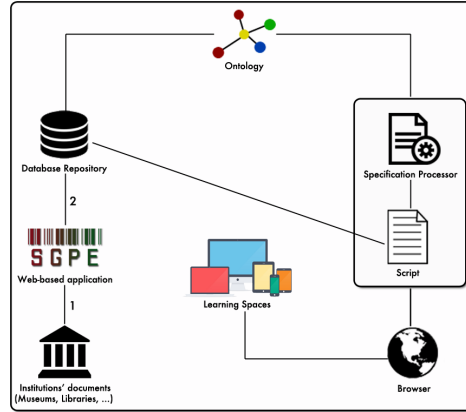
In this paper, we present our contribution in terms of designing a database and an application to store and preserve emigration documents. In Subsection 1.1 is presented the contextualization of this work in CaVa project. Section 2 outlines how emigration data is organized in their original support (the Archive physical documents). Section 3 discusses the design of the database, as well as its final schema. In Section 4 is presented the developed system (SGPE) with its features and is explained how the application helps with the records to be stored. Finally, in Section 5 is described what was made and the future work that can be developed with the collected information.

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<sup>4</sup> Accessible at: <http://www.britishmuseum.org/explore.aspx>

### 1.1 CaVa, an overview

The work presented in this paper is part of a PhD project called **CaVa** (Criação de Ambientes Virtuais de Aprendizagem) to automatically create virtual Learning Spaces. In Figure 1 is illustrated the proposed architecture to achieve the final goal.



**Fig. 1.** Proposed Architecture of CaVa Project

SGPE information system is an essential and initial part of CaVa, because this component is responsible for the electronic storage of the emigration documents that later are used to generate the virtual learning spaces.

As can be seen in Figure 1, the ontology, the specification processor and the browser are the necessary components after SGPE to achieve the objective. The ontology serves to describe and to relate semantic concepts of a specific domain, in addition to connecting these concepts with the digital objects stored in the database. The specification processor transforms the formal description of the learning spaces into scripts. Finally, the generated scripts are processed by the web browser to render the final learning spaces.

## 2 The Emigration Documents

In order to define the principles for the protection of the emigrant, the Portuguese Decree-Law 36 558 of October, 28th, 1947 created *Junta da Emigração*, a department to treat of “all due diligence and preparatory formalities of boarding of any emigrant and of their application forms.”<sup>5</sup> [9], but later, this department was unable to deal with all the applications of the emigration in Portugal. Then its tasks were reduced to the appreciation of passport applications that started to be processed and archived locally at the Municipal Departments [10].

<sup>5</sup> See also: <https://dre.pt/application/file/635905>

Therefore, the emigration documents characterized in this paper are restricted to those that describe the emigrants' data needed to apply for a passport. These files contain information such as general data of the document itself (document identification), general data about the emigrant, list of attached documents, family members accompanying the emigrant, desired type of transportation, qualifications (literary and professional) and criminal records, family members in charge of the emigrant who remain in the country, previous travel abroad, details of the person calling the emigrant, employment contract, aid in the destination country, among other information. All these data items (more than 80) must be provided to get a passport; some fields are atomic (strings, numbers, or dates); some fields are lists; some of them are compulsory while others are empty.

As previously said, this large set of data items has a big potential to describe each individual integrated in the society of his epoch, but also provides knowledge about the society in a precise context of the country/world history.

### 3 Designing a Database

In fact, our main goal has been to design a database dedicated to the analysis of emigration documents (as can be seen in Figure 1, the database repository). To design this kind of the database it is required knowledge about the domain and also access to the organization that provide these documents.

In the context of this project, we have the cooperation of the municipal Archive of Fafe (a city at the North of Portugal), which is liable for the preservation, dissemination and organization of the physical emigration documents<sup>6</sup>.

This collaboration brings to us many benefits in the scope of the development of this project. Working with professionals of the domain like archivists, we had the opportunity to learn and to improve the knowledge about the documents and what they include as well as we had the chance to exchange information and experience with the experts in terms of the emigration documents.

From that cooperation we had the chance to develop a database to preserve and later to disseminate in virtual Exhibition Rooms the data included in the emigration documents.

The logical model of the database implemented covers the data items described in Section 2 necessary to obtain an emigration passport. This model with sixteen tables is the result of the normalization of the high-level conceptual schema firstly drawn centered on tables *Processo* and *IdentificacaoEmigrante*. From it, the relational database (physical model) was developed in Mysql.

The design of this database was of great importance for this project, because storing the emigration documents in a database is a good way to preserve them and later to create the Exhibition Rooms, disseminating the emigrations data. This information shall be displayed in the best possible way, making the Exhibition Rooms easier to handle than the physical documents.

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<sup>6</sup> The documental serie *processos de emigração* contains more than 6400 records.

## 4 SGPE, the application

Analyze, understand and transcribe the correct data of the emigration documents are difficult tasks when those records are written by hand or typewritten.

Typesetting all data items mentioned in Section 2, to transform the original paper documents into electronic documents (for safety purpose and further processing), must be a user-friendly and secure task.

