Designing a Method to Capture, Insert, and Retrieve Digitized Archives at St. Mary's Parish in Panama

An Interactive Qualifying Project
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Abstract

This project addressed the issue of accessibility and damage mitigation of historical ledgers in the archives of St. Mary's Parish in Panama. After investigating free software development tools, the team collaborated with parish staff and Footprint Possibilities to remotely build a working prototype of St. Mary's Digital Archives, an archival database system to preserve the parish's physical archives and provide quick access to the church's sacramental records. This software system enables parish staff and volunteers to capture and load high quality images of ledger pages, insert individual sacramental records into a MySQL database, subsequently retrieve valuable records and print out an authorized certificate of a sacramental event for parishioners and visiting researchers.

Acknowledgments

The team would like to thank all the organizations and individuals who worked together to make this project a success. Firstly, we would like to thank St. Mary's Parish for the opportunity to work on this project and all the support given during its journey by Tito Mouynes, Father Pio, and the secretary at St. Mary's Parish. Also, all of this would not have been possible without the support of Footprint Possibilities and Rick Montanari. Lastly, we would like to thank our advisors Prof. Robert Kinicki and Prof. James Chiarelli who guided our project from conception through implementation and completion

Executive Summary

1 Introduction

This project developed a prototype for a functional database that attributes metadata about a record to an image and allows for users of the software to easily retrieve that information. The team developed this software solution for St. Mary's Parish, a Catholic church in Panama City, Panama in conjunction with Footprint Possibilities. Footprint Possibilities provided extra support and resources for the project team and St. Mary's Parish that successfully guided the project to completion. Prior to this project, the parish staff searched for the records in their archives by using a system of index cards. The card system was originally very helpful, however keeping the index cards updated and completed proved challenging. The index cards today do not provide the functionality that they once did, and so St. Mary's was interested in utilizing a digital system to track and retrieve their physical records. Such a system would be more useful for not only the staff, but for researchers and family members who wanted to view the information contained in the archives.

2 Background

The archives at St. Mary's Parish contain records from 1810 to the present. There are 38 ledgers in the archives containing approximately 100,000 unique records for the sacraments of baptism, first communion, confirmation, and marriage, as well as death records. Figure 1 contains an example of a baptismal record in the archives. Figure 2 shows several leatherbound ledgers containing many different types of records at St. Mary's. The ledgers vary in condition from new to very old and fragile. The records are either in tabular form or in free-form paragraphs. The records are also handwritten in beautiful script, which makes understanding them more difficult. St. Mary's is concerned that handling the ledgers to find records in them will ultimately damage those very same records. In addition to over-handling, their records are susceptible to accidental fire and/or water damage, and without another copy, physical or electronic, the records are in danger. It is the duty of St. Mary's Parish to find a way to preserve these documents for not only its staff members, who handle them, but also for the individuals listed inside and their family members.

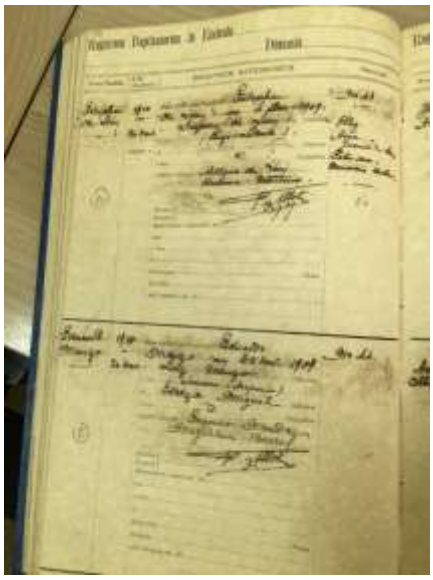

Figure 1: Baptismal Record from St. Mary's Parish. Pio, P. (2020).

Figure 2: Ledgers from St. Mary's Parish. Pio, P. (2020).

3 Methodology

The team determined that designing a customized prototype for St. Mary's to organize their records was the best option. The team researched methods that other projects used to get a sense of what was acceptable and what was the standard practice. At the same time, the students interviewed the parish staff to get a better understanding of the types of documents in the archives, and to determine the needs of the parish. The parish needed a system that could correlate an image to its data within a database. They also needed a way to search for those records with many keywords, display a certificate for a record, display the image associated with it, as well as backup, restore, and delete information in the database. The student team researched imaging, hardware, and software options for the project while considering the limitations imposed on the team by the size and shape of the documents as well as by the budget at St. Mary's. The project team also needed to learn the languages to write the software, namely HTML and PHP for the web pages and MariaDB for the database. The team had to learn them quickly and focus its efforts to maximize the number of features it produced in a short period of time.

4 Implementation

The first step to implementing our project was to create a method for capturing and digitizing documents. To do this the WPI student team procured digitizing equipment, with the help of Footprint Possibilities, which was able to consistently capture high quality images of the documents inside of St.

Mary's Parish. The equipment involved three physical components, a digital camera, a tripod, and a music stand, and one software component, an image editing software. To capture an image, the staff open a ledger to a specific page and place it on the music stand. Then, the staff adjusts the camera so that the entire page is clearly in view, and then they take the picture. After several images are taken, the parish staff member uploads the images to a computer and edits them to make the text clearer. Doing this prepares many images for the staff to insert into the database.

The second step that the students took towards implementing our project was to install and set up the database and the tools required to operate the database. The students installed two primary pieces of software. First the student group installed the administrative tools for the database. This software was called XAMPP and it included the Apache webserver that runs the web pages, the language PHP that the team wrote the web pages in, the MariaDB server that ran the database server, and the database editor phpMyAdmin. Next the project team installed the software solution itself. This consisted of an SQL database, a file system for captured documents, and the code for the operation of the database. The church used both pieces of software together to operate the database.

Once the students finished installing software and the parish staff completed the imaging process the software solution is available for use. The project team decided that the software had to be usable by individuals with little technical experience and by individuals who spoke either English or Spanish. With this in mind, the project group designed the user interface to be simple and self-explanatory. The group wrote all the text on the solution in both Spanish and English. The group created fields and buttons which are simple to use and understand. In addition to a simple user interface, the team created a manual to guide users through the operation of the software solution, not only for normal use but for installing and maintaining the software.

5 Results and Analysis

The students designed the software with ease of use in mind. The most technical thing that a user must do is to select a file or a file path. Beyond that, the user only interacts with the system and the database through many buttons and text boxes. Prior to using the software, staff at St. Mary's will capture several images of the ledger pages. The staff use a setup to capture images of the ledgers like the one shown in Figure 3. The staff then edit those images with Adobe Photoshop 2020 to make them more readable. Once these images are readable, the staff can

input a new record into the system. Parish staff can insert a new record for five different types of sacraments, as they each have their own input screen. The staff can preview images in a new window while they are entering data. An example of a front-end input screen is shown in Figure 4. After they have confirmed the information in the submission, they have the option to reuse that image with a new record, or to pick a new image.

Figure 3: Imaging setup at St. Mary's Parish. Pio, P. (2020).

Figure 4: Front end input screen. (2020).

The parish staff can also search for a record. After receiving the search criteria from a visitor to the parish, the staff can access the search screens for a particular sacrament. The team customized the search screens for each sacrament (see Figure 5). After sorting and reviewing the search results that the software produced, staff members have the option to view a record directly or print a certificate containing all the information that is contained in the record. The staff can hand out these certificates to visitors so that they can take something home.

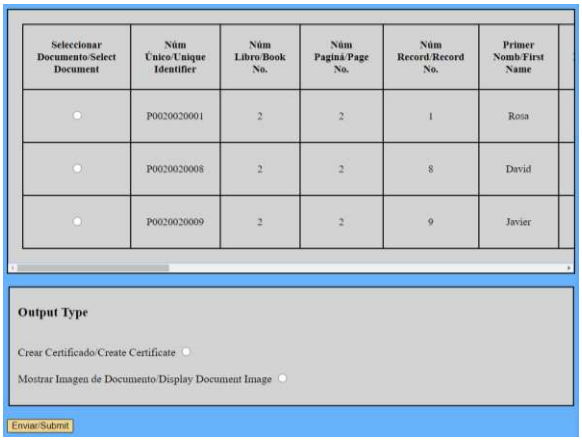

Figure 5: Front end search screen. (2020).

The student team designed the user interface to be aesthetically pleasing as well as easy to use. The students customized the color theme for St. Mary's Parish, and organized fields in ways that made sense. Instructions on the page were simple and direct. No extra options appeared on any page in order to streamline information flow. The project team designed the software to be custom-built for that one task. The group also added backup, restore, and delete features to the software so that St. Mary's could maintain the database. These features were hidden from standard users behind an administrative page with warnings explaining how to use them.

The team submitted two surveys to St. Mary's during the late stages of development guided how the WPI student team detailed the software. The group surveyed the parish staff and a few members of Footprint Possibilities who used the software. This feedback provided extra input from outside the team, and it gave the staff who would be using the software an extra avenue to voice their praises and concerns.

6 Recommendations and Conclusions

We developed a system for St. Mary's Parish to digitize, store, and retrieve the records in the parish's archives (see Figure 6). The system that the team created includes using a camera, tripod, and music stand to capture images of documents, and a software solution that utilizes a web browser, web server, and a database server to track images. The software also comes with functions to create a backup of itself, to restore itself from that backup, and to delete records within the database. This solution is a major step forward for the parish in modernizing their archives and will greatly increase the speed with which the staff can find records.

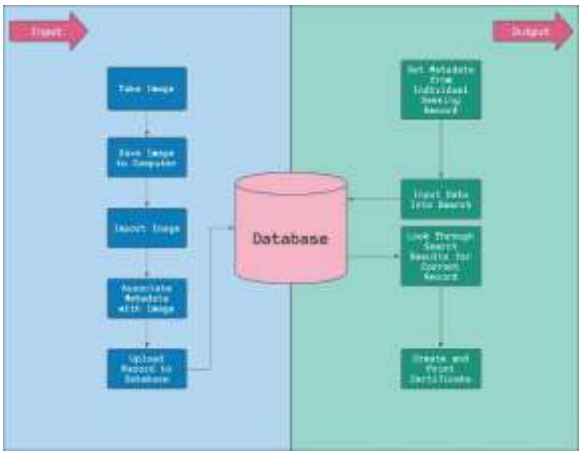

Figure 6: Workflow diagram of database operations. (2020).

The project team recommends that St. Mary's uses this software, however the team understands that there are some shortcomings with what the team produced. Multiple users cannot access the database at the same time, there is no import scheme, and the software can only run on one computer. However, the team believes that this prototype will be useful for St. Mary's, and that it will still benefit them.

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The Size, Shape, and Form...	Nathan	Erik & Ferris
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1 Introduction

The recorded history of Panama stretches back for hundreds of years, documenting the daily lives and interactions of its people after the Spanish conquest in 1501. The Spanish brought their religion and culture, primarily founded in the Catholic Church, as it was among their goals for colonizing the New World to evangelize and convert to Catholicism the native population. A core feature of the Catholic faith is that individuals have sacraments conferred upon them at key moments in their lives. The church has, for the most part, kept track of these events through handwritten ledgers' information about the event and who was present. The records may be many hundreds of years old and in good to poor condition depending on where and how the

Figure 1.1: Image of Pánama Viejo historic district of Panama City, Panama

parish staff had stored them. These records, however, contain information that describes landmark events of the people of Panama outside of the official state records and are priceless cultural artifacts.

St. Mary's Parish, located in Panama City (see Figure 1.1), has served the Catholic Church as the head of the archdiocese in the city since 1513 and serves its parishioners by keeping records of key life events in the Catholic faith. They possess roughly 100,000 records in 48 ledgers that document the lives of their parishioners from 1810 to the present (V. Guerrero, personal communications, May 6, 2020). The types of sacraments that the parish recorded include baptisms, communions, confirmations, marriages, and deaths. These records are in danger of being lost to damages in a catastrophic event. The archives are disorganized and difficult to search through. The parish created the books when they conducted new sacraments or when they filled an entire book with records. This meant that there were more books describing baptisms than other sacraments, it also meant that these books were out of order with an inconsistent numbering scheme. The archivist at St. Mary's had to handle multiple books to find a specific record, due to this there was a greater risk that the books would become damaged or destroyed. Destruction of these records would be an invaluable loss for St. Mary's Parish.

Prior to the WPI student team's involvement, the church used an index card system to organize and search through the parish archives. As the church staff added records to the archive, they would create an index card associated with each record. Each index card includes the book number, page number, and the first and last name of the individual associated with the record. In addition to this index card system, another organization had completed digitizing the parish's records, however, this group took all the information with them and did not allow the parish to have access to the records after their capture. The students created the St. Mary's Digital

Archives to replace the index card system. Once the parish staff finished filling the Digital Archives with the records in their physical archives, the index card system can be retired. St. Mary's Parish has relied upon that filing system for several years. However, it was outdated, and some records did not have an index card associated with them. So, while the index card system helped the parish staff to a certain degree, the process for finding a record still consisted of a staff member looking through many books by hand.

Footprint Possibilities, a 501(c)3 private charity, has worked to support local community centers like St. Mary's Parish by providing support, funding, and coordination to create more opportunities for educational and cultural platforms (Footprint Possibilities FAQ, 2020). St. Mary's Parish reached out to Footprint Possibilities seeking help in developing a digital system to replace the outdated index card system, thus, improving the efficiency of document retrieval and providing a digital method of searching the contents of the archive. Footprint Possibilities then connected the WPI team to this project and continued to facilitate the project until its completion.

St. Mary's Parish wanted a solution that enabled them to find their records quickly and securely. Anyone who is looking for records can ask the staff to search the database and produce potential matches for review. This investigation's goal was to develop a functional prototype of a database that can be used to organize the historic documents stored in the St. Mary's Parish archives. To accomplish this, the team established a system for both digitally capturing these records and inputting them into the software. This database is an organizational tool for the parish with which they can search for a record by name, date, location, sacrament, etc. The team learned about past archival projects, gained insight and an understanding of the goals of the project from the perspective of the church staff, delivered product recommendations that took

into account the church's limitations, and learned the programming languages necessary for designing the St. Mary's Digital Archives.

The students designed the Digital Archives to reduce the time that it takes to find an individual record from multiple days to just a few minutes, creating less work for the staff and a more convenient experience for any individuals that are requesting records. The totality of the system includes a front-end application for operating the database, a system for managing document image files, and the database itself. The students developed a manual, found in appendices E and F, to accompany the Digital Archives which guided users through the operations of the software. Once the team created and installed a usable prototype at St. Mary's Parish, the group asked the parish staff to complete a survey, found in Appendix G, about the success of the Digital Archives. The results of this survey showed that overall, the parish staff was satisfied with the Digital Archives and allowed the staff to recommend changes or bug fixes. The team conducted another survey of this nature, found in Appendix H, after they installed the final prototype of the Digital Archives.

2 Background

2.1 Footprint Possibilities

Footprint Possibilities is a 501(c)3 private charity with headquarters in St. Petersburg, FL in the United States (Footprints FAQ, 2020). Currently, they are focusing their activities entirely within the nation of Panama. However, their website indicates that this scope may change with longer range assistance, more access to resources, and greater expertise (Footprints FAQ, 2020). Within Panama, the charity's mission is largely centered around organizing local community efforts. Their initiatives range from healthcare to education, to construction projects, and the environment (Footprints FAQ, 2020). Communities in Panama come to Footprints and lobby them for assistance. If Footprints determines that it can assist these groups, they find resources and other expertise that are specific to their problems (Footprints FAQ, 2020). In essence, Footprint Possibilities provides a pathway for communities in Panama to reach out into the broader world for aid which might not be normally available to them.

Footprint Possibilities has helped many different groups and communities in Panama with their service efforts, and they document several of these initiatives on their Facebook page. Between January and April of 2020, they began work on a water distribution system in conjunction with Michigan Technological University at La Penita in eastern Panama (Footprint Possibilities Facebook Page, 2020). They also began work on another water distribution system in conjunction with Columbia University in San Lorenzo del Chagres along the Atlantic coast of Panama (Footprints Facebook, 2020). Furthermore, they are actively working to continue previously existing projects related to clean drinking water in Kuna and San Francisco in Panama (Footprints Facebook, 2020). However, while this might suggest that Footprints only works to

create water distribution systems, in October 2019 they completed two projects with groups of WPI students. One student team focused on creating a guided tour of the museum at the El Cano archeological site, and the other team focused on identifying dried plants buried alongside the chieftains at the El Cano site (Footprints Facebook, 2020). Footprint Possibilities is committed to helping communities in Panama by working closely with them, and by providing resources and expertise to accomplish the goals of those communities.

2.2 The Catholic Church and Its Influence over the People of Panama

The Catholic Church has been present in Panama since the early 1500s when Spanish explorers began converting the native population to Christianity. For the next three hundred years, Christianity spread throughout South America and Central America including Mexico and Panama. Spanish colonists built towns with churches as their epicenter, and parish communities formed around them. In 1821, Spanish rule ended with the liberation of the people of Panama who immediately joined the Union of Gran Colombia. By this time, churches were where people would regularly congregate and churches were the town halls of communities where civil and religious officials made and kept official documents. The Catholic churches of Panama kept records of baptisms, first communions, confirmations, marriages, and deaths. When a church performs a baptism, for example, it creates a baptismal certificate to record the event. The certificate includes information like the baptized individual's date of birth and the names of the parents with the mother's maiden name (see Figure 2.1). This information is also in a ledger, providing proof that the church baptized that individual. This is a very important record to keep for individuals who are getting married in the Catholic church. Both individuals must be baptized, and if one or both of them lost their baptismal certificate, they would have to go to the

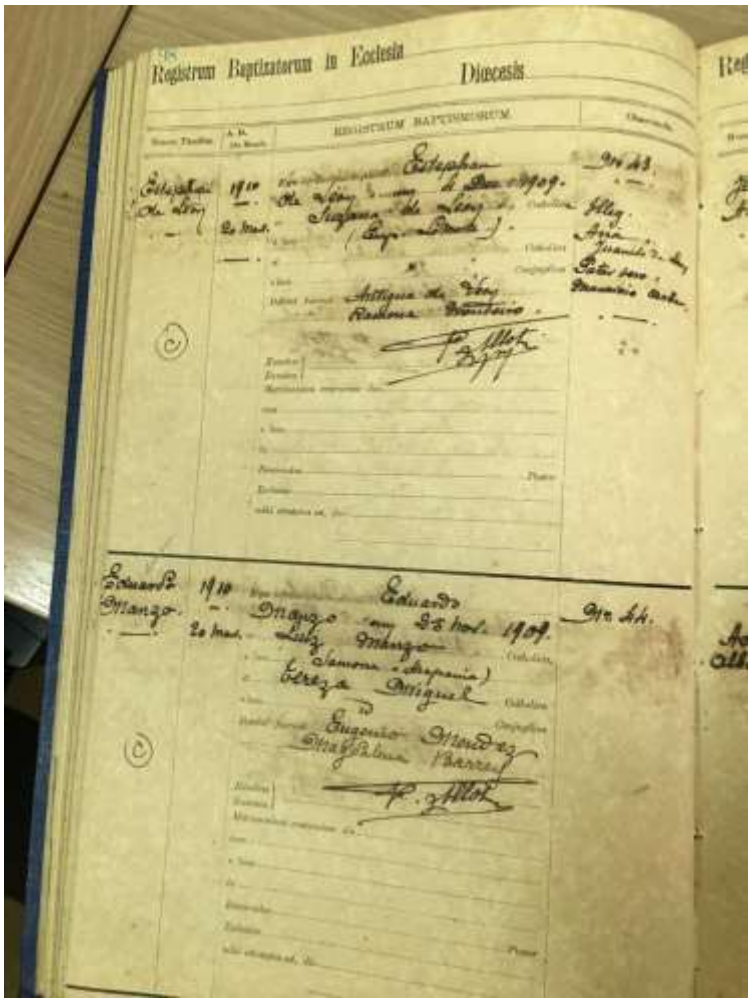


Figure 2.1: Baptismal Record from St. Mary's Parish. Pio, P. (2020).

church that baptized them and request to see their file. It is important for the church to work effectively to maintain these records for the community (Museum, 2018).

2.3 St. Mary's Parish

Footprint Possibilities and the project team worked with St. Mary's Parish on a project that assisted their record-keeping abilities. St. Mary's Parish is the headquarters of the Catholic Archdiocese of Panama, with their house of worship being the iconic Cathedral Basilica of St. Mary, shown in Figure 2.2. It is located in the Old Quarter of Panama City, Panama. Bishop

Remigio de la Santa Maria la Antigua consecrated the Cathedral in 1796 after over one hundred years of construction (Arquidiócesis de Panamá, 2020). The parish itself, however, predates the completion of the Cathedral by nearly three hundred years. In 1513, King Ferdinand of Aragon asked Pope Leo X to appoint a bishop to convert and evangelize the native population of mainland America (Arquidiócesis de Panamá, 2020). The Pope granted this request and created the Diocese of Santa Maria la Antigua located at a town called Santa Maria la Antigua on the Atlantic coast (Arquidiócesis de Panamá, 2020). In 1520, Governor Pedrarias of the Panama colony transferred the bishopric across the isthmus to the site of present-day Panama City, shown in Figure 2.3 (Chow, 2020). In 1925, the church elevated the See to the status of Archdiocese, and today its head is Archbishop Jose Domingo Ulloa Mendieta, O.S.A. (Chow, 2020).

St. Mary's Parish maintains archives that chronicle the lives of people who have shared a portion of their time with the church in Panama City. According to Padre Pio, the custodian of the documents at St. Mary's, their archives stretch back as far as the year 1810, meaning that they document over two hundred years of the parish's history. Formerly, when a member of the parish requested to see any record in their possession, a staff member had to look through a filing cabinet of names on index cards, and match the requested name to a name in the index card system. If there was a match, the information on the card indicates a book where the actual record is kept (V. Guerrero, personal communications, 2020). The parish is unwavering in its commitment to the long-term storage and use of their records and archives as intended. However, the past process for accessing records was inefficient and slow as many of the books are very fragile. Formerly, an index card-based filing system is used, though it is incomplete as the staff has sporadically updated it over the years. The parish must continue to care for the archives and

to provide information for anyone who requests it since they have a duty as responsible stewards for their archives.

Figure 2.2 St. Mary's Cathedral Exterior. Dooley, J. (2005).

Figure 2.3: Google Maps Location of St. Mary's Cathedral in Panama.

2.4 The Cultural Significance of Archives

An organization preserves itself and potentially its culture through the use of archives. Organizations maintain archives to preserve their history and to learn from their past experiences (King's College, 2020). There are also a wide variety of groups outside the organization that might find the archives useful. For example, a local historian might be interested in a certain archive to describe life in the past in a specific locality, or an academic might be interested in a certain archive to place themselves in the past. Government officials might search archives to validate or dispute the past actions of people, or artists might search them for inspiration from the past to guide their work (King's College, 2020). Archives, then, propagate cultures due to their contents which many groups and organizations might find informative. It is important for the organization which houses their archives to do well in maintaining them.

Custodians of archives have a responsibility to identify, appraise, preserve, and make available any and all documents in their possession if someone who has the correct privilege seeks them (Council on Library and Information Resources, 2020). They must be familiar with the history of their organization, and they have to be sensitive to any of the associated connotations that documents in their collections might have, whether they are good or bad. The organization which hosts the archive, then, has it in their best interests to support the custodians of archives and the processes that preserve them. Archives not only preserve the historical value of documents; they also preserve any legal implications that the documents may have. It may be the case that an organization is required to provide documents to government organizations (CLIR, 2020). The institution might also have an obligation to provide documents to the relatives of the people that the archives name; the institution would give those people the freedom and the ability to access information related to their families.

In the case of St. Mary's Parish, the custodian of their archives is Padre Pio. Padre Pio is also a priest at St. Mary's Parish, this makes him a qualified person to oversee the parish archives. In Panama, the state records information on the births, marriages, and deaths of its citizens and of foreigners. St. Mary's also records information related to births, marriages, and deaths, but that only pertains to sacraments and burial location and is not legally binding. For example, marriages within the church require a civil marriage along with the traditional ceremony in order to be legal (Angloinfo, 2020). Because of this, it is unlikely that the government of Panama would be relying on St. Mary's for this information. The primary obligation for an organization like St. Mary's Parish is to make their records available to their parishioners and their families. This takes on an even greater meaning because these records describe the lives of numerous individuals who have families and contribute to the culture of the parish. Archives are significant to organizations like St. Mary's because they house information that no one today can reproduce.

2.5 The Size, Shape, and Form of St. Mary's Documents

The staff at St. Mary's Parish has stored most of the documents in the form of logbooks (see Appendix A). According to email communications with Padre Pio, the logbooks are similar in size, with the pages of the largest book being 60 cm tall by 50 cm wide. On the pages are tables that record sacramental events including baptisms, confirmations, marriages. Included in these records are the dates of the events and names of participants. There are also other recorded details about the events which vary across the different logbooks. Figure 2.4 shows a photograph of a logbook that is in the parish archives. The parish wrote these records in a wide variety of styles and formats. The only similarity across all the records is that they are handwritten in ink.

The biggest difference is the language of the records. The parish wrote these records in Spanish or in Latin depending on their age. The next difference is that the parish wrote the majority of records in cursive, while they wrote some of the newest ones in print. Additionally, the parish organized the information in the documents in two different ways, either in the form of a long paragraph or in the form of a table. Finally, most of the older records writing has faded partially or entirely. This wide range of variation can make reading these documents a very difficult and time-consuming task.

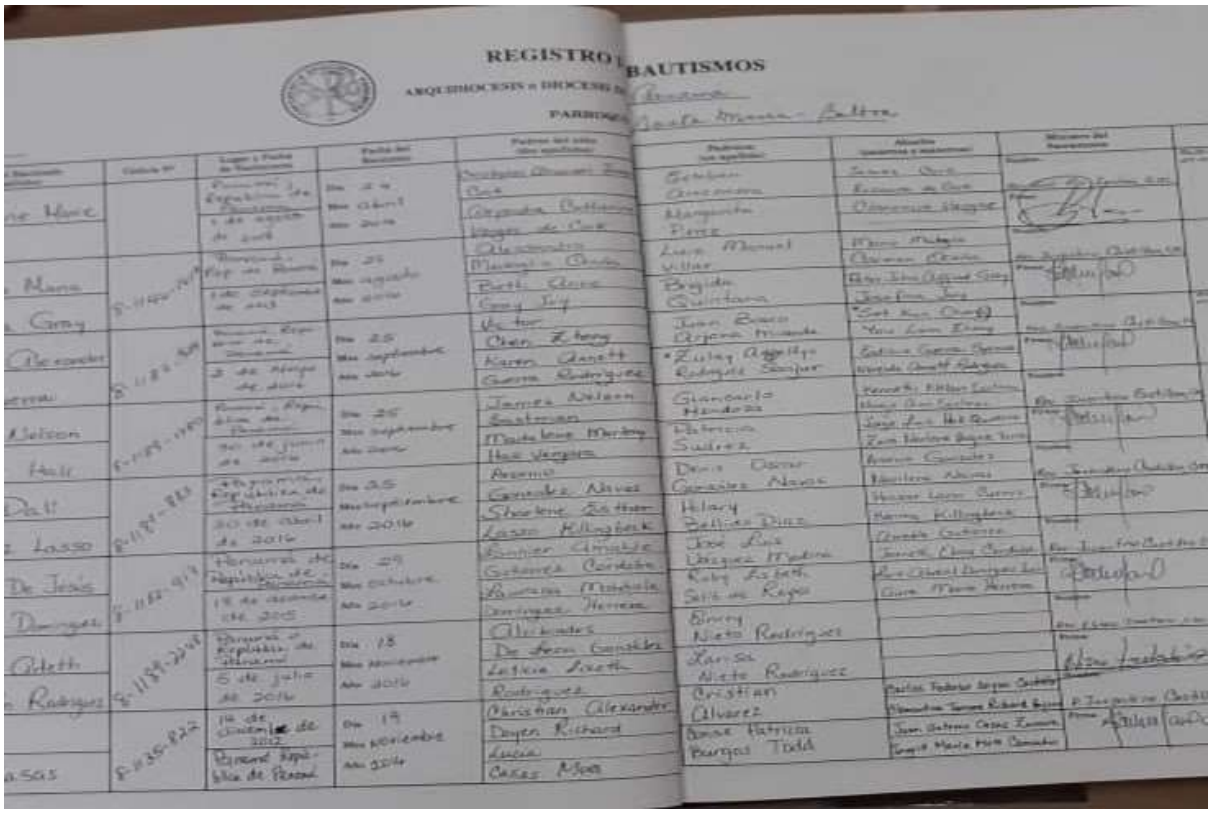


Figure 2.4: Baptismal Record from St. Mary's Parish. Pio, P. (2020).

2.6 Understanding Risks to the Archives

There are two categories of damage risks for the parish archives. There is damage that could be caused by potential disasters, and there is damage caused by handling the documents in

the archives. Natural disasters are a common occurrence in Panama and have the potential to destroy the St. Mary's Parish archives. In Panama, there is a "high" risk of river floods, urban floods, coastal floods, earthquakes, landslides, tsunamis, volcanos, and wildfires (Global Facility for Disaster Reduction and Recovery, 2020). As it would be nearly impossible for the parish to prevent these disasters from happening, the only way for the parish to protect the history within the documents is for them to create copies of the documents. Since it is not feasible for the parish staff to make handwritten copies of every record in their archives, the most effective way to protect these documents from being lost to disasters is for the staff to create digital copies of these documents. While the church keeps one copy which they use to search for records, the parish sent multiple copies to various other locations physically outside the church. Having multiple backups in different locations means that if one or more documents are lost to damage the parish can still recover the documents from the other backups. It would still be a great loss to the parish if the original documents were lost or destroyed, but at least the parish will be able to preserve the history contained within the documents.

Another threat to the integrity of the documents is damage done by the physical handling of the archives. Each time someone handles a document, there is a potential for damage. The St. Mary's archives consist of ledgers that contain their records. Each time someone opens one of these ledgers the binding slowly wears out. Documents can also be damaged by the oil from a person's skin, ink, food, drinks, or sharp objects (Library of Congress, 2020). The process of digitization is a double-edged sword when it comes to this issue. The parish staff must handle the documents in the archive to digitize them, however once they complete the digitization process the parish will not need to handle the original copies as often. The parish staff removed these hazards to ensure that the original copies will endure after the church staff completes the capture.

2.7 The Technology Used for the Project

Designers of databases organize the storage of digital records by selecting a database platform that organizes the data well and then enables a computer to query a database and retrieve the information stored in the database. A database exists on a dedicated computer for managing queries and returning the requested information. Sometimes the user requirements for databases are very complicated due to the need to handle multiple users that have different read and write privileges, records of modifications, and even being distributed across multiple computers. Databases with simpler functional user requirements store and assist a single user with rapid retrieval of information. They are relatively easy to construct and have been commonly used since the 1980s. Many databases store an entry with extra details about the record. Frequently in modern database infrastructures, a database consists of several "tables" which users can construct and access using the language SQL, a language which has many free implementations (W3Schools, 2017).

Computers store this information on devices called storage drives. Depending on the required speed of the database or other database usage requirements, the storage drive holding the information of a modern database could be a hard disk drive (HDD) or a solid-state drive (SSD). HDDs contain physical disks that spin at very high speeds. Because of their physical, high-precision components, HDDs are somewhat fragile and should not be left running for long periods of time. Sudden changes in the temperature, humidity or even orientation of an HDD can cause the drive to damage itself. SSDs store data in logic-gate circuit components which act as switches. SSDs are faster than hard disk drives and can be left running for much longer,

however, they are significantly more expensive and can only be re-written a few times (Brant, 2019). An HDD and an SSD with their covers removed can be seen in Figure 2.5.

Designers of databases assume that something may damage or destroy the information storage devices eventually, leading to data loss. To mitigate this risk, architects of a database design a method for backing it up. Copying database records via a regular backup operation to external storage devices is a necessary step that an entity must perform. This precaution means that one can recover the information even if the master database itself is somehow damaged. It is best practice to store the backups in a separate location from the database itself and to have

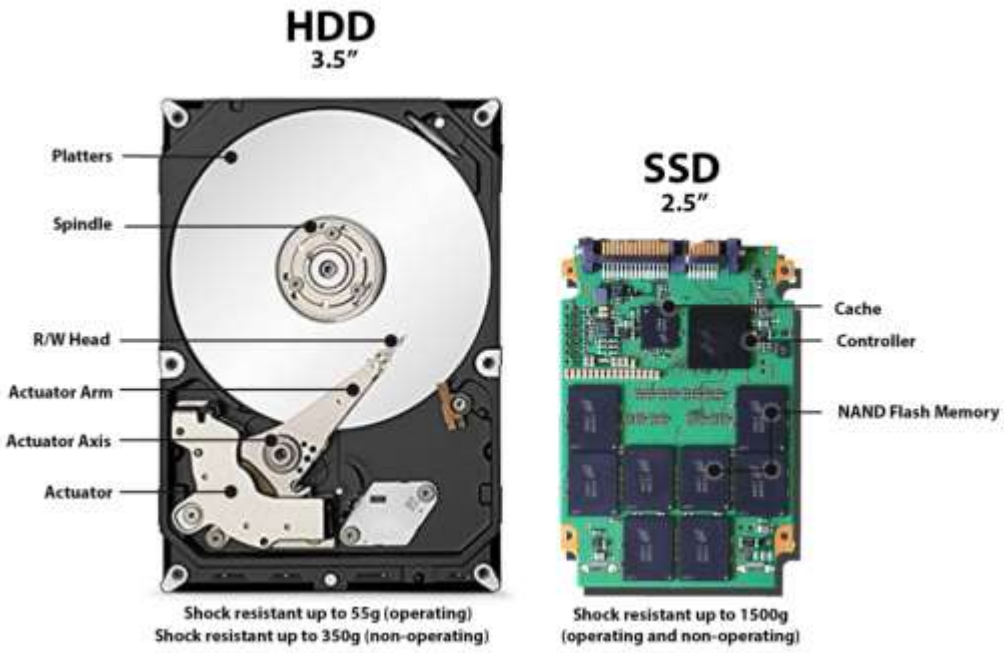


Figure 2.5: Internals of hard drives. Chakraborty, P. (2019).

multiple backups in case one fails. Simple computer programs known as scripts can be written to automatically restore a database from a backup (Mahalik, 2015).

For a project of this nature, there were three options for digitization technology. These options are to use a flatbed scanner, an overhead scanner, or a digital camera. Typically, when a

person operates a flatbed scanner, they scan simple flat pieces of paper that can be safely pressed between the scanner faces. When an individual employs an overhead scanner, they scan books that cannot be pressed into a flatbed scanner. Finally, when someone utilizes a digital camera, they generally capture irregular documents or artifacts which cannot be captured by either type of scanner. Each option for capture has its pros and cons and there are many products with a wide range of prices and features (Theil, 2008). In general, more expensive options will result in better quality captures and will have more features than their cheaper counterparts. However, if the parish staff employed more expensive imaging equipment the resulting image quality increase, would mean that the software would take longer to backup, would use more space, and that it would be more difficult to distribute larger numbers of images to the volunteers that transcribe the data.

2.8 Perceived Stakeholders

The two primary stakeholders who have a long-term vested interest in the successful completion of this project are the church staff who will be interacting with the project and the people interested in retrieving information from the parish archives. The first stakeholder is the staff of St. Mary's Parish. The team's primary contact at St. Mary's Parish, Tito Mouynes, has indicated that the parish would like to have a digital copy of their records. This will permit them to quickly retrieve records upon request by individuals seeking information from the parish. The parish is a key player in this project because they are the organization that houses the archives, and without their assistance, this project could not have happened. The second stakeholders are the individuals and relatives who seek information stored in the archives at St. Mary's Parish. Many times, when someone is married their original baptism certificate is requested in some

South American countries. There are also many other reasons to want to access the archives, including researchers investigating the past of a specific person or family, and general research about a certain time period. The St. Mary's archives hold the history of generations of Panamanians and therefore there is a historical significance in the safekeeping of this information.

2.9 Summary

St. Mary's Parish has been a religious center for Catholics in the Panama City area since the early 1500s. The stakeholders for this project wanted a database that could rapidly retrieve records and protect the information contained in the database records from becoming lost or damaged. Many people have their sacramental records stored in the archives of St. Mary's. Footprint Possibilities supported this endeavor of St. Mary's Parish, and worked with the project team to digitize the documents and to build the database. By creating digitized records and holding copies of them off-site, this project preserved the integrity and accessibility of these documents for future use. The team decided to research database solutions, find the required hardware to capture the records and run the database, digitally capture the records within the St. Mary's archive, and design a database to contain the digitized archive with an interface that allows users to search by keyword. The team also created a manual to train the volunteers at St. Mary's Parish and Footprint Possibilities on how to use the database and perform the capture.

3 Methodology

The team's goal was to develop a process for digitally capturing and organizing historic documents stored in the St. Mary's Parish archives in Panama City, Panama. The documents held in the archives of St. Mary's contain a variety of documents from church business to death certificates. Much of the archive is a recorded history of the people who were a part of the parish and the archive was regularly queried by parishioners and other persons seeking official documentation. Previously, when someone requested to see a record, the parish staff would go through a cumbersome system of index cards to find the document's location. This process was slow and tedious, and our team devised a solution to their issue of document management. By digitizing archives and entering the information into a database, the documents could be made more accessible for the church staff. To further understand the minutiae of the problem we were solving, our team developed research goals to guide the development of the project. This chapter discusses the proposed methods used to accomplish these four objectives with justification for the team's methods choices.

- Learn how similar projects have been completed in the past.
- Understand the goals and limitations of the project in greater detail from the perspective of the church.
- Inform the sponsor and the church of the hardware and software options available for the project.
- Learn the programming languages that create the solution

3.1 Research Other Archival Projects

To better inform this study's choices, it was important to investigate other successful archival projects. Reviewing previous efforts of a similar nature provided insight into key design decisions for this project that were not obvious at first glance. These decisions ranged anywhere from selecting the imaging techniques best suited for this project to choosing the most efficient database organization schema for St. Mary's identified needs. The team established two methods to investigate this objective. First, the team searched the Internet for similar projects to get a sense of the amount of work required to complete this investigation. Second, the team interviewed experts in the digitization and archival fields to refine the team's knowledge of this process. Both methods worked together to create a backdrop that informed other objectives for this project.

3.1.1 Research Similar Projects on the Internet

Investigating other archival projects called for accessing similar research in conferences, journals, or other papers on the Internet. The purpose of this method specifically was to gain insight into the work required to create a database retrieval system that fits the parish's requirements. Team's fundamental organizational and technical decisions were made while utilizing interviews with experts in this field, knowledge of the documents, and the limitations of commercially available hardware and software. Archives are used globally for a variety of reasons with publicly accessible ones available from the government organizations, as well as museums, and libraries.

The team researched methods surrounding archive digitization techniques and learned about the importance of document preservation and handling. The team was able to pick out document preservation techniques that were utilized across multiple projects and was applicable

to our project. Giving our team an understanding of how these issues had been solved in the past and what kind of obstacles we would face was instrumental in the development of our solution.

3.1.2 Interview Archival and Database Experts

The second method, which investigated other archival projects, called for interviewing experts in the fields of historic archives and archival databases. The information gained from these interviews was specific to our project. The team sought these experts to fill gaps regarding best practices for digitizing archives that St. Mary's was not acquainted with, and to fill in gaps regarding research on the Internet of other successful projects. Information gathered through interview questions informed stylistic decisions later in the project and was more pertinent to the team's needs.

The team conducted interviews over video conferencing platforms or over the phone. These interviews involved the team asking the interviewee questions from a script. The set of questions which the team asked experts can be found in Appendix C. Topics that the questions covered include personal experience and accomplishments, document handling techniques, imaging methods, database structuring ideas, and long-term maintenance strategies. The project team contacted an archival expert from the U.S. Army Corps of Engineers who provided our team with specific insight into difficulties our team faced and provided us with an in-depth government-issued manual on document digitization.

3.2 Understanding St. Mary's Situation

The next objective was to gain an understanding of St. Mary's Parish's desired product features and the available resources to create this product. Both the church's budget and the church's needs guided the design and implementation of the product. Initially, Footprint

Possibilities gave the team general information about the project. However, this initial information did not sufficiently describe the scope of the project, and therefore the team conducted interviews to expand on this base. One interview was conducted with Tito Mouynes, a member of St. Mary's financial committee and the team's contact at the church. The secretary at St. Mary's Parish was the intended main user of the database, as her job entails scouring the archives as requested. The team conducted an interview with the Secretary at the parish during our user-interface development phase to ask specific questions. The staff at St. Mary's explained the specifics of their mission and the challenge they were presented with.

The team collected information in this area directly from the staff at St. Mary's. We contacted the current priest at St. Mary's Father Tio who provided our team with specifics about the archives in question including size, age, and quantity. We also gained insight into the information contained in the documents, which was important for software development. The detailed information the team collected in this phase of the project was important for the team to consider when recommending hardware and software. The team considered these details while developing a solution for the Parish.

3.2.1 Project Constraints

The first goal of these interviews was to understand the constraints that the church had for this project. The interview with Tito clarified many of these constraints. This allowed the team to center their research around the specific hardware and software involved with the project. The team asked several questions that covered a range of topics regarding the church and their opinions on the project (see Appendix D). One line of questioning for this interview was about the documents the church had stored in their library. The questions focused on the types of documents stored, the number of documents stored, and the condition of the documents.

Learning about the types of documents stored in the church's library allowed the team to narrow down their search for options for capturing the documents. Getting a rough estimate of the number of documents stored in the church's library provided insight into the amount of digital storage needed to hold the images in the database. Understanding the condition of the documents stored in the library informed the team of certain precautions that the church staff needed to take to protect the documents.

Additionally, the project team asked about the church's budget for the project. The budget was one of the main limiting factors for the project. The budget affected all the hardware and software that the church was able to afford for the project. There were many hardware options available for capturing and storing images, which cover a wide range of prices. With this information in mind, the team was able to develop a solution that fit the church's budget while still being able to solve their problem.

3.2.2 Requirement Research

The next goal of these interviews was to understand the requirements of this project and what limitations the team was working within. Understanding the functional specifications for the database was a key step in determining what kind of hardware would be required and what kind of user would have access to the database. Knowing who will have access to the operational digital archival system and what its primary function will be, enabled the team to understand the required hardware and software needs of the project.

The next interview was with the staff member at St. Mary's Parish who are the primary users of the team's database solution. This interview served to collect information on the user-side of the program for the final implementation of the product. This information was used by the team in the design of the user interface. To get this information the team developed questions

to determine what features and constraints our program required. Due to their proximity to these documents, the church staff was able to provide critical insight into how the software was going to be used. With these interviews, the team was able to clarify specific features and discuss if they could be effective. Both Tito and the secretary at St. Mary's Parish were able to answer most of the questions posed by the team, however, they were not able to answer every question that the team had. In both cases, the team supplemented these interviews with email communication. The team also continued to meet with Tito on a regular basis as the project evolved.

3.3 Recommending Scanner and Computer Options for the Parish

Completing the project requires us to outline constraints and limitations, related to the hardware and software recommended for this project. The sponsor's budget was a limiting factor to consider, as they could not afford an expensive solution. The parish is funded by donations from their parishioners and can only afford to budget a maximum of a few hundred dollars on the project - *though expenses should be limited as much as possible* (Tito Mouynes, interview, May 1st, 2020). Establishing contact with the parish to discuss their specific requirements and their budget was initially difficult because of the confusion caused by the lockdown in Panama.

3.3.1 Research Scanner Options

To recommend options for capture hardware that is relevant to this project, the team needed to continue to research the different types of capturing hardware. Each type came with its own pros and cons. The information gathered on this topic comes from various sources on the Internet. Our research into scanning equipment led us to *BCR's CDP Digital Imaging Best Practices* (Theil, 2008). This document explains how to capture documents and what tools to use

for the process. The team used this information to narrow down the search for imaging hardware. After discussing the Parish's needs with Tito Mouynes, the team and Tito decided to test an affordable method of digitizing the records using an existing camera that the Parish already possessed. The rest of the information that the team gathered was about specific products for data capturing, however, found that most commercial solutions were beyond the budget for this project. Using knowledge gleaned during the team's research and the project's narrow budget, we realized that the scanning equipment could be boiled down to a camera on a tripod.

3.3.2 Research Database Hardware and Software Options

The team conducted research on the database hardware by establishing requirements for the potential computational load, the database storage, and the basic computer components. Via communications with St. Mary's, this investigation concluded that the expected computational load for the system will be very minimal. According to St. Mary's, only one user will be using the database at a time and users will only access the database in person (Tito Mouynes, personal communication, May 1st, 2020). By learning the approximate number of physical records to digitize, the project team calculated the necessary storage space requirements. Based on these insights, the team compared available computers and decided a dedicated computer would be purchased for the database. Our team created a list of specific features to be developed that were central to the database software including:

- Ability to input a record with data based on an attached document digitization into a database.
- Create an easy to use bi-lingual User Interface
- Create a search tool to query the database based on multiple search fields
- Return multiple results on one page

- Create import tool for submitting records and attached data
- Create a backup protocol to periodically backup the database
- Option to print certificate of record and associated image

For software research, the project team wanted to learn about similar implementations of database software. Our team discovered that existing commercial archival software was cost-prohibitive and was intended towards large-scale archival databases compared to the amount of information our team had estimated the database to encompass. We researched commercial scanning software that includes features such as digitization auto-correcting, OCR (optical character recognition), and advanced database integration. Though commercial solutions were outside of the budget of this project, this research led us to open source programming language MySQL dedicated to file management. Designing a database structure and integrated user-interface required extensive research into existing database tools and open-source programming languages.

3.4 Learn Programming Languages

Our project involved creating an archival database for St. Mary's Parish to utilize. This meant the team had to learn the programming languages MySQL, PHP, and HTML. These languages completely constructed the database and since they worked in conjunction with one another, learning how they worked together was crucial for the success of the prototype. For example, the documentation of MySQL was available without cost directly from the developers on their website online (Oracle Corp, 2020). While it did not provide examples of code and how MySQL interacted with the other languages, that documentation was the ultimate arbiter for MySQL. Similarly, PHP and HTML also published their documentation online for free use,

giving this project resources straight from the developers to use (The PHP Documentation Group, 2020) (Mozilla Developer Network, 2018).