On one hand, typesetting errors should be avoided by reducing the text required to enter, and by validating data fields as soon as they are fulfilled. Comboboxes (drop down lists) offering lists of predefined values to choose, and similar user interaction techniques should be carefully identified and provided.

Thus, to transcribe and to populate the emigrant's database on an easier way, we developed a web-based application called SGPE (Sistema Gerenciador de Processos de Emigração)<sup>7</sup>.

SGPE deals adequately with typesetting problems mentioned previously. As referred earlier, this project is concerned with the emigration documents that belong to the municipal Archive of Fafe dated from 1960s till 1970s. However, the application can be used for any time period. This is true because the interface does not impose any constraints concerning the application date. Moreover SGPE is not oriented to a special kind of form. This means that SGPE can cope with data collected from similar documents produced by Junta da Emigração along the years.

To understand how SGPE works and its role in CaVa project (introduced in Section 1.1), Figure 1 shows the connections that SGPE establishes with the other components (Archive documents and database repository).

The first important task to do after accessing the sources, represented in Figure 1 by number (1), is to enter the documents' data in SGPE application, which in turn stores these data in a repository, represented by the edge (2), i.e., in the relational database described in Section 3.

The web-based application was developed in PHP programming language, jQuery and javascript and with the aid of a high-performance PHP framework (Yii<sup>8</sup>). The framework come with rich features like MVC (Model-View-Controller), DAO (Data Access Object) / ActiveRecord, I18N/L10N, among others, what can reduce significantly the development time. Furthermore, Yii also helps in the four basic operations of a database generating automatically code for the CRUD (Create, Read, Update and Delete) operations.

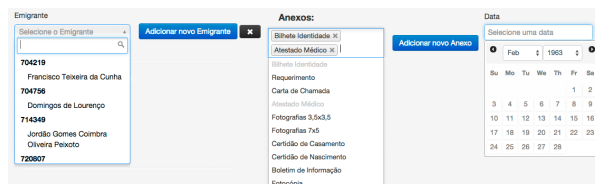
Actually to create an application with Yii is necessary to follow three steps: (i) Create the database; (ii) Generate the PHP code; (iii) Customize the code to fit the needs of the application. For the second step, Yii has a module called Gii that provides web-based code generation capabilities. Gii creates the fundamental code for each MVC layers.

As referred earlier, the typesetting errors can occur and to prevent them, SGPE has applied the interaction techniques previously mentioned. To illustrate

<sup>7</sup> Emigration Documents Management System

<sup>8</sup> Available at: <http://www.yiiframework.com/>

this, in Figure 2 can be seen three examples of preselected value components that help the user to enter the correct data without giving the chance to type incorrectly.



**Fig. 2.** Components with preselected values

The first example is a component that shows a list of emigrants with their identification numbers to select one of them. The second is a widget that presents a predefined list of attached documents that can be appended to the emigration records and the third is a component to select a date. These interface components exemplify three situations that are error prone. All widgets have the same purpose that is to let the user choose one option to avoid duplicate data or mistyping. If the user needs to enter a different information, not existing in the database, then the buttons on the right side of the component enable this feature (except for the date widget).

## 5 Conclusion

The web-based application, SGPE, described in this article was developed with all the desirable features identified along the paper. Having the information, extracted from the physical documents, properly stored in the database (the central repository of CaVa project), it is possible to proceed to the next steps towards the achievement of the final project objectives. To guarantee the high level of data correctness, required by the phase of information exhibition, SGPE does not enable the user to enter wrong data through the use of interface components of preselected values (instead of free text fields), and performs various semantic checks. To read more details about the database scheme and tables or about SGPE design and implementation, please access <http://www.di.uminho.pt/~gepl/SGPE>.

In a first stage (before the existence of SGPE), some emigration records (around 233), were processed and stored electronically in Excel workbooks that were organized in separated worksheets similar to database tables. The decision of storing directly these data items in spreadsheet cells gave rise to various problems as those mentioned earlier (typesetting errors, or more severe ones like mistakes in data references). However it was possible to load automatically all these records into our SGPE database. An additional processor (based on a parser) was developed to read the worksheets and to store all data items in our tables. For that purpose, two scripts in Perl and Java were developed; they read

the spreadsheet cells and load the database, writing to a log file all the erroneous situations detected (later, the domain expert will decide and overcome those problems).

The objective of this paper was to describe an web-based application (SGPE) and the database of the emigration documents in order to preserve, to disseminate and to create virtual learning spaces. However, other important purposes also should be worked in the future like seminars and other social programmes.

In fact, the cultural recognition of society can only be enhanced if studies showing the importance of the various historical subjects are developed. In the context of this work, we believe that to follow the route of the emigrants is important, because this allows the recognition of the cultural trades, the difficulties in the adaptation, the prejudices that they suffered, among others relevant subjects. To sum up, the study of the emigrants potentiated by the information system reported is essential to understand the development of the destination areas as well as the influences that the emigration causes in the society in the return of the emigrant to his country.

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