Additionally, this investigation utilized other resources besides the development documentation to construct the prototype. Numerous online guides and tutorials provided examples and use cases of each of the three languages. More importantly, these guides showed how HTML interacts with PHP and how PHP communicates and sends data to the MySQL database. For instance, a quick Google search showed results for many different websites that described how to connect PHP and MySQL. Not all of these results were suited to this project, but at least some of them were, and even just one good one like the guide on w3schools.com informed the team with sufficient depth (W3Schools, 2020). A similar search concerning how HTML and PHP interact yielded similar results.

Another resource that proved useful for the team was YouTube and the video guides available. Searching for a video tutorial was quite similar to searching for a tutorial on a website. The team used YouTube to find supplementary material that served as the building blocks for understanding each language. Again, searching YouTube for a tutorial on MySQL yielded numerous results, including the top result which was a three-hour video for beginners on MySQL (Programming with Mosh, 2019). The team worked together on each component of the program as the team had little experience with all three languages and their combined use. This investigation used video tutorials to gain a basic understanding for each language and answered specific questions as described in this section.

3.5 Summary

St. Mary’s Parish asked Footprint Possibilities and the project team to help them with digitizing and providing access to their archives. The team concluded that commercially available file management software was out of the project’s budget. The team's solution was to create a database to manage and provide access to the information with attached document images for future reference. The team designed the database to be accessible from a computer at the parish. The interface allowed for the parish staff to use keyword searches and more advanced retrieval methods to locate relevant documents.

4 Implementation

Based on the design specifications of St. Mary's and Footprint Possibilities, the WPI student group needed to design and create the St. Mary's Digital Archives, a solution that would attempt to include as many of these design specifications as possible. The student team was able to fulfil the key features of the database, however due to lack of time and manpower, certain features were not able to be implemented in the "St. Mary's Digital Archives". Many of the choices that the project group made were concerning the skill of the students and the distance that the students were from Panama during the completion of the project. The team prioritized making the software easy for the St. Mary's parish staff to operate, by developing only useful and necessary features, and utilized free development tools enabling the project team to create the St. Mary's Digital Archives quickly and efficiently. The student group has outlined the six primary components to our implementation in the following sections.

4.1 Imaging

This project involved parish staff taking images of historical documents to digitize them for later use. The archive room at St. Mary's Parish contains 48 ledgers that have a combined total of roughly 12,000 pages. The staff at St. Mary's parish must capture an image of each page to import into the St. Mary's Digital Archives. The imaging setup for this task consisted of three physical parts: a camera, a tripod, and a music stand. First, the parish made use of a Nikon Coolpix P510 digital camera to capture high-quality images of each document within the church's archive. Footprint Possibilities donated this camera so that the parish would not have to spend their limited budget to create the imaging setup. The project team decided that St. Mary's Parish would employ a digital camera for this project after eliminating the other available

options. Another option that the project team reviewed was a flatbed scanner, the team chose not to recommend this option to St. Mary's Parish because a flatbed scanner would damage the ledgers in the church's archives. Likewise, the team chose not to recommend an overhead scanner to the parish due to the lack of available options. When the group investigated overhead scanners the options available were either too small to scan the ledgers in the church's archives or they did not fit into the churches budget. By employing a digital camera, the church was able to capture documents with varying sizes and shapes.

Next, the parish utilized a camera tripod to hold the camera steady and a music stand to stabilize the documents during the capture process. If the parish staff were to fail to correctly operate the imaging setup by not employing the tripod and music stand, the resulting camera

Figure 4.1: Imaging setup at St. Mary's Parish. Pio, P. (2020).

shake would cause the images captured to be blurry and misaligned. These images would be more difficult for the volunteers to read. This combined with the prior deterioration of older records means that older records captured without these stabilization tools would be nearly impossible to read. If the volunteers are unable to read a record, the image of that record is rendered useless and the parish staff must retake the image. The parish staff uses these tools in tandem to avoid wasting time capturing images that are unreadable and thus useless to the parish staff. Instead, the church staff can capture high quality and consistent images of each ledger in the parish archives.

4.2 Database

The WPI student group chose to associate all the information related to the records in a database. Many different professions and organizations maintain databases that organize their data. There are generally two models for databases today: relational databases and NoSQL databases (Microsoft Docs, 2020). The key difference between each model is that relational databases are highly structured and relate information stored across different tables. NoSQL databases are loosely structured and are much more decentralized in how they store information. Within each of those models, many different implementations exist that have their own niche and level of support. The student team chose to utilize a relational database management system for this project because the students could construct the database for this unique purpose and potentially relate the tables together. The implementation that the students decided to utilize for the development of the St. Mary's Digital Archives was MariaDB. MariaDB is a fork of MySQL that is a free and open-source software tool which closely shares qualities like syntax and information handling with MySQL and can be found on https://mariadb.org/. Support for the two implementations is so intertwined that supplemental material for MySQL is compatible with

MariaDB and requires no changes. Therefore, with its high level of support and its open-source philosophy, MariaDB was the right choice for this project.

Within the database, the group had to organize information in a scheme that was logical and clear. Databases store information in tables. Tables are a data structure to organize and store rows of data. These rows are the individual units of a database, in this case each row contains information from one record in the parish archives. In more complex settings, administrators of a database under the relational model can join tables together to gather information about the individuals or items in it. This project did not require anything so complex, but it did require that there be separate tables for each sacrament type. By separating each sacrament into its own table, the students could more carefully craft queries and create the tables with fields specific to each type of sacrament. For instance, the table in the database for baptisms could contain information about only baptisms and querying that table specifically would return information about only baptisms. The individual table model, then, was another level of organization for this project. The tables and fields of this organizational model can be found in Appendix I.

Each table within the database had fields with associated datatypes. In a table within a database, a field can be thought of as a column and the datatype as the kind of information that can go in the column. For example, the ‘BOOK’ field of the table for baptisms had a data-type of ‘int (11)’, or an integer that is eleven digits long. The ‘BOOK’ field does not accept any information that is a string of text. There were other safeguards in place to make sure that the ‘BOOK’ field could not accept strings. However, the project group chose the datatype for each field based on the type of information that it would contain. The group chose the fields that were in each sacrament-table based on the sample records that St. Mary’s Parish provided, shown in Appendix J. The students asked members of the parish staff to send pictures of every type of

record for every sacrament to the students. The student team evaluated which fields were common in records of the same sacrament type. The group assumed that the records represented every possible field value in the archive and chose the fields that were in each of the tables based on that assessment. Each table had different fields because each sacrament contained different information. The students then chose the most important and most common fields for each sacrament type and made them required fields. By making certain fields required, the team ensured that each record inputted would have enough information to be retrievable using the search feature. If the assumption that these records represented all records in the archive were wrong, the tables would be short valuable entry space, so the group included four spare fields with each type of sacrament which St. Mary's could repurpose if the need arose.

The last consideration for the database was where and how the captured images would be associated with the records in the database. MariaDB natively supports uploading images to a database and saving them within its structure. When someone saves images inside of this type of database, they store them with the data-type 'blob', a binary string. While the database can store large files, the database slows down significantly once there are a large number saved in it. Instead, the group went with an alternative approach where the parish staff stored the images outside of the database. The staff then associates the location of an image with the records contained within that image. The software that the students created to access the database had the ability to read these file paths and interpret them correctly, displaying the image. This had two added benefits. First, if a user entered an image containing ten records into the database, the user could reuse the image thereby saving the image one time instead of ten times, reducing the number of images the parish staff needs to store and thus reducing the storage space required to hold the images of the records. Second, it allowed for the images to be saved such that a user

could examine the filesystem and read the images outside of the software. While the team did not encourage St. Mary's to do this, a user could use image viewing software to read the images like they were in the original books page-by-page.

4.3 Installing the Software

This section outlines the steps the WPI student team took to install the developed software onto the parish's computer. The primary goal of the installation process was to make the software seem invisible to the parish staff when they were not using it. The software needed to start automatically when a staff member logged into the parish computer. This was the most important detail in the entire installation process because users could potentially have little or no experience with managing Windows services or starting Apache servers. Once the installation process completes, the only action a parish staff member must take is double-clicking the shortcut on the desktop to start the software.

The students installed a software solution stack called XAMPP, which can be found at https://www.apachefriends.org/index.html, to run the digital archive. The team chose to develop and utilize software on a computer running the latest version of Windows 10. However, most likely future developers could port the developed system to a Mac or Linux environment. XAMPP came with three packages that the group needed to run the software: Apache, PHP, and MariaDB. The fourth component, a web browser, comes standard on any modern computer, and the software does run on Google Chrome, Mozilla Firefox, and Microsoft Edge. XAMPP came with phpMyAdmin, a software package used to manipulate the database information. After XAMPP finished installing on the parish computer, an administrator user on the computer had to run the XAMPP Control Panel. Otherwise, the installed software would break. On the first run of the software, the students installed Apache and MariaDB as Windows services and checked the

box allowing them to start automatically. However, at this point, XAMPP did not start automatically.

The database in its final form had five different accounts: root, standard user, backup, restore, and delete. Initially, XAMPP does not apply a password to the root account in the database. This is a serious security risk because a malicious actor could gain access to the database and erase or modify the contents. Consequently, the team applied a root password to all three variants of the root account in phpMyAdmin. Next, the group stopped Apache, MariaDB, and XAMPP and edited an additional configuration file that allows phpMyAdmin to start. Restarting XAMPP, Apache, and MariaDB at this point confirmed those changes and secured the root account of the database management system.

Only after securing the root account could the team install the St. Mary's Digital Archives. One specific directory in the XAMPP installation folder called "htdocs" was the location that the Apache webserver accessed to make the web pages available. While HTML can run anywhere on the computer, files that included PHP needed to run in this directory to access Apache and the PHP environment. The student group initially downloaded the software from its Gitlab repository where the project group saved its code during the development of the St. Mary's Digital Archives. The project team added a restore feature to the software to restore the installed software system and the accompanying images and database to the parish's computer from a backup so that the parish staff would not have to externally download the software again. After downloading the empty software, the students imported the blank database into phpMyAdmin. However, before anyone could use the archival system, the group had to create four more users to the parish computer.

The idea behind each user was the same: give only the rights necessary for the actions that they would be performing to each user. The process for granting those permissions to each user was also the same. The team created a new user with a name and password then hardcoded it into the software. Then, for each user, the student team granted privileges based on the function of the account. The standard user received all permissions on the database containing the St. Mary's records except the permission to grant new permissions. The backup user received only the permissions necessary to select and lock the tables in the St. Mary's database. Creating both users enabled more functionality for the software.

The remaining installation steps did not take place inside of XAMPP and phpMyAdmin but rather in Windows. The student team needed to configure Windows to start XAMPP automatically for all users, and to allow for PowerShell unsigned scripts to be run locally. First, the student group employed a Task Scheduler to create a task that ran XAMPP at login. When a user logged in, XAMPP ran as if it were an administrator starting the software whether or not it was the administrator who logged in. This is important because starting the software automatically usually runs the software as if the user logging in was starting it. XAMPP needed administrator privileges, so this was key. The other Windows configuration step that needed to take place before the students and the parish staff could fully use the software related to PowerShell. The team utilized PowerShell to run the backup and restore scripts because it ran Windows executable files and tools that PHP could not. By default, scripts that a certificate authority does not sign cannot run. In PowerShell, the students modified a setting to allow scripts that originated on the local machine to run without issue. Inside of the software, PHP checked to make sure the directory the administrator entered existed before passing it along to the PowerShell script. This prevented the administrator from breaking the software by entering a

path that does not exist, but also meant creating a folder before the administrator could run the backup. Once the group completed these steps, the installation and configuration process were complete.

4.4 Front End

The design of the user interface for the St. Mary's Digital Archives had to be simple and intuitive to make it accessible to anyone interested in using it. The WPI student team wrote the visual user-interface component in HTML which allows it to run as a website. The students translated all text in the software into Spanish and displayed it side by side with the English text. This feature was important for the group to include because the primary users base of the St. Mary's Digital Archives were Spanish speaking individuals. Additionally, the students created a manual to guide users through the operations of the database. The team created this resource to answer the users' questions while using the St. Mary's Digital Archives. The full manual can be found in Appendices E and F. There were two different general operations within the St. Mary's Digital Archives. First, the student team designed an input function which eliminated unnecessary textboxes and buttons to reduce confusion and improved the workflow of the function. Next, the students designed an output function which allowed for users to conduct detailed searches for records within each table in the database. In addition to general operations, there are three special operations that more advanced users can conduct for maintaining the database.

When a user launches the St. Mary's Digital Archives they are greeted by a welcome page. The welcome page of the program asks if you would like to input a record, search for a record, conduct administrative activities, or view the acknowledgements for the software. When a user wants to input a record, they select the input page. The first page of the input feature is

where users select a sacrament type and an image file to input into the database. After the user selects an image and a sacrament type, the program directs them to the main input page. This

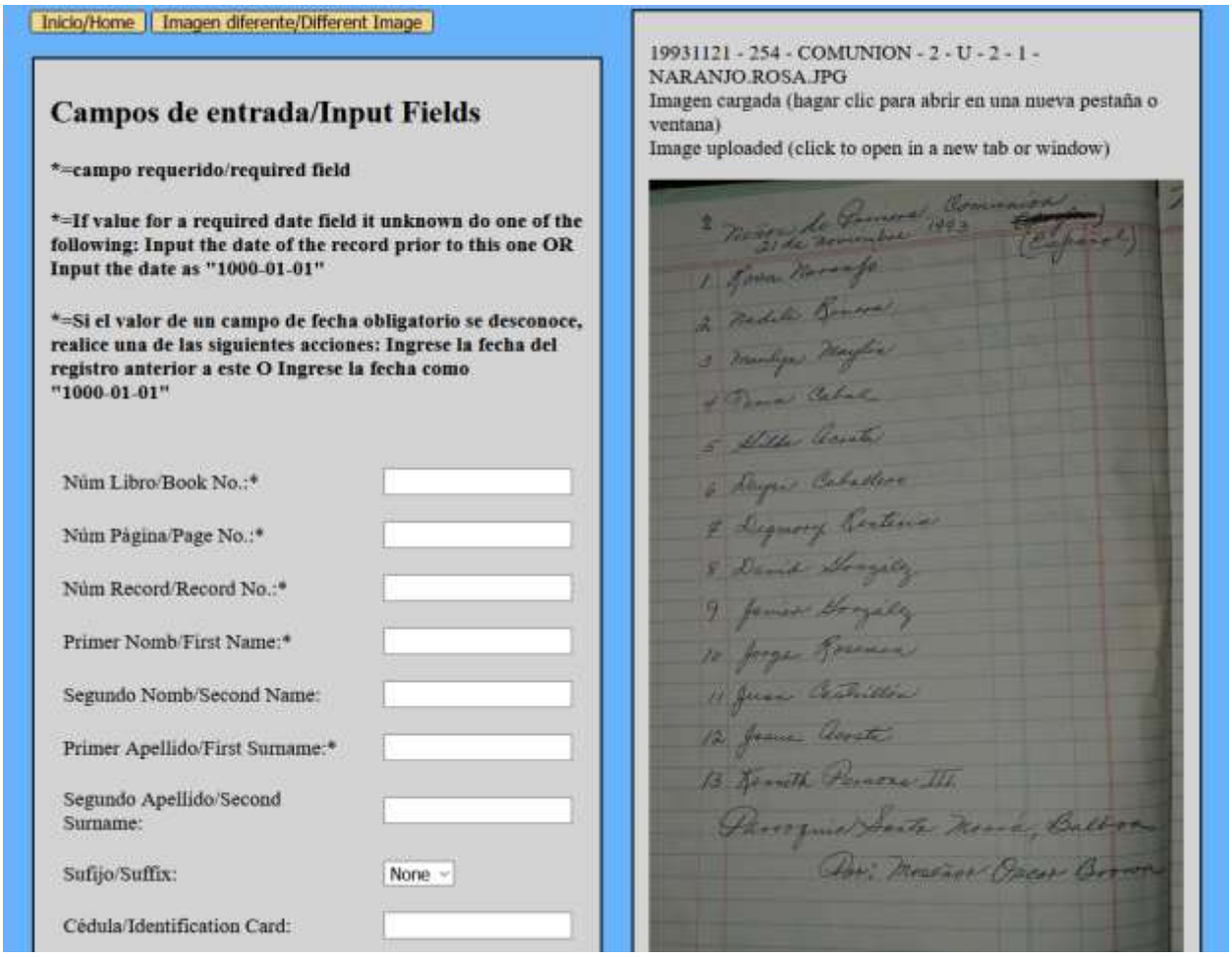


Figure 4.2: Screenshot of the "St. Mary's Digital Archives" primary page for inputting records into the database. (2020).

page included custom fields specific to the type of record the user selected, a button for clearing all inputs, a button for submitting the inputted information, a button to go back to the previous page, a button to bring the user back to the welcome page, and finally the displaying of the image that the user selected. The idea is for the user to read directly from the displayed image while inputting data (see Figure 4.2). The text fields on this page include relevant dates, important locations, relevant names, four extra fields, and record keeping information such as book number, page number, and record number. The system creates a unique identifier for each record

inputted into the database that combines the type of sacrament and the record keeping information into one field. After the user inputs the correct information and clicks the ‘submit’ button, they are directed to a page that displays the information inputted by the user so that they can double check the accuracy of their inputs before finalizing the process. If the user is satisfied with their inputs, they confirm the submission, inserting the entered information into the database.

The project group directed the features of this function toward making the input process simple and accurate for all users. The group utilized self-explanatory buttons and fields to simplify the operation. In addition, the students included a page for checking user inputs to reduce errors in entering information into the database. The student team created the St. Mary’s Digital Archives to allow users of multiple backgrounds and levels of expertise to use the database by combining these features with bilingual text.

When the parish staff wants to search for documents, they select the search option on the welcome page bringing them to a page where the user selects the type of sacrament record, they seek. After selecting a record type and selecting submit, the user is brought to a search results page (see figure 4.3). This page consists of custom search fields specific to the type of record the user selected, a button for submitting the search criteria, a button to go back to the previous page, and a button to bring the user back to the welcome page. The search fields on this page were the same as the fields in the input process, apart from a few additional fields. For the date fields on the records, users could enter a date range using a start and end date as opposed to searching for a specific date. Users also had the ability to search for a record's unique identifier that the system creates when users first input a record. Finally, users can select a field for sorting the search results with a dropdown menu. Once the user inputs and submits the search criteria, they are

brought to a page that displays the search results and allows users to select a record and conduct two operations on it. First the user can create a certificate which

includes all important information from the record and a line for a priest's signature. The user can print this certificate to give to individuals who want a copy of the information in a particular

Figure 4.3: Screenshot of the "St. Mary's Digital Archives" search results page where user can select a record and an action to perform with that record. (2020).

record. The user can also choose to display an image of the document containing the selected record. The user can also print this image if they would like to have a copy of the original document.

The system design directed the features of this function toward increasing the functionality of the search operation. The group once again utilized self-explanatory buttons and fields to simplify the operation while giving the user as many options as possible for searching the database. This feature improved the functionality of the search operations but made the function more complicated to utilize. It was more important for this feature to have a wide range of search functionality, than for it to be simple to utilize. Before someone came to the church looking for a record, the search criteria available to find the record was unknown, thus it was important to include every possible search criterion. The student team created the St. Mary's Digital Archives to enable users to find the records stored within the database based on a wide range of search options with varying levels of information.

The system permits the system administrator (system admin) to access special operations of the database by selecting the administration option on the welcome page. Only the system admin, who is more experienced than the average user, should be completing these operations because these operations have the capability of damaging or removing information from the database. This page (see figure 4.4) includes three functions: a backup operation, a restore operation, and a delete operation. The backup operation is simple. The system admin selects a location to save the backup. Typically, an external drive would store backups in case there is a critical failure of the St. Mary's Digital Archives. When the system admin runs this operation, all relevant files are saved to the selected location. These files include the image files associated with the database, the files that run the database solution, and the database itself. The system

admin could then use the restore feature to recreate the database returning it to the state it was in at the time of the backup. The system admin simply selects the location of the backup files and clicks the restore button. The final function on the administration page is a delete function. The system admin selects this function when a record contains incorrect information. Selecting this function brings the system admin to a page where they select the type of sacrament they would like to delete and input the unique identifier of the record. The system admin then clicks delete, bringing them to a page that displays all the information on that record, and prompts the system admin to look over the information before confirming the deletion of the record.

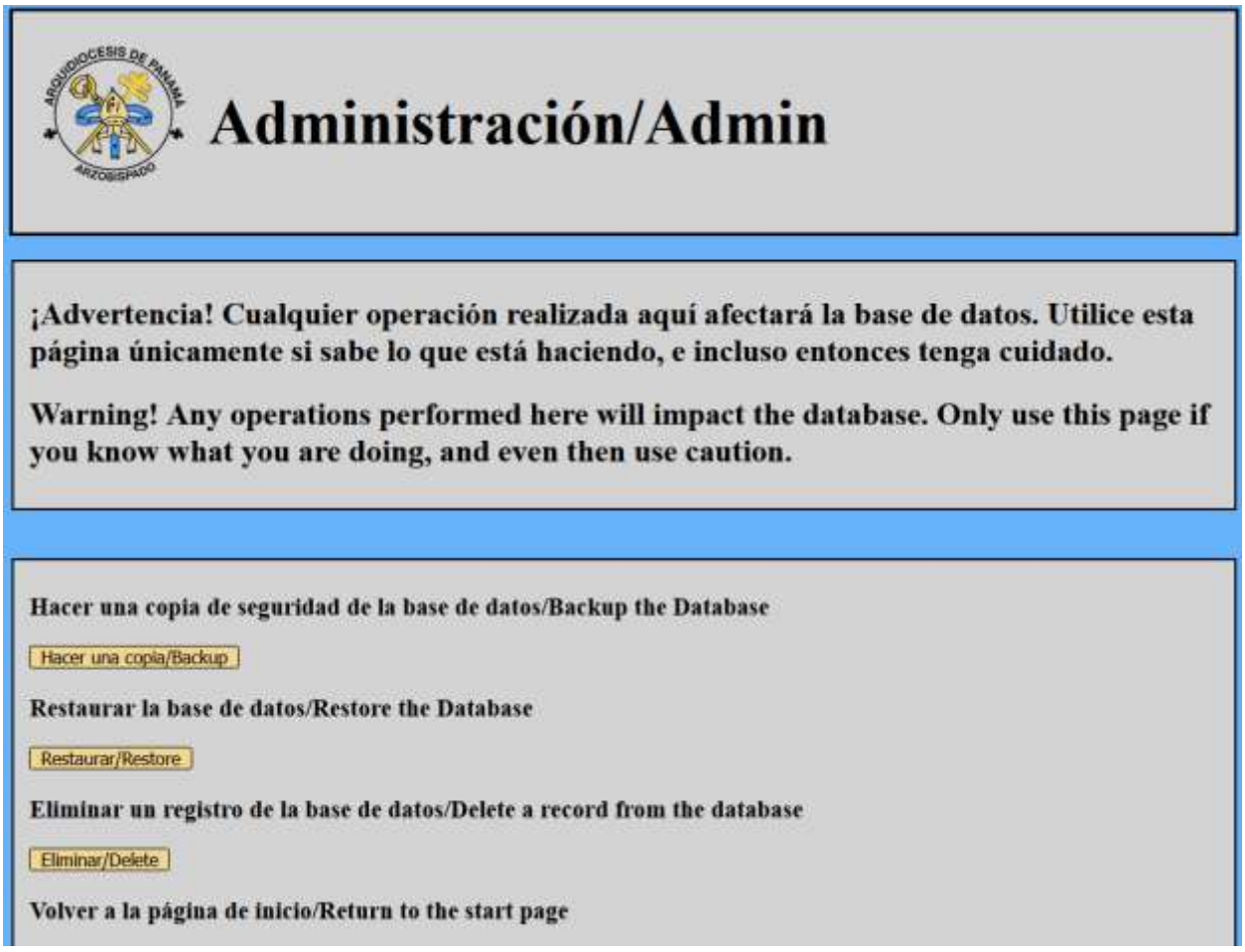


Figure 4.4: Screenshot of the "St. Mary's Digital Archives" primary administration page for special operations. (2020).

The team designed the administrative page to separate the more complicated operations from the basic operations of the database. The group did this in order to prevent users from

Figure 4.4: Screenshot of the "St. Mary's Digital Archives" primary administration page for special operations. (2020).

accidentally causing irreparable damage to the St. Mary's Digital Archives. The software includes many warning messages within these pages to further reduce the possibility of a user causing damage to the database.

The goal of the front-end design of the "St. Mary's Digital Archive" was to be simple and effective when conducting general operations, and safe when conducting special operations. The WPI student team, through the use of self-explanatory buttons and fields, both Spanish and English text, and separate administration functions, was able to create a database for the Staff at St. Mary's Parish which was simple and effective for the general user to input and search for records, while still including crucial administrative features for the system admin to maintain the database integrity.

4.5 Back End

The WPI student group coded the back end of our software solution using PHP "a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML"(The PHP Group, 2020). This language was well suited to this project as it is good at interacting with HTML, the language used to create our front end, and MariaDB, the SQL implementation used to create our database. Together, these three languages provided the team with tools to create a database through which a user could interact with an offline web browser.

The back end is where all the information processing occurs. Before a data input by a user can access the database, the back end of the group's software solution processes that data in various ways. After a user inputs data, the backend sanitizes the inputs to prevent SQL injections. An SQL injection is when a user unknowingly or maliciously executes SQL code through the user inputs. If an injection occurs, it has the potential to destroy the entire database. Thus, it was important to sanitize inputs to make sure they could not cause problems for the database.

Once the software sanitizes the user inputs, the software constructs an SQL query from the inputs. An SQL query is an operation that searches or modifies data within an SQL database. Queries can either be prepared or unprepared. The students decided to use a prepared query to further protect the function of the St. Mary's Digital Archives. This design separates the function of the query from the variables utilized by that query. When a user inputs a record, the software creates an SQL insert query which creates a new record in the database based on the user's inputs. When outputting records, an SQL "search" query finds records in the database which match the user's inputs. These back-end queries are the bridge between the front-end user inputs and the database.

4.6 Administrative Choices

The WPI student team could not do all of this without some administrative tools which control system processes and ensure that the software is reading data from the database correctly. The team's software runs inside of a web server. Contrary to the name "web server", the St. Mary's Digital Archives are not on the open Internet and only run on the local machine. In addition to the web server, the software also utilizes a database server to open the database when the software queries it. Both the web server and the database server run silently in the

background of the computer and the user is never aware that they are running, however, the students needed to be able to control both during development. The student group utilized a software stack called XAMPP which stands for cross-platform, Apache, MySQL, PHP, and Perl. Not only did XAMPP include, install, and configure a web server that ran Apache and a database server that ran MariaDB, it also provided extra controls so the students could configure both servers. Most importantly, it was the control panel that the project team used to stop and start both servers on-demand and to set both servers to start automatically when a user logged into the computer at St. Mary's Parish.

Included with XAMPP is another software package that could interface directly with the database to change settings, add or remove fields and tables, and enter, modify, or delete entries in tables. This software is called phpMyAdmin, and its primary use is to check that the software entered information correctly. Since phpMyAdmin read the database files directly rather than going through layers of PHP and HTML, it showed what information the group was entering in the database and what information the software could read out to the group. phpMyAdmin was also the tool that the students employed to create and modify the tables and fields that the software utilizes. Since the student team did not design the project software to manipulate the structure of the database, phpMyAdmin was crucial for checking the project group's work. It was also useful for modifying fields, adding tables, and creating new users to access the database. While the final software did not use phpMyAdmin, it was a useful tool for administering the database.

Another decision was whether the St. Mary's Digital Archives would be an online or offline program. The student team chose not to put the solution online even though the option was tempting. First, online solutions require a domain name which usually requires the domain

name holder to pay a fee for the rights to the name. St. Mary's did not have the funds in their budget to pay for something like this. Second, online solutions are much more complicated to develop compared to a local solution, and with the students' lack of expertise in matters of designing and writing software, an online solution would have been a burden on the team. Lastly, online solutions that the parish could host locally are risky due to exposure to the open Internet. The information contained in the records had to stay inside of the parish's computer network, so exposing the computer running the software to the Internet was not an option. Ultimately, the offline solution was easier to develop, safer for the data, and free.

The last major piece of this software that the students created was the backup solution. Just as the database is an electronic archive of physical records, a backup is an electronic archive of electronic records. Early in the planning stages of software design, the group decided that a backup mechanism was useful for St. Mary's. St. Mary's had an existing cloud backup that they would use to backup this software. However, since cloud services are paid services and control of the data is not directly in the hands of St. Mary's, the group decided to create a small backup script for the software. It runs inside the main software application, and it utilizes a Windows tool called "Robocopy," or Robust File Copy to create a mirror image of the pictures and application pages on the external drive. It also utilizes tools built into MariaDB to export the database along with all the associated files. If a catastrophe were to occur on the primary computer, the backup could restore the database and all the images. The user can find instructions that describe how to take and restore a backup or to do any administrative maintenance in the manual for this software (see Appendix E and F).

5 Results and Analysis

This chapter presents the results of this project which had the goal of constructing a database system for St. Mary's that would eventually hold the entirety of its parish archives. The team connected the database structure to the user experience, designing the solution in conjunction with staff and volunteers at St. Mary's. St. Mary's Parish now has the capability and tools to insert and locate records in their archives based on names, dates, or locations. Increasing accessibility to these documents will undoubtedly increase interest in the archives. The result of the project was an effective software-based filing system that utilized a database structure and web pages to display parish records.

5.1 Imaging Workflow

This section describes the methods the parish staff use to set up and complete the image capture process. Due to the COVID-19 pandemic and the distance that the team was from Panama, the team did not have much influence over how this process occurred. For the church staff to digitize the records, they must first assemble the imaging setup (see Figure 5.1). To create the setup, the parish staff set up the tripod and camera in a clean room that does not put the documents at risk. They then place the music stand directly below the camera. In addition to the physical setup, the parish staff use Adobe Photoshop 2020, an image editing software, to adjust the images such that they are readable in the database.

Figure 5.1: Imaging setup at St. Mary's Parish. Pio, P. (2020).

After completing the imaging setup, the parish staff can use it to capture high-quality images of the documents in the parish's archives. The parish staff place a ledger on the music stand and open the ledger to a certain page. The staff then check the alignment and zoom of the camera and adjust it so that the document takes up the entire space of the image. By combining the tripod, music stand, and proper camera alignment for every image capture, the parish staff can capture high-quality images that are consistent across all the different ledgers.

Next, the staff uploads the images from the camera onto the computer where the database resides. From here the parish staff use Adobe Photoshop to modify the images to make them more readable. The staff do this by adjusting the brightness and contrast of the images such that the text stands out better. If a document is really faded, the parish staff can make the image

negative. When the staff make an image negative, the white space turns black and the writing turns white. This makes the text stand out better so anyone can read the information within the document image more easily. The staff saves the modified images to a new directory and makes a note of where it is so that the staff member that inserts the records knows where to look. Upon completing the image capture and processing step, the parish staff executes the next step of attributing a record to an image and writing the result to a new location inside the digital archive.

5.2 Inserting a New Record

The first primary function of the software system is inserting a new record into the database with an accompanying image. The user starts the software by double-clicking on an icon on the parish computer's desktop. The webpage that the computer accesses is the "Start" page, and it is the point from which all operations begin. From the "Start" page, the parish staff select the "Create" button to navigate to the next page that is titled "Choose an image to archive" (see Figure 5.2). In addition to choosing a processed image to attribute information to, the staff choose the type of sacrament that the record is on this page using a drop-down menu (see Figure 5.3). After doing this, the user browses to the directory that contains the edited images and selects the specific image to upload. The staff member that edited the images made a note of where this directory is, and the staff member that is uploading the images should be cognizant of which ones have and have not been uploaded. Between this screen and the next one, the software saves the imported image in a temporary folder with a unique filename. By saving the image in a temporary folder, it persists beyond the initial import screen and the software can rename it.

Figure 5.2: St. Mary's Digital Archives Start Page. (2020).

Figure 5.3: Choose an Image to Archive Page. (2020).

The appearance of the "Enter Data" screen varies depending on the sacrament, but the functionality of the software is the same. Figure 5.4 shows the input screen for baptismal records. The left half of the page displays the possible fields that the sacrament can contain. The team chose them during the design of the software. The right half of the page displays the image that

the staff member uploaded for attribution. The user can click on the image to open it in a new tab to zoom in and pan around. After viewing the image, the user transcribes the information that is on the record into the fields on the left half of the screen. If for some reason the staff member makes a significant number of errors, they can press the "Reset Fields" button to clear their entries. Otherwise, the staff member clicks "Submit" (see Figure 5.5). This greets the user with a "Confirm Entry" page like in Figure 5.6 that allows the staff member to review their submission. If there is information that the user did not enter correctly, they can click "Back," otherwise if it is correct, they can click "Confirm" on this page. Doing so writes the image to a new file and creates an entry in the database that contains all the information in the submission.

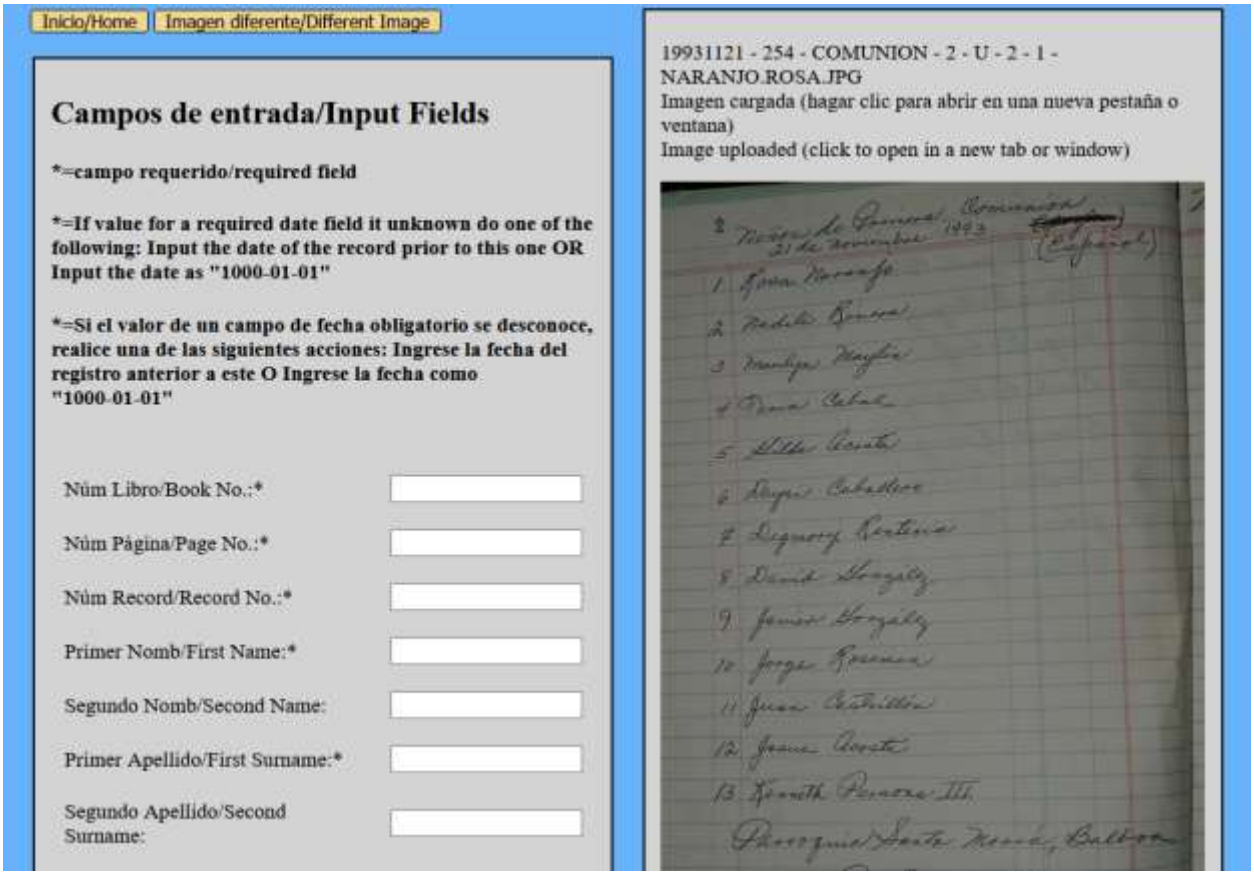


Figure 5.4: First Communion Input Page Top Half. (2020).

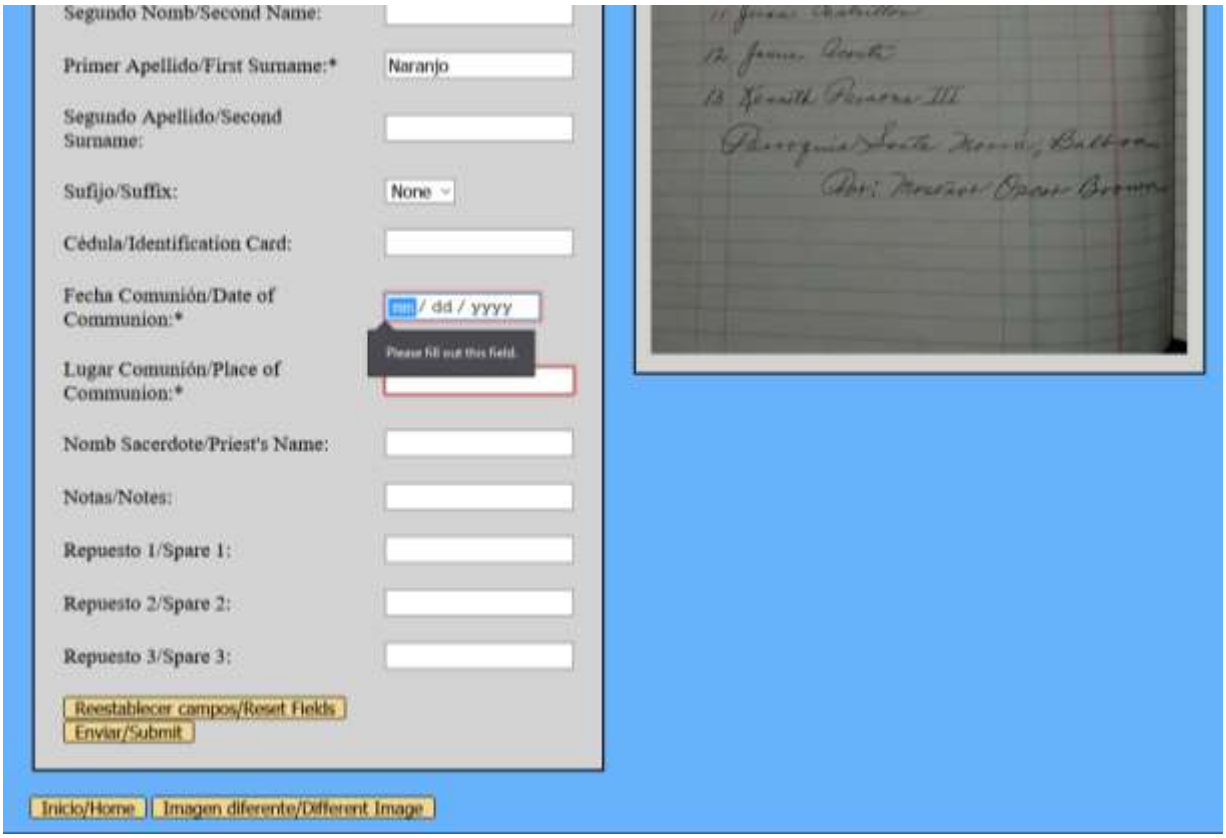


Figure 5.5: First Communion Input Page Bottom Half. (2020).

Información del Documento/Document Information:

Núm Único/Unique Identifier	Núm Libro/Book No.	Núm Pagina/Page No.	Núm Record/Record No.	Ruta de la Imagen Cargada/Uploaded Image Path (Click para ver/Click to view)
P1010020001	101	002	0001	19931121 - 254 - COMUNION - 2 - U - 2 - 1 - NARANJO.ROSA.JPG

Información del Feligrés/Parishoner Information:

Primer Nomb/First Name	Segundo Nomb/Second Name	Premier Apellido/First Surname	Segundo Apellido/Second Surname	Sufijo/Suffix	Cédula/Identification Card
Rosa	None	Naranjo	None	None	None

Información del Registro/Record Information:

Fecha Comunión/Date of Communion	Lugar Comunión/Place of Communion	Nomb Padre/Priest's Name

Figure 5.6: First Communion Record Confirmation Page. (2020).

The “Status” screen shows a message that explained if the submission was successful (see Figure 5.7). Behind the scenes, an SQL prepared statement inserts the record. That process also sanitizes and validates the user submitted text. Optional fields that the user leaves blank have the word “None” inserted instead. Based on the book, page, record number, and sacrament type of the record, the software generates a unique record ID as well as a name for the system to assign the uploaded image on the filesystem. After an attempt to save the uploaded image was successful, the software executes the prepared statement and writes the filename of the image and all its attributes to a new entry in the database. At this point, the user has two options. The user can reuse the last image and return to the input screen, or the user can use a new image. Reusing the image is a valuable feature for the software because a user must return to the “Input” screen each time the user submits an individual record. This feature allows the user to retain the previous image to use for all the records on one image. The temporary file from which the final image is generated is not deleted upon uploading the record to the database, it is only deleted when the user would like to use a new image or to return to the “Start” page. The team made this possible by taking advantage of PHP session variables to make the value of the filename persist through multiple pages. If the staff member submits a record by mistake, they can make a note of the unique record ID and ask the software administrator to delete the record.

Figure 5.7: Record Input Status Page. (2020).

5.3 Searching for an Existing Record

The second primary function of the software system is to search for sacramental records in the database and to view them. To accomplish this task, parish staff use the output function in the team's software solution. The output process starts when a visitor comes to the parish seeking information on a relative or another individual and potentially asks for that in the form of a certificate. The church staff screen the individual to make sure that they are authorized to view the records. Then the staff ask the visitor to specify search criteria in order to search for that record. After getting the search criteria from the individual, a member of the parish staff navigates to the "Select Sacrament" page shown in Figure 5.8 where they choose the type of sacrament to query. The page after that is the "Search" page where the staff member enters information into the fields (see Figure 5.9). The page lists all available fields that the database attributes to a sacrament. It allows a staff member to also search for date ranges and to sort the resulting output by any of the available fields.

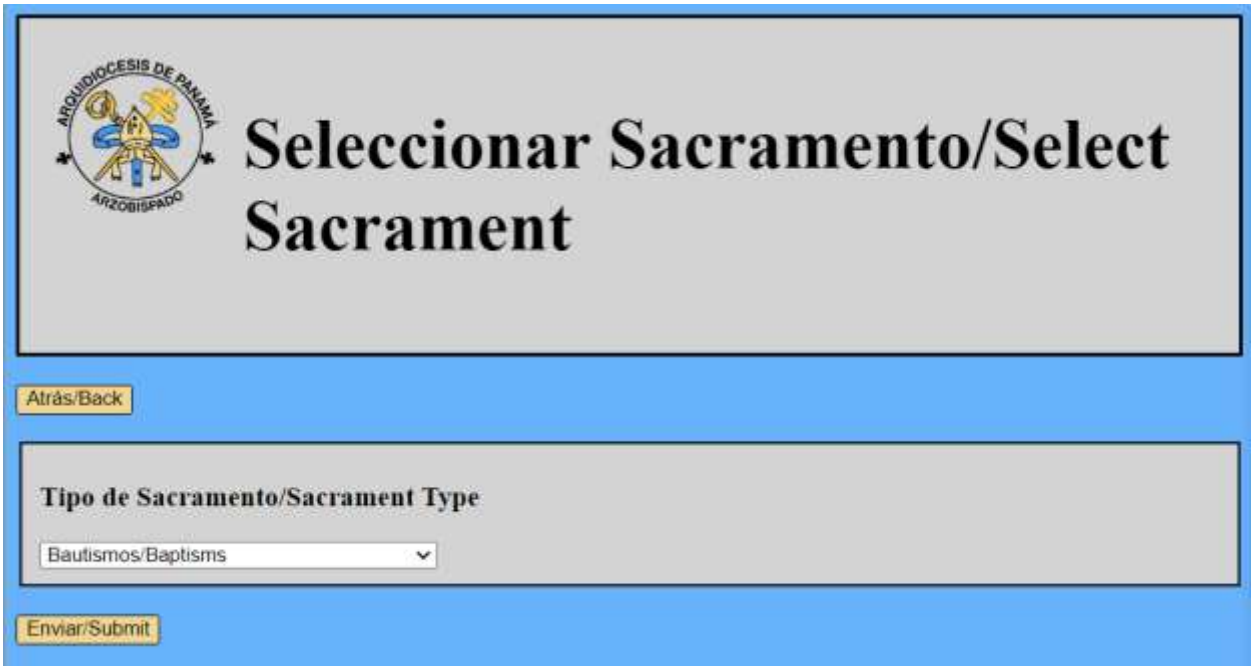
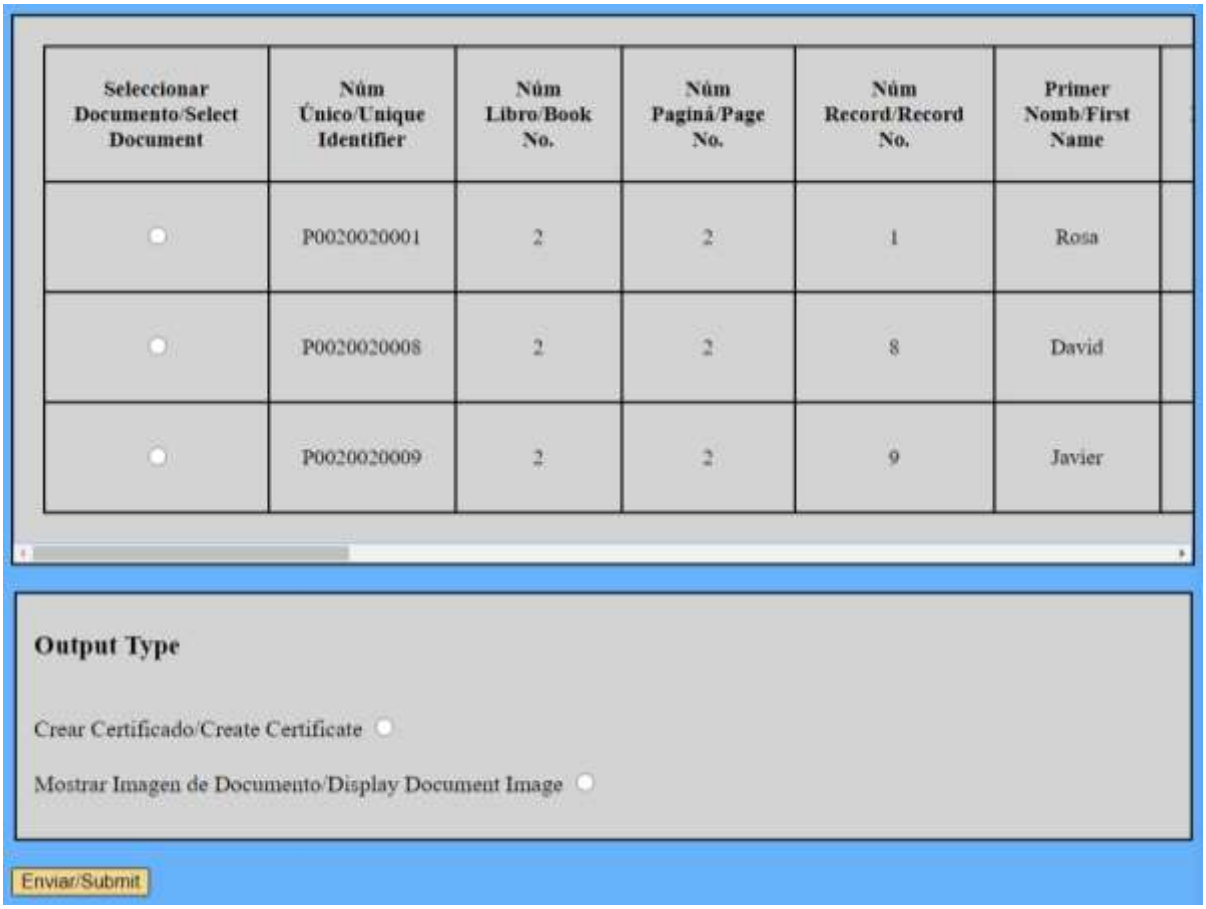


Figure 5.8: Select Sacrament Page. (2020).

Figure 5.9: First Communion Search Page. (2020).

Clicking "Submit" here brings the user to a page of search results. The "Results" page shown in Figure 5.10 lists all matches to the search criteria. Leaving a field blank on the "Search" page causes the software to assume that all records should be returned provided that a record fits the constraints of the other fields. The user looks through the search results to choose the correct record based on any other available information. Having selected a record, the staff member can either display the image associated with the record and print it, or the staff member can send the information that is associated with the record to a certificate and then print the certificate (see Figure 5.11). If the search is not successful, the user can retry it with different criteria by pressing the "Back" button.



Seleccionar Documento/Select Document	Núm Único/Unique Identifier	Núm Libro/Book No.	Núm Paginá/Page No.	Núm Record/Record No.	Primer Nomb/First Name
○	P0020020001	2	2	1	Rosa
○	P0020020008	2	2	8	David
○	P0020020009	2	2	9	Javier

Figure 5.10: First Communion Search Results Page. (2020).

Información del Registro/Record Information:

Fecha Comunión/Date of Communion	Lugar Comunión/Place of Communion	Nomb Padre/Priest's Name
1993-11-21	Parroquia Santa Maria	Oscar Brown

Firma del Sacerdote/Priest Signature: _____

Impresión/Print

Figure 5.11: Bottom Half of First Communion Certificate. (2020).

5.4 User Interface

A unified front-end user interface is crucial to the reception of our project. When presented with the software, the end-user's experience must be welcoming and easy to lower any technical barriers. The computer at St. Mary's hosts the database in the background. The user launches the software system as a web page to make the program usage as seamless as possible. Buttons and fields are self-describing, especially since each page only does one thing at a time. Parish staff must be able to sort through thousands of records, and while there are comparatively few records now, the project team believes that this software system will be able to handle that volume of information. It is critical that the software solution has the capabilities to effectively query the database using one or many search terms.

5.5 Backing up the Digital Archives

Regular backups are an important part to the health of a database. The team developed a manual solution for backing up the entire team created software package. It utilized a PowerShell script that took an input from the "Backup" page of the software and ran a MariaDB utility and a Windows utility. First, to start the backup process, the administrator must mount the target backup storage device. The team recommends using a device with at least 1 TB of storage space total. After mounting the device, the user checks the path to the folder that keeps the backup in File Explorer. Navigating from the "Admin" page, shown in Figure 5.12, to the "Backup" page shown in Figure 5.13, the user can either type or copy and paste that path into the field following the format listed above it. When the user clicks "Backup," the PowerShell script runs in the background.

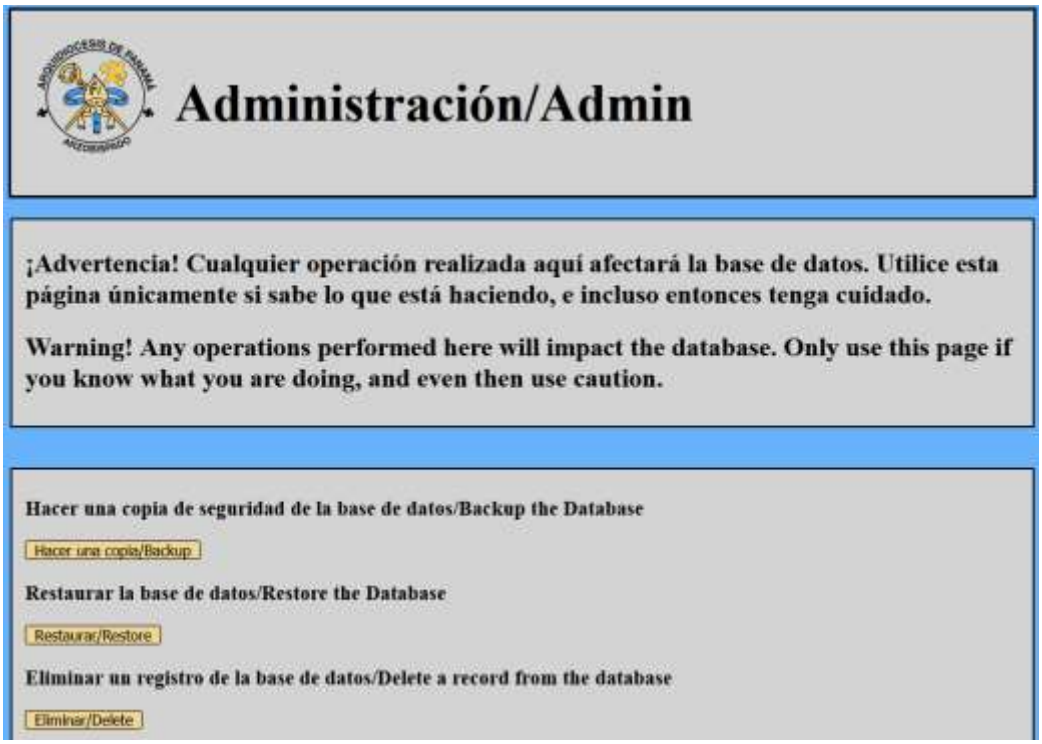


Figure 5.12: Admin Page. (2020).

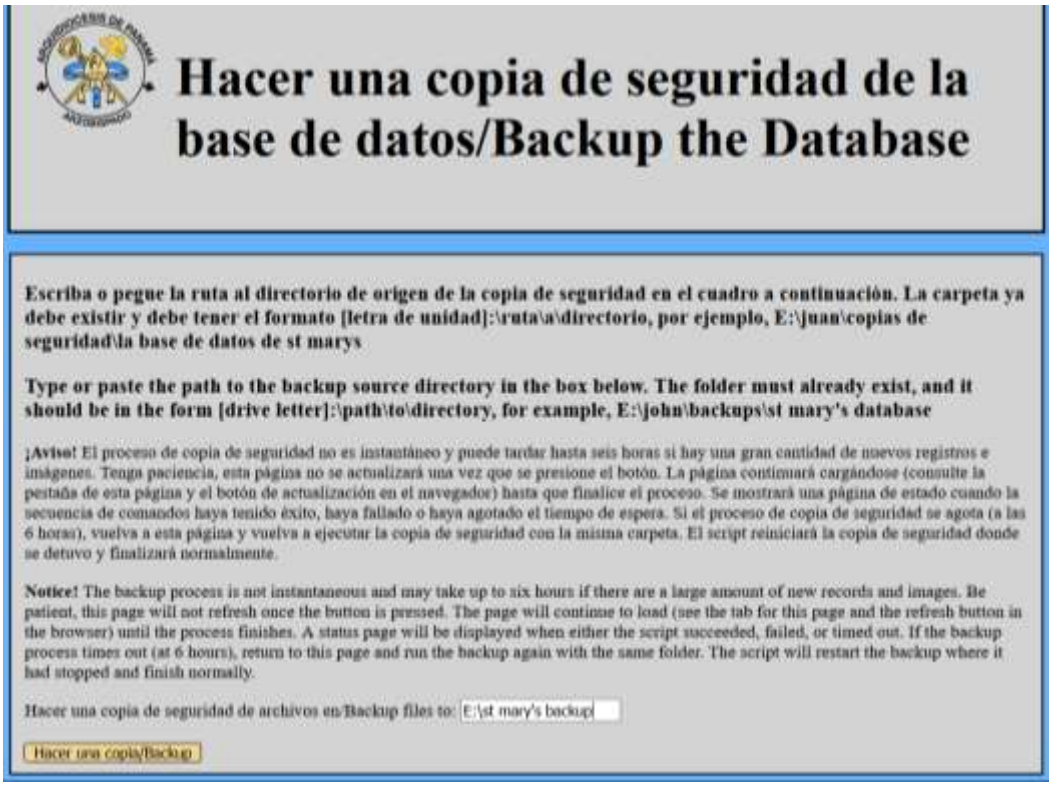


Figure 5.13: Backup Page. (2020).

The PowerShell script runs two utilities: *mysqldump.exe* and *Robocopy.exe*. *mysqldump.exe* is a tool included with the MariaDB installation that exports the database and all the associated information to one file using the user account named for backups. *Robocopy.exe* is a Windows utility that creates a mirror image of the directory containing the software. It requires a destination directory, or the directory on the backup device to where *Robocopy.exe* will write. The file path from the "Backup" page is the destination directory, and *Robocopy.exe* uses it to create the mirror image of the team's software. *Robocopy.exe* takes a variable amount of time to complete, depending on the number of files to be backed up. The maximum time that a backup can take is six hours, however if the backup fails to complete in six hours the administrator can resume the backup by repeating this process. Once it completes, it prints a status message for the user (see Figure 5.14).

Figure 5.14: Backup Status Page. (2020).

5.6 Restoring the Digital Archives

In the event that a catastrophe does occur, and something damages or corrupts the digital archives, an administrator has the option to restore the team's software from the latest backup.

The process for doing so is nearly identical to taking a backup. The administrator navigates to the “Restore” page, shown in Figure 5.15, from the “Admin” page. There, the page prompts them for a source directory as opposed to a destination directory for a backup. This is the location where the backup is saved on the external hard drive. The administrator can either type or copy and paste this path from File Explorer into the “Restore” page and then click the “Restore” button. The PowerShell script runs in the background while it completes.

Figure 5.15: Restore Page. (2020).

The PowerShell script runs two utilities: *Robocopy.exe* and *mysql.exe*. This is the same *Robocopy.exe* that the team uses for the backup process. The only difference between the operations in the restore and the backup operation is that the source and destination directories are reversed. This process also takes a variable amount of time that depends on the volume of

records, and as with the backup process, it times out after six hours. If it fails before the restoration is complete, the administrator can resume it by repeating this process. But, after the restore operation is complete, *mysql.exe* runs to import the database file that the backup created into the database server. The restore function will only succeed if the system admin has the database server prepared and the rest of the software installed. Therefore, if the computer does not have the database server configured, then the restore operation will never succeed.

5.7 Deleting a Record

The team decided to include a method for deleting records while deliberately not making it easy to accomplish. The team considered deleting records as an administrative operation since modifying or removing information was potentially dangerous for the integrity of the database. Standard users must report malformed or incorrect records to the software administrator so that the administrator can take further action. Navigating to the "Delete" page, shown in Figure 5.16, from the "Admin" page, the administrator sees a warning regarding deleting records. Below the warning is a field where the administrator types the unique ID of the record and selects the type of sacrament from a drop-down. After the administrative user clicks "Delete," the "Confirm Deletion" page appears if there is a record that has that ID number (see Figure 5.17). This page displays all the record information for that specific ID number and also includes a link to the image. After confirming this decision one more time, the software deletes the record from the database. However, this does not delete the image from the database, as other records may in fact rely on that image. Once an administrator deletes a record it cannot be recovered, though they can recreate the record by inserting a new record, with or without using the same image as before.

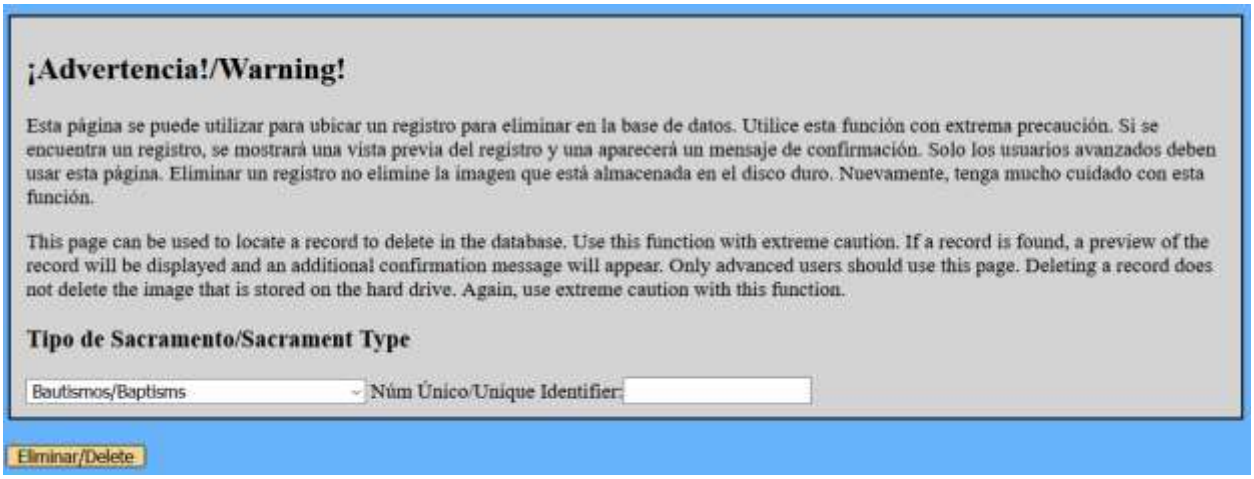


Figure 5.16: Delete Page. (2020).

Figure 5.17: Delete Confirmation Page. (2020).

5.8 User Manual

The team wrote a user manual to accompany this software solution. The manual is divided into two significant sections: one that is for general use and one that is for administrative use. In the general use chapter (see Appendices E&F chapter 2), readers can learn how to insert and search for a record in the database, as well as print a report and a certificate for a specific search result. Since this is primarily how the parish staff will use the database system, this chapter in the user's manual has many pictures to show exactly the actions needed to use the system. In the special use chapter (see Appendices E&F chapter 3), administrators can learn how to install the software, run a backup, restore from a backup, and delete a record. The delete operation is an administrative one because deleting information should not be easily accessible to volunteers or standard users. The special use chapter describes operations which a normal user has no business executing. The special use chapter also comes with pictures for the backup, restore, and delete sections.

5.9 Feedback

The only metrics that show the current level of success of this project is the satisfaction level of our sponsors. To determine this the team created a survey for any users of the software to complete. This survey included questions about how easy the software was to navigate, whether they found any bugs in the software, and if the flow of information made sense. The sample size for this survey is rather small because only a few people have access to the software system, namely Father Pio, his secretary, and the Footprint Possibilities liaisons. It is possible to at least determine the level of satisfaction of the parish staff with our solution. The team sent an initial survey to St. Mary's Parish with the first version of the software (see Appendix G). The team added a question to the original survey once they had reviewed the first version of the

software, and the team sent out the second survey with the second version of the software (see Appendix H).

The first survey yielded generally positive reviews from the testers. Question 1 asked testers to rate their overall satisfaction with the software on a 1 to 5 scale, with 1 being not satisfied to 5 being fully satisfied. For the four testers that responded to the team, all responses were either a 4 or a 5. This means that overall, the users of the software are happy with what the team has created for them (see Figure 5.18). Generally, this trend repeated itself over the course of the remaining questions. The exception to this was question 5 which asked the tester to rate the readability of the text. Figure 5.19 shows the results for this question. The remaining two questions asked the testers to explain any defects that they encountered while using the software, and if they had any additional comments. The team utilized this feedback while developing the second version of the software. The responses from the first survey can be found in Appendix G.

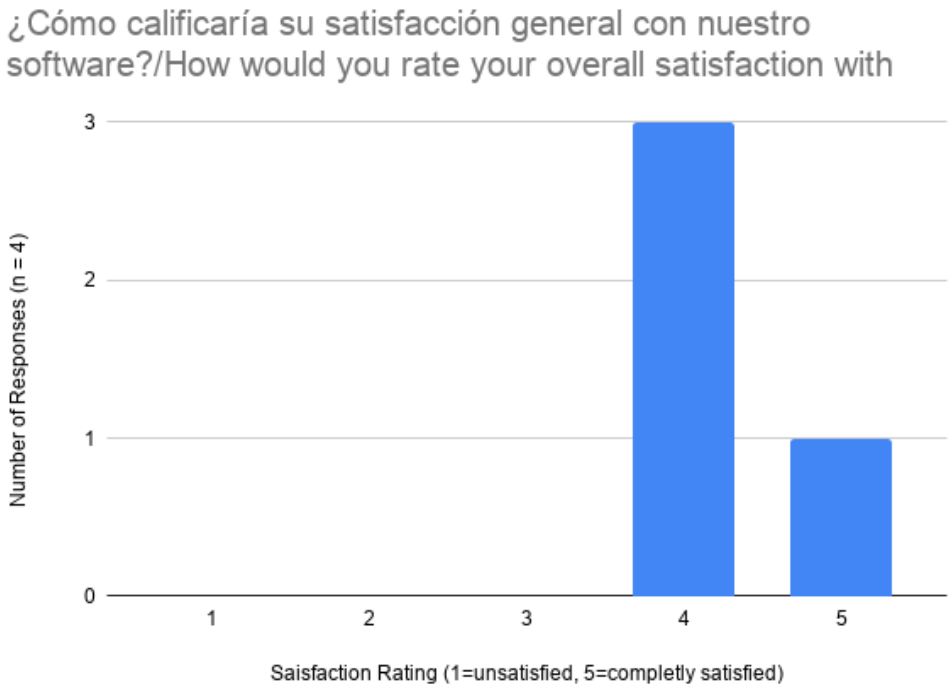


Figure 5.18: *Frequency Chart for Survey 1, Question 1.* (2020).

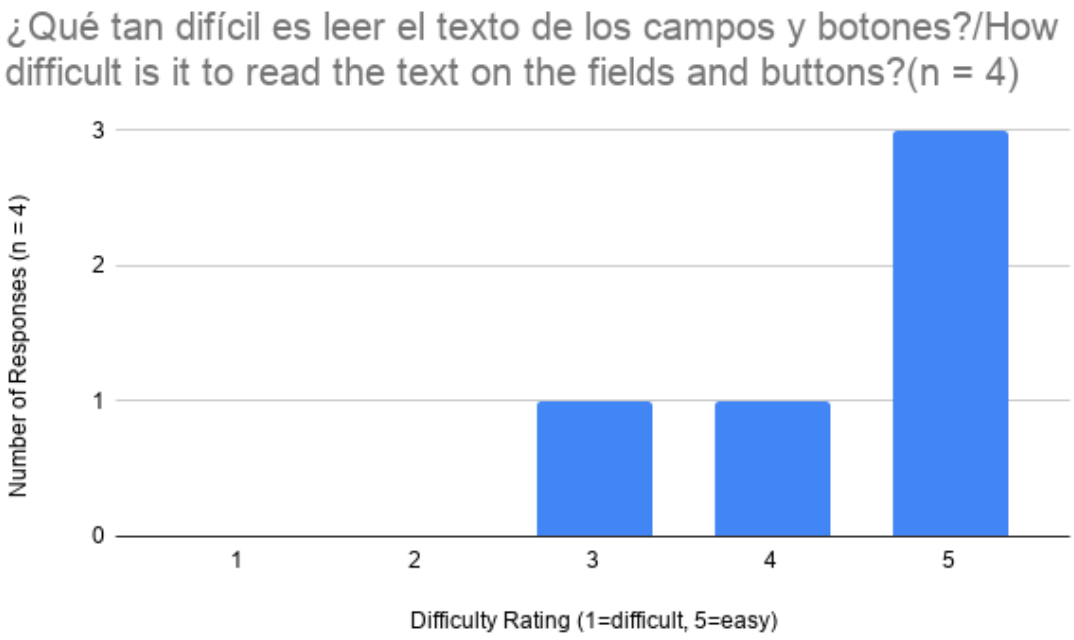


Figure 5.19: Frequency Chart for Survey 1, Question 5. (2020).

The second survey only yielded one response, and this was because the team sent it too late. The team received one response from this survey that affirmed that the software was good to use. The respondent provided feedback on the translations in the software and made a few suggestions that would make the translation more accurate. The team incorporated these suggestions into the third and final version of the software. Other than this response, there was no usable data that the team could gather from the second survey.

5.10 Summary

St. Mary's Parish has served its surrounding communities for decades. When visitors requested documents from their extensive archives, St. Mary's Parish staff would spend large amounts of time using multiple different systems of record keeping. The team developed and implemented a system for digitizing, filing, and searching through all the digitally created

archives at St. Mary's in both Spanish and English. Beginning with a photograph of a document, a volunteer can quickly analyze and input the information from the document using the user interface side of the software into the database. The database manages the digitized documents; the query software provides the ability to reference both the photograph as well as including its physical location in the archives. Making the structure of the database solid was integral to the overall goal of the project to protect the information being stored there and to allow for future developments. To allow for users with any skill level to utilize the database, a comprehensive user manual was written in Spanish and English, detailing each step of the process from digitizing the original document to querying for a record using keywords.

6 Recommendations and Conclusions

The project team developed a system for St. Mary's Parish in Panama City, Panama to digitize their archives. The software, called the St. Mary's Digital Archives, allows parish staff to attribute records to an image utilizing a database and a web browser. Now, when visitors come to St. Mary's looking for information, rather than using an index card system and physically finding the ledgers, the parish staff can use the Digital Archives to search for a record and review it further. The parish staff can even print out a certificate for the visitor to keep. The software comes with the capability to back up the database and the images to an external destination as well as restore from an external source. It also can delete malformed records without impacting the integrity of the rest of the system. The new software is a major step in modernizing the archives at St. Mary's Parish and will increase the speed with which the staff can find records.

The student team could not have completed this project without the support of Rick Montanari, Footprint Possibilities, and the staff at St. Mary's Parish. Due to the COVID-19 pandemic, the team could not have contact with any of the records, the current filing system, the staff, or the computer which currently runs the Digital Archives. In addition, the team has no Computer Science majors, and lacked much of the formal knowledge that projects of this magnitude typically require. Many weeks of hard work created the result, a working system for the parish staff to use, however there are still more improvements needed. An automatic method for importing records was at the top of the list of unfulfilled features for St. Mary's at the completion of the project. Close behind that was the ability for multiple users to connect to the database inside of St. Mary's. Additionally, more advanced search techniques were also desired by St. Mary's and Footprint Possibilities. Due to time and technical restrictions, the team did not

create these features. It is the hope of the team that someone else continues to develop this software.

Rick Montanari and the staff at St. Mary's were indispensable during the completion of this project. They provided support, including sending documents and records to the team here in Worcester, allowing for remote access of the parish computer, design specifications, and feedback on the software at many stages of development. If any of these things were missing, the team would have failed in its goal to produce a prototype for an archival system that St. Mary's Parish could use for its sacramental records. The team recommends that St. Mary's Parish utilize the team's software further and enter more records into it to test its capabilities. The team believes that the Digital Archives will be a suitable replacement for the physical index card system. However, that does not mean that the staff should discard the index card system. Rather, it should be frozen as it is now, and new records should solely utilize the computerized system. While the software is not perfect, we believe that the parish staff can use it to assist their archival abilities and provide a faster and easier experience for them and the visitors who are looking for information on loved ones, relatives, or maybe someone else.

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Appendix A: Lists of Documents to Be Captured at St. Mary's Parish

- There are 38 books of baptismal records
    - Each book is estimated to have 250 pages
    - Each book is estimated to have around 800 entries
    - Some books are in good condition, generally these are the newer ones
    - Some books are in poor condition, generally these are the older ones
    - The largest of these books is 60cm wide and 50cm tall

This appendix includes what the team currently knows about the documents at St. Mary's Parish. This information was gathered from the interview of Tito Mouynes, a member of the St. Mary's Parish financial committee, and the preceding email communications. The team hopes to get more information on this topic as the project develops.

Appendix B: Interview Informed Consent Template Script

Considerations:

- Remain neutral on the subject. Ask open ended questions that are not leading in any way.
- Make sure the interviewee is aware they can remain anonymous if they choose. This will hopefully ensure their answers are honest.
- If the interviewee appears to be uncomfortable with a question, do not pry, just move to the next question.

Introduction:

Hello _____. We are American students from Worcester Polytechnic Institute doing a research project on digitizing a historic archive at a church in Panama City, Panama. We are working with St. Mary's Parish and Footprint Possibilities, the custodian organization of the archive and a group brought in to assist the project. We would like to interview you on _____. If it is okay with you, could we get your permission to record this interview on our phones to make sure we capture your responses? If you would rather not, it is perfectly fine, we can just take notes instead. Any information you share with us is completely confidential and will only be used for research purposes with your permission. Do we have your permission to quote you in our report? You have the option to remain anonymous. We will not identify you by name in any of our writing to make sure the information you share with us is confidential unless you would like to be quoted. Our report will summarize methods for creating a digital database for the retrieval of documents in their possession. Our recommendations will at minimum provide a pathway to creating what we have outlined and will at optimum implement

our solution. It will be available online after we finish writing it, and we can also email it to you if you wish. If we ask a question that you do not want to answer, just let us know and we will move to the next one. If you do not understand our question, let us know and we can try to rephrase. Do you have any questions for us before we begin?

Date/Time: _____

Location: _____

Interviewers: _____

Interviewee(s): _____

Interviewee(s) Role: _____

Question	Yes	No
Do we have permission to record this interview?		
Would you like to be confidential, or can we use your name and quote you in our report?		
Would you like us to share our paper with you when it is complete?		

Interview Questions:	Notes on Response:
Q(N)	
Q(N+1)	

Conclusion:

Thank you for talking with us today and for participating in our research! Was there anything in the interview that you think we missed or wish we would have talked about more? Do you want to review our notes and transcript of the interview? Is there anything else you would like to add? You can always reach us at _____ and you can also contact Footprint Possibilities at _____ to ask for us. Thank you for your time.

Appendix C: Interview Questions for Experts

Introductions:

- What past projects have you worked on regarding archival work?
- What is your past work experience and education in general?

State of the documents:

- Is there any special care that needs to be taken with regards to the physical age and condition of the documents?
    - Is there a concern that handling the documents like this will cause them damage?
- Is there any specific way that you have scanned documents?
    - What quality of capture should the parish be looking for image-wise?
    - How important should image quality be to the parish?
    - Should a scanner built for the task be used, or is it acceptable to use a camera or a smartphone to do this job (cost is a big thing here)?
    - Is a smartphone camera too low of quality (depends on the smartphone)?
- Our level of involvement is going to be somewhat minimal with regards to scanning the documents, what is your experience with instructing others to do the actual work of archiving documents?
- Are there any privacy concerns?
    - Our sponsor contact has told us in our initial meeting that we would only have to put a statement saying that we are not responsible for this, however the records

stretch into the late part of the 20th century, meaning that we could safely assume there are people still living that are named in these documents.

Database questions:

- What is the current organizational scheme of the parish archives?
    - Can we somehow adapt this structure so that we are creating a "virtual archive", almost a one-to-one mirror of the physical archives?
- In your opinion, is one record equal to one page of a book, or is one record equal to one entry in a book?
    - Could this be taken care of with tagging and transcription of the picture?
    - If each record is going to be its own file do you want to include the whole image multiple times, crop each section, or map multiple records to one image?
- How much storage space is needed?
    - This is dependent on how we capture the data and how many documents there are.
- Where do you recommend the master copy of the data be hosted?
    - We have concerns about cloud storage, mainly that if the parish were to stop paying for the service all the data would be erased.
- Are the images expected to be "high quality, lossless" pictures to be held onto for all eternity (this affects the amount of storage required)?
- In the long term, how have you dealt with the creation of a digital archive and then it is maintained once the original architects of the database are no longer involved?

- St. Mary's has said the database will not be open to the Internet, therefore who should our end user be?
- Should volunteers be entering the data by hand, or should some type of software (OCR) be employed to do the heavy lifting of transcription?
    - The documents were not created with a computer in mind, it would be more tedious for the volunteers to do it by hand but it might be more accurate, especially since we don't know how mature OCR is in working with Spanish script.
        - Maybe run the two methods in parallel to ensure accuracy, and then if OCR is good enough stick with that to reduce hand work.
- User Interface: "a link to the image of the certificate, book, page, or original document"
    - For example, if one document were searched for, should the final interface contain just the document in question, or should the interface contain more details like what each field reads in some organized way?
    - What types of information should be searchable, for example: title of document, date of creation, names present in the document, location of creation, etc. (complex or simple searches)?
    - Does the interface need to look "pretty" or just get the job done?
    - What language should the final user interface be?
        - The documents were originally written in Latin, Spanish, and a little English, so this would depend on who was using the interface (parish staff we would assume)?

    - Would it be more helpful when organizing the files on the interface to have them pre-sorted in some default way (by type then date, for example), as if they were in a filing cabinet (imagine how files are stored on your personal computer)?
- Is there any software that you have used that you might be able to recommend to us?

- Backups
    - In your opinion, what is a bare minimum for a number of backups and what is a sufficient number of backups?
        - Remote backups that are stored at other parish locations?
        - This goes back to the point asking if the parish is the only group that will have access to this data, or are there other groups in Panama that would benefit from this data?
    - Should there be full backups of the database implementation as well?
    - Should these backups include all documents or only certain ones? (For privacy concerns)

Closing Remarks:

- Ask any other questions that might have been put off here

Appendix D: Interview Questions for Tito Mouynes at St. Mary's Parish

Introductions:

- What role do you fill at the parish?

State of the documents:

- What is the physical condition of the documents, generally?
    - How large are the documents inside the church's library?
    - Are those books the largest things that we will encounter?
    - Is there a concern that handling the documents like this will cause them damage?
- Is there any specific way the parish would like the documents scanned?
    - How important is image quality to the parish?
    - Should a scanner built for the task be used, or is it acceptable to use a camera or a smartphone to do this job, this will greatly affect the cost?
    - Would a smartphone camera be sufficient, or is the quality too low?
- How many documents will be scanned into the system?
    - Will the database include all the parish's historic records, or only a subset of them?
    - How many documents are there total?
- What is our level of involvement in scanning the documents?
    - Will the team handle the documents at all, or will only the parish staff be handling them?

- Information contained on the documents:
    - Will we be having to handle marriage and death certificates, property transactions, and other types of records in this project?
    - Are there any privacy concerns?

Database Information:

- What is the current organizational scheme of the parish archives?
    - Can this somehow be adapted into a “virtual archive”, almost a one-to-one mirror of the physical archives?
- In your opinion, is one record equal to one page of a book, or is one record equal to one entry in a book?
- How much storage space is needed?
    - This is dependent on how we capture the data and how many documents there are.
- Since we are not from Panama, how easily can hardware be acquired for computing and scanning in general?
- Where would you like the master copy of data to be hosted: locally on a computer, somewhere in a “cloud”, or somewhere else?
    - A concern with cloud storage is if the parish were to stop paying for the service all the data would be erased.
- Are the images expected to be “high quality, lossless” pictures to be held onto for all eternity?
- Who will be curating the database once we are no longer involved?

- Who is our “customer,” that is, who is the end user in all of this?
- Should volunteers be entering the data by hand, or should some type of software be employed to do the heavy lifting of transcription?
- User Interface: “a link to the image of the certificate, book, page, or original document”
    - For example, if one document were searched for, should the final interface contain just the document in question, or should the interface contain more details like what each field reads in some organized way?
    - What types of information should be searchable, for example: title of document, date of creation, names present in the document, location of creation, etc.?
    - Does the interface need to look “pretty” or just get the job done?
    - What language should the final user interface be?
        - The documents were originally written in Latin, Spanish, and a little English, so this would depend on who was using the interface?
    - Would it be more helpful when organizing the files on the interface to have them pre-sorted in some default way, as if they were in a filing cabinet?

Digital Backup Information:

- Where does the parish want their backups stored and how many of them should there be?
    - Should remote backups be stored at other parish locations?
- Do you want full backups of the database implementation as well?
- Should these backups include all documents or only certain ones?

Budgetary Questions:

- What kind of investment is the parish willing to put into this?
    - Even a rough ceiling for the amount that the parish is willing to pay would be helpful so that we can focus our product research more.

Appendix E: English User Manual for the St. Mary's Digital Archives

1 Introduction

Thank you for choosing to use the St. Mary's Digital Archives software written and designed by the WPI A20 IQP team at St. Mary's Parish. The project team would like to thank our advisors, Prof. Jim Chiarelli and Prof. Bob Kinicki, as well as our sponsors at Footprint Possibilities, Rick Montanari and Valmy Guerrero, and at St. Mary's Parish, Tito Mouynes and Father Pio. Without their assistance, this project would not have been possible.

This manual describes in detail how to use this software. It also describes how to install the Digital Archives as well as how to backup and restore the software. This manual was originally written in English by the project team and has been translated into Spanish. This is the definitive guide for operating this software.

2 General Operation

This chapter describes how to use the St. Mary's Digital Archives to insert a new record, to insert a new record while repeating the image that was used, to search for a record, and to print a certificate. The software was designed with ease-of-use in mind, and steps were taken to make sure that the flow of data and information is logical. Buttons to return to the welcome screen are provided on most pages.

2.a Starting the St. Mary's Digital Archives

To start the St. Mary's Digital Archives, double-click the shortcut on the desktop. The software opens in the default web browser and presents the user with the 'Welcome' screen. Here, the user can choose to create a new record, search for an existing record, or go to the 'Admin' page. The 'Admin' page will not be covered in this chapter of the manual. Turn to section 3.b.i for more information on the 'Admin' page.

2.b Taking Pictures

Follow these steps to create the setup for taking and editing images.

2.b.i Setup Environment

Setup the tripod and the music stand in a clean and safe room for the documents. Place the camera on the tripod. Limit hazards such as ink, food, drinks, sharp objects, and anything else that could cause harm to the records.

2.b.ii Prepare the Document

Carefully put a ledger onto the music stand and open it up to a given page. Make sure to be delicate when handling any documents. As a precaution, anyone handling documents should wash their hands beforehand.

2.b.iii Adjust and Align the Camera

Adjust the camera height and alignment until the record is properly framed. Proper alignment is key to getting images with consistent quality.

2.b.iv Take the Photo

Take the photo of the page. Many images may be taken at once, and an entire book should be done at once to minimize handling. Repeat steps 2.b.i-iv for as many images as necessary.

2.b.v Download to Computer

Download the images to the computer. This may be done by inserting the SD card from the camera into the computer, or by directly attaching the camera to the computer and cutting and pasting the files into a known holding directory.

2.b.vi Run Adobe Photoshop 2020

Open Adobe Photoshop 2020 and load the images in it. Here the images can be edited to make them easier to read.

2.b.vii Adjust Image Properties

Use Photoshop to adjust the image brightness, contrast, and possibly invert the colors of the image so that they are easier to read. Save the images on the computer in a folder that is easy to access. Once they are edited, the images are ready to be inserted into the database. Repeat steps 2.b.vi-vii for each image.

2.c Inserting a Record

To insert a new record, images of the records must be taken and ready to be uploaded onto the computer.

2.c.i Locate the Folder Containing the Edited Images

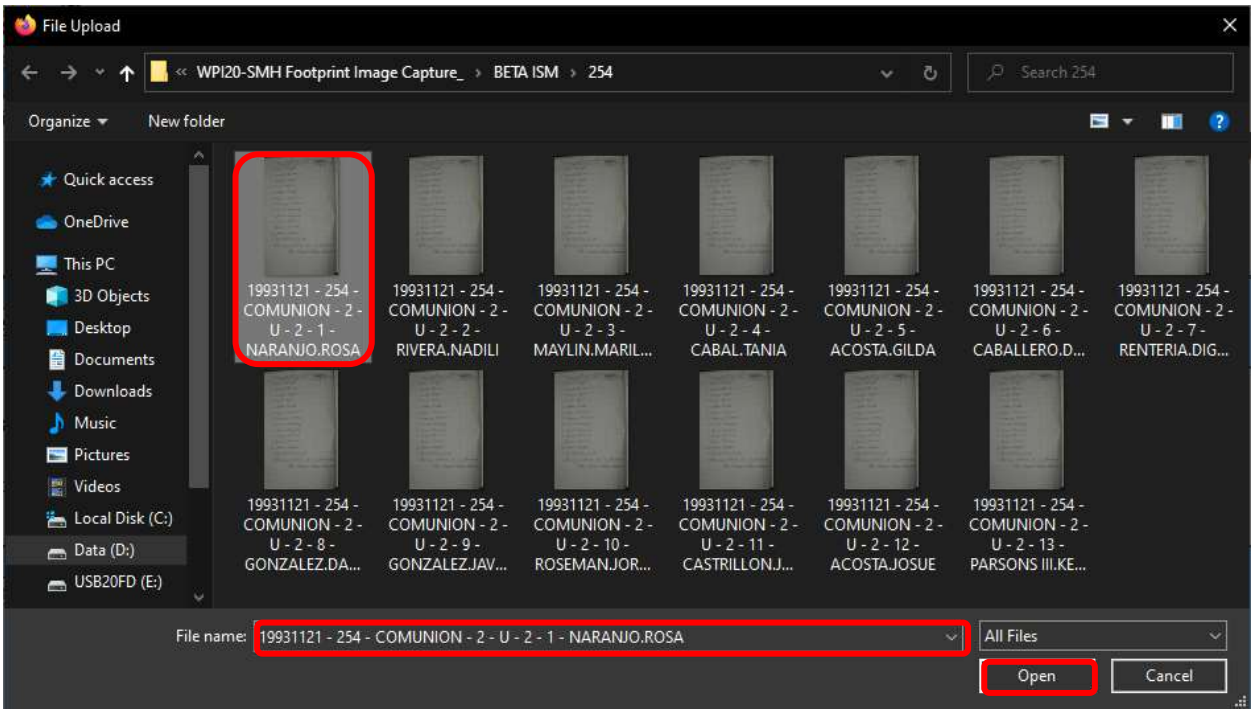
Make a note of the folder that contains the edited images as it will be important for the rest of this section.

2.c.ii Click Create

Click '**Create**' on the 'Welcome' page. This leads to a new page that allows the user to select an image to upload as well as a sacrament type.

2.c.iii Browse to the Image

Click '**Browse**' and navigate to the file that is to be uploaded. This file is found in the folder from step 2.c.i. Once the correct file is selected, click '**Open**'. Select the sacrament that is to be recorded, then click '**Submit**'. The next page displays the fields associated with the sacrament that was selected on the previous page as well as a preview of the image. Generally, this page is the same for each sacrament.



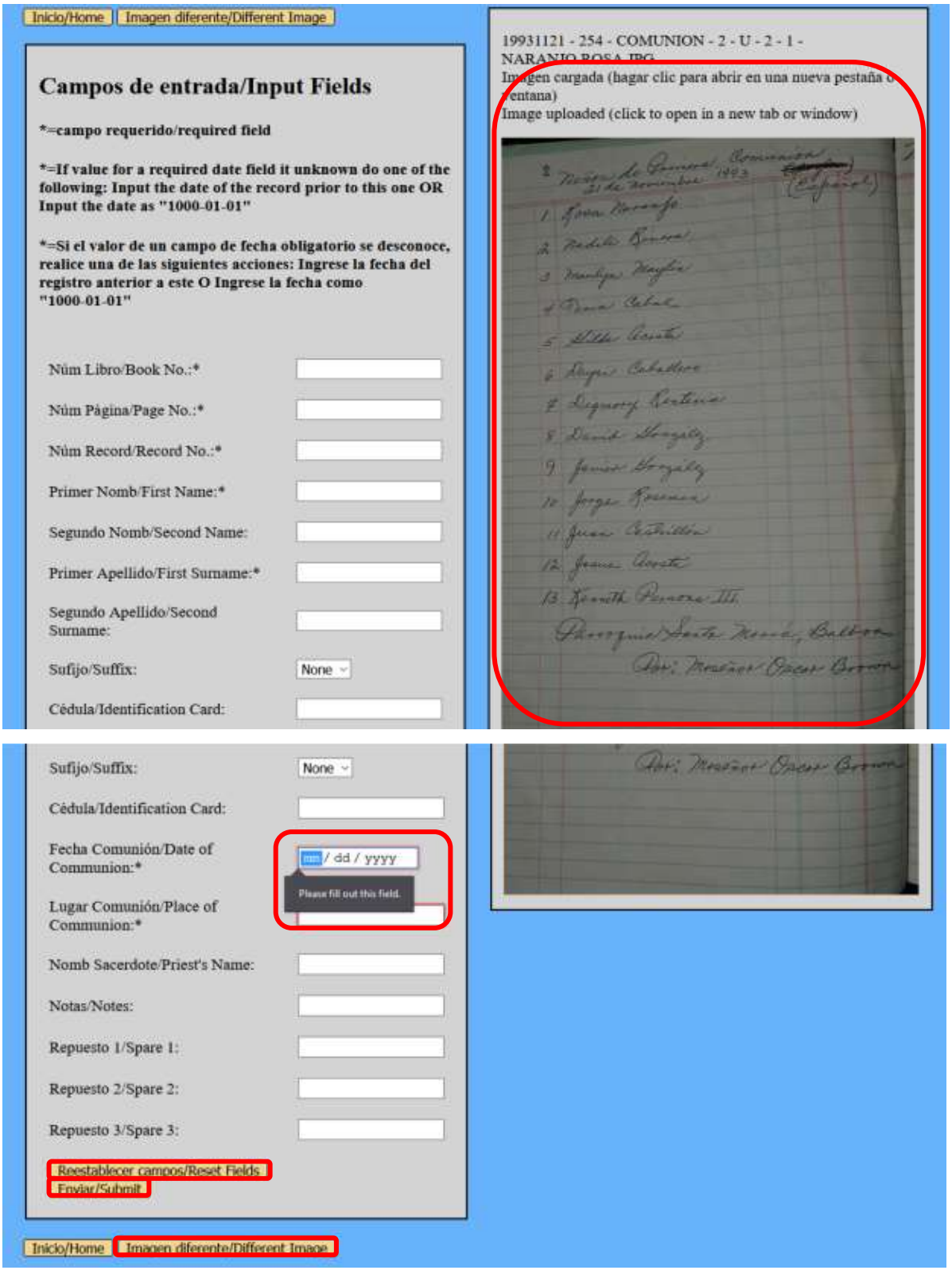
2.c.iv Transcribe the Data

Read the image for information to enter into the fields on the left. The image can be clicked on to make it larger. Clicking the image opens it in a new tab in the web browser where the user can zoom in to see more details. Back on the previous page, however, enter the information that is contained in the records into the blank fields. If all the fields need to be cleared, click '**Reset Fields**' to reset all field values. If the wrong image was selected, click '**Different Image**' to select a new image. Once all the fields have been filled in, click '**Submit**'. Certain fields for each sacrament are required and will appear with a red outline if the record is submitted with them blank. These fields must be filled in for the record to be submitted successfully.

NOTE: * = Required field: The form will not submit without these fields filled in. When the value for one of these fields is unknown it must be filled with a placeholder. For required text fields input "None". For required date fields there are two options.

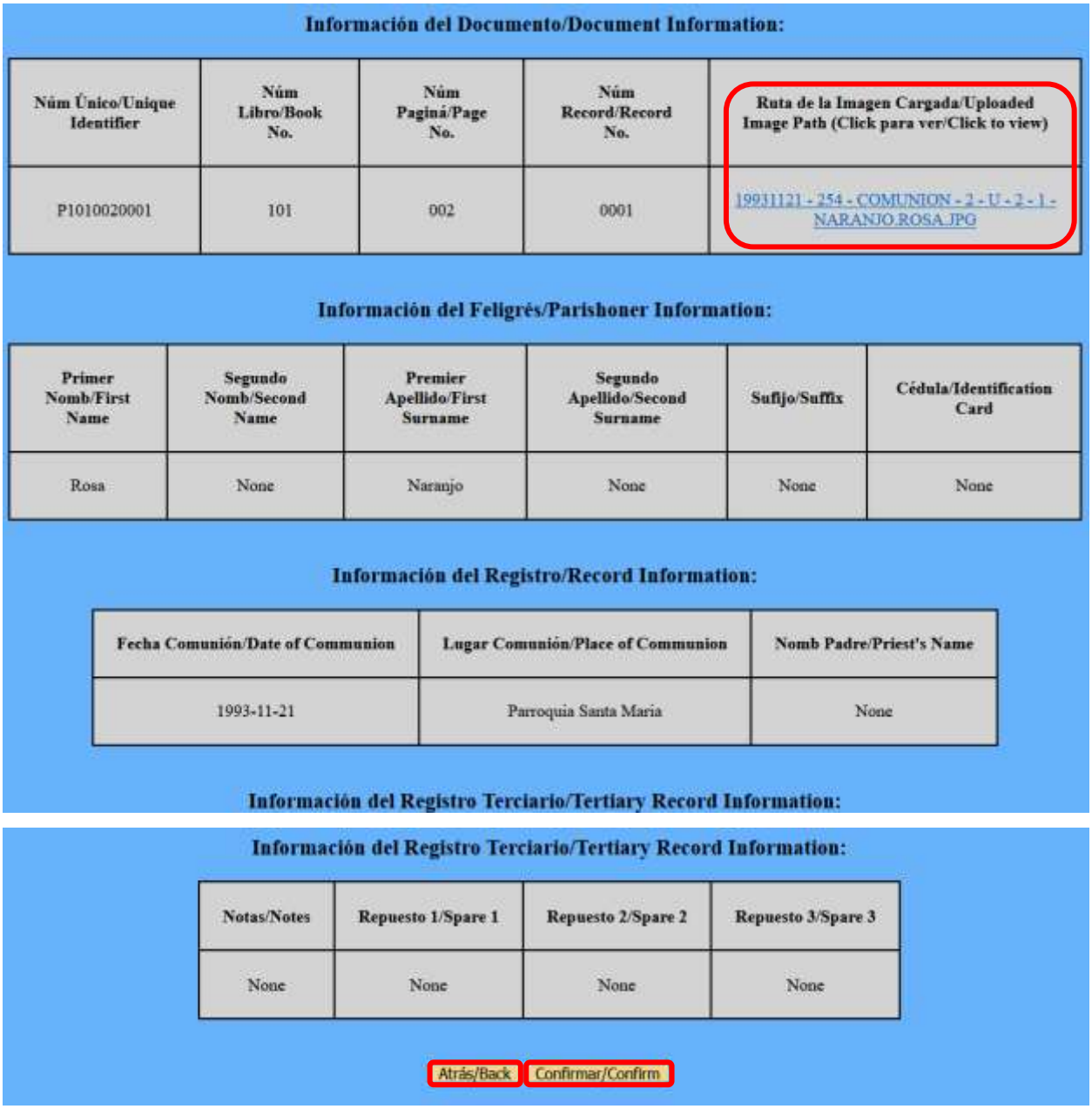
One: Enter the date on the previous record. This will allow the record to be found with an approximate date search.

Two: Enter the date as “1000-01-01”. This is the lowest possible date the database can hold. When the record is found the date will be set to “None”.



2.c.v Check Record Details

Submitting will bring the user to a status page that prints all the record information. The user will be asked to check the accuracy of the information on the record. At this point, the user has two options. One, confirm the insertion of the record. In that case, click '**Confirm**' and the record will be inserted. Two, go back and reenter information. In that case, click '**Back**' and you will be returned to the previous page. The image that is being uploaded can be previewed by clicking the link in the "Uploaded Image Path" cell.



Información del Documento/Document Information:

Núm Único/Unique Identifier	Núm Libro/Book No.	Núm Paginá/Page No.	Núm Record/Record No.	Ruta de la Imagen Cargada/Uploaded Image Path (Click para ver/Click to view)
P1010020001	101	002	0001	19931121 - 254 - COMUNION - 2 - U - 2 - 1 - NARANJO ROSA JPG

Información del Feligrés/Parishoner Information:

Primer Nomb/First Name	Segundo Nomb/Second Name	Premier Apellido/First Surname	Segundo Apellido/Second Surname	Sufijo/Suffix	Cédula/Identification Card
Rosa	None	Naranjo	None	None	None

Información del Registro/Record Information:

Fecha Comunión/Date of Communion	Lugar Comunión/Place of Communion	Nomb Padre/Priest's Name
1993-11-21	Parroquia Santa Maria	None

Información del Registro Terciario/Tertiary Record Information:

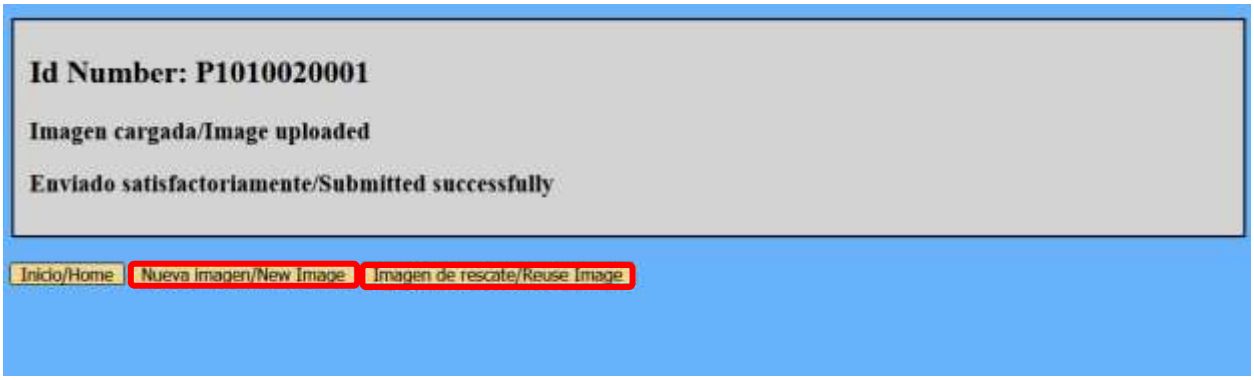
Información del Registro Terciario/Tertiary Record Information:

Notas/Notes	Repuesto 1/Spare 1	Repuesto 2/Spare 2	Repuesto 3/Spare 3
None	None	None	None

Atrás/Back | Confirmar/Confirm

2.c.vi Submit the Record

Confirming will bring the user to a status page that prints a record ID as well as the connection and submission status of the record. At this point, the user has two options. One, reuse the last used image in the case that more than one record is going to be entered for the image. In that case, click '**Reuse Image**' and return to section 2.c. iv. Two, choose a new image to insert records from an entirely different page and/or sacrament type. In that case, click '**New Image**' and return to section 2.c.iii.

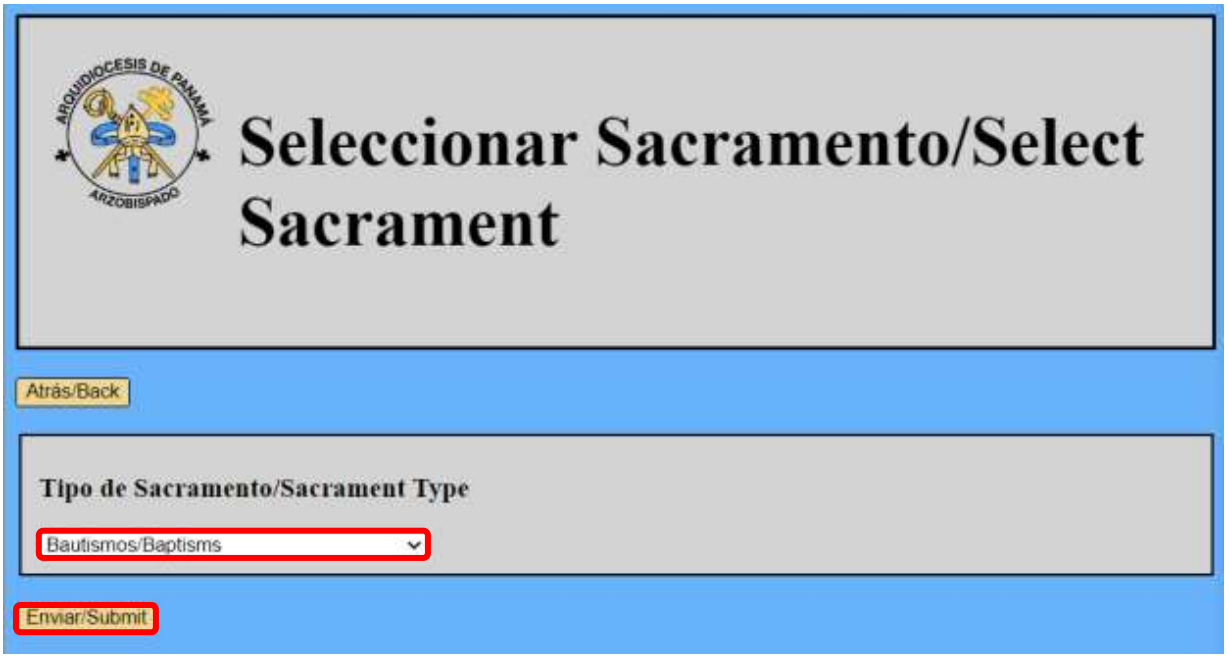


2.d 2.d Searching for a Record

To search for an existing record, there are no prior steps that need to be taken.

2.d.i Click Search

Click '**Search**' on the '**Welcome**' page. This brings the user to a page with an option to select a sacrament. After choosing one, click '**Submit**'. This brings the user to a page with fields to search for that specific sacrament.



2.d.ii Input Search Parameters

The user can query the database by entering information in the empty boxes. Leaving a box empty will return all results for that sacrament, as an empty input matches all values in the database. One useful tip, to search for all records from one book, type the book number in its field and click '**Submit**'. This will return all records with that book number. Search results can also be sorted using the '**Sort by?**' drop-down menu. Fields with names or places are sorted

alphabetically. For all queries, however, enter the information, choose a sort order, and click '**Submit**'.

2.d.iii Look through Results

The next page produces the output search results from the query. The information on the records in the search result is displayed here. First select a record by clicking one of the buttons in the far-left column of the table. Next you can select one of two options of what to do with that record. To select what you want to do with the record select one of the two options at the bottom. First, you can create a certificate for the record by selecting the corresponding button. Or you can display the document image by selecting the corresponding option. Once a record and action are selected you can click '**Submit**' to execute that action.

2.d.iii.1 Print the Certificate

If you select '**Create Certificate**' you will be directed to a page with a certificate for the record you chose. You can print this certificate by clicking '**Print**'.

Información del Registro/Record Information:

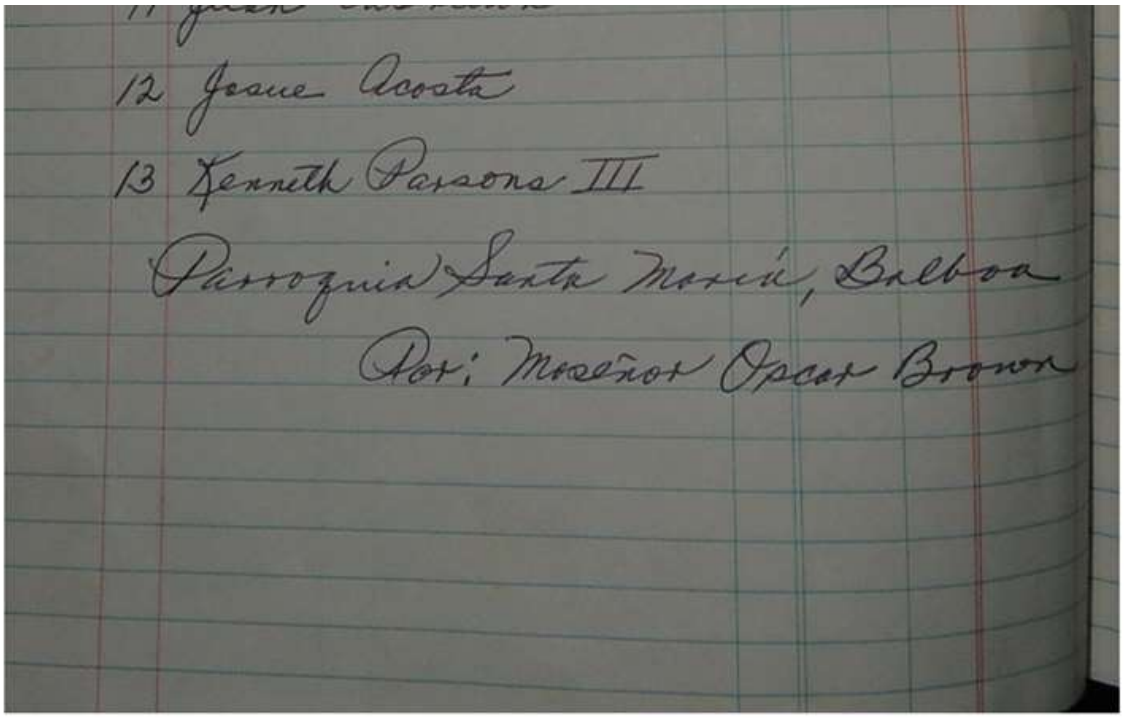
Fecha Comunión/Date of Communion	Lugar Comunión/Place of Communion	Nomb Padre/Priest's Name
1993-11-21	Parroquia Santa Maria	Oscar Brown

Firma del Sacerdote/Priest Signature: _____

Impresión/Print

2.d.iii.2 Print Document Image

If you select '**Display Document Image**' you will be directed to a page the image of the document containing the record you chose. You can print this image by clicking '**Print**'.



Impresión/Print

2.e Importing Records

Users can distribute images that have received editing to other users for transcription into an Excel spreadsheet. That spreadsheet can be used to speed up the process of entering information into the database. At this time, there is no automatic way to do this, records must be transcribed from the spreadsheet into the '**Create**' side of the database, following the steps in section 2.c. Blank templates for the spreadsheets are provided in the folder at 'C:\Program Files\xampp\htdocs\stmdatabase\Import Templates\'. They can be distributed with bundles of images and then returned for someone else to insert into the database itself.

3 Special Operation

This chapter describes in detail how to install the prerequisite software that is required to run the St. Mary's Digital Archives. It also describes how to backup and restore the software from an external hard drive. This section is for advanced users. None of these processes should be completed without carefully reading these instructions.

3.a Installation

There are many steps to installing the Digital Archives, most of them are related to prerequisite software and creating new users in the database.

3.a.i Install XAMPP as an Admin

XAMPP is a solution stack that bundles Apache, PHP, and MariaDB (a free and open-source fork of MySQL) as well as the database software phpMyAdmin.

3.a.i.1 Download the XAMPP Installer

Begin by downloading the latest XAMPP installer from their website, https://www.apachefriends.org/index.html. Once it finishes, open the downloads folder, right-click on it and select '**Run as administrator**'.

3.a.i.2 Dismiss Warning

On the first dialog that appears, click '**OK**' to dismiss the warning. Then click next.

3.a.i.3 Select Software to Install

This screen presents a list of software that comes with XAMPP. Only check the boxes for Apache, MySQL, PHP, Perl, and phpMyAdmin. Then click next.

3.a.i.4 Make a New Folder at ‘C:\Program Files\xampp\’

Now pick a folder to install XAMPP in. Navigate to ‘C:\Program Files\’ in the folder picker inside the XAMPP installer and create a new folder called ‘xampp’. This is the folder where XAMPP will be installed. Select ‘C:\Program Files\xampp\’ and then click next.

3.a.i.5 Final Steps

Select English as the language for the software. Click next, then deselect the box that asks about Bitnami. Click next and then install the software. At the end of the installation, do not run the XAMPP control panel, exit the installer.

3.a.ii Run Apache and MariaDB as Windows Services

Now configure the Windows services for Apache and MariaDB to start and run automatically whenever XAMPP starts.

3.a.ii.1 Start the XAMPP Control Panel

Whenever the XAMPP Control Panel is run, it should be as a user with administrator rights. Go to the Start menu, then scroll to a folder labeled ‘XAMPP’ in the list of applications. Open that folder, right-click ‘XAMPP Control Panel’, and select ‘More’ > ‘Run as administrator’. After confirming that choice, the XAMPP Control Panel will start.

3.a.ii.2 Start Apache

Start Apache for the first time by clicking ‘**Start**’ on the line for Apache. In the next dialog that appears, select the box for ‘Private networks’ and deselect the box for ‘Public networks’. Then click ‘**Allow**’.

3.a.ii.3 Start MariaDB

Start MariaDB for the first time by clicking ‘Start’ on the line for MySQL. In the next dialog that appears, select the box for ‘Private networks’ and deselect the box for ‘Public networks’. Then click ‘**Allow**’.

3.a.ii.4 Stop Apache and MariaDB

Now that both services work when started manually, they can be configured to start automatically. Click '**Stop**' on the lines for Apache and MySQL.

3.a.ii.5 Install Them as Windows Services

Once they have stopped, click the red X next to Apache and MySQL to install both as Windows services. Click '**Yes**' in the next dialog for each.

3.a.ii.6 Final Steps

Now click '**Config**' in the XAMPP Control Panel. Under the section outlining autostart modules, check the boxes for Apache and MySQL. Confirm that change. To test it, restart XAMPP with administrative privileges and notice if they start automatically.

3.a.iii Set Database Root Password

By default, MariaDB and phpMyAdmin do not have a root password, or a password on the account that controls the database server. This absolutely needs to be configured before doing anything else.

3.a.iii.1 Start phpMyAdmin

In the XAMPP Control Panel, click '**Admin**' on the MySQL line. This launches phpMyAdmin. phpMyAdmin can also be reached by typing 'http://localhost/phpmyadmin/' into a web browser.

3.a.iii.2 Click User Accounts

The first screen that is displayed is the home screen. On that page, click the button on the top banner called '**User accounts**'

3.a.iii.3 Change the Root Password

There are three accounts with the username ‘root’. Each of them has to have the same password and each of them have to be changed manually. For the first one, click ‘**Edit privileges**’, then click the button at the top that says, ‘**Change password**’. Enter a password twice and then click go. Repeat this for the other two ‘root’ users. Write this password down somewhere and keep it in a safe place near the computer running the Digital Archives. Once this is done, exit phpMyAdmin and stop Apache, MariaDB, and XAMPP.

3.a.iii.4 Run Notepad

phpMyAdmin must be configured manually to require a password for all users. Go to the Start menu and in the list of programs go to ‘**Windows Accessories**’ > ‘**Notepad**’. Right-click that and go to ‘**More**’ > ‘**Run as administrator**’.

3.a.iii.5 Edit the Configuration File in Notepad

Click ‘**File**’ > ‘**Open**’ and open the file at ‘C:\Program Files\xampp\phpmyadmin\config.inc.php’. Then, edit the line that reads

$cfg[‘server’][$i][‘auth_type’] = ‘config’

to read

$cfg[‘server’][$i][‘auth_type’] = ‘cookie’

Edit the line that reads

$cfg[‘server’][$i][‘AllowNoPassword’] = true

to read

$cfg[‘server’][$i][‘AllowNoPassword’] = false

Save the file and exit Notepad.

3.a.iii.6 Restart XAMPP

Restart XAMPP like in step 3.a.ii.1. Apache and MariaDB should start automatically if the steps in section 3.a.ii were followed. If they did not, start them like in steps 3.a.ii.2 and 3.a.ii.3. Start phpMyAdmin like in step 3.a.iii.1. Enter ‘root’ for the username and the password that was entered in step 3.a.iii.3 for the password.

3.a.iv Initialize the Digital Archives

This section should only be done if there is no usable backup from which to restore the software. Doing this step will generate a blank database with NO records or images.

3.a.iv.1 Download from GitLab

Download the files in the repository at ‘https://gitlab.com/st.-mary-s-iqp/database’. A developer of this software may have to log in to their account to do this if the repository is not public.

3.a.iv.2 Extract the Archive

Extract the files from the ‘.zip’ archive into a folder called ‘stmdatabase’.

3.a.iv.3 Copy Files

Copy the folder named ‘stmdatabase’ into another folder called ‘C:\Program Files\xampp\htdocs\’. Administrative rights may be required.

3.a.iv.4 Create the Desktop Shortcut

Create a desktop shortcut for the Digital Archives. Right-click on the desktop and select ‘**New**’ > ‘**Shortcut**’. Type ‘http://localhost/stmdatabase/index.php’ into the first box, and then give it a name in the second box.

3.a.iv.5 Start phpMyAdmin

Start phpMyAdmin like in step 3.a.iii.1 and log into phpMyAdmin as the root user.

3.a.iv.6 Click Import

Click the button on the top banner called ‘**Import**’. The fresh install of the software comes with a file to import into phpMyAdmin to initialize the database.

3.a.iv.7 Browse to the File

Browse to the blank database file at ‘C:\Program Files\xampp\htdocs\stmdatabase\stmary.sql’. Select no other options on this page and click ‘**Go**’ at the bottom of the page. This initializes the database so that it can be used by the Digital Archives.

3.a.v Create Four New Users

Four new users in phpMyAdmin must be created in order for the Digital Archives to work. They are the general user, the user for the backups, the user for the restores, and the user to delete. The process to create each user is the same, however the usernames, passwords, and privileges are not. This section will create the general user, and these steps can be repeated for the backup, restore, and delete users with the information provided at the end of this section.

3.a.v.1 Start phpMyAdmin

Start phpMyAdmin like in step 3.a.iii.1 and log into phpMyAdmin as the root user.

3.a.v.2 Click User Accounts

Click the button on the top banner called ‘**User accounts**’.

3.a.v.3 Click add user account

On the next page, click ‘**Add user account**’ below the table of existing users. A new window appears to set the authentication settings for the new account.

For this user

Username = Mary

Hostname = localhost

Password = StMarysIQPA20

Check no other boxes and click ‘**Go**’.

3.a.v.4 Click Home

Click the **Home** icon in the top left corner of phpMyAdmin.

3.a.v.5 Click User Accounts

Click the button on the top banner called '**User accounts**'.

3.a.v.6 Edit Privileges for the New User

On the line for the new user, 'Mary', click '**Edit privileges**'.

3.a.v.7 Click Database

On the next page, click the button under the top banner called '**Databases**'.

3.a.v.8 Select the Database

Select 'stmary' from the list of databases and click '**Go**'.

3.a.v.9 Select the Permissions for the User

On the next screen, check the boxes for 'SELECT', 'INSERT', and 'LOCK TABLES' only. These permissions are different between different users. Click '**Go**'.

3.a.v.10 Repeat for other users with new information

Repeat these steps to create two new users. The information for each is

Backup User:

Username = root_backup

Hostname = localhost

Password = StMarysParishA20

Permissions = SELECT, LOCK TABLES

Restore User:

Username = root_restore

Hostname = localhost

Password = sTmARYSpARISHa20

Permissions = INSERT, SELECT, CREATE, ALTER, DROP, LOCK TABLES

Delete User:

Username = root_delete

Hostname = localhost

Password = Maryhadalittlelamb710

Permissions = SELECT, DELETE, LOCK TABLES

3.a.vi Autostart XAMPP

Now that all the configuring for XAMPP is completed, it can be configured to start in the background for all users that log into the computer.

3.a.vi.1 Press 'win+r'

Press 'win+r' (the Windows key and the 'R' key) at the same time to start the Run dialog. Type 'taskschd.msc' in the dialog box and then press the 'Ctrl+Shift+Enter' to run it as an administrator.

3.a.vi.2 Import a Task

This is the task scheduler for Windows. It will be used to start XAMPP automatically. On the right pane click '**Import task**'.

3.a.vi.3 Browse to File

Navigate to 'C:\Program Files\xampp\htdocs\stmdatabase\xamppautostarttask.xml' and select it. Accept and save that choice. Log out and log back in, then navigate to the '**Welcome**' page to check that XAMPP started automatically. This section was successfully completed if the software starts without any further steps.

3.a.vii Configure PowerShell

Windows still must be configured to run unsigned local PowerShell scripts. This software takes advantage of two PowerShell scripts that were created by the IQP team. They backup and restore the Digital Archives.

3.a.vii.1 Run PowerShell

To start, run PowerShell as an administrator. Go to the Start menu and go to '**Windows PowerShell**' > '**Windows PowerShell**'. Then, right-click on '**Windows PowerShell**' and select '**More**' > '**Run as administrator**'. This will open a command prompt for PowerShell.

3.a.vii.2 Check the Current Execution Policy

In PowerShell, type 'Get-ExecutionPolicy' and then press 'Enter' to check what the current policy is. By default, it should be 'Restricted'.

3.a.vii.3 Set the New Execution Policy

Type 'Set-ExecutionPolicy -ExecutionPolicy RemoteSigned' and press 'Enter' to change the execution policy in Windows to allow locally written PowerShell scripts to run without a Certificate Authority signature.

3.a.vii.4 Check the New Execution Policy

Type 'Get-ExecutionPolicy' and press 'Enter' again to make sure that it was set correctly. This time, it should print 'RemoteSigned'. After that is done, the St. Mary's Digital Archives are ready to be used.

3.b Maintenance

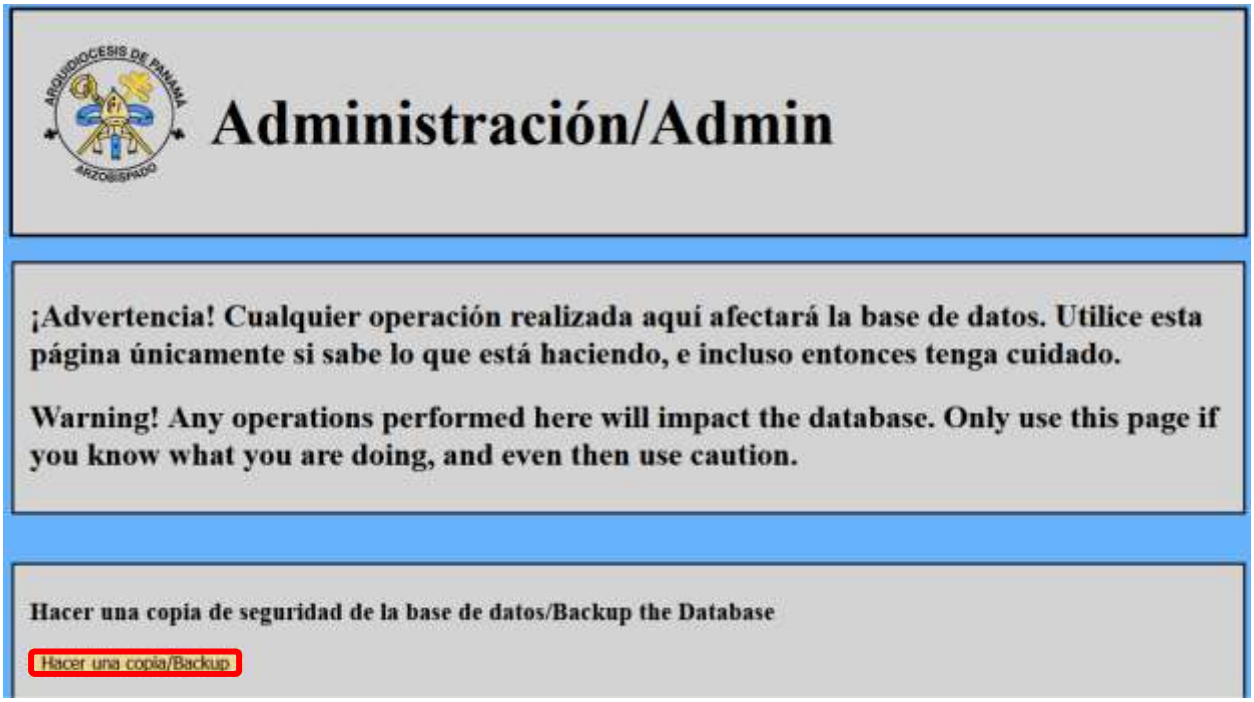
This section describes how to perform general maintenance on the Digital Archives. Here, the process for backing up images and the database as well as restoring the last saved database and archive of images is described. The process for deleting records is also described here.

3.b.i Backup to External Destination

Backing up the images and database to an external destination is an important part of ensuring that the information in the database is preserved. Regular backups should be performed on the order of every week for as long as new data is being entered into the database. The physical backup drive should be stored in another building, separate from where the master database except for when the backup takes place. This backup process copies everything inside of the folder 'C:\Program Files\xampp\htdocs\stmdatabase' onto the backup drive. It exports the database to a file in this folder, then it copies the contents of that folder which include images and webpages to the backup drive.

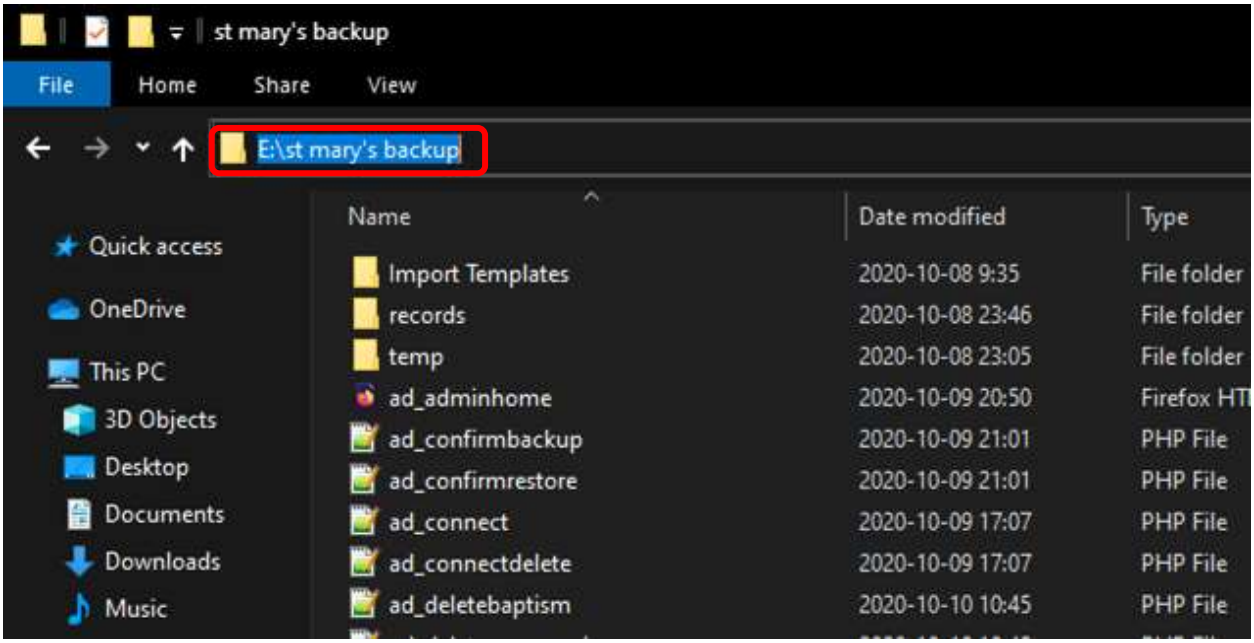
3.b.i.1 Click Admin

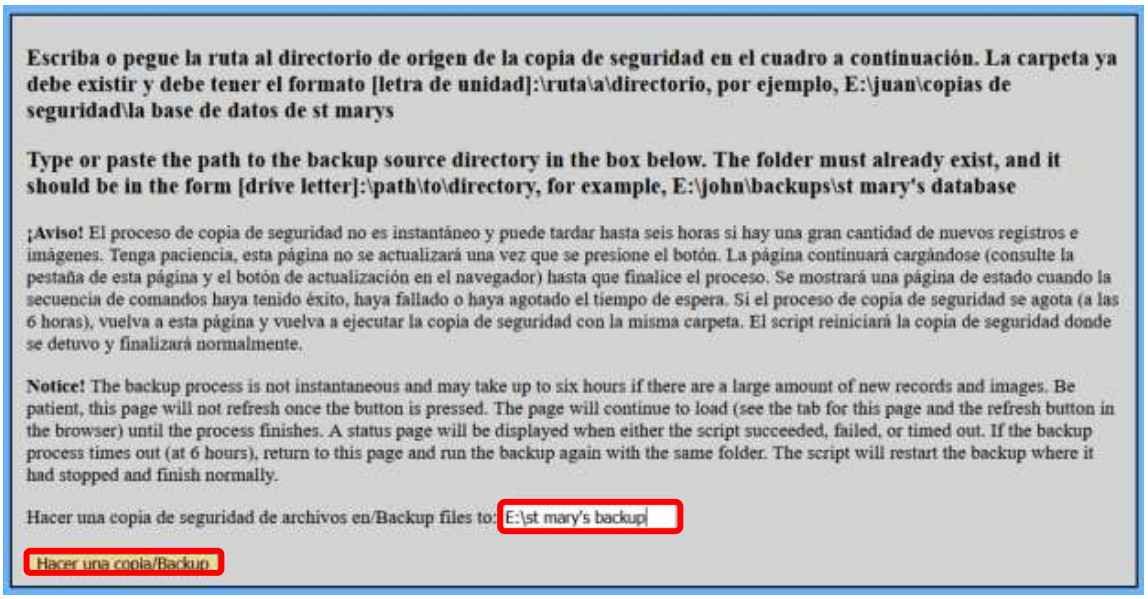
On the '**Welcome**' page, click '**Admin**' to view the page with administrative tools for this software. To run a backup, click '**Backup**' on the '**Admin**' page. After mounting the external hard drive, use File Explorer to locate the folder to where the backup will be saved.



3.b.i.2 Enter the Path to the External Drive

Copy and paste the path in the address bar in File Explorer or type the path directly into the text box in the form "[drive letter]:\path\to\directory" under the '**Backup**' heading on the '**Admin**' page.





3.b.i.3 Final Steps

Once this is done, click '**Backup**'. Doing this will run a PowerShell script in the background and download the database and the images to the external drive. This process may take some time depending on how many files there are. If it takes a long time, it may fail silently and not alert the user in the software directly. If this fails, the backup can be run manually from a PowerShell prompt opened in 'C:\Program Files\xampp\htdocs\stmdatabase' with Administrative privileges. The command is '.\stmarysbackup.ps1 -destdir <path from step 3.b.i.2>'. The path is not in angle brackets but should be typed with a pair of quotes, for example

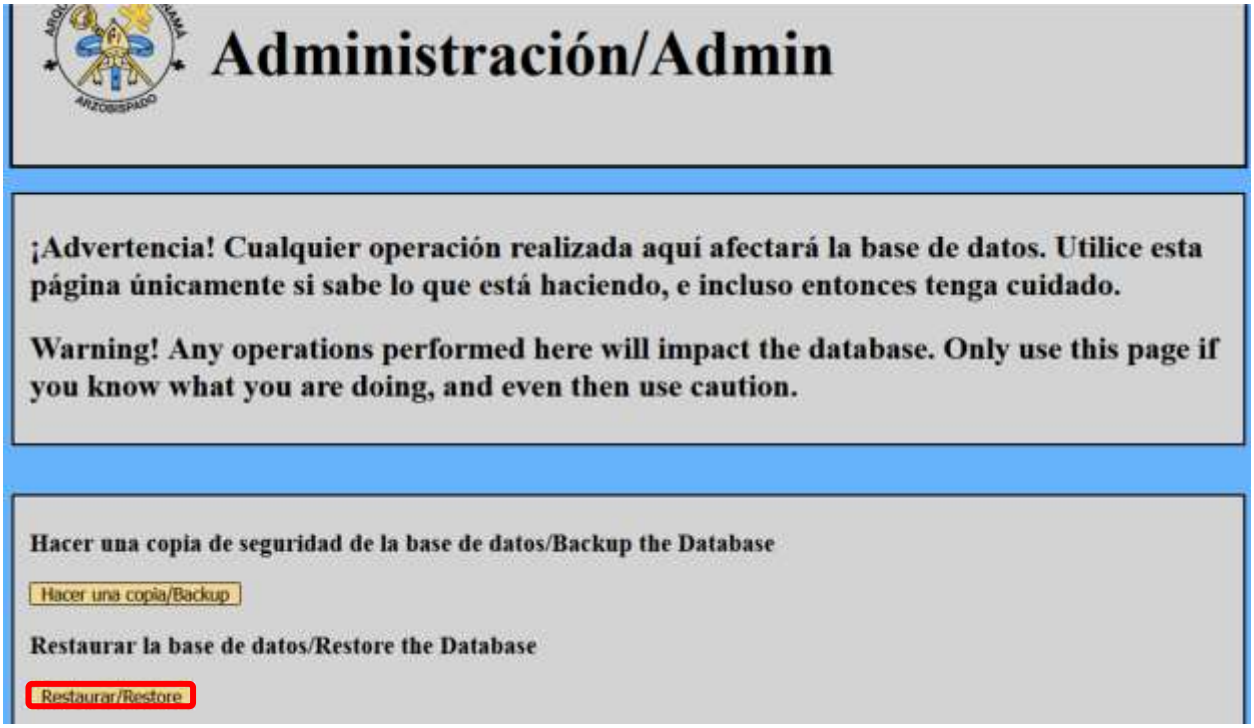
.\stmarysbackup.ps1 -destdir "E:\path\to\backup folder"

3.b.ii Restore from External Source

In case the images and database become corrupted or otherwise unusable, the software can be restored from an external source. By convention, this source is the backup that was created in section 3.b.i.

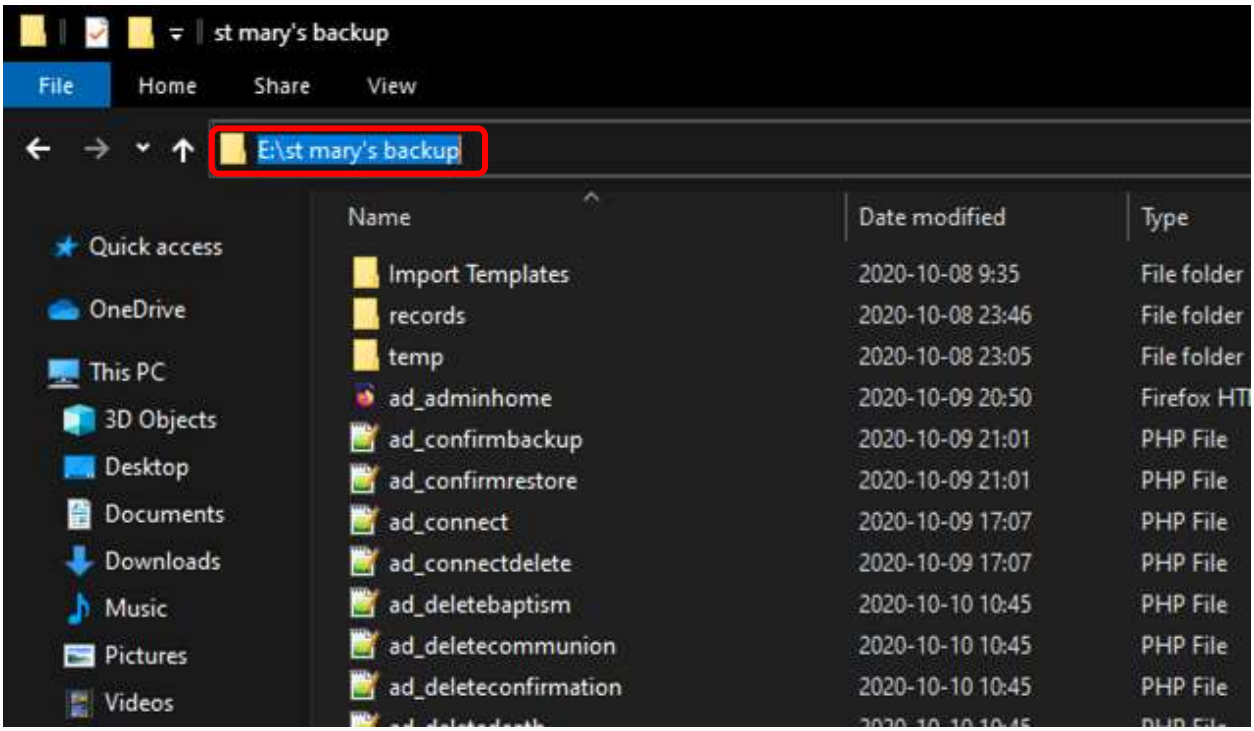
3.b.ii.1 Click Admin

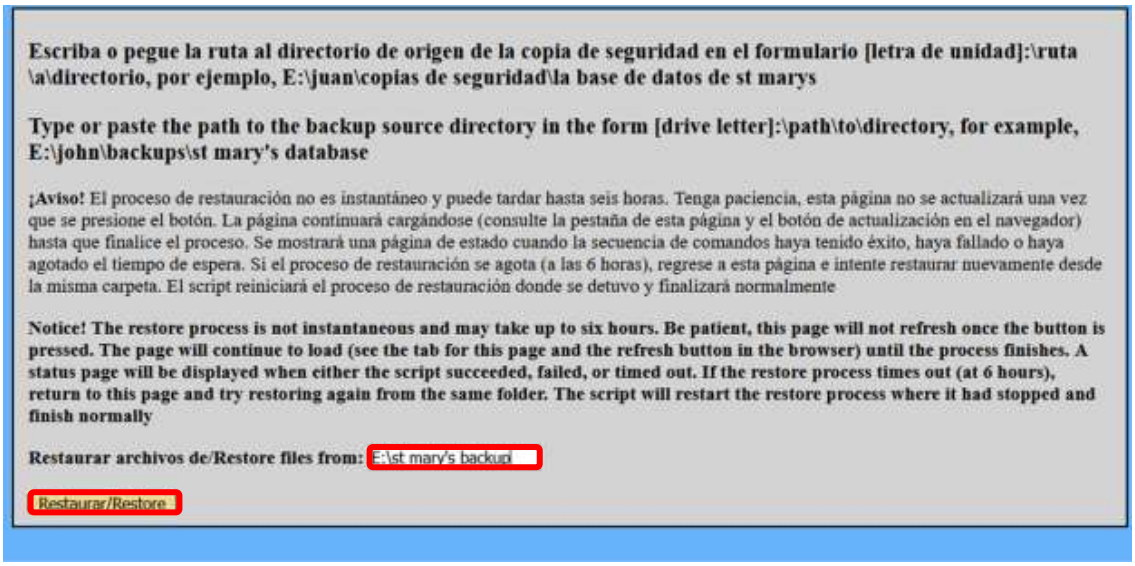
On the welcome page, click '**Admin**' to view the page with administrative tools. To restore the Digital Archives from a backup, utilize the second field under the heading labeled '**Restore**'. After mounting the external hard drive, use File Explorer to locate the folder where the backup is saved to.



3.b.ii.2 Type of paste the path to the external drive

Copy and paste the path in the address bar in File Explorer or type the path directly into the text box under the '**Restore**' heading on the '**Admin**' page.

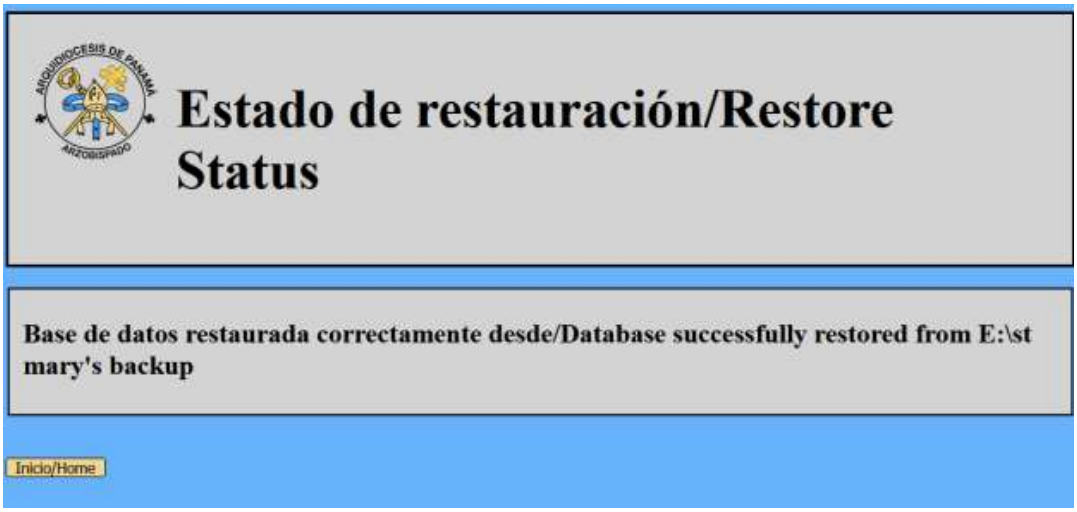




3.b.ii.3 Click go

Once this is done, click '**Restore**'. Doing this will run a powershell script in the background and restore the last version of the database and the images that were backed up to the computer. This process may take some time depending on how many files there are. If it takes a long time, it may fail silently and not alert the user in the software directly. If this fails, the restore can be run manually from a PowerShell prompt opened in 'C:\Program Files\xampp\htdocs\stmdatabase' with Administrative privileges. The command is '.\stmarysrestore.ps1 -sourcedir <path from step 3.b.ii.2>'. The path is not in angle brackets but should be typed with a pair of quotes, for example

.\stmarysrestore.ps1 -sourcedir "E:\path\to\backup folder"

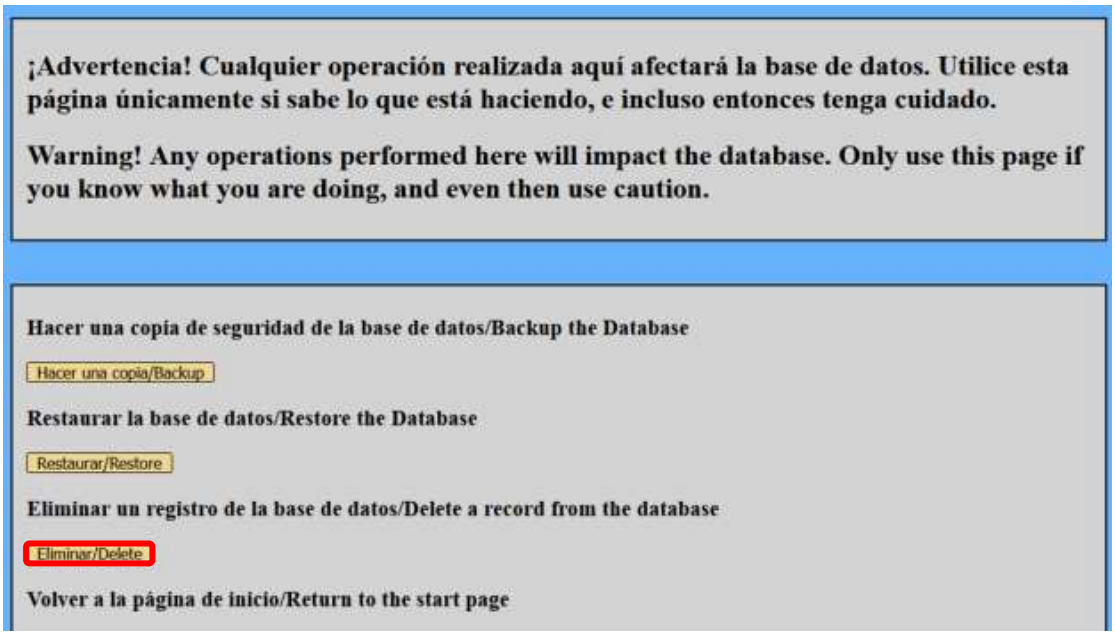


3.b.iii Delete Record from Database

In case a record has been entered incorrectly it can be deleted from the database. **Warning**, once a record has been deleted it cannot be recovered. To recreate a deleted record, it must be reentered using the insert tool.

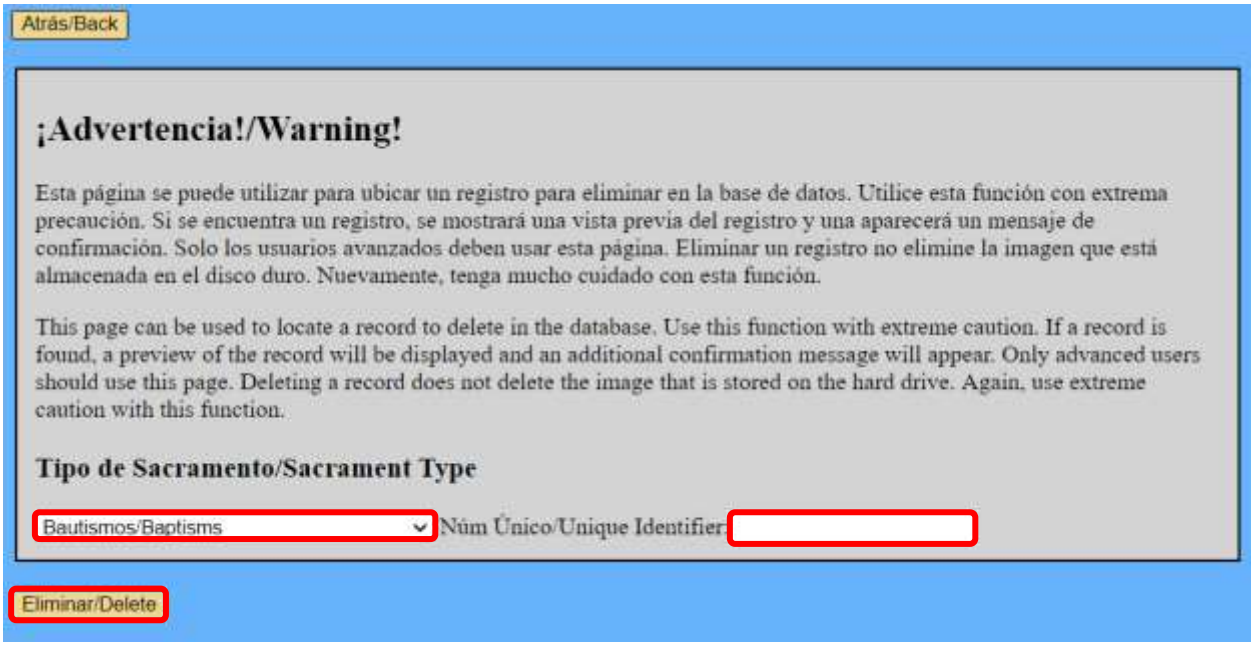
3.b.iii.1 Click Admin

On the welcome page, click '**Admin**' to view the page with administrative tools. To delete a record from the database, utilize the third field under the heading labeled '**Delete**'.



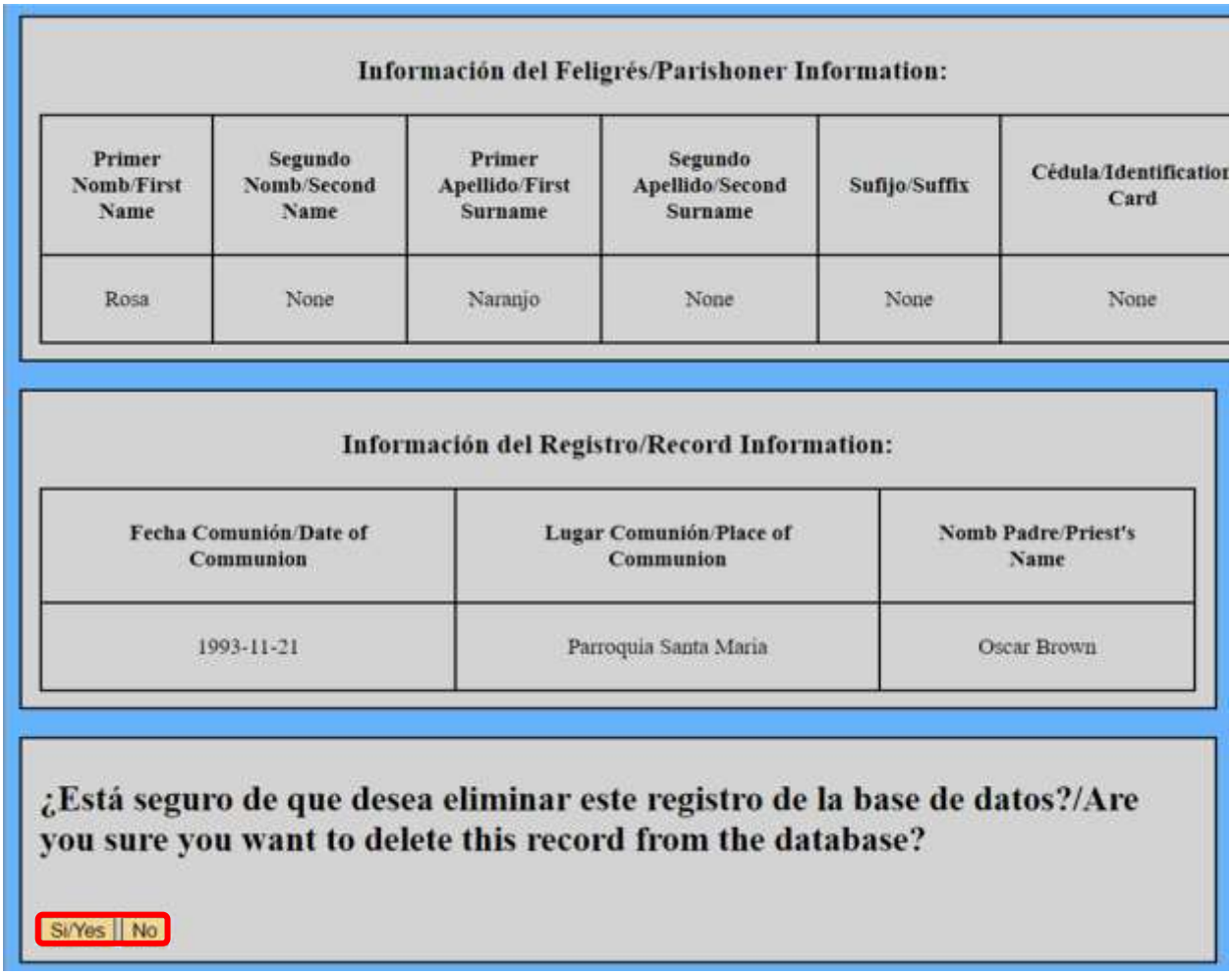
3.b.iii.2 Type of paste the path to the external drive

First select the sacrament type of the record you want to delete using the dropdown menu. Next enter the unique identifier of the record you want to delete (e.g. B0120120123, F1231231234). This can be found by searching for the record and looking at the second column of the results table. Once the sacrament type is selected and the unique identifier has been entered, click '**Delete**'.



3.b.iii.3 Check Record Details

Deleting will bring the user to a status page that prints all the record information. The user will be asked to check the accuracy of the information on the record. At this point, the user has two options. One, confirm the deletion of the record. In that case, click '**Yes**' and the record will be deleted. Two, go back and delete a different record. In that case, click '**No**' and you will be returned to the previous page.



Información del Feligrés/Parishoner Information:

Primer Nomb/First Name	Segundo Nomb/Second Name	Primer Apellido/First Surname	Segundo Apellido/Second Surname	Sufijo/Suffix	Cédula/Identificatior Card
Rosa	None	Naranjo	None	None	None

Información del Registro/Record Information:

Fecha Comunión/Date of Communion	Lugar Comunión/Place of Communion	Nomb Padre/Priest's Name
1993-11-21	Parroquia Santa Maria	Oscar Brown

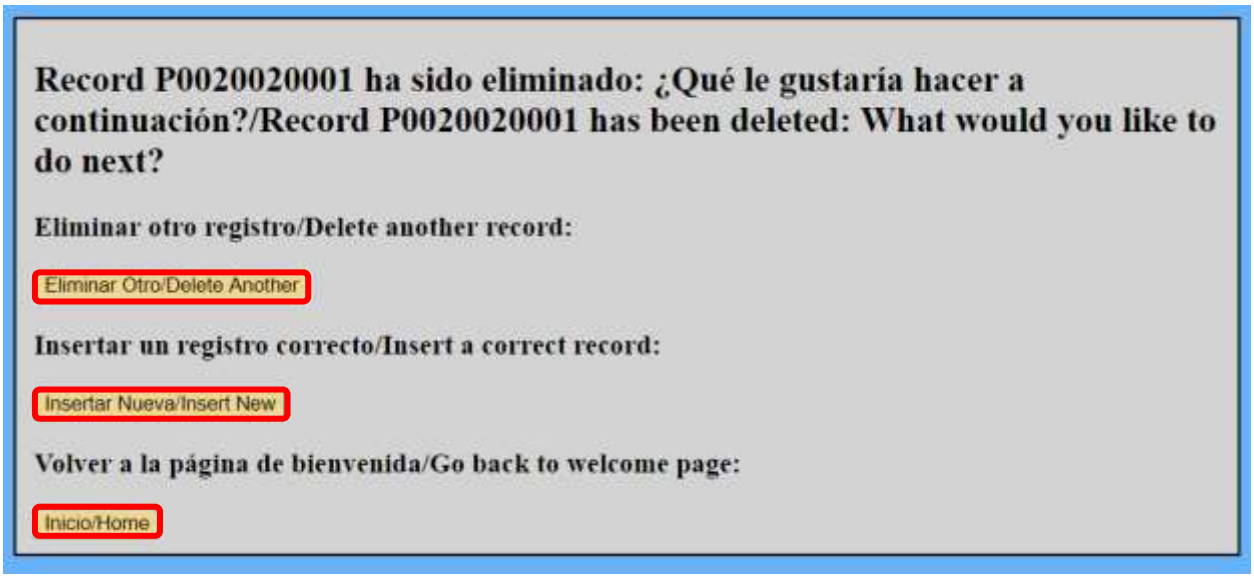
¿Está seguro de que desea eliminar este registro de la base de datos?/Are you sure you want to delete this record from the database?

Si/Yes | No

3.b.iii.4 Click go

Deleting will bring the user to a status page that prints a record ID and asks what you would like to do next. At this point, the user has three options. One, delete another record. In that case, click '**Delete Another**' and return to section 3.b.iii.2. Two, insert a new record to replace

the one that was deleted. In that case, click '**Insert New**' and go to section 2.c.iii. Three, return to the home page. In that case, click '**Home**' and go to the home page.



4 Summary of File Locations and Terms

4.a Software

XAMPP = Cross(X)-platform (A)pache (M)ySQL (P)HP and (P)erl, the software that bundles and installs these services.

Apache = A http web server implementation that runs PHP and HTML pages.

MySQL = An implementation of the Structured Query Language, SQL. This is a misnomer as XAMPP does not use MySQL anymore, but a fork of that project called MariaDB.

MariaDB = An implementation of the Structured Query Language, SQL. This is a free and open-source version of that language that has been forked from MySQL. However, it is still nearly 100% compatible with MySQL.

PHP = PHP Hypertext Preprocessor, runs the logic between the user and the database.

HTML = HyperText Markup Language, is the language used to render the web pages.

Localhost = The local web server hosting name, if this is typed into the address bar of a web browser, the web browser looks to the localhost directory for a file called ‘index.php’. This software is installed inside that directory.

phpMyAdmin = A database administration tool for both MySQL and MariaDB, comes bundled with XAMPP. It can be accessed from the XAMPP Control Panel or from ‘http://localhost/phpmyadmin’.

4.b Software Download Links

Link to XAMPP installer download = https://www.apachefriends.org/index.html

Link to team GitLab repository (may not work without team intervention) = https://gitlab.com/st.-mary-s-iqp/database

4.c Installation Directories

XAMPP Install Directory = ‘C:\Program Files\xampp\’

Localhost Directory = ‘C:\Program Files\xampp\htdocs\’

Digital Archives Install Directory = ‘C:\Program Files\xampp\htdocs\stmdatabase\’

Template Directory = ‘C:\Program Files\xampp\htdocs\stmdatabase\Import Templates\’

4.d Database Usernames

Admin/Root Username = root

General Username = Mary

Backup Username = root_backup

Restore Username = root_restore

Delete Username = root_delete

See section 3.a.v for their login information. Root user has a password defined by the administrator of the Digital Archives and it should be written down near the computer that is running the software.

4.e PowerShell Commands

Manual backup command run from Digital Archives Install Directory in PowerShell as an admin = .\stmarysbackup.ps1 -destdir “E:\path\to\backup folder”

Manual restore command run from Digital Archives Install Directory in PowerShell as an admin = .\stmarysrestore.ps1 -sourcedir “E:\path\to\backup folder”

Appendix F: Spanish User Manual for the St. Mary's Digital Archives

1 Introducción

Gracias por elegir utilizar los Archivos Digitales de Santa María escrito y diseñado por WPI Equipo A20 IQP en la Parroquia de Santa María. El equipo del proyecto quisiera agradecer a nuestros asesores, el Prof. Jim Chiarelli y el Prof. Bob Kinicki, así como a nuestros patrocinadores en Footprint Possibilities, Rick Montanari y Valmy Guerrero, y en la Parroquia de Santa María, Tito Mouynes y el Padre Pio. Sin su ayuda, este proyecto no habría sido posible.

Este manual describe en detalle cómo utilizar este software. También describe cómo instalar los Archivos Digitales y cómo hacer una copia de seguridad y restaurar la base de datos. Este manual fue escrito originalmente en inglés por el equipo del proyecto y ha sido traducido al español. Esta es la guía definitiva para operar este software.

2 Funcionamiento general

Este capítulo describe cómo utilizar los Archivos Digitales de Santa María para insertar un nuevo registro, insertar un nuevo registro mientras se repite la imagen que se utilizó, buscar un registro e imprimir un certificado. El software se diseñó teniendo en cuenta la facilidad de uso y se tomaron las medidas necesarias para garantizar que el flujo de datos e información sea lógico. En la mayoría de las páginas se proporcionan botones para volver a la pantalla de bienvenida.

2.a Inicio de los Archivos Digitales de Santa María

Para iniciar los Archivos Digitales de Santa María, haga doble clic en el acceso directo del escritorio. El software se abre en el navegador web por defecto y presenta al usuario la 'Bienvenidos' pantalla. Aquí, el usuario puede optar por crear un nuevo registro, buscar un registro existente o ir a la página 'Administración' . La página 'Administración' no se tratará en este capítulo del manual. A su vez a la sección 3.b.i para obtener más información sobre la 'Administración' página

2.b Toma de fotografías

Siga estos pasos para crear la configuración para la toma y edición de imágenes.

2.b.i Entorno de Configuración

Prepare el trípode y el atril en una habitación limpia y segura para los documentos. Coloque la cámara en el trípode. Limite los peligros como tinta, comida, bebidas, objetos cortantes y cualquier otra cosa que pueda dañar los registros.

2.b.ii Prepare el documento

Coloque con cuidado un libro de contabilidad en el atril y ábralo en una página determinada. Asegúrese de ser delicado al manipular cualquier documento. Como medida de precaución, cualquier persona que manipule documentos debe lavarse las manos de antemano.

2.b.iii Ajuste y alinee la cámara

Ajuste la altura y la alineación de la cámara hasta que el registro esté enmarcado correctamente. La alineación adecuada es clave para obtener imágenes con una calidad constante.

2.b.iv Tomar la foto

Tome la foto de la página. Se pueden tomar muchas imágenes a la vez y se debe hacer un libro completo a la vez para minimizar la manipulación. Repita los pasos 2.b.i-iv para tantas imágenes como sea necesario.

2.b.v Descargar a la computadora

Descargue las imágenes a la computadora con el software. Esto se puede hacer insertando la tarjeta SD de la cámara en la computadora o conectando directamente la cámara a la computadora.

2.b.vi Ejecute Adobe Photoshop 2020

Abra Adobe Photoshop 2020 y cargue las imágenes en él. Aquí las imágenes se pueden editar para facilitar su lectura.

2.b.vii Ajustar las propiedades de la imagen

Utilice Photoshop para ajustar el brillo y el contraste de la imagen y posiblemente invertir los colores de la imagen para que sean más fáciles de leer. Guarde las imágenes en la computadora en una carpeta de fácil acceso. Una vez editadas, las imágenes están listas para ser insertadas en la base de datos. Repita los pasos 2.b.vi-vii para cada imagen.

2.c Insertar un registro

Para insertar un nuevo registro, se deben tomar imágenes de los registros y estar listas para ser cargadas en la computadora.

2.c.i Localice la carpeta que contiene las imágenes editadas

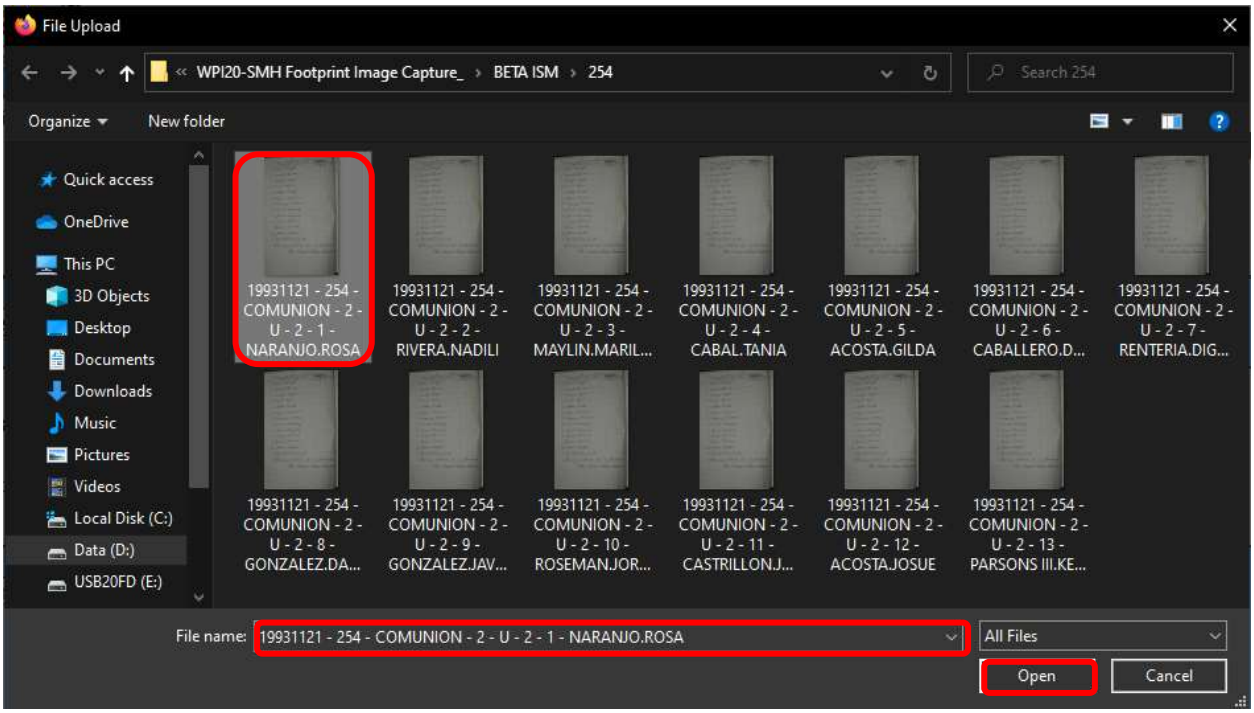
Tome nota de la carpeta que contiene las imágenes editadas, ya que será importante para el resto de esta sección.

2.c.ii Haga clic en Crear

Haga clic en '**Crear**' en la página de 'Bienvenida'. Esto conduce a una nueva página que permite al usuario seleccionar una imagen para cargar, así como un tipo de sacramento.

2.c.iii Navegar hasta la imagen

Haga clic en '**Examinar**' y navegue hasta el archivo que se va a cargar. Este archivo se encuentra en la carpeta del paso 2.c.i Una vez seleccionado el archivo correcto, haga clic en '**Abrir**'. Seleccione el sacramento que se va a registrar, luego haga clic en '**Enviar**'. La página siguiente muestra los campos asociados con el sacramento que se seleccionó en la página anterior, así como una vista previa de la imagen. Generalmente, esta página es la misma para cada sacramento.



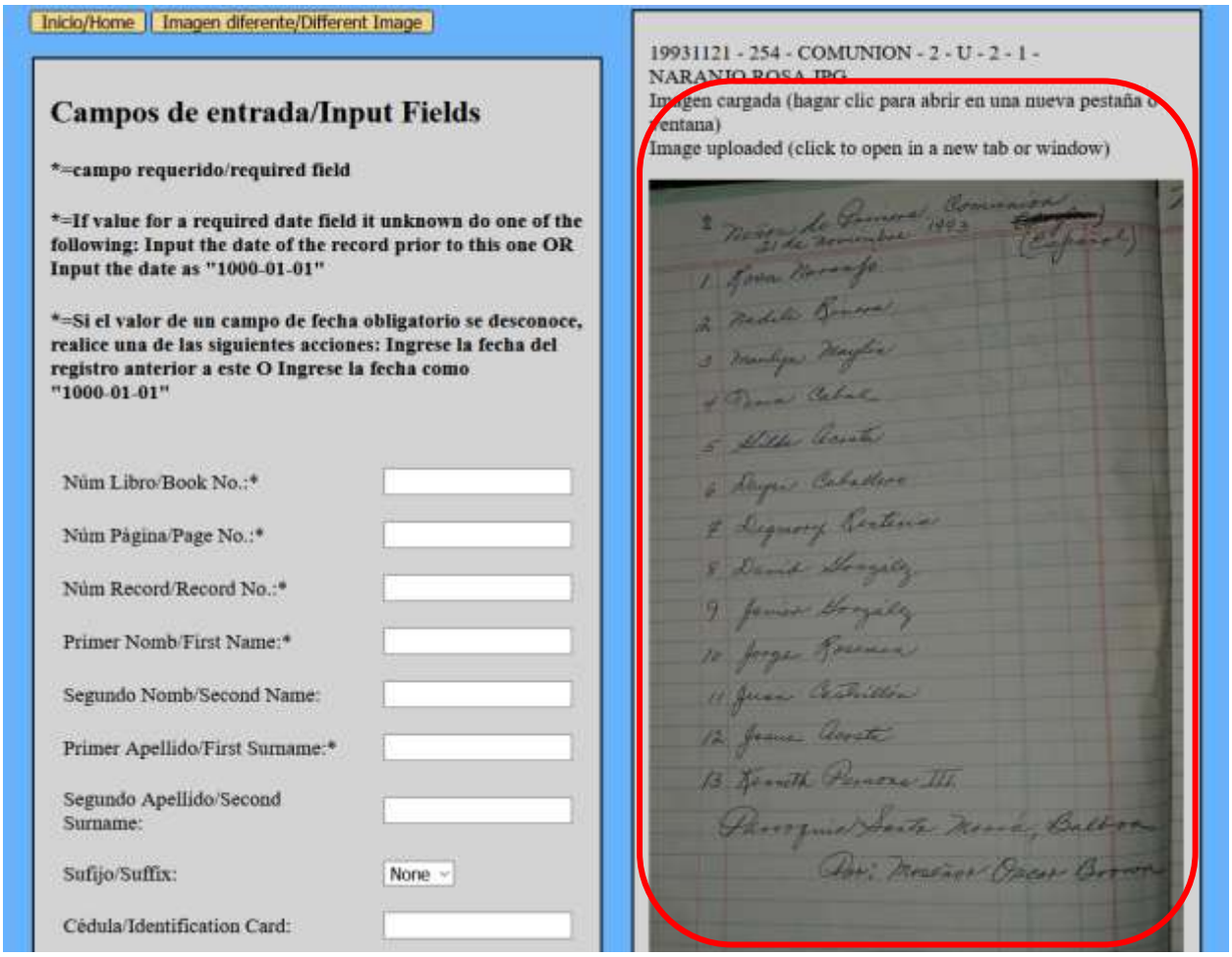
2.c.iv Transcriba los datos

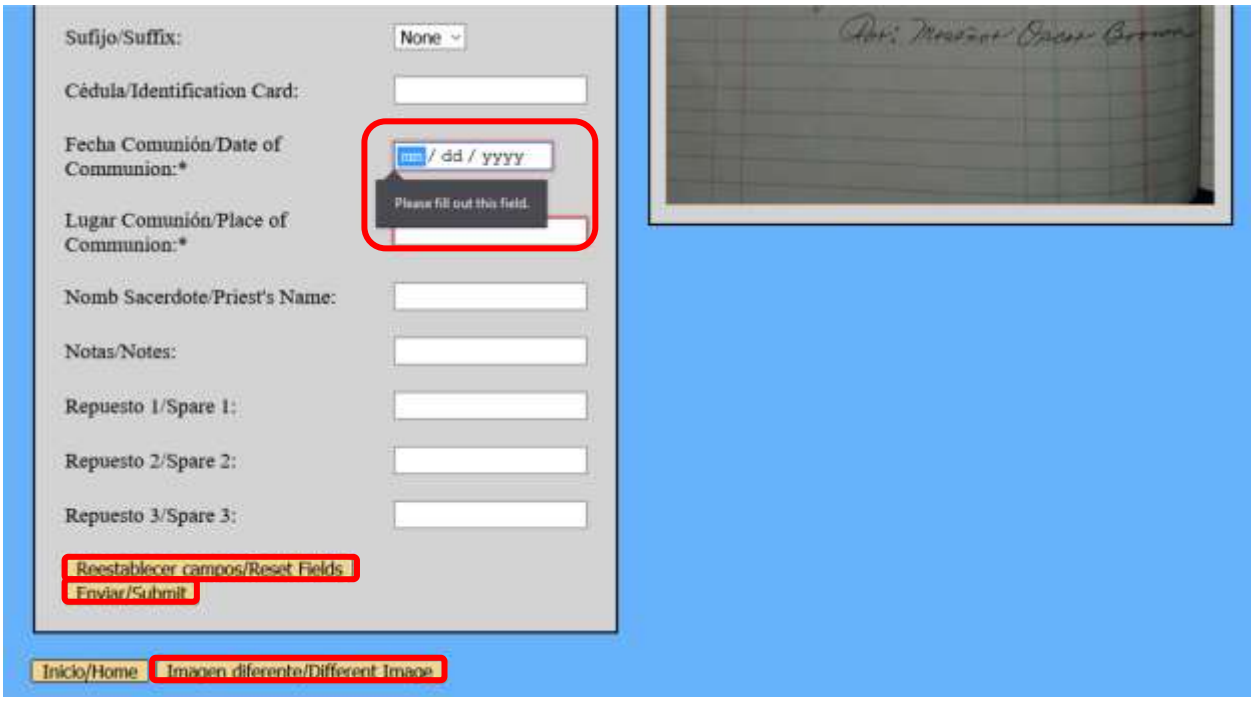
Lea la imagen para obtener información para ingresar en los campos de la izquierda. Se puede hacer clic en la imagen para agrandarla. Al hacer clic en la imagen, se abre en una nueva pestaña en el navegador web donde el usuario puede hacer zoom para ver más detalles. Sin embargo, de regreso a la página anterior, ingrese la información contenida en los registros en los campos en blanco. Si es necesario borrar todos los campos, haga clic en '**Restablecer campos**' para restablecer todos los valores de los campos. Si se seleccionó la imagen incorrecta, haga clic en '**Imagen diferente**' para seleccionar una nueva imagen. Una vez que se hayan completado todos los campos, haga clic en '**Enviar**'. Ciertos campos para cada sacramento son obligatorios y aparecerán con un contorno rojo si el registro se envía con ellos en blanco. Estos campos deben completarse para que el registro se envíe correctamente.

NOTA: * = campo requerido: El formulario no se enviará sin estos campos completados. Cuando se desconoce el valor de uno de estos campos, debe llenarse con un marcador de posición. Para los campos de texto obligatorios, ingrese “None”. Para los campos de fecha obligatorios, hay dos opciones.

Uno: Ingrese la fecha en el registro anterior. Esto permitirá encontrar el registro con una búsqueda de fecha aproximada.

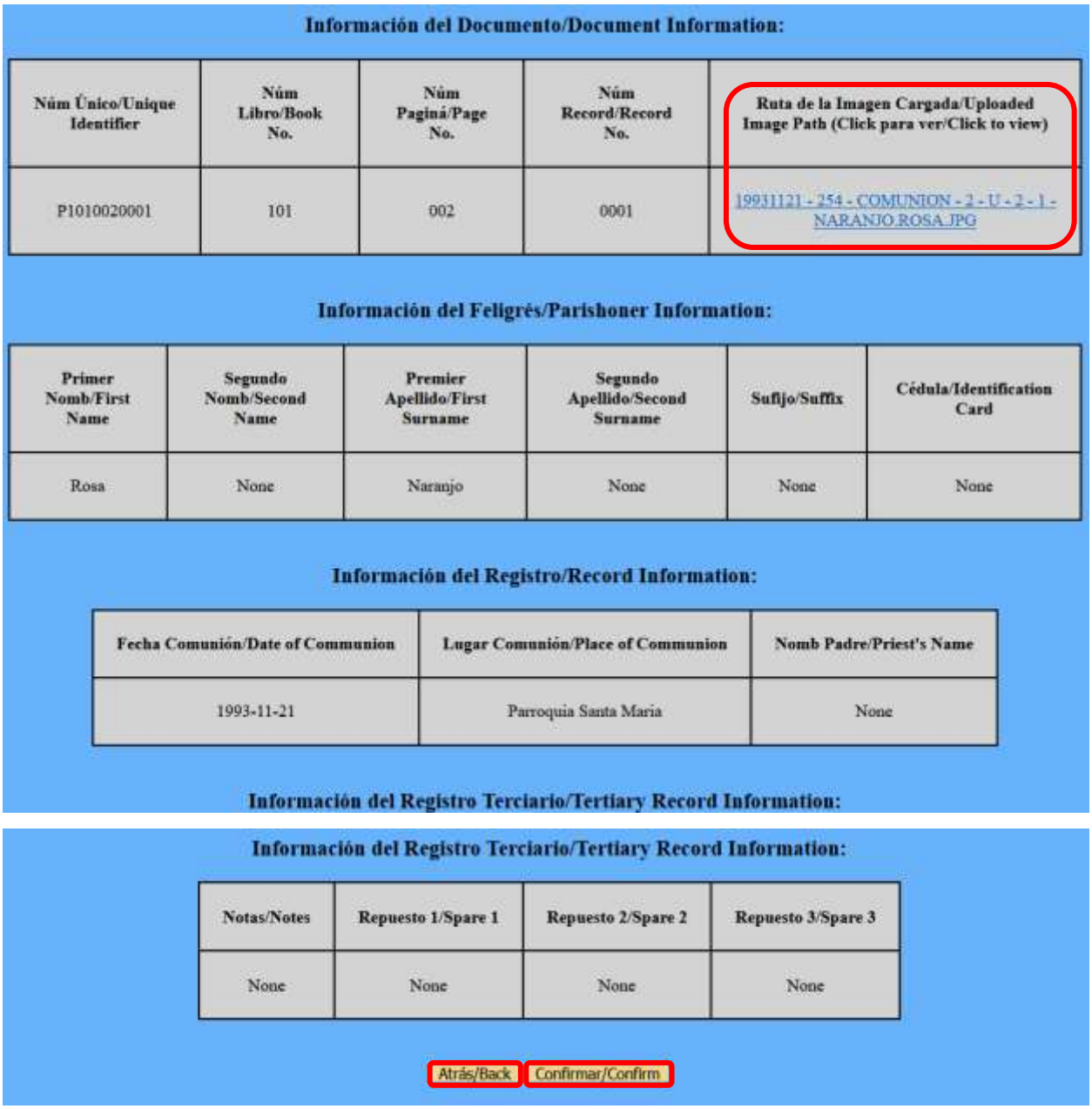
Dos: Ingrese la fecha como "1000-01-01". Esta es la fecha más baja posible que puede contener la base de datos. Cuando se encuentre el registro, la fecha se establecerá en “None”.





2.c.v Verifique los detalles del registro

El envío llevará al usuario a una página de estado que imprime toda la información del registro. Se le pedirá al usuario que verifique la exactitud de la información en el registro. En este punto, el usuario tiene dos opciones. Uno, confirme la inserción del registro. En ese caso, haga clic en '**Confirmar**' y se insertará el registro. Dos, retroceda y vuelva a ingresar la información. En ese caso, haga clic en '**Atrás**' y volverá a la página anterior. Se puede obtener una vista previa de la imagen que se está subiendo haciendo clic en el enlace en la celda "Ruta de la imagen cargada".



Información del Documento/Document Information:

Núm Único/Unique Identifier	Núm Libro/Book No.	Núm Pagina/Page No.	Núm Record/Record No.	Ruta de la Imagen Cargada/Uploaded Image Path (Click para ver/Click to view)
P1010020001	101	002	0001	19931121 - 254 - COMUNION - 2 - U - 2 - 1 - NARANJO ROSA.JPG

Información del Feligrés/Parishoner Information:

Primer Nomb/First Name	Segundo Nomb/Second Name	Premier Apellido/First Surname	Segundo Apellido/Second Surname	Sufijo/Suffix	Cédula/Identification Card
Rosa	None	Naranjo	None	None	None

Información del Registro/Record Information:

Fecha Comunión/Date of Communion	Lugar Comunión/Place of Communion	Nomb Padre/Priest's Name
1993-11-21	Parroquia Santa Maria	None

Información del Registro Terciario/Tertiary Record Information:

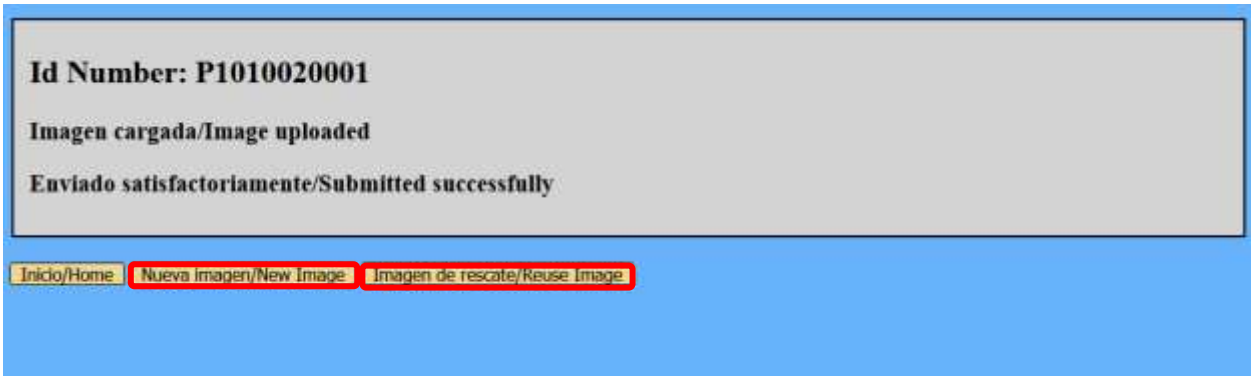
Información del Registro Terciario/Tertiary Record Information:

Notas/Notes	Repuesto 1/Spare 1	Repuesto 2/Spare 2	Repuesto 3/Spare 3
None	None	None	None

Atrás/Back | Confirmar/Confirm

2.c.vi Enviar el registro

La confirmación llevará al usuario a una página de estado que imprime un ID de registro, así como el estado de conexión y envío del registro. En este punto, el usuario tiene dos opciones. Uno, reutilice la última imagen utilizada en el caso de que se ingrese más de un registro para la imagen. En ese caso, haga clic en '**Imagen de rescate**' y vuelva a la sección 2.c.iv. Dos, elija una nueva imagen para insertar registros de una página y / o tipo de sacramento completamente diferente. En ese caso, haga clic en '**Nueva imagen**' y vuelva a la sección 2.c.iii.

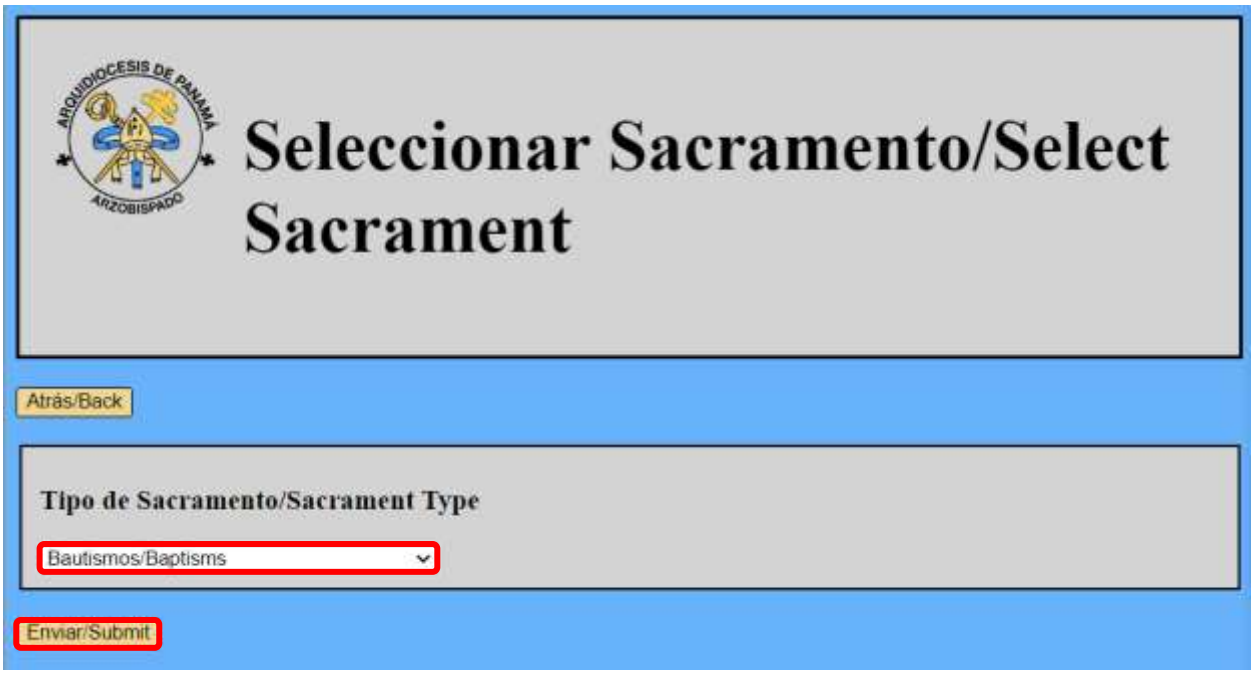


2.d Búsqueda de un registro

Para buscar un registro existente, no es necesario realizar pasos previos.

2.d.i Haga clic en Buscar

Haga clic en '**Buscar**' en la página de '**Bienvenida**'. Esto lleva al usuario a una página con la opción de seleccionar un sacramento. Después de elegir uno, haga clic en '**Enviar**'. Esto lleva al usuario a una página con campos para buscar ese sacramento específico



2.d.ii Parámetros de búsqueda de entrada

El usuario puede consultar la base de datos ingresando información en los cuadros vacíos. Dejar una casilla vacía devolverá todos los resultados de ese sacramento, ya que una entrada vacía coincide con todos los valores de la base de datos. Un consejo útil, para buscar todos los registros de un libro, escriba el número del libro en su campo y haga clic en '**Enviar**'. Esto devolverá todos los registros con ese número de libro. Los resultados de la búsqueda también se

pueden ordenar mediante el menú desplegable '**¿Ordenar por?**'. Los campos con nombres o lugares están ordenados alfabéticamente. Sin embargo, para todas las consultas, ingrese la información, elija un orden de clasificación y haga clic en '**Enviar**'

2.d.iii Revisar los resultados

La página siguiente genera los resultados de búsqueda de salida de la consulta. La información sobre los registros en el resultado de la búsqueda aquí se muestra. Primero seleccione un registro haciendo clic en uno de los botones de la columna del extremo izquierdo de la tabla. A continuación, puede seleccionar una de las dos opciones de qué hacer con ese registro. Para seleccionar lo que quiere hacer con el registro, seleccione una de las dos opciones en la parte inferior. Primero, puede crear un certificado para el registro seleccionando el botón correspondiente. O puede mostrar la imagen del documento seleccionando la opción correspondiente. Una vez que se selecciona un registro y una acción, puede hacer clic en '**Enviar**' para ejecutar esa acción.

2.d.iii.1 Imprimir el certificado

Si selecciona '**Crear certificado**', será dirigido a una página con un certificado para el registro que eligió. Puede imprimir este certificado haciendo clic en "**Impresión**".

Información del Registro/Record Information:

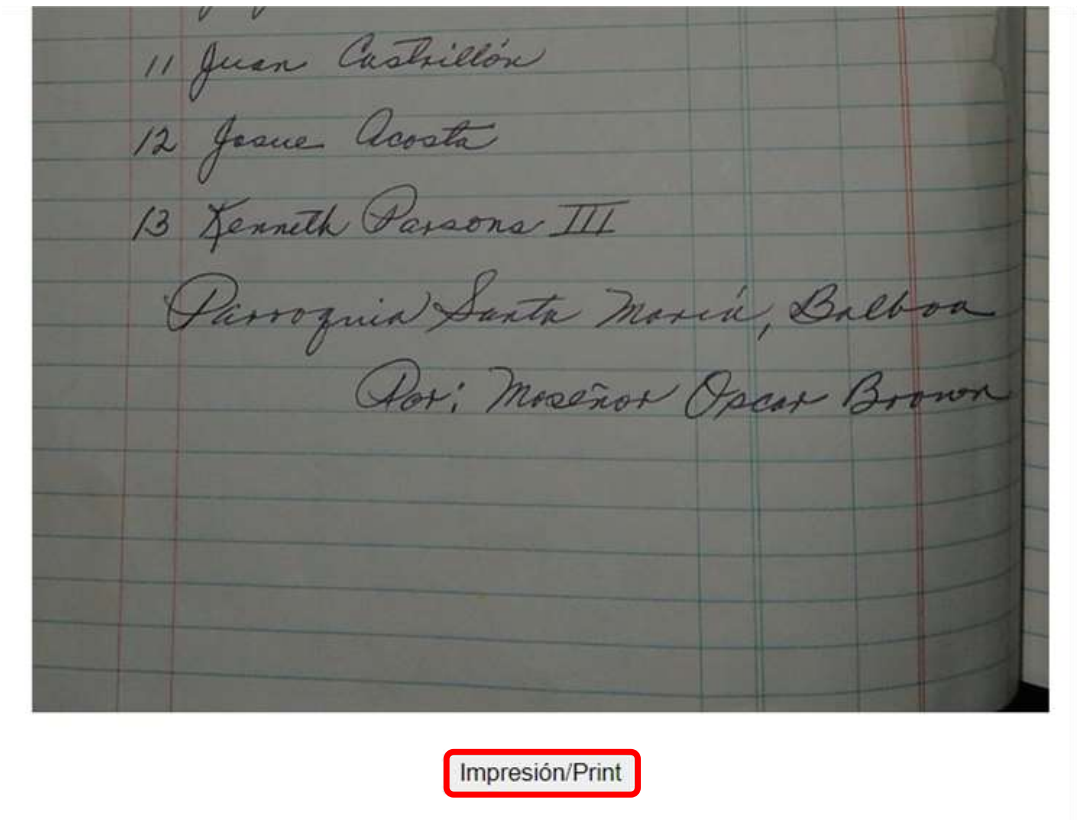
Fecha Comunión/Date of Communion	Lugar Comunión/Place of Communion	Nomb Padre/Priest's Name
1993-11-21	Parroquia Santa Maria	Oscar Brown

Firma del Sacerdote/Priest Signature: _____

Impresión/Print

2.d.iii.2 Imprimir imagen de documento

Si selecciona '**Mostrar imagen de documento**', se le dirigirá a una página con la imagen del documento que contiene el registro que eligió. Puede imprimir esta imagen haciendo clic en "**Impresión**".



2.e Importación de registros

Los usuarios pueden distribuir imágenes que hayan sido editadas a otros usuarios para su transcripción a una hoja de cálculo de Excel. Esa hoja de cálculo se puede utilizar para acelerar el proceso de ingresar información en la base de datos. En este momento, no hay una forma automática de hacer esto, los registros deben transcribirse de la hoja de cálculo al '**Crear'** lado de la base de datos, siguiendo los pasos de la sección 2.c. Las plantillas en blanco para las hojas de cálculo se proporcionan en la carpeta 'C:\Archivos de programa\xampp\htdocs\stmdatabase\Import Templates\'. Pueden distribuirse con paquetes de imágenes y luego devolverse para que otra persona las inserte en la base de datos.

3 Operación especial

Este capítulo describe en detalle cómo instalar el software prerrequisito que se requiere para ejecutar los Archivos Digitales de Santa María. También describe cómo hacer una copia de seguridad y restaurar el software desde un disco duro externo. Esta sección es para usuarios avanzados. Ninguno de estos procesos debe completarse sin leer detenidamente estas instrucciones.

3.a Instalación

Hay muchos pasos para instalar los Archivos Digitales, la mayoría de ellos están relacionados con el software prerrequisito y la creación de nuevos usuarios en la base de datos.

3.a.i Instalar XAMPP como administrador

XAMPP es una pila de soluciones que incluye Apache, PHP y MariaDB (una bifurcación gratuita y de código abierto de MySQL), así como el software de base de datos phpMyAdmin.

3.a.i.1 Descargue el instalador de XAMPP

Comience descargando el instalador de XAMPP más reciente de su sitio web, https://www.apachefriends.org/index.html. Una vez que termine, abra la carpeta de descargas, haga clic derecho sobre ella y seleccione '**Ejecutar como administrador**'.

3.a.i.2 Ignorar advertencia

En el primer cuadro de diálogo que aparece, haga clic en "**Aceptar**" para descartar la advertencia. Luego haga clic en siguiente.

3.a.i.3 Seleccionar software para instalar

Esta pantalla presenta una lista de software que viene con XAMPP. Solo marque las casillas de Apache, MySQL, PHP, Perl y phpMyAdmin. Luego haga clic en siguiente.

3.a.i.4 Cree una carpeta nueva en 'C:\Archivos de programa\xampp\'

Ahora elija una carpeta para instalar XAMPP. Vaya a 'C:\Archivos de programa\' en el selector de carpetas dentro del instalador de XAMPP y cree una nueva carpeta llamado 'xampp'. Esta es la carpeta donde se instalará XAMPP. Seleccione 'C:\Archivos de programa\xampp\' y luego haga clic en siguiente.

3.a.i.5 Pasos finales

Seleccione inglés como idioma para el software. Haga clic en siguiente, luego anule la selección del cuadro que pregunta sobre Bitnami. Haga clic en siguiente y luego instale el software. Al final de la instalación, no ejecute el panel de control XAMPP, salga del instalador.

3.a.ii Ejecute Apache y MariaDB como servicios de Windows

Ahora configure los servicios de Windows para que Apache y MariaDB se inicien y se ejecuten automáticamente cada vez que se inicie XAMPP.

3.a.ii.1 Inicie el Panel de control de XAMPP

Siempre que se ejecute el Panel de control de XAMPP, debe ser como un usuario con derechos de administrador. Vaya al menú Inicio, luego desplácese a una carpeta con la etiqueta 'XAMPP' en la lista de aplicaciones. Abra esa carpeta, haga clic con el botón derecho en 'Panel de control de XAMPP' y seleccione 'Más'> 'Ejecutar como administrador'. Después de confirmar esa elección, se iniciará el panel de control XAMPP.

3.a.ii.2 Inicie Apache

Inicie Apache por primera vez haciendo clic en '**Start**' en la línea de Apache. En el siguiente cuadro de diálogo que aparece, seleccione la casilla de 'Redes privadas' y desmarque la casilla de 'Redes públicas'. Luego haga clic en '**Permitir**'.

3.a.ii.3 Inicie MariaDB

Inicie MariaDB por primera vez haciendo clic en 'Iniciar' en la línea de MySQL. En el siguiente cuadro de diálogo que aparece, seleccione la casilla de 'Redes privadas' y desmarque la casilla de 'Redes públicas'. Luego haga clic en '**Permitir**'.

3.a.ii.4 Detener Apache y MariaDB

Ahora que ambos servicios funcionan cuando se inician manualmente, se pueden configurar para que se inicien automáticamente. Haga clic en '**Stop**' en las líneas de Apache y MySQL.

3.a.ii.5 Instalarlos como servicios de Windows

Una vez que se hayan detenido, haga clic en la X roja junto a Apache y MySQL para instalar ambos como servicios de Windows. Haga clic en '**Yes**' en el siguiente cuadro de diálogo para cada uno.

3.a.ii.6 Pasos finales

Ahora haga clic en '**Config**' en el Panel de control de XAMPP. En la sección que describe los módulos de inicio automático, marque las casillas de Apache y MySQL. Confirma ese cambio. Para probarlo, reinicie XAMPP con privilegios administrativos y observe si se inician automáticamente.

3.a.iii Establecer la contraseña raíz de la base de datos

De forma predeterminada, MariaDB y phpMyAdmin no tienen una contraseña raíz o una contraseña en la cuenta que controla el servidor de la base de datos. Esto absolutamente debe configurarse antes de hacer cualquier otra cosa.

3.a.iii.1 Inicie phpMyAdmin

En el Panel de control de XAMPP, haga clic en '**Admin**' en la línea MySQL. Esto lanza phpMyAdmin. También se puede acceder a phpMyAdmin escribiendo 'http://localhost/phpmyadmin/' en un navegador web.

3.a.iii.2 Haga clic en User Accounts

La primera pantalla que se muestra es la pantalla de inicio. En esa página, haga clic en el botón en el banner superior llamado '**User Accounts**'

3.a.iii.3 Cambiar la contraseña de root

Hay tres cuentas con el nombre de usuario 'root'. Cada uno de ellos debe tener la misma contraseña y cada uno de ellos debe cambiarse manualmente. Para el primero, haga clic en '**Edit privileges**', luego haga clic en el botón en la parte superior que dice '**Change password**'. Ingrese una contraseña dos veces y luego haga clic en Ir. Repita esto para los otros dos usuarios 'root'. Escriba esta contraseña en algún lugar y guárdela en un lugar seguro cerca de la computadora que ejecuta los Archivos Digitales. Una vez hecho esto, salga de phpMyAdmin y detenga Apache, MariaDB y XAMPP.

3.a.iii.4 Ejecutar el Bloc de notas

phpMyAdmin debe configurarse manualmente para requerir una contraseña para todos los usuarios. Vaya al menú Inicio y en la lista de programas vaya a '**Accesorios de Windows**' > '**el Bloc de notas**'. Haga clic derecho en eso y vaya a '**Más**' > '**Ejecutar como administrador**'.

3.a.iii.5 Edite el archivo de configuración en el Bloc de notas

Haga clic en '**Archivo**' > '**Abrir**' y abra el archivo en 'C:\Archivos de programa\xampp\phpmyadmin\config.inc.php'. Luego, edite la línea que dice

```
$cfg['server'][$i]['auth_type'] = 'config'
```

para leer

```
$cfg['server'][$i]['auth_type'] = 'cookie'
```

Editar la línea que dice

$cfg['server'][$i]['AllowNoPassword'] = 'true'

para leer

$ cfg['server'][$i]['AllowNoPassword'] = 'false'

Guarde el archivo y salga del Bloc de notas.

3.a.iii.6 Reinicie XAMPP

Reinicie XAMPP como en el paso 3.a.ii.1. Apache y MariaDB deberían iniciarse automáticamente si se siguieron los pasos de la sección 3.a.ii. Si no es así, iniciales como en los pasos 3.a.ii.2 y 3.a.ii.3. Inicie phpMyAdmin como en el paso 3.a.iii.1. Ingrese 'root' para el nombre de usuario y la contraseña que ingresó en el paso 3.a.iii.3 para la contraseña.

3.a.iv Inicializar los Archivos Digitales

Esta sección solo debe realizarse si no hay una copia de seguridad utilizable desde la cual restaurar el software. Hacer este paso generará una base de datos en blanco sin registros ni imágenes.

3.a.iv.1 Descargar desde GitLab

Descargue los archivos en el repositorio en 'https://gitlab.com/st.-mary-s-iqp/database'. Un desarrollador de este software puede tener que iniciar sesión en su cuenta para hacer esto si el repositorio no es público.

3.a.iv.2 Extraiga el archivo

Extraiga los archivos del archivo '.zip' en una carpeta llamada 'stmdatabase'.

3.a.iv.3 Copiar archivos

Copie la carpeta llamada 'stmdatabase' en otra carpeta llamada 'C:\Archivos de programa\xampp\htdocs\'. Es posible que se requieren derechos administrativos.

3.a.iv.4 Crear el acceso directo en el escritorio

Cree un acceso directo en el escritorio para los Archivos Digitales. Haga clic derecho en el escritorio y seleccione '**Nuevo**' > '**Acceso directo**'. Escriba 'http://localhost/stmdatabase/index.php' en el primer cuadro y luego asígnele un nombre en el segundo cuadro.

3.a.iv.5 Inicie phpMyAdmin

Inicie phpMyAdmin como en el paso 3.a.iii.1 e inicie sesión en phpMyAdmin como usuario root.

3.a.iv.6 Haga clic en Importar

Haga clic en el botón en el banner superior llamado '**Import**'. La nueva instalación del software viene con un archivo para importar a phpMyAdmin para inicializar la base de datos.

3.a.iv.7 Busque el archivo

Busque el archivo de base de datos en blanco en 'C:\Archivos de programa\xampp\htdocs\stmdatabase\stmary.sql'. No seleccione otras opciones en esta página y haga clic en '**Go**' en la parte inferior de la página. Esto inicializa la base de datos para que pueda ser utilizada por los Archivos Digitales.

3.a.v Crear cuatro nuevos usuarios

Cuatro nuevos usuarios en phpMyAdmin tienen que ser creado a fin de que los Archivos Digitales para el trabajo. Son el usuario general, el usuario de las copias de seguridad, el usuario de las restauraciones y el usuario a eliminar. El proceso para crear cada usuario es el mismo, sin embargo, los nombres de usuario, las contraseñas y los privilegios no lo son. Esta sección creará el usuario general, y estos pasos se pueden repetir para la copia de seguridad, restauración y eliminación de usuarios con la información proporcionada al final de esta sección.

3.a.v.1 Inicie phpMyAdmin

Inicie phpMyAdmin como en el paso 3.a.iii.1 e inicie sesión en phpMyAdmin como usuario root.

3.a.v.2 Haga clic en Cuentas de usuario

Haga clic en el botón en el banner superior llamado '**User accounts**'.

3.a.v.3 Haga clic en agregar cuenta de usuario

En la página siguiente, haga clic en '**Add user account**' debajo de la tabla de usuarios existentes. Aparece una nueva ventana para establecer la configuración de autenticación para la nueva cuenta.

Para este usuario

Username = Mary

Hostname = localhost

Password = StMarysIQPA20

No marque otras casillas y haga clic en '**Go**'.

3.a.v.4 Haga clic en Inicio

Haga clic en el **Inicio** iconoen la esquina superior izquierda de phpMyAdmin.

3.a.v.5 Haga clic en Cuentas de usuario

Haga clic en el botón en el banner superior llamado '**User accounts**'.

3.a.v.6 Editar privilegios para el nuevo usuario

En la línea del nuevo usuario, 'Mary', haga clic en '**Edit privileges**'.

3.a.v.7 Haga clic en Base de datos

En la página siguiente, haga clic en el botón debajo del banner superior llamado '**Databases**'.

3.a.v.8 Seleccione la base de datos

Seleccione 'stmary' de la lista de bases de datos y haga clic en '**Go**'.

3.a.v.9 Seleccione los permisos para el usuario

En la siguiente pantalla, marque las casillas de 'SELECT', 'INSERT' y 'LOCK TABLES' solamente. Estos permisos son diferentes entre diferentes usuarios. Haga clic en '**Go**'.

3.a.v.10 Repita para otros usuarios con nueva información

Repita estos pasos para crear dos nuevos usuarios. La información para cada uno es

Usuario de respaldo:

Nombre de usuario = root_backup

Nombre de host = localhost

Contraseña = StMarysParishA20

Permisos = SELECT, LOCK TABLES

Restaurar usuario:

Nombre de usuario = root_restore

Nombre de host = localhost

Contraseña = sTmARYSpARISHa20

Permisos = INSERT, SELECT, CREATE, ALTER, DROP, LOCK TABLES

Eliminar Usuario:

Nombre de usuario = root_delete

Nombre de host = localhost

Contraseña = Maryhadalittlelamb710

Permisos = SELECT, DELETE, LOCK TABLES

3.a.vi Inicio automático de XAMPP

Ahora que se ha completado toda la configuración de XAMPP, se puede configurar para que se inicie en segundo plano para todos los usuarios que inicie sesión en la computadora.

3.a.vi.1 Presione 'win + r'

Presione 'win + r' (la tecla de Windows y la tecla 'R') al mismo tiempo para iniciar el cuadro de diálogo Ejecutar. Escriba 'taskschd.msc' en el cuadro de diálogo y luego presione 'Ctrl + Shift + Enter' para ejecutarlo como administrador.

3.a.vi.2 Importar una tarea

Este es el programador de tareas para Windows. Se utilizará para iniciar XAMPP automáticamente. En el panel derecho, haga clic en '**Importar tarea**'.

3.a.vi.3 Navegar hasta Archivo

Navegue hasta 'C:\Archivos de programa\xampp\htdocs\stmdatabase\xamppautostarttask.xml' y selecciónelo. Acepte y guarde esa elección. Cierra sesión y vuelve a iniciarla, luego navega a la página de '**Bienvenida'** para verificar que XAMPP se inició automáticamente. Esta sección se completó con éxito si el software se inicia sin más pasos.

3.a.vii Configurar PowerShell

Windows aún debe configurarse para ejecutar scripts de PowerShell locales sin firmar. Este software aprovecha dos scripts de PowerShell que fueron creados por el equipo de IQP. Realizan copias de seguridad y restauran los Archivos Digitales.

3.a.vii.1 Ejecutar PowerShell

Para comenzar, ejecute PowerShell como administrador. Vaya al menú Inicio y vaya a '**Windows PowerShell**' > '**Windows PowerShell**'. Luego, haga clic derecho en '**Windows PowerShell**' y seleccione '**Más**' > '**Ejecutar como administrador**'. Esto abrirá un símbolo del sistema para PowerShell.

3.a.vii.2 Verifique la política de ejecución actual

En PowerShell, escriba 'Get-ExecutionPolicy' y luego presione 'Enter' para verificar cuál es la política actual. De forma predeterminada, debería estar 'Restringido'.

3.a.vii.3 Establezca el nuevo política de ejecución

Escriba 'Set-ExecutionPolicy -ExecutionPolicy RemoteSigned' y presione 'Enter' para cambiar la política de ejecución en Windows para permitir que los scripts de PowerShell escritos localmente se ejecuten sin la firma de una autoridad de certificación.

3.a.vii.4 Verifique el nuevo política de ejecución

Escriba 'Get-ExecutionPolicy' y presione 'Enter' nuevamente para asegurarse de que se haya configurado correctamente. Esta vez, debería imprimir 'RemoteSigned'. Una vez hecho esto, el software está listo para ser utilizado.

3.b Mantenimiento

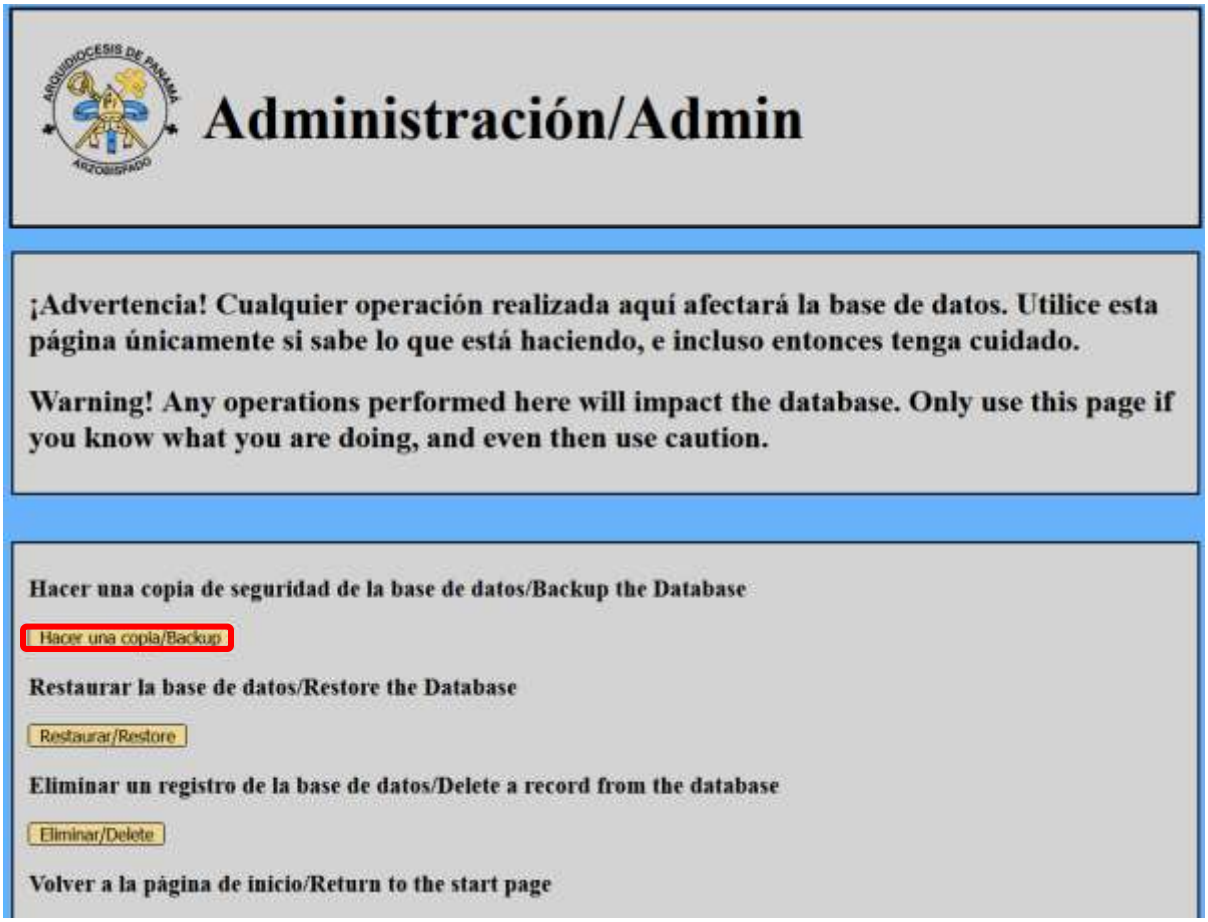
Esta sección describe cómo realizar el mantenimiento general de los Archivos Digitales. Aquí, se describe el proceso para hacer una copia de seguridad de las imágenes y la base de datos, así como para restaurar la última base de datos guardada y el archivo de imágenes. El proceso para eliminar registros también se describe aquí.

3.b.i Copia de seguridad en un destino externo

Hacer una copia de seguridad de las imágenes y la base de datos en un destino externo es una parte importante para garantizar que se conserve la información de la base de datos. Se deben realizar copias de seguridad periódicas en el orden de cada semana durante el tiempo que se ingresen nuevos datos en la base de datos. La unidad de copia de seguridad física debe almacenarse en otro edificio, separado de la base de datos maestra, excepto cuando se realiza la copia de seguridad. Este proceso de copia de seguridad copia todo dentro de la carpeta 'C:\Archivos de programa\xampp\htdocs\stmdatabase' en la unidad de copia de seguridad. Exporta la base de datos a un archivo en esta carpeta, luego copia el contenido de esa carpeta que incluye imágenes y páginas web a la unidad de respaldo.

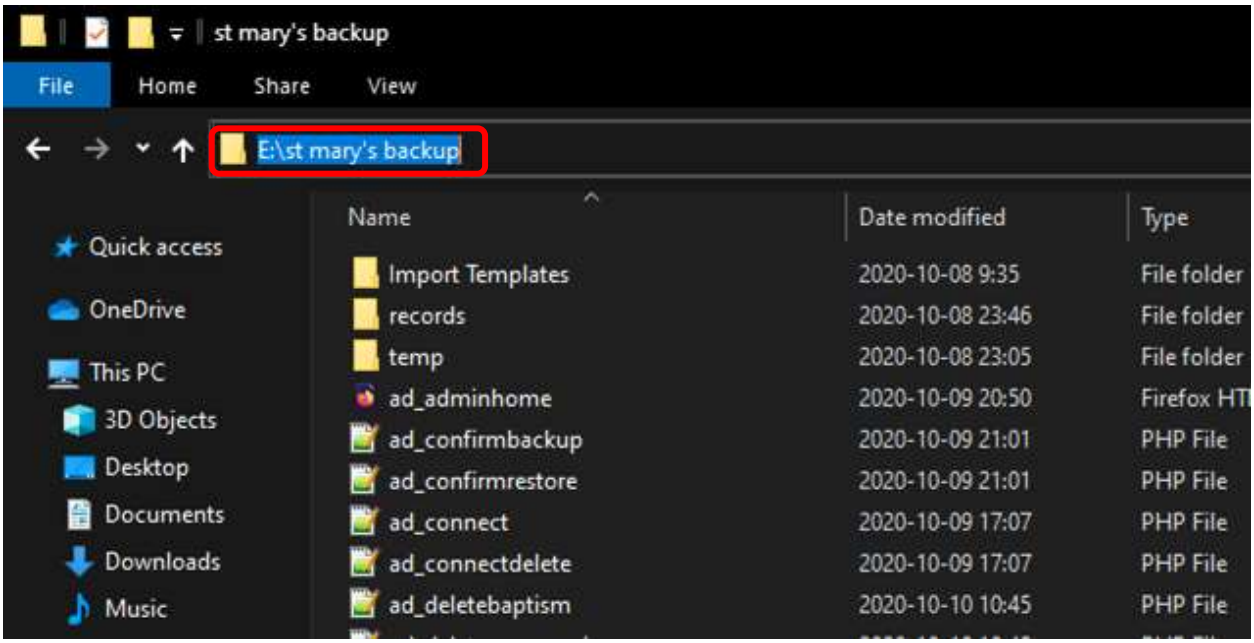
3.b.i.1 Haga clic en Administración.

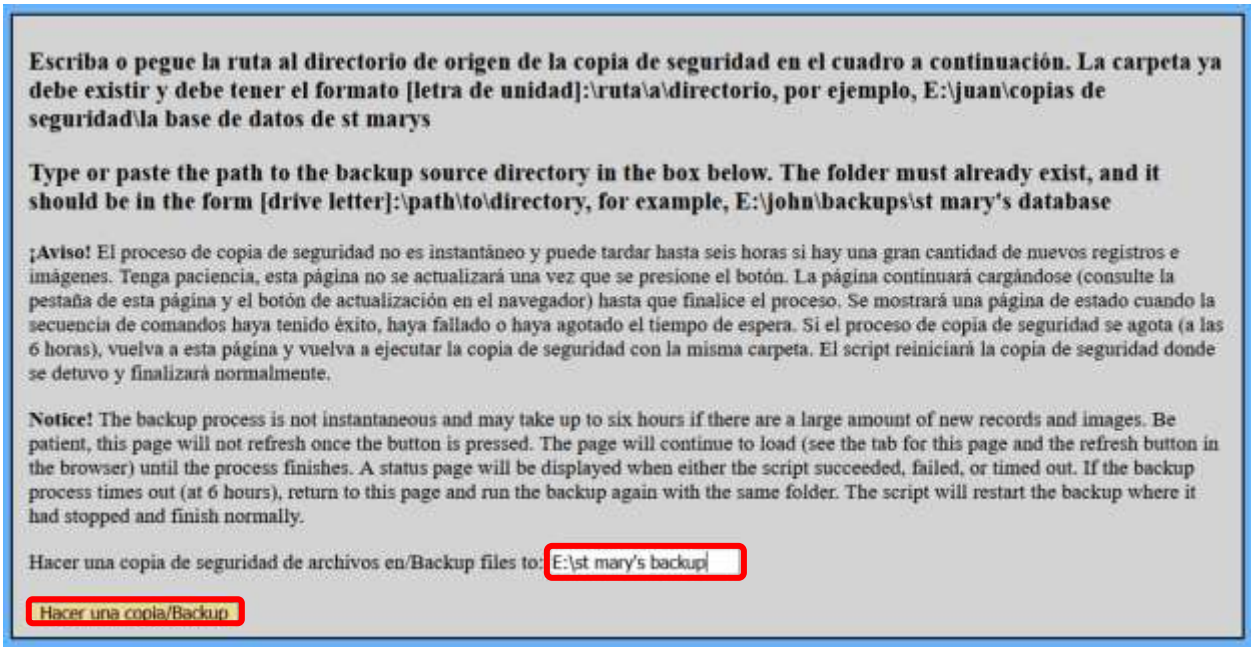
En la página de '**Bienvenido**', haga clic en '**Administración**' para ver la página con las herramientas administrativas de este software. Para ejecutar una copia de seguridad, haga clic en '**Hacer una copia**' en la página de '**Administración**'. Después de montar el disco duro externo, use el Explorador de archivos para ubicar la carpeta donde se guardará la copia de seguridad.



3.b.i.2 Ingrese la ruta a la unidad externa

Copie y pegue la ruta en la barra de direcciones en el Explorador de archivos o escriba la ruta directamente en el cuadro de texto con el formato "[letra de unidad]:\ruta\a\directorio" debajo del encabezado '**Copia de seguridad**' en la página de '**Administración**'.





3.b.i.3 Pasos finales

Una vez hecho esto, haga clic en '**Hacer una copia**'. Hacer esto ejecutará un script de PowerShell en segundo plano y descargará la base de datos y las imágenes a la unidad externa. Este proceso puede llevar algún tiempo dependiendo de cuántos archivos haya. Si tarda mucho tiempo, puede fallar silenciosamente y no alertar al usuario en el software directamente. Si esto falla, la copia de seguridad se puede ejecutar manualmente desde un indicador de PowerShell

abierto en 'C:\Archivos de programa\xampp\htdocs\stmdatabase' con privilegios administrativos. El comando es '.\stmarysbackup.ps1 -destdir <ruta del paso 3.b.i.2>'. La ruta no está entre corchetes angulares, pero debe escribirse con un par de comillas, por ejemplo

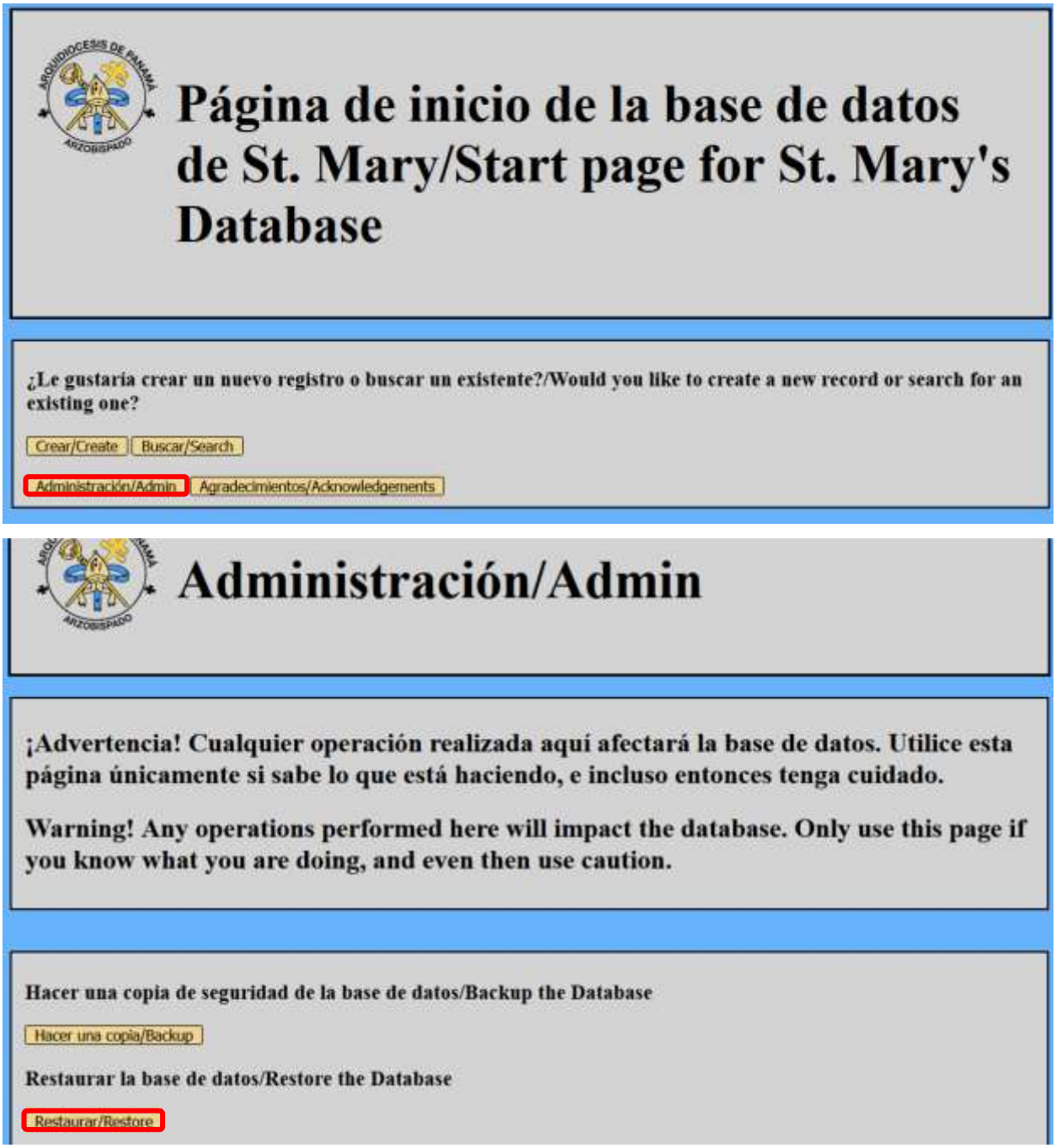
.\stmarysbackup.ps1 -destdir “E:\ruta\a\carpeta de respaldo”

3.b.ii Restaurar desde una fuente externa

en caso de que las imágenes y la base de datos se daña o se vuelve inutilizable, el software se puede restaurar desde una fuente externa. Por convención, esta fuente es la copia de seguridad que se creó en la sección 3.b.i

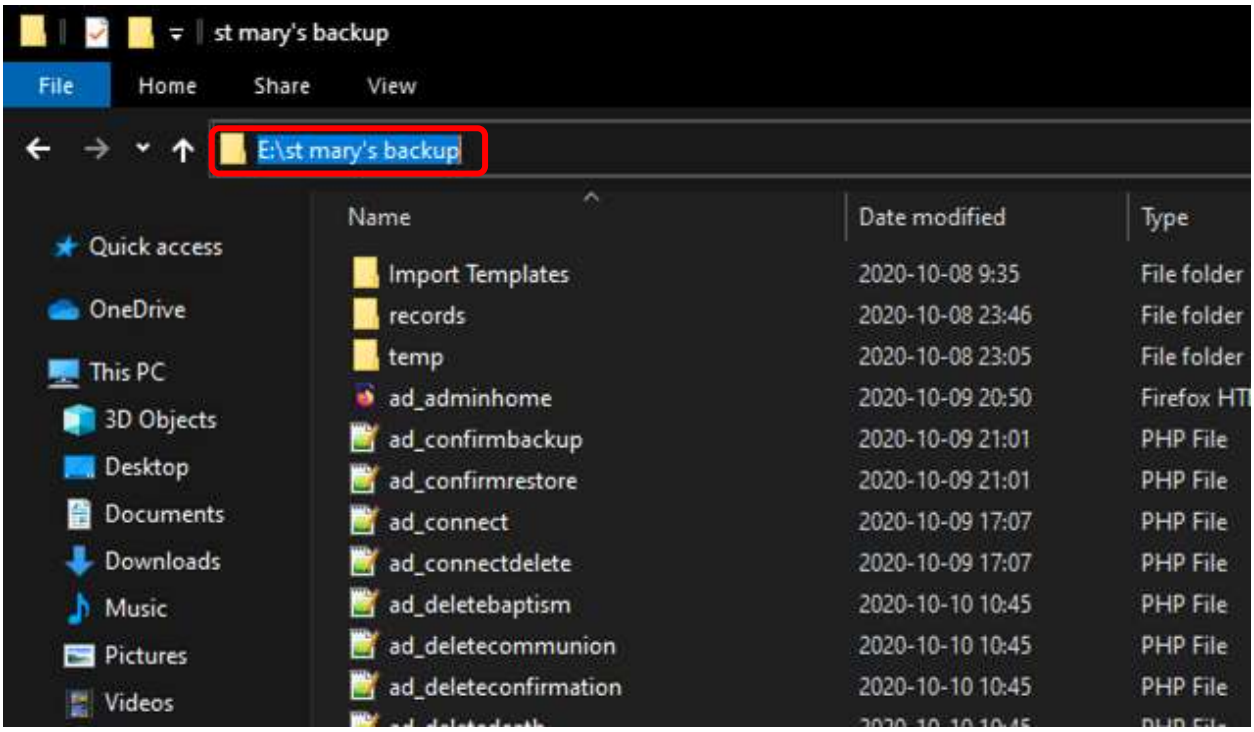
3.b.ii.1 Haga clic en Administración.

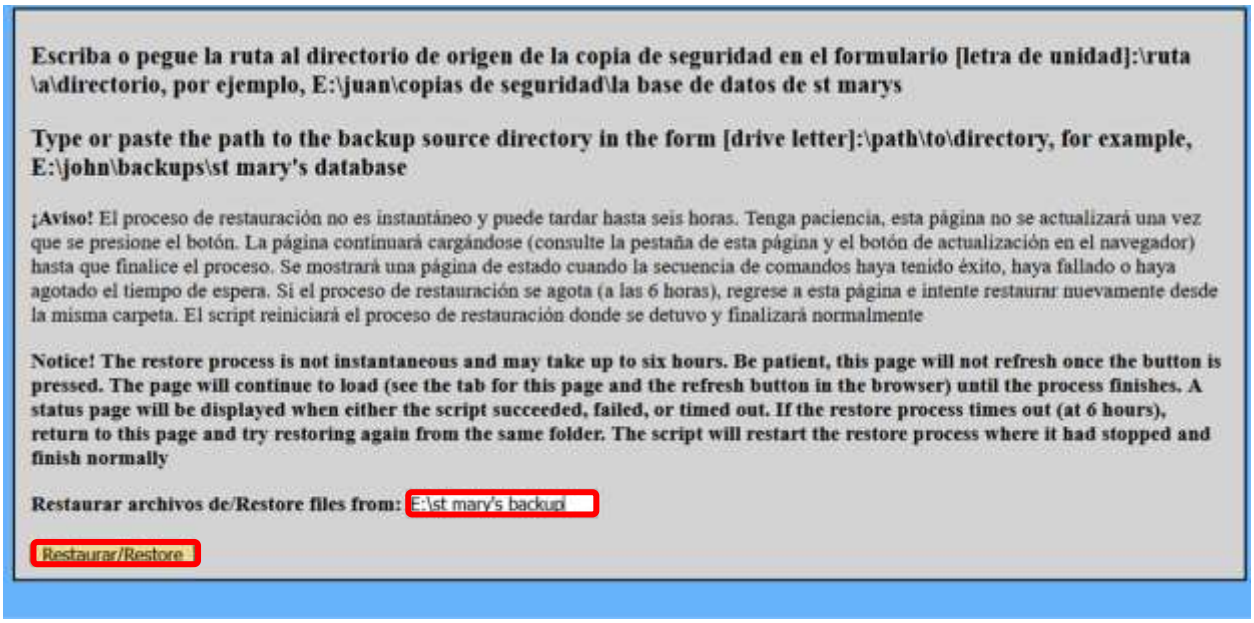
En la página de bienvenida, haga clic en '**Administración**' para ver la página con herramientas administrativas. Para restaurar los Archivos Digitales desde una copia de seguridad, utilice el segundo campo bajo el título "**Restaurar**". Después de montar el disco duro externo, use el Explorador de archivos para ubicar la carpeta donde se guarda la copia de seguridad.



3.b.ii.2 Tipo de pegar la ruta a la unidad externa

Copie y pegue la ruta en la barra de direcciones en el Explorador de archivos o escriba la ruta directamente en el cuadro de texto debajo del encabezado '**Restaurar**' en la página de '**Administración**'.



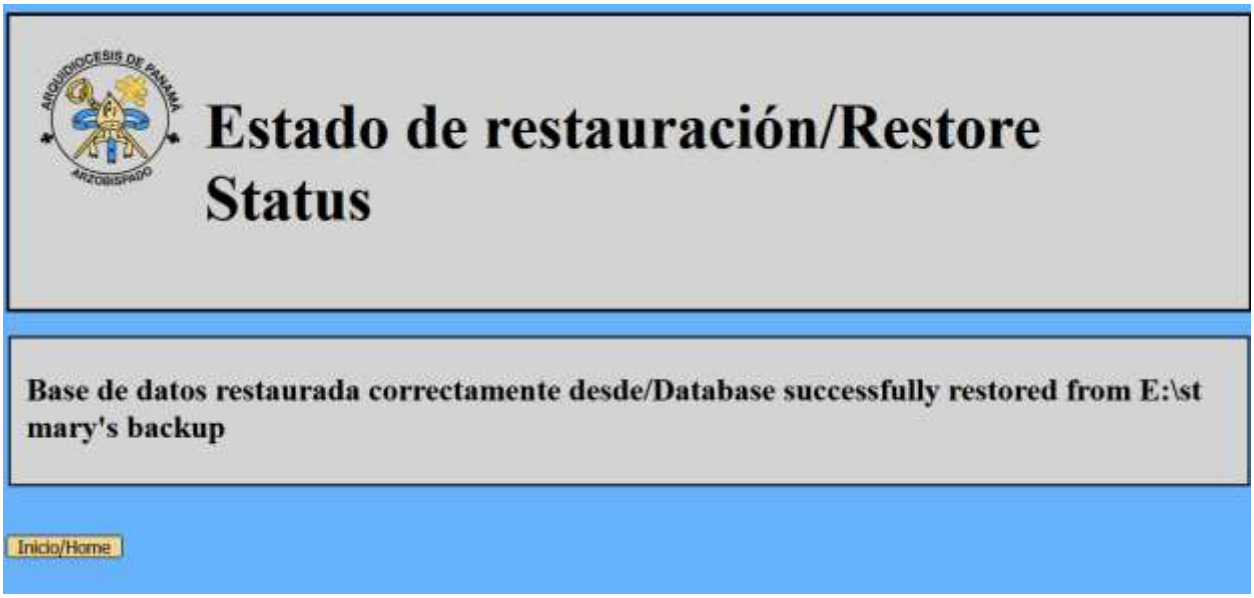


3.b.ii.3 Haga clic en ir

Una vez hecho esto, haga clic en '**Restaurar**'. Al hacer esto, se ejecutará un script de PowerShell en segundo plano y se restaurará la última versión de la base de datos y las imágenes que fueron respaldadas en la computadora. Este proceso puede llevar algún tiempo dependiendo de cuántos archivos haya. Si tarda mucho tiempo, puede fallar silenciosamente y no alertar al

usuario en el software directamente. Si esto falla, la restauración se puede ejecutar manualmente desde un indicador de PowerShell abierto en 'C:\Archivos de programa\xampp\htdocs\stmdatabase' con privilegios administrativos. El comando es '.\stmarysrestore.ps1 -sourcedir <ruta del paso 3.b.ii.2>'. La ruta no está entre corchetes angulares, pero debe escribirse con un par de comillas, por ejemplo

.\stmarysrestore.ps1 -sourcedir “E:\ruta\a\carpeta de respaldo”

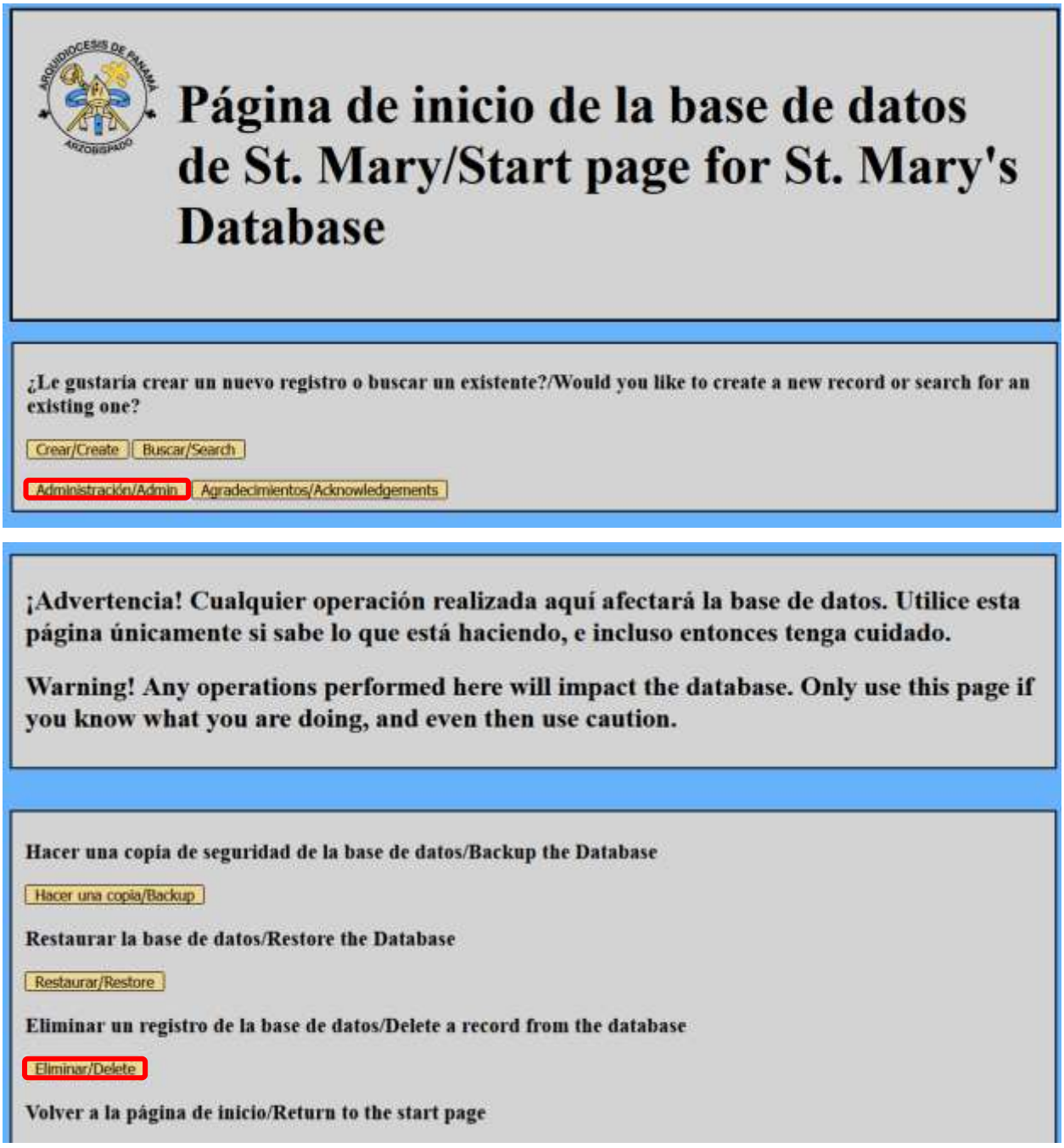


3.b.iii Eliminar registro de la base de datos

En caso de que haya un registro se ha introducido incorrectamente, se puede eliminar de la base de datos. **Advertencia**, una vez que se ha eliminado un registro, no se puede recuperar. Para volver a crear un registro eliminado, debe volver a ingresar con la herramienta de inserción.

3.b.iii.1 Haga clic en Administración.

En la página de bienvenida, haga clic en '**Administración**' para ver la página con herramientas administrativas. Para eliminar un registro de la base de datos, utilice el tercer campo bajo el encabezado denominado "**Eliminar**".



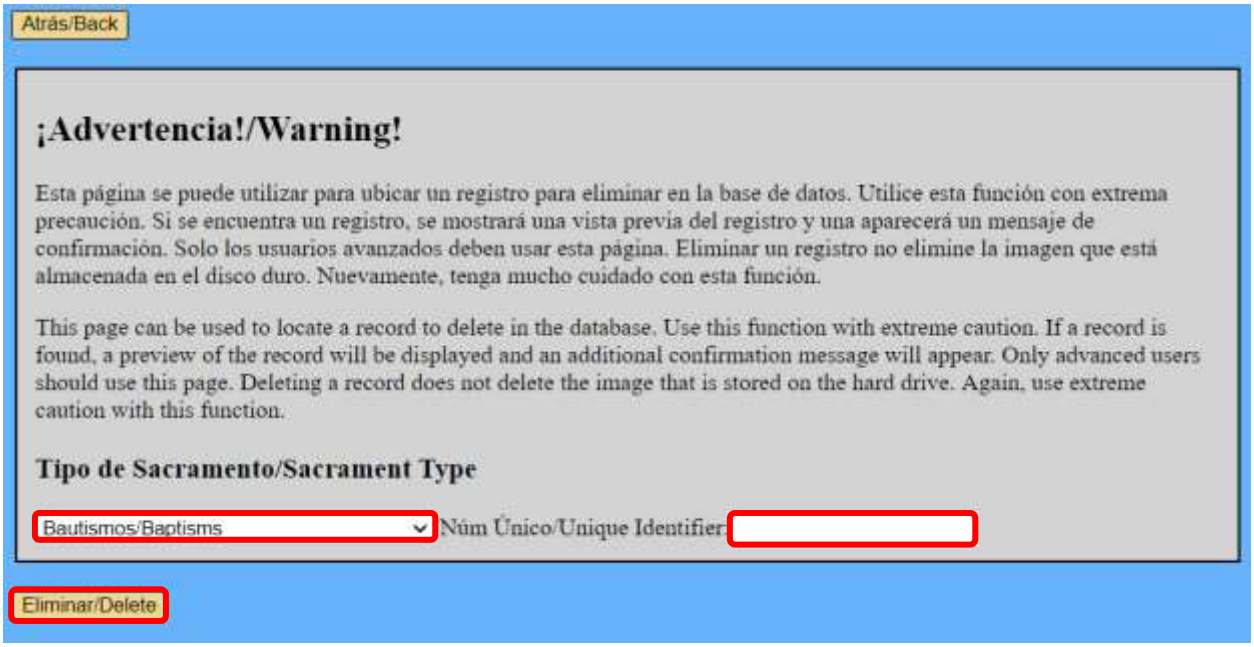
3.b.iii.2 Tipo de pegar la ruta a la unidad externa

Primero seleccione el tipo de sacramento del registro que desea eliminar usando el menú desplegable. A continuación, introduzca el identificador único del registro que desea eliminar (por ejemplo, B0120120123, F1231231234). Esto se puede encontrar buscando el registro y

mirando la segunda columna de la tabla de resultados. Una vez que se selecciona el tipo de sacramento y se ingresa el identificador único, haga clic en '**Eliminar**'.

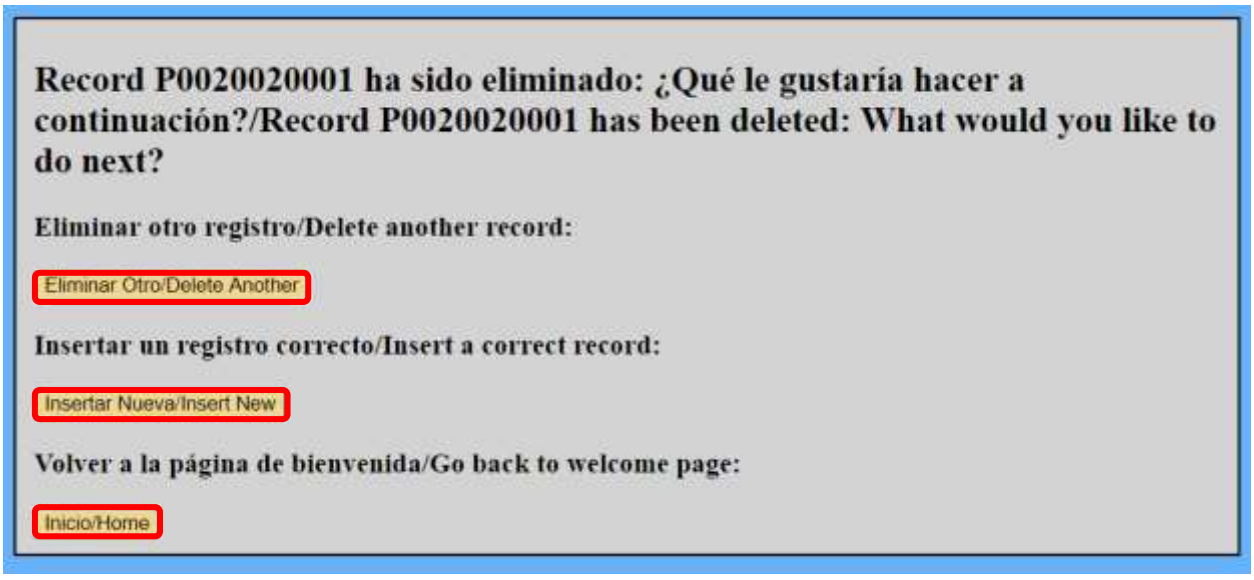
3.b.iii.3 Verificar los detalles del registro

La eliminación llevará al usuario a una página de estado que imprime toda la información del registro. Se le pedirá al usuario que verifique la exactitud de la información en el registro. En este punto, el usuario tiene dos opciones. Uno, confirme la eliminación del registro. En ese caso, haga clic en '**Sí**' y el registro se eliminará. Dos, regrese y elimine un registro diferente. En ese caso, haga clic en '**No**' y volverá a la página anterior.



3.b.iii.4 Haga clic en Ir

La eliminación llevará al usuario a una página de estado que imprime un ID de registro y le pregunta qué le gustaría hacer a continuación. En este punto, el usuario tiene tres opciones. Uno, borre otro registro. En ese caso, haga clic en '**Eliminar otro**' y vuelva a la sección 3.b.iii.2. Dos, inserte un nuevo registro para reemplazar el que fue eliminado. En ese caso, haga clic en '**Insertar nueva**' y vaya a la sección 2.c.iii. Tres, regrese a la página de inicio. En ese caso, haga clic en '**Inicio**' y vaya a la página de inicio.



4 Resumen de ubicaciones de archivos y términos

4.a Software

XAMPP = plataforma cruzada(X) (A)pache (M)ySQL (P)HP y (P)erl, el software que agrupa e instala estos servicios.

Apache = Una implementación de servidor web http que ejecuta páginas PHP y HTML.

MySQL = Una implementación del lenguaje de consulta estructurado, SQL. Este es un nombre inapropiado ya que XAMPP ya no usa MySQL sino una bifurcación de ese proyecto llamado MariaDB.

MariaDB = Una implementación del lenguaje de consulta estructurado, SQL. Esta es una versión gratuita y de código abierto de ese lenguaje que se ha bifurcado desde MySQL. Sin embargo, todavía es casi 100% compatible con MySQL.

PHP = PHP Hypertext Preprocessor, ejecuta la lógica entre el usuario y la base de datos.

HTML = HyperText Markup Language, es el lenguaje utilizado para representar las páginas web.

Localhost = El nombre de alojamiento del servidor web local, si se escribe en la barra de direcciones de un navegador web, el navegador web busca en el directorio localhost un archivo llamado 'index.php'. Este software está instalado dentro de ese directorio.

phpMyAdmin = Una herramienta de administración de bases de datos para MySQL y MariaDB, viene incluida con XAMPP. Se puede acceder desde el Panel de control de XAMPP o desde 'http://localhost/phpmyadmin'.

4.b Enlaces de descarga de software

Enlace a la descarga del instalador XAMPP = https://www.apachefriends.org/index.html

Enlace al repositorio de GitLab del equipo (puede que no funcione sin la intervención del equipo) = https://gitlab.com/st.-mary-s-iqp/database

4.c Installation Directories

Directorio de instalación para XAMPP = 'C:\Archivos de programa\xampp\'

Directorio de instalación para Localhost = 'C:\Archivos de programa\xampp\htdocs\'

Directorio de instalación para los Archivos Digitales = 'C:\Archivos de programa\xampp\htdocs\stmdatabase\'

Directorio de instalación para las plantillas = 'C:\Archivos de programa\xampp\htdocs\stmdatabase\Import Templates\'

4.d Nombres de usuario de la base de datos

Nombre de usuario Admin/Root = root

Nombre de usuario general = Mary

Nombre de usuario para copias de seguridad = root_backup

Nombre de usuario para Restaurar = root_restore

Nombre de usuario para Eliminar = root_delete

Consulte la sección 3.a.v para obtener su información de inicio de sesión. El usuario root tiene una contraseña definida por el administrador del software y debe escribirse cerca de la computadora que está ejecutando los Archivos Digitales.

4.e Comandos de PowerShell

El comando de copia de seguridad manual que se ejecuta desde el directorio de instalación de los Archivos Digitales en PowerShell como administrador = .\stmarysbackup.ps1 -destdir “E:\path\to\backup folder”

El comando de restauración manual que se ejecuta desde el directorio de instalación de los Archivos Digitales en powershell como administrador = .\stmarysrestore.ps1 -sourcedir “E:\path\to\backup folder”

Appendix G: Survey Questions for Feedback on Software (First Prototype)

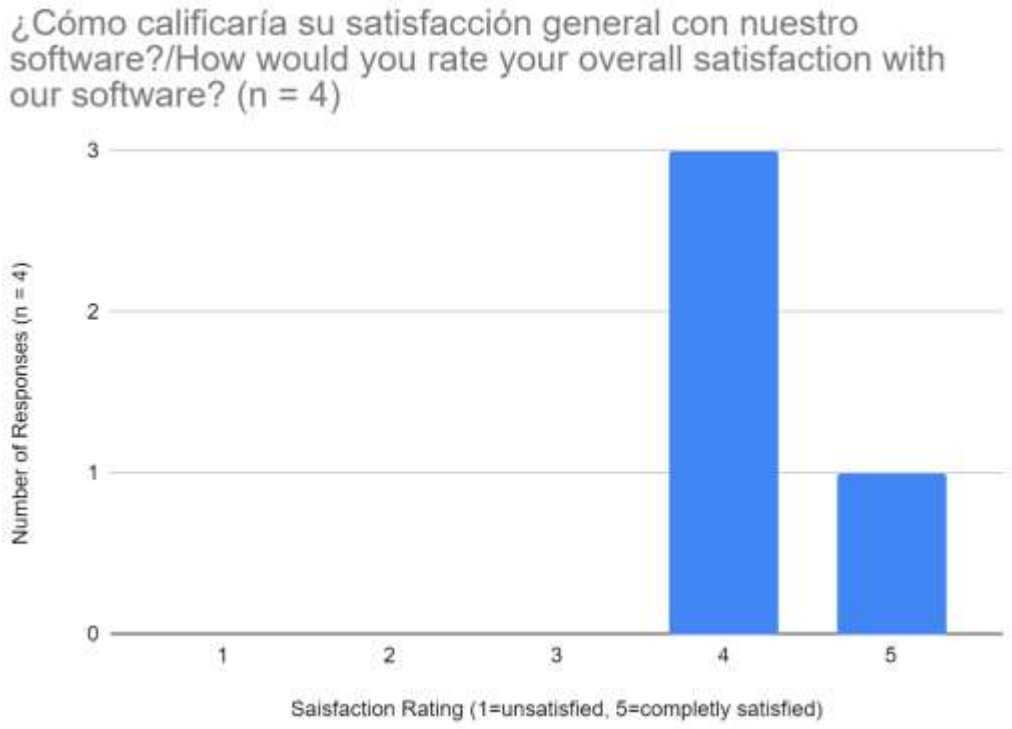
The team wrote this survey with Google Forms and transcribed to Google Docs.

Encuesta al personal/Staff Survey

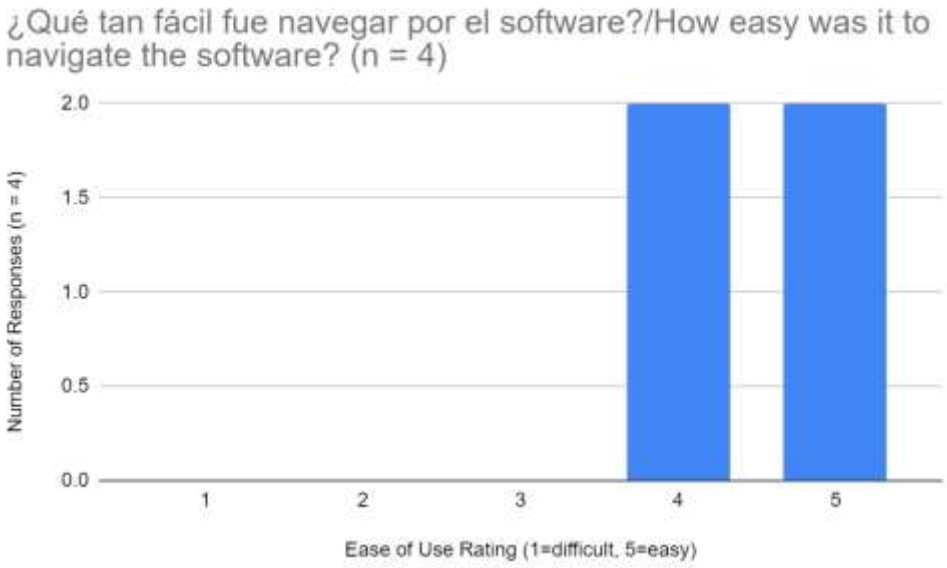
Esta es una encuesta para determinar la satisfacción del personal de St. Mary's Parish con el producto del equipo./This is a survey to determine the satisfaction of the staff at St. Mary's Parish with the team's product.

On a scale of 1 to 5 with 1 being the most negative and 5 being the most positive:

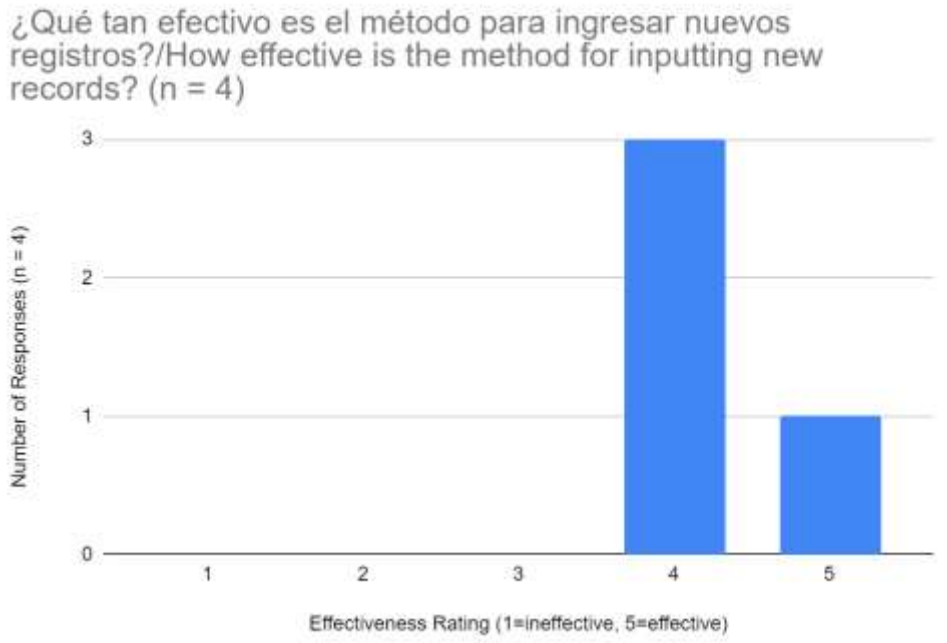
1. ¿Cómo calificaría su satisfacción general con nuestro software?/How would you rate your overall satisfaction with our software? (from not satisfied to fully satisfied)



2. ¿Qué tan fácil fue navegar por el software?/How easy was it to navigate the software? (from difficult to easy)

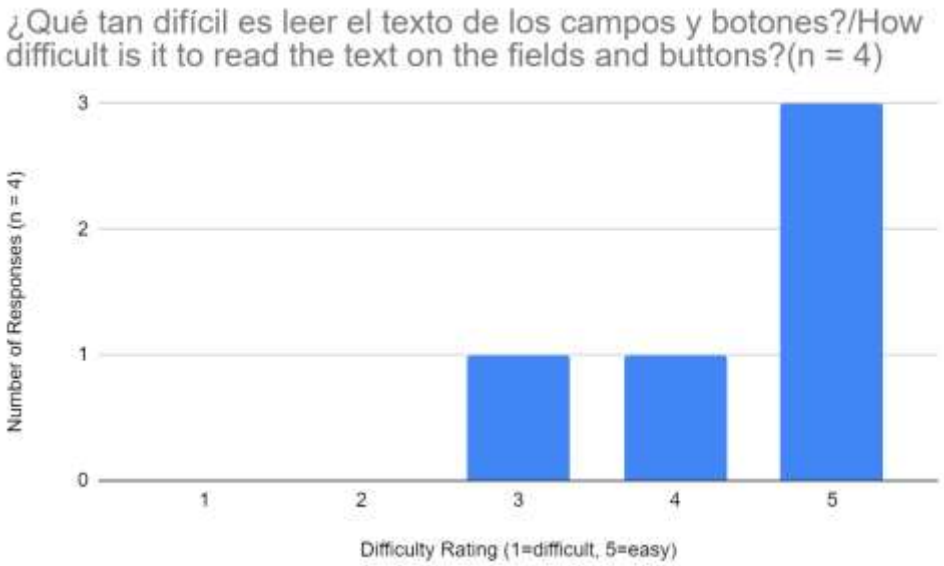


3. ¿Qué tan efectivo es el método para ingresar nuevos registros?/How effective is the method for inputting new records? (from completely ineffective to extremely effective)

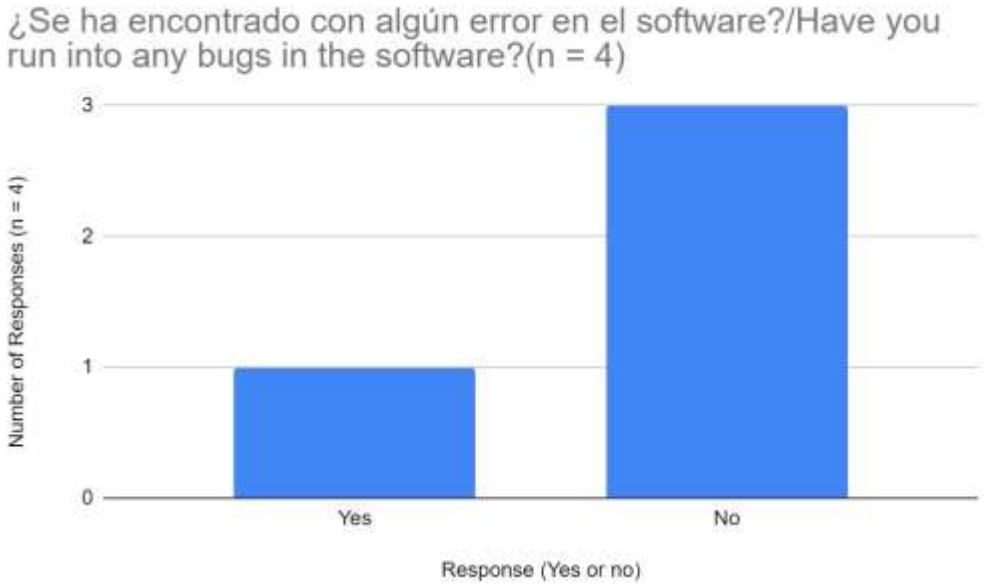


4. ¿Qué tan efectivo es el método para generar los registros deseados?/How effective is the method for outputting desired records? (from completely ineffective to extremely effective)

5. ¿Qué tan difícil es leer el texto de los campos y botones?/How difficult is it to read the text on the fields and buttons? (from difficult to easy)



6. ¿Se ha encontrado con algún error en el software?/Have you run into any bugs in the software? (answer yes or no, if no then the individual sees: Describe los errores que se encontraron/Please describe the bugs that were encountered)



7. Cualquier comentario adicional se puede dejar aquí/Any additional comments can be left here

Appendix H: Survey Questions for Feedback on Software (Second Prototype)

The team wrote this survey with Google Forms and transcribed to Google Docs.

Encuesta al personal/Staff Survey

Esta es una encuesta para determinar la satisfacción del personal de St. Mary's Parish con el producto del equipo./This is a survey to determine the satisfaction of the staff at St. Mary's Parish with the team's product.

On a scale of 1 to 5 with 1 being the most negative and 5 being the most positive:

1. ¿Cómo calificaría su satisfacción general con nuestro software?/How would you rate your overall satisfaction with our software? (from not satisfied to fully satisfied)
2. ¿Qué tan fácil fue navegar por el software?/How easy was it to navigate the software? (from difficult to easy)
3. ¿Qué tan efectivo es el método para ingresar nuevos registros?/How effective is the method for inputting new records? (from completely ineffective to extremely effective)
4. ¿Qué tan efectivo es el método para generar los registros deseados?/How effective is the method for outputting desired records? (from completely ineffective to extremely effective)
5. ¿Qué tan difícil es leer el texto de los campos y botones?/How difficult is it to read the text on the fields and buttons? (from difficult to easy)

6. ¿Notó algún error en las traducciones al español?/Did you notice any errors in the Spanish translations? (answer yes or no, if no then the individual sees: Describe los errores de traducción/Please describe the translation errors)
7. ¿Se ha encontrado con algún error en el software?/Have you run into any bugs in the software? (answer yes or no, if no then the individual sees: Describe los errores que se encontraron/Please describe the bugs that were encountered)
8. Cualquier comentario adicional se puede dejar aquí/Any additional comments can be left here

Appendix I: St. Mary's Digital Archives database structure

This appendix describes the fields and tables that made up the database element of the St. Mary's Digital Archives. The database structure consisted of tables and fields. Each table held a number of fields relevant to the corresponding record type. There were a number of "common fields" that were shared among all record types, as well as a number of unique fields for each record type.

Tables

- Baptisms
- First Communions
- Confirmations
- Marriages
- Deaths

Common Fields

- Unique Identifier (automatically generated)
- Book Number (required)
- Page Number (required)
- Record Number (required)
- Priest Name (except for Confirmations)
- Notes
- Spare 1
- Spare 2

- Spare 3
- Image Path (automatically generated)
- Creator (automatically generated)
- Time Created (automatically generated)

Baptism Unique Fields

- First Name (required)
- Second name
- First Surname (required)
- Second Surname
- Suffix
- Identification Card
- Date of Birth (required)
- Place of Birth (required)
- Date of Baptism (required)
- Place of Baptism (required)
- Father Name
- Mother Name
- Godfather Name
- Godmother Name

First Communion Unique Fields

- First Name (required)
- Second name

- First Surname (required)
- Second Surname
- Suffix
- Identification Card
- Date of First Communion
- Place of First Communion

Confirmation Unique Fields

- First Name (required)
- Second name
- First Surname (required)
- Second Surname
- Suffix
- Identification Card
- Confirmation Name
- Date of Confirmation (required)
- Place of Confirmation (required)
- Age Confirmed (required)
- Sponsor Name
- Father Name
- Mother Name
- Bishop’s Name (replaces Priest’s Name)

Marriage Unique Fields

- Husband First Name (required)
- Husband Second name
- Husband First Surname (required)
- Husband Second Surname
- Husband Suffix
- Husband Identification Card
- Husband Date of Baptism
- Husband Place of Baptism
- Husband Place of Residence
- Husband Father Name
- Husband Mother Name
- Wife First Name (required)
- Wife Second name
- Wife First Surname (required)
- Wife Second Surname
- Wife Identification Card
- Wife Date of Baptism
- Wife Place of Baptism
- Wife Place of Residence
- Wife Father Name
- Wife Mother Name
- Date of Marriage (required)

- Place of Marriage (required)
- Witness 1
- Witness 2

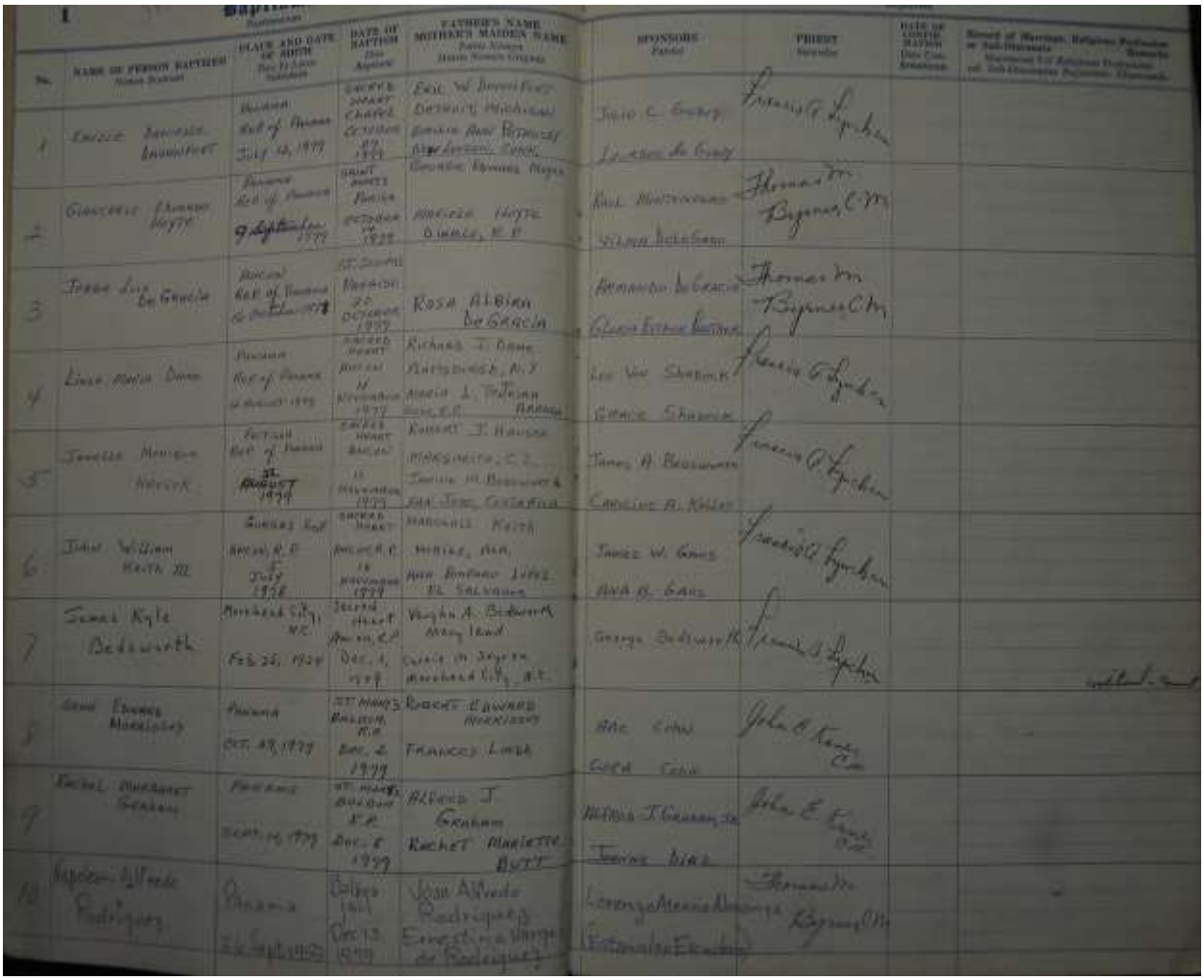
Death Unique Fields

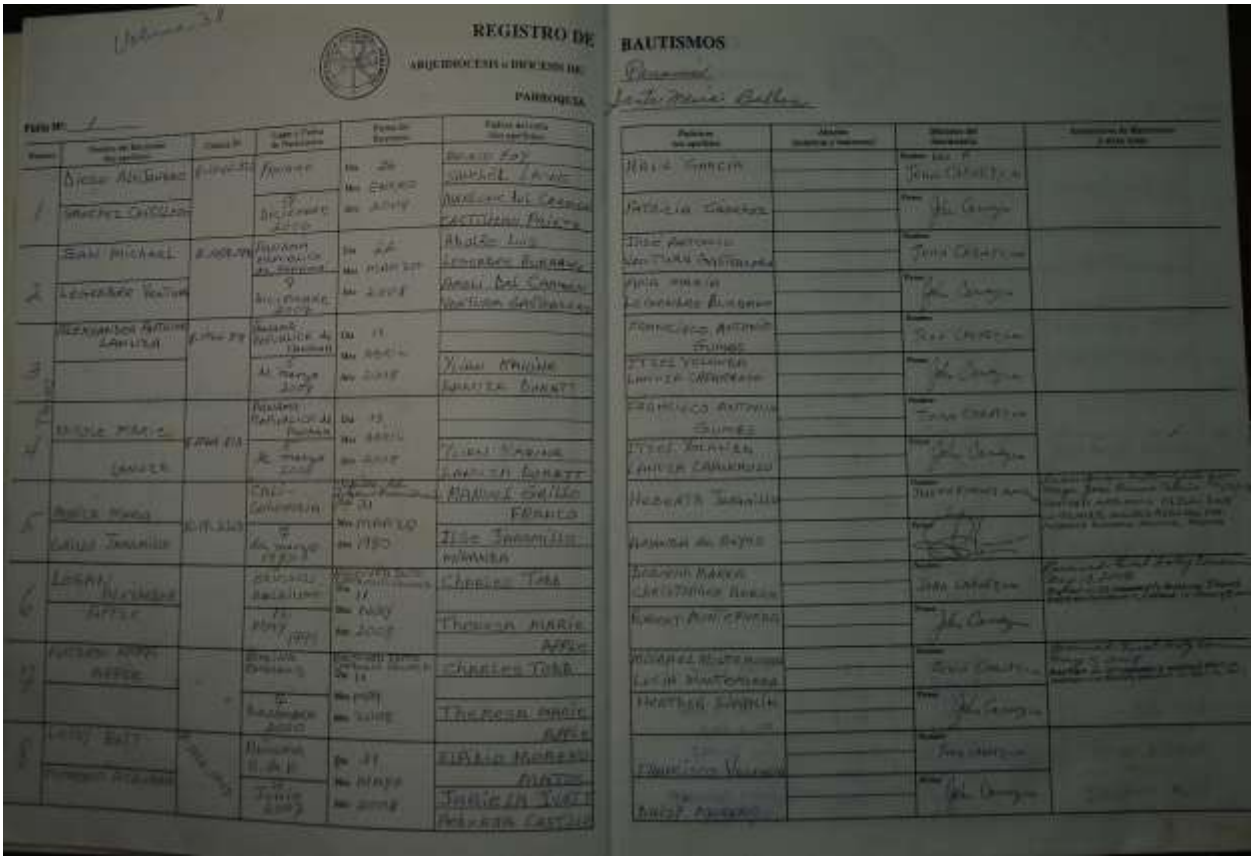
- First Name
- Second name
- First Surname
- Second Surname
- Suffix
- Identification Card
- Age (Years)
- Age (Months)
- Spouse Name
- Date of Death (required)
- Place of Residence (required)
- Date of Burial (required)
- Place of Burial (required)
- Father Name
- Mother Name
- Church
- Diocese

Appendix J: St. Mary's Parish Archives Sample Images

This appendix shows the full sample of document images provided by the staff at St. Mary's Parish. The student team used these images to create the tables and fields that made up the St. Mary's Digital Archives. In total the students were provided 22 images in total with at least one record of each sacrament type.

Baptism Records



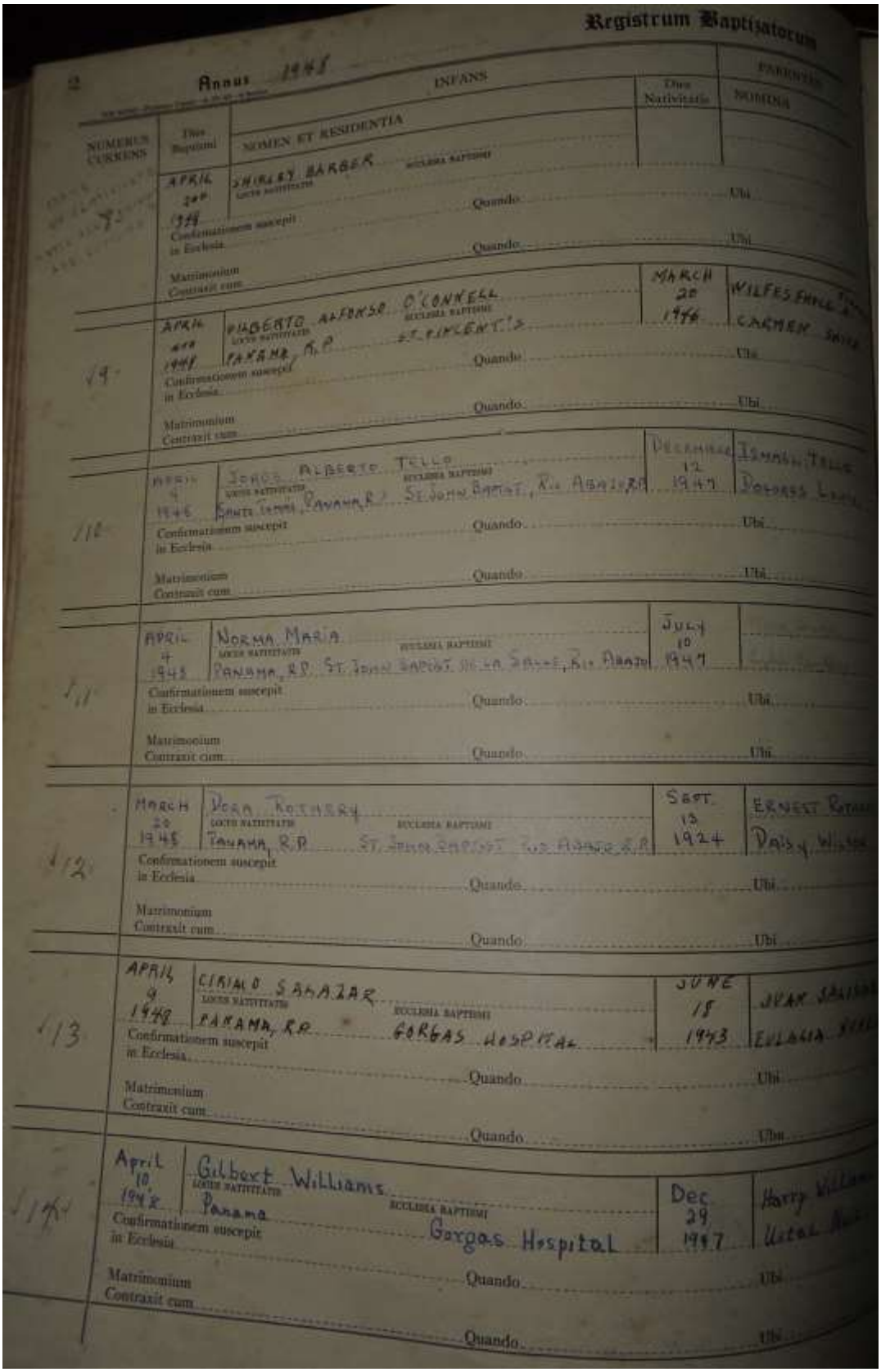


REGISTRO DE

ARQUIDIÓCESIS o DIÓCESIS DE

PARROQUIA

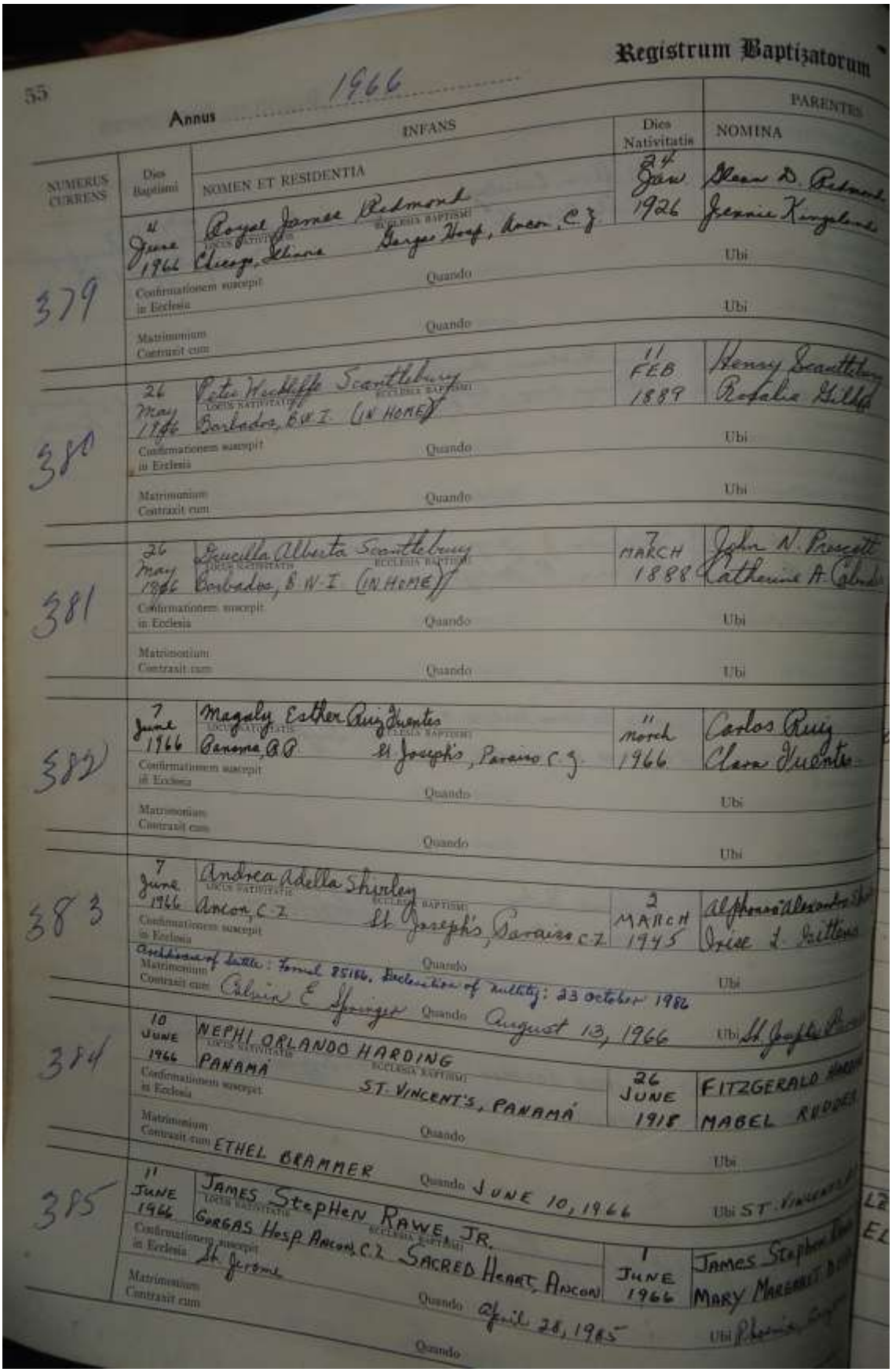
BAUTISMOS



Registrum Baptizatorum

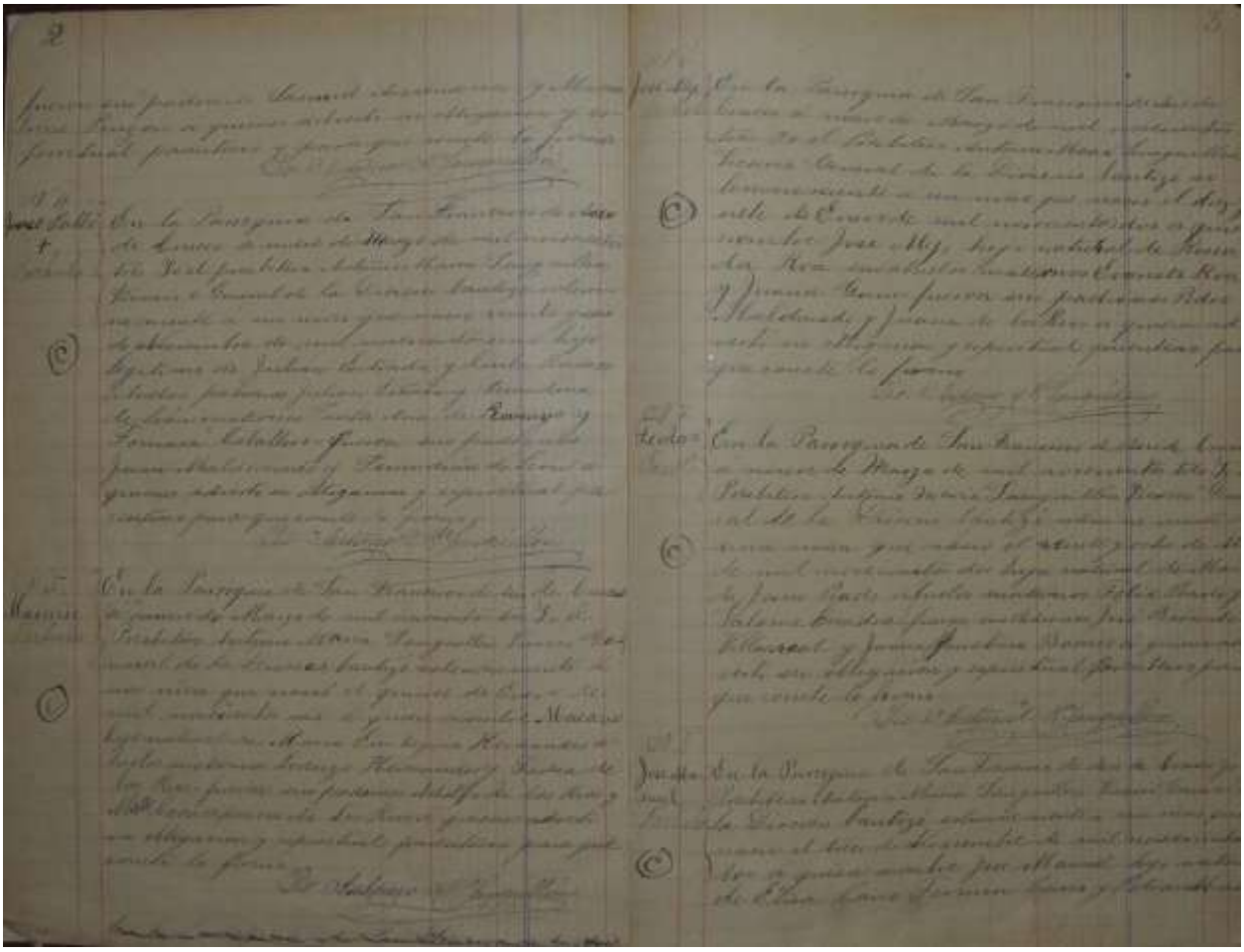
2 Annus 1948

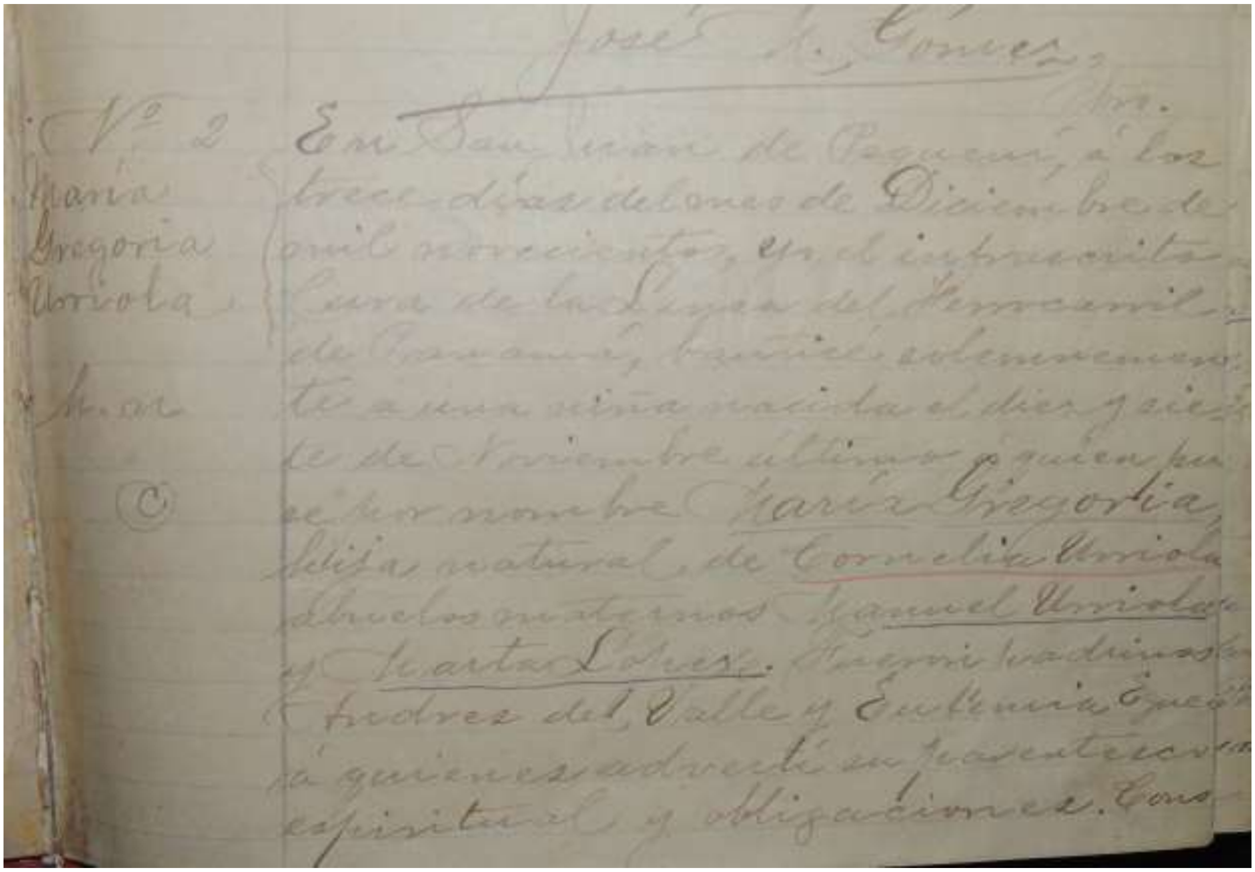
NUMERUS CURRENS	Dies Baptismi	INFANS: NOMEN ET RESIDENTIA	Dies Nativitatis	PARENTES: NOMINA
8	APRIL 2nd 1948	SHIRLEY BARBER — LOCUS NATIVITATIS — ECCLESIA BAPTISMI		
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		
9	APRIL 4th 1948	ALBERTO ALFONSO O'CONNELL — LOCUS NATIVITATIS — ECCLESIA BAPTISMI — PANAMA, R.P. — ST. VINCENT'S	MARCH 20 1946	WILFES EMILE — CARMEN
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		
10	APRIL 4 1948	JORGE ALBERTO TELLO — LOCUS NATIVITATIS — ECCLESIA BAPTISMI — SANTA TERESA, PANAMA R. — ST. JOHN BAPTIST, R.R. ABAJO, R.P.	DECEMBER 12 1947	ISMAEL TELLO — DOLORES
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		
11	APRIL 4 1948	NORMA MARIA — LOCUS NATIVITATIS — ECCLESIA BAPTISMI — PANAMA, R.P. ST. JOHN BAPTIST DE LA SALLE, R.R. ABAJO	JULY 10 1947	
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		
12	MARCH 20 1948	ROSA ROSARIO — LOCUS NATIVITATIS — ECCLESIA BAPTISMI — PANAMA, R.P. ST. JOHN BAPTIST R.R. ABAJO R.P.	SEPT. 13 1924	ERNEST — DAISY
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		
13	APRIL 9 1948	CIRIACO SAMAZAR — LOCUS NATIVITATIS — ECCLESIA BAPTISMI — PANAMA, R.P. GORGAS HOSPITAL	JUNE 15 1943	JUAN — EULALIA
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		
14	April 10 1948	Gilbert Williams — LOCUS NATIVITATIS — ECCLESIA BAPTISMI — Panama — Gorgas Hospital	Dec 29 1947	Harry — Ustal
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		



55 Annus 1966 — Registrum Baptizatorum

NUMERUS CURRENS	Dies Baptismi	INFANS: NOMEN ET RESIDENTIA	Dies Nativitatis	PARENTES: NOMINA
379	4 June 1966	Royal James Redmond; Locus Nativitatis: Chicago, Illinois; Ecclesia Baptismi: Bergan Hosp, Ancon C.Z.	24th Jan 1926	Glenn D. Redmond; Jennie Kingsland
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		
380	26 May 1966	Peter Hadliffe Scantlebury; Locus Nativitatis: Barbados, B.W.I. (IN HOME)	11 FEB 1889	Henry Scantlebury; Rosalia Hilla
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		
381	26 May 1966	Lucilla Alberta Scantlebury; Locus Nativitatis: Barbados, B.W.I. (IN HOME)	MARCH 1888	John N. Prescott; Catherine A. Glad
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		
382	7 June 1966	Magaly Esther Ruiz Fuentes; Locus Nativitatis: Panama, R.P.; Ecclesia Baptismi: St Joseph's, Paraiso C.Z.	11 March 1966	Carlos Ruiz; Clara Fuentes
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		
383	7 June 1966	Andrea Adella Shirley; Locus Nativitatis: Ancon C.Z.; Ecclesia Baptismi: St Joseph's, Paraiso C.Z.	2 MARCH 1945	Alphonso Alexander; Ovide L. Gittens
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum Calvin E Springer — Quando August 13, 1966 — Ubi St Joseph's		
384	10 JUNE 1966	NEPHI ORLANDO HARDING; Locus Nativitatis: PANAMA; Ecclesia Baptismi: ST. VINCENT'S, PANAMA	26 JUNE 1918	FITZGERALD; MABEL REDDEN
		Confirmationem suscepit in Ecclesia — Quando — Ubi		
		Matrimonium Contraxit cum ETHEL BRAMMER — Quando JUNE 10, 1966 — Ubi ST. VINCENT'S		
385	11 JUNE 1966	JAMES STEPHEN RAWE JR.; Locus Nativitatis: GORGAS HOSP. ANCON, C.Z.; Ecclesia Baptismi: SACRED HEART, ANCON	1 JUNE 1966	JAMES STEPHEN; MARY MARGARET
		Confirmationem suscepit in Ecclesia St Jerome — Quando April 28, 1985 — Ubi		
		Matrimonium Contraxit cum — Quando — Ubi		

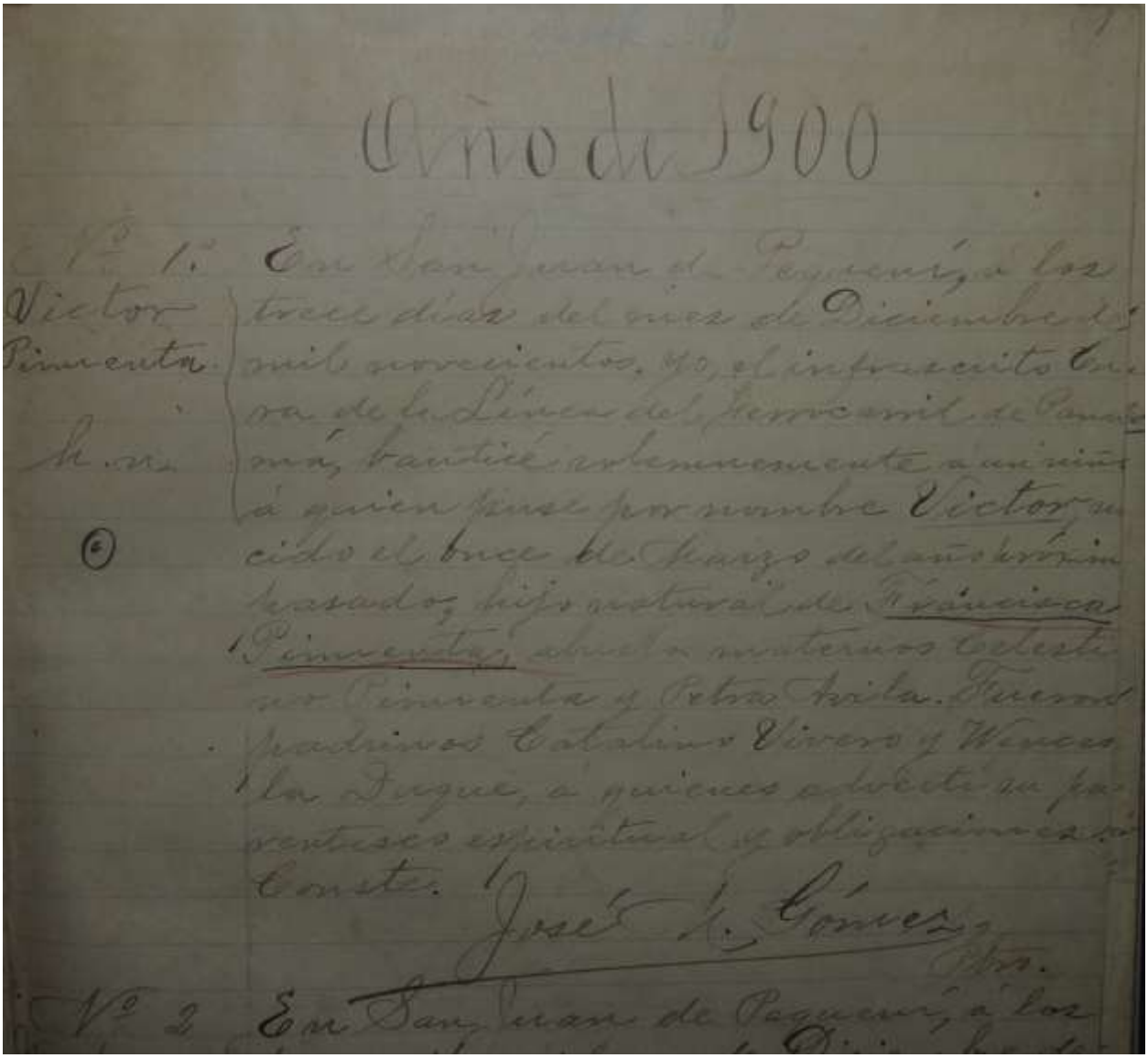




José M. Gómez
Pro.

Nº 2
María Gregoria Urriola

En San Juan de Pequení, á los trece días del mes de Diciembre de mil novecientos, yo el infrascrito Cura de la Línea del Ferrocarril de Panamá, bauticé solemnemente á una niña nacida el diez y siete de Noviembre último á quien puse por nombre María Gregoria, hija natural de Cornelia Urriola. Abuelos maternos Manuel Urriola y Marta López. Fueron padrinos Andres del Valle y Eufemia [illegible] á quienes advertí su parentesco espiritual y obligaciones. Cons



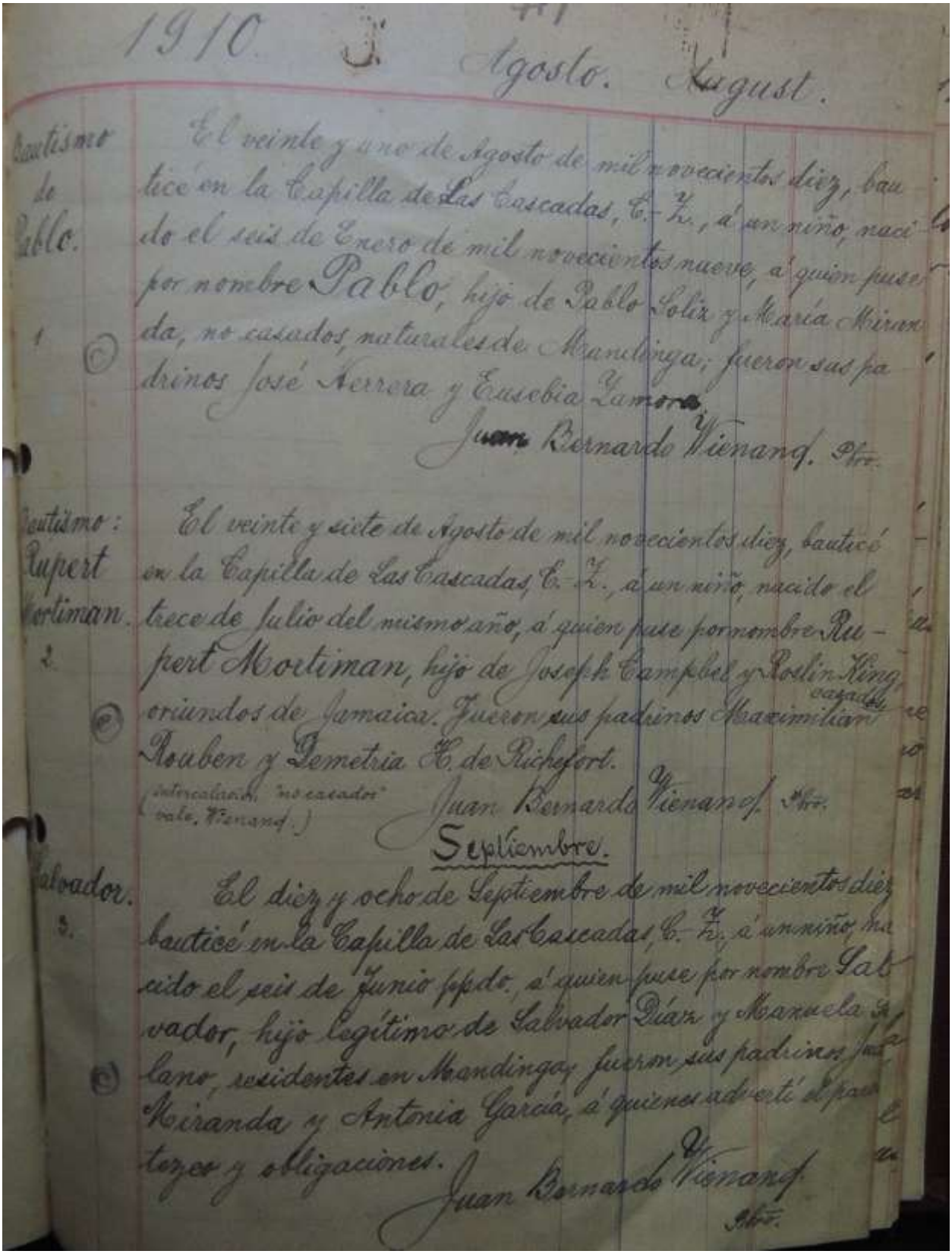
Año de 1900

Nº 1º
Victor
Pimienta.

En San Juan de Paguey á los trece días del mes de Diciembre de mil novecientos. Yo, el infrascrito Cura de la Línea del ferrocarril de Sanamá, bautizé solemnemente á un niño á quien puse por nombre Victor, nacido el once de Marzo del año próximo pasado, hijo natural de Francisca Pimienta, abuelos maternos Celestino Pimienta y Petrona Mota. Fueron padrinos Catalino Vivero y Wenceslao Duque, á quienes advertí su parentesco espiritual y obligaciones. Es cuanto Conste.

José L. Gómez
Pbro.

Nº 2 En San Juan de Paguey, á los



1910. Agosto. August.

Bautismo de Pablo. 1

El veinte y uno de Agosto de mil novecientos diez, bauticé en la Capilla de Las Cascadas, C. Z., á un niño, nacido el seis de Enero de mil novecientos nueve, á quien puse por nombre Pablo, hijo de Pablo Soler y María Miranda, no casados, naturales de Manalinga; fueron sus padrinos José Herrera y Eusebia Zamora.

Juan Bernardo Vienanf. Pbro.

Bautismo: Rupert Mortiman. 2.

El veinte y siete de Agosto de mil novecientos diez, bauticé en la Capilla de Las Cascadas, C. Z., á un niño, nacido el trece de Julio del mismo año, á quien puse por nombre Rupert Mortiman, hijo de Joseph Campbell y Roslin King, casados, oriundos de Jamaica. Fueron sus padrinos Maximilian Rouben y Demetria E. de Richefort.

(interlineado: "no casados" vale. Vienanf.)

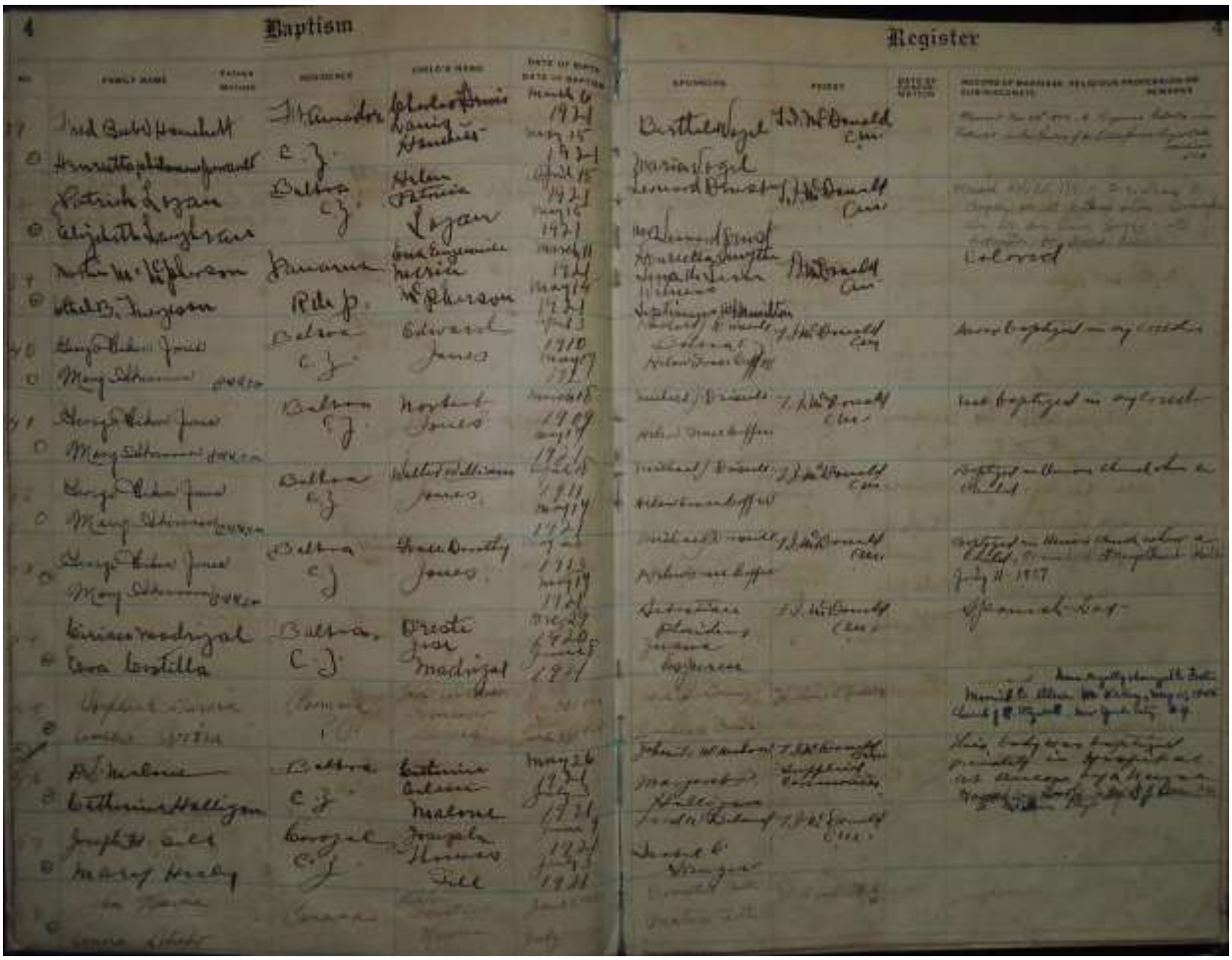
Juan Bernardo Vienanf. Pbro.

Septiembre.

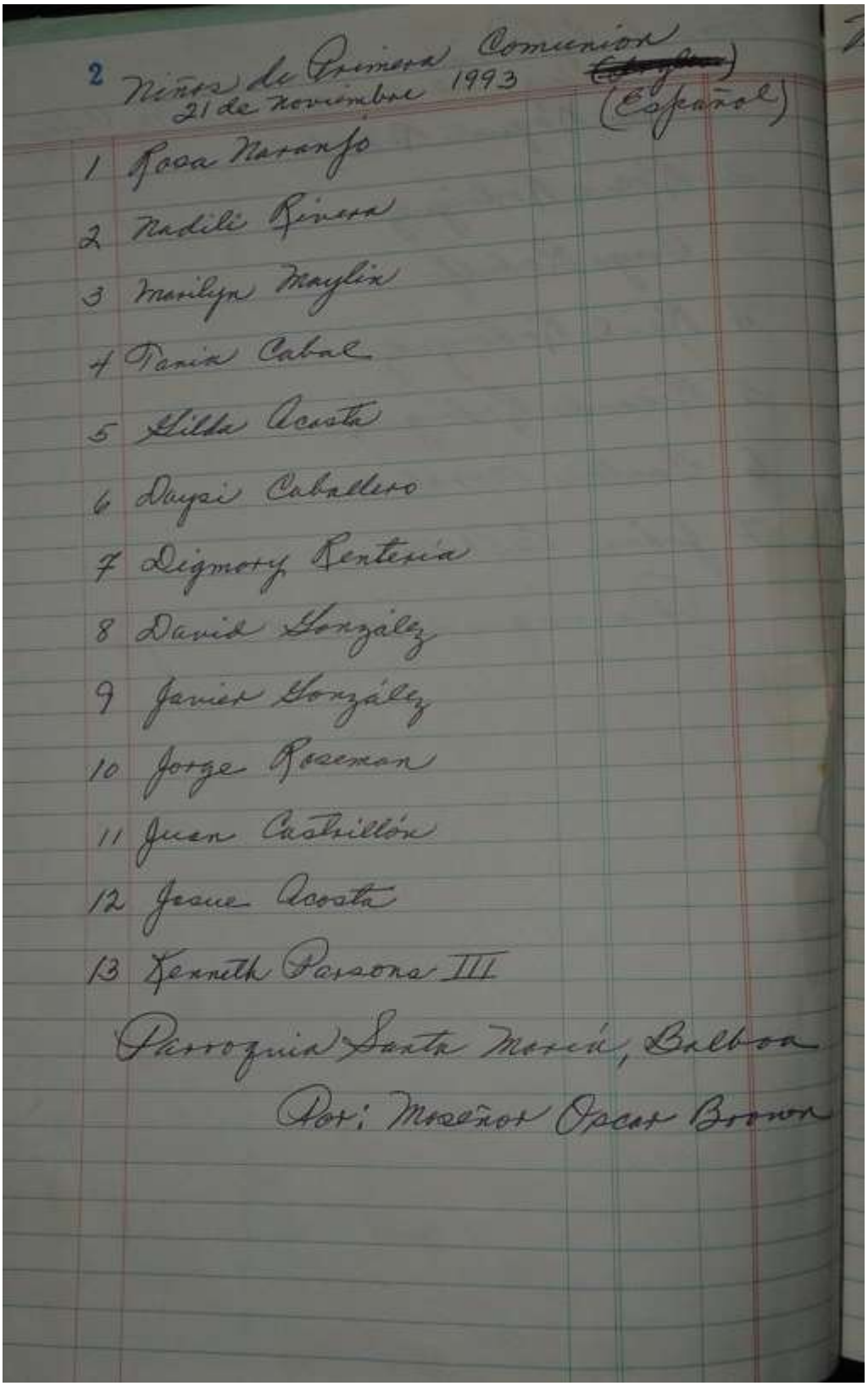
Salvador. 3.

El diez y ocho de Septiembre de mil novecientos diez, bauticé en la Capilla de Las Cascadas, C. Z., á un niño, nacido el seis de Junio próximo pasado, á quien puse por nombre Salvador, hijo legítimo de Salvador Díaz y Manuela Solano, residentes en Mandinga; fueron sus padrinos José Miranda y Antonia García, á quienes advertí el parentezco y obligaciones.

Juan Bernardo Vienanf. Pbro.


Baptism
Register

First Communion Record

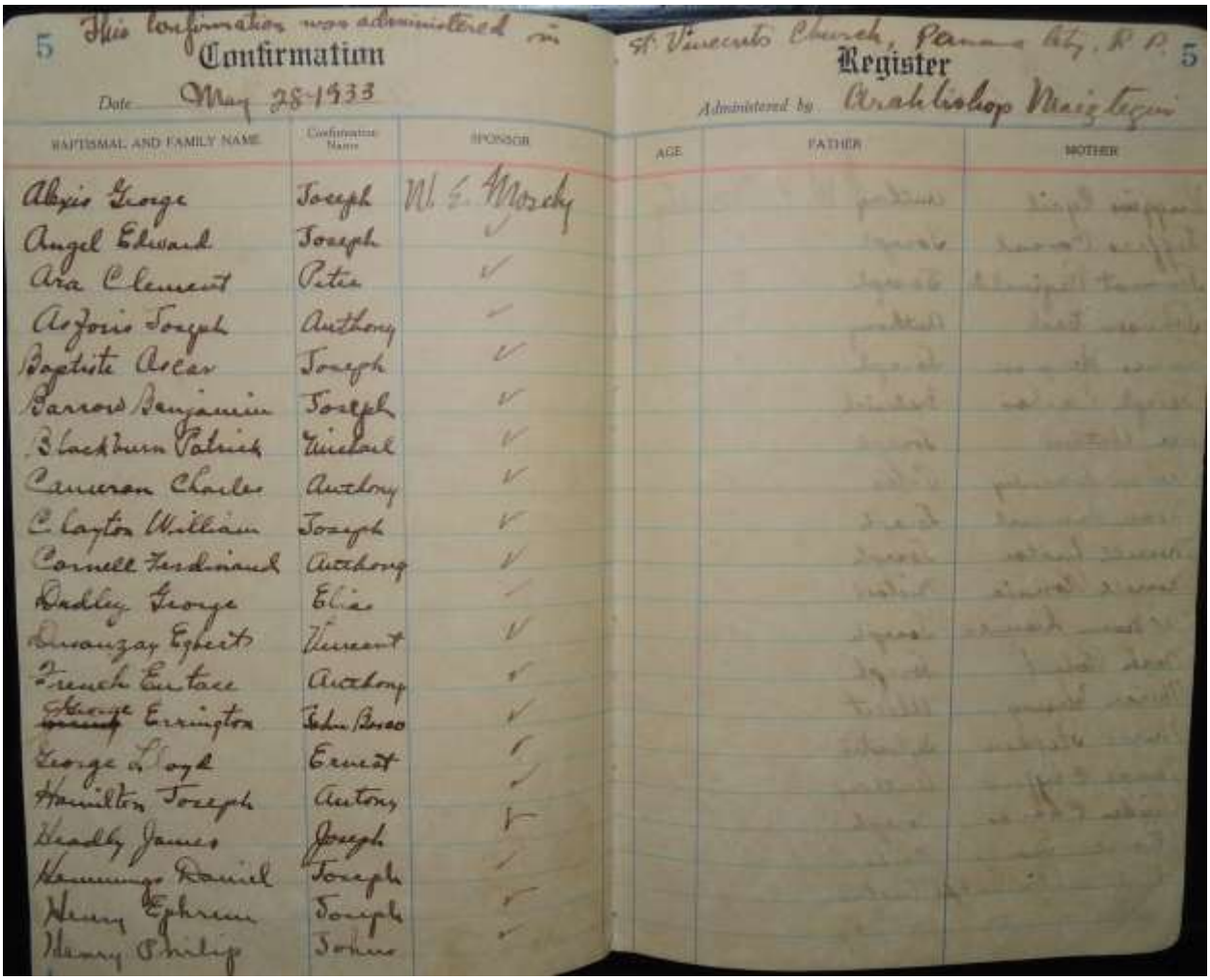


2 Niños de Primera Comunion
21 de noviembre 1993 ~~(Ingles)~~ (Español)

1 Rosa Naranjo
2 Nadili Rivera
3 Marilyn Maylin
4 Dania Cabal
5 Gilda Acosta
6 Dayai Caballero
7 Digmary Renteria
8 David Gonzalez
9 Javier Gonzalez
10 Jorge Roseman
11 Juan Castrillón
12 Jesus Acosta
13 Kenneth Parsons III

Parroquia Santa Maria, Balboa
Por: Monseñor Oscar Brown

Confirmation Record



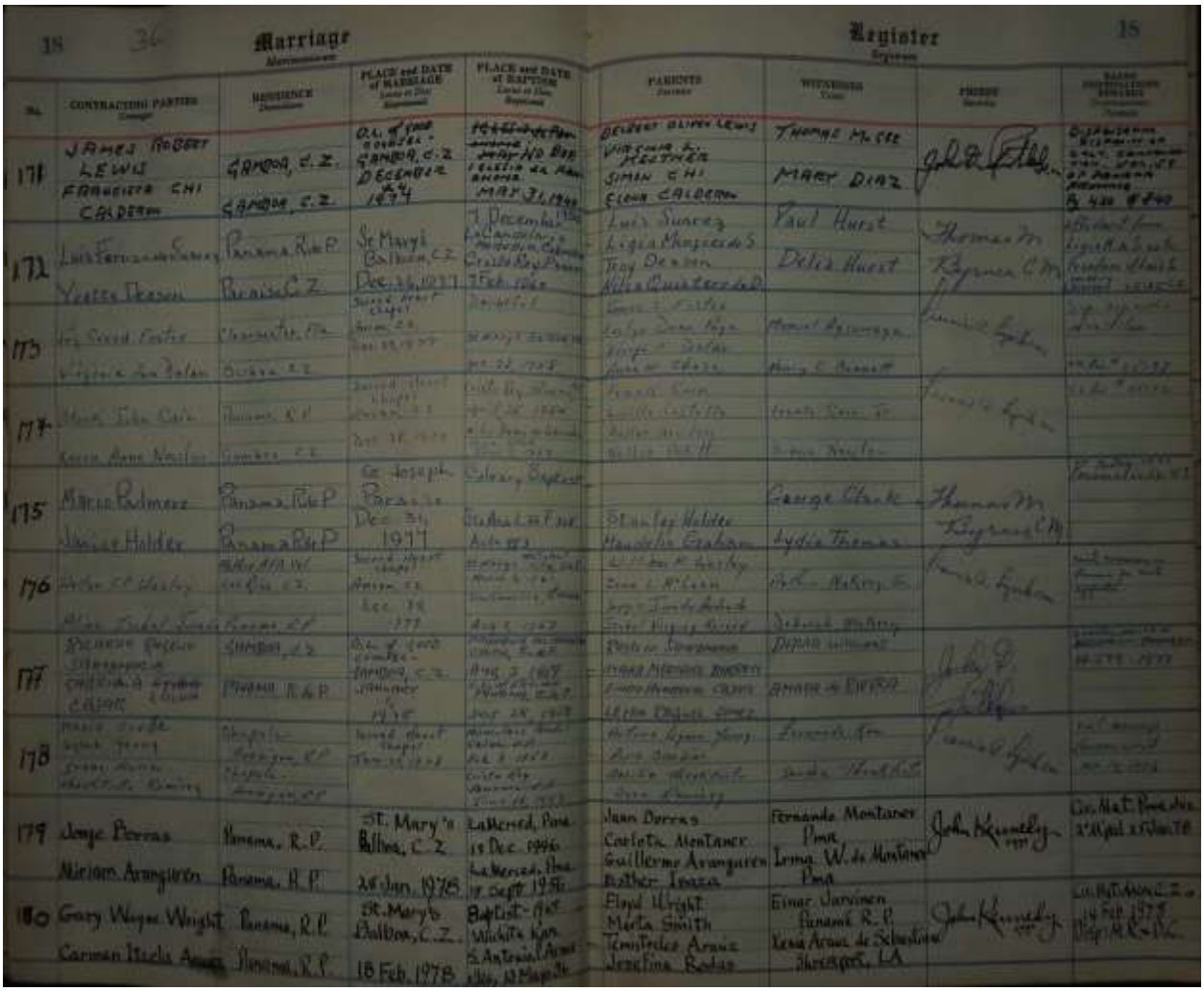
5 This confirmation was administered in St. Vincents Church, Panama City, P. P. 5

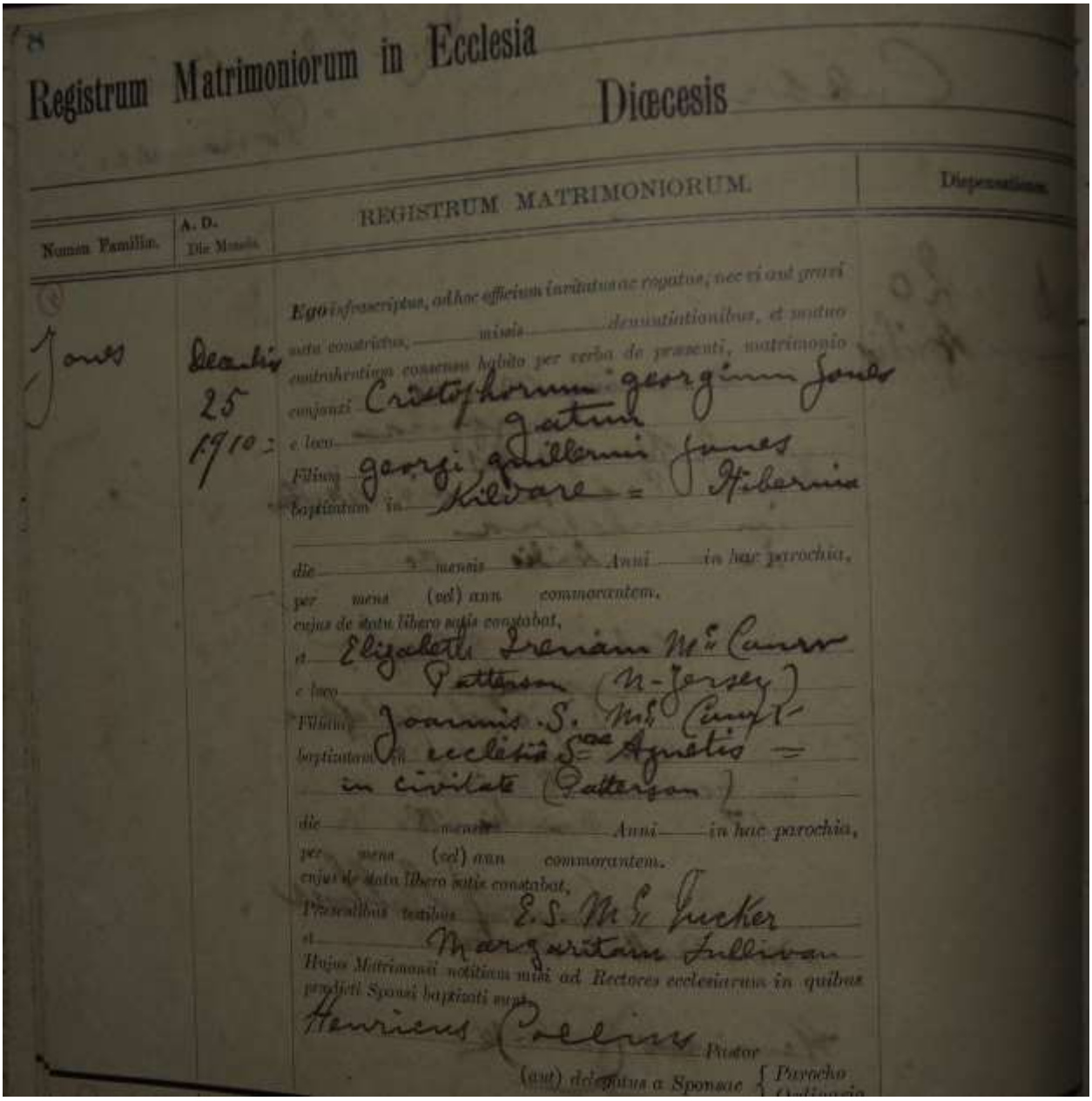
Confirmation Register

Date May 28-1933 Administered by Archbishop Meiglejohn

BAPTISMAL AND FAMILY NAME	Confirmation Name	SPONSOR	AGE	FATHER	MOTHER
Abxis George	Joseph	W. E. Mosely			
Angel Edward	Joseph	✓			
Ara Clement	Peter	✓			
Arjonis Joseph	Anthony	✓			
Baptiste Oscar	Joseph	✓			
Barrow Benjamin	Joseph	✓			
Blackburn Patrick	Michael	✓			
Cameron Charles	Anthony	✓			
Clayton William	Joseph	✓			
Cornell Ferdinand	Anthony	✓			
Dadley George	Elias	✓			
Dranzay Egbert	Vincent	✓			
French Eustace	Anthony	✓			
George Errington	John Baco	✓			
George Lloyd	Ernest	✓			
Hamilton Joseph	Antony	✓			
Headley James	Joseph	✓			
Hemmings Daniel	Joseph	✓			
Henry Ephrem	Joseph	✓			
Henry Philip	John	✓			

Marriage Records

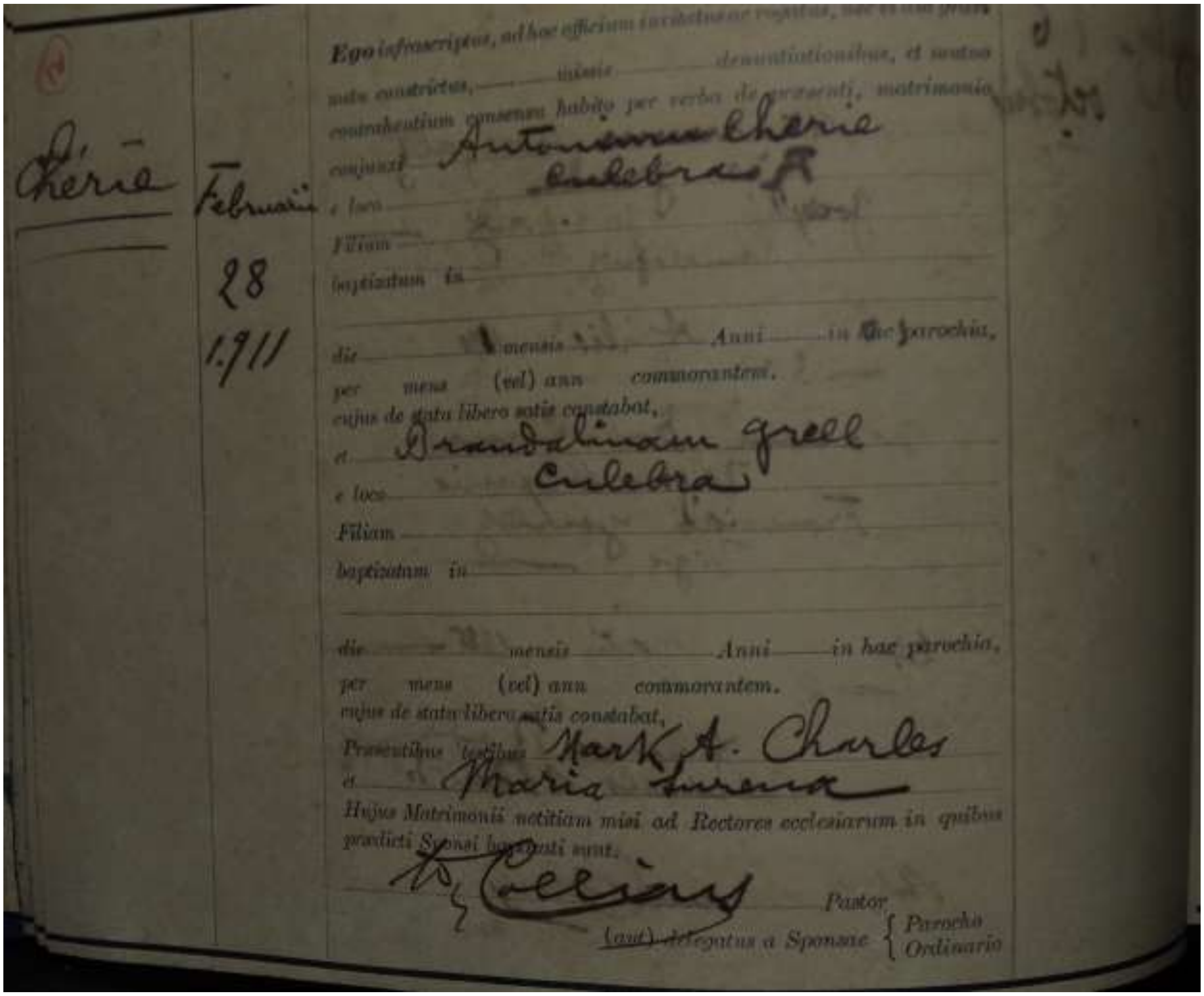




Registrum Matrimoniorum in Ecclesia

Diœcesis

Nomen Familiæ.	A. D. Die Mensis.	REGISTRUM MATRIMONIORUM.	Dispensationes.
Jones	Decembris 25 1910 =	Ego infrascriptus, adhuc efficium inritatum ac ropatus, nec vi aut gravi ratu constrictus, missis denuntiationibus, et mutuo contrahentium consensu habito per verba de præsenti, matrimonio conjunxi Cristophorum georginum Jones e loco Jatum Filium georgii Guillelmi James baptizatum in Kildare = Hiberniæ die mensis Anni in hac parochia, per mensa (vel) ann commorantem, cujus de statu libero satis constabat, et Elizabetha Irenium M.a Carrr e loco Patterson (N-Jersey) Filiam Joannis S. M.d (Unyt- baptizatam in ecclesia S.ae Agnetis = in civitate (Patterson) die mensis Anni in hac parochia, per mensa (vel) ann commorantem, cujus de statu libero satis constabat, Præsentibus testibus E.S. M.c Tucker et Margaritam Sullivan Hujus Matrimonii notitiam mihi ad Rectores ecclesiarum in quibus prædicti Sponsi baptizati sunt Henricus Collins Pastor (aut) delegatus a Sponsæ { Parocho Ordinario	



Chérie

Februarii 28 1911

Ego infrascriptus, ad hoc officium ... denuntiationibus, et mutuo ... contrahentium consensu habito per verba de praesenti, matrimonio conjunxi Antonium Chérie

e loco Culebra

Filium

baptizatum in

die mensis Anni in hac parochia,

per mens (vel) ann commorantem,

cujus de statu libero satis constabat,

et Brandalinam Grell

e loco Culebra

Filiam

baptizatam in

die mensis Anni in hac parochia,

per mens (vel) ann commorantem,

cujus de statu libero satis constabat,

Praesentibus testibus Mark A. Charles

et Maria [illegible]

Hujus Matrimonii notitiam misi ad Rectores ecclesiarum in quibus praedicti Sponsi baptizati sunt.

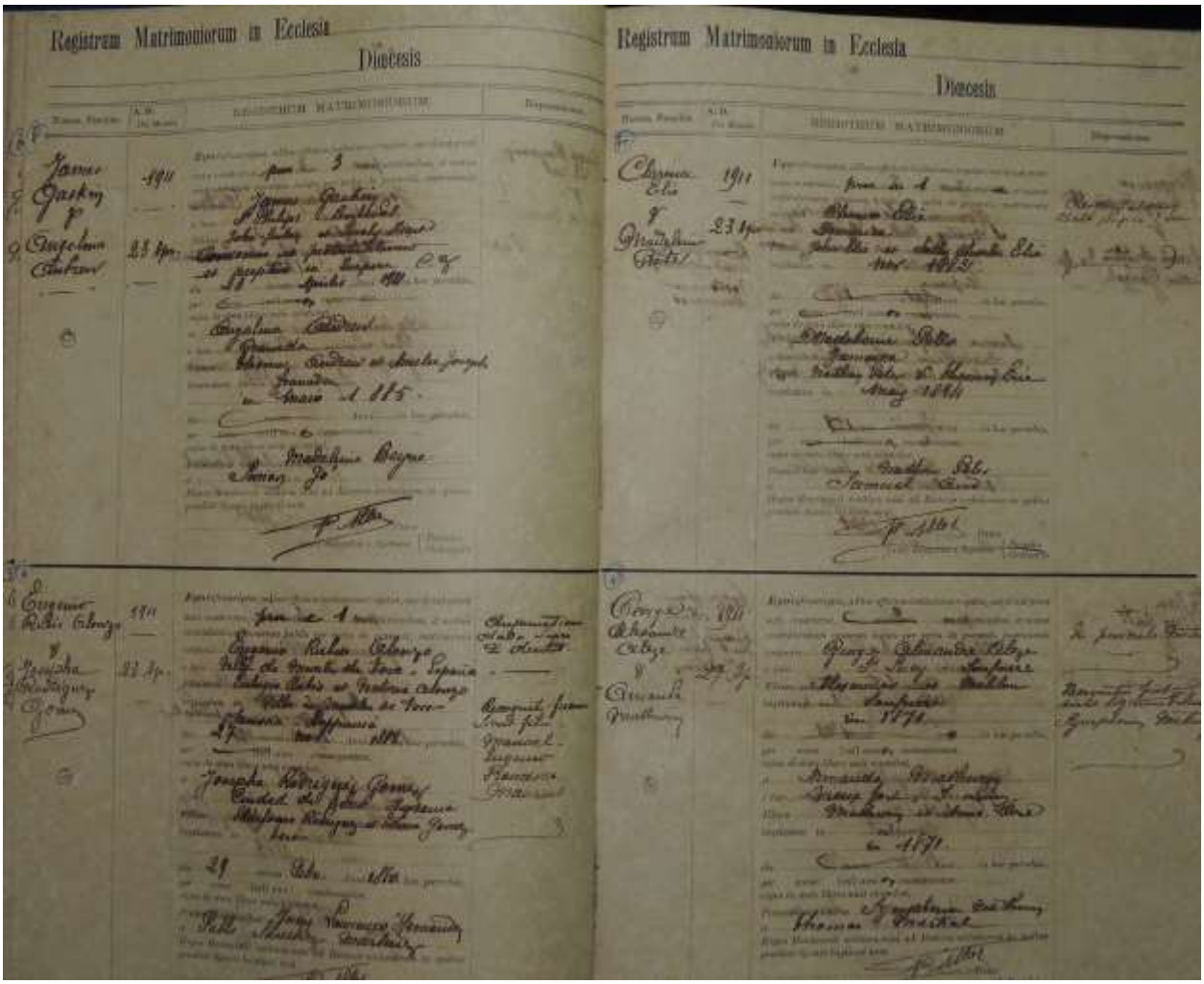
[illegible signature] Pastor

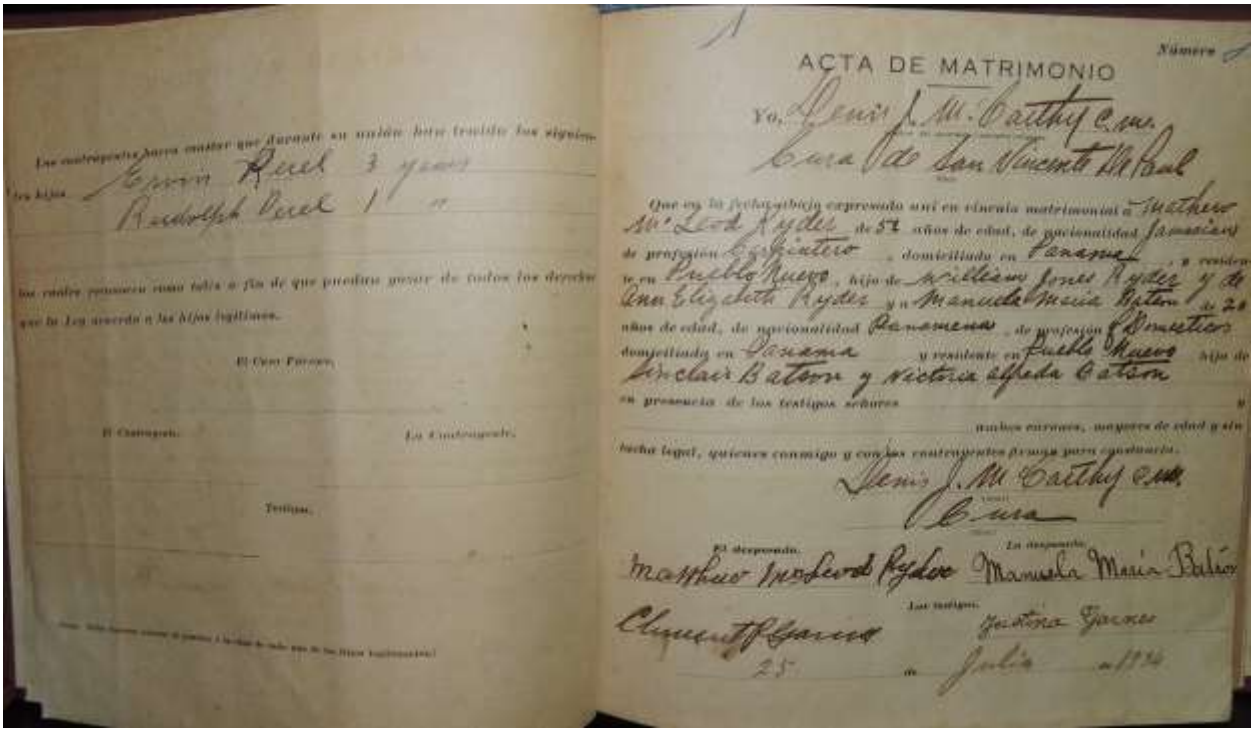
(aut) delegatus a Sponsae { Parocho / Ordinario

Registrum Matrimoniorum in Ecclesia

Diœcesis

Nomen Familiæ.	A. D. Die Mensis.	REGISTRUM MATRIMONIORUM.	Dispensationes.
Silva	May 10-11	Ego infrascriptus, ad hoc officium legitimus rogatus, nec ... denuntiationibus, et mutuo contrahentium consensu habito per verba de præsenti, matrimonio conjunxi Carolum Silva Garaitto e loco Filium baptizatum in die mensis Anni in hac parochia, per mese (vel) aqua communicatum, cujus de statu libero satis constabat, et Petram Herrera D. Araiza e loco Filiam baptizatam in die mensis Anni in hac parochia, per mese (vel) aqua communicatam, cujus de statu libero satis constabat, Præsentibus testibus Rafael Gutierrez et Julia Silva Hujus Matrimonii notitiam misi ad Rectores ecclesiarum in quibus jam dicti Sponsi baptizati sunt. Rev. [illegible] Pastor (vel) delegatus a Sponsis { Parocho Ordinario	
Fay	Septbris 12-11	Ego infrascriptus, ad hoc officium legitimus rogatus, nec ... denuntiationibus, et mutuo contrahentium consensu habito per verba de præsenti, matrimonio conjunxi Arthurum Edwardum Fay U-S e loco Filium baptizatum in die mensis Anni in hac parochia, per mese (vel) aqua communicatum, cujus de statu libero satis constabat, et Mariam Connor U-S e loco Filiam baptizatam in die mensis Anni in hac parochia, per mese (vel) aqua communicatam, cujus de statu libero satis constabat, Præsentibus testibus Essie Bell et Essie Farley Hujus Matrimonii notitiam misi ad Rectores ecclesiarum in quibus jam dicti Sponsi baptizati sunt. [illegible] Collins Pastor (vel) delegatus a Sponsis { Parocho Ordinario	


Registrum Matrimoniorum in Ecclesia
Dioecesis
Registrum Matrimoniorum in Ecclesia
Dioecesis



Los contrayentes para constar que durante su unión han tenido los siguientes hijos

Ernie Reed 3 years

Rudolph Reed 1 "

los cuales reconocen como tales a fin de que puedan gozar de todos los derechos que la Ley acuerda a los hijos legítimos.

El Cura Párroco,

El Contrayente. La Contrayente.

Testigos.

Nº

Número

ACTA DE MATRIMONIO

Yo, Denis J. M. Carthy C.SS.R.

Cura de San Vicente de Paul

Que en la parroquia expresada unió en vínculo matrimonial a Matheo Mc Leod Ryder de 57 años de edad, de nacionalidad Jamaicano de profesión Ingeniero, domiciliado en Panamá, y residente en Pueblo Nuevo, hijo de Williams Jones Ryder y de Ana Elizabeth Ryder y a Manuela María Batón de 21 años de edad, de nacionalidad Panameña, de profesión Oficios domiciliada en Panamá y residente en Pueblo Nuevo hijo de Inclair Batón y Victoria Ofreda Batón en presencia de los testigos señores

mayores de edad y sin tacha legal, quienes conmigo y con los contrayentes firman para constancia.

Denis J. M. Carthy C.SS.R.
Cura

El desposado. La desposada.

Matheo Mc Leod Ryder Manuela María Batón

Los testigos.

Clemente Garcia Faustina Garcia

25 de Julio de 1914

ACTA DE MATRIMONIO

2)

Nº 83

Yo, Robert B. Clifford C.M.
nombre del sacerdote o ministro religioso

Cura Asistente de San Vicente
título

Que en la fecha abajo expresada uní en vínculo matrimonial a Clifford Marville de 47 años de edad, de nacionalidad Barbadino de profesión Zapatero domiciliado en Panama, y residente en 15 de Fab # 10, hijo de John Marville & Catherine de Marville y a Modestine Thomas de 30 años de edad, de nacionalidad Barbadinas, de profesión Domesticos domiciliada en Panama y residente en 15 de Feb # 10 hija de Robinson S.T. Louis & Hannaine Thomas en presencia de los testigos señores Thomas St. Clair y Emerencia Lagonteré ambos varones, mayores de edad y sin tacha legal, quienes conmigo y con los contrayentes firman para constancia.

Robert B. Clifford C.M.
firma

Cura Asistente de San Vicente
título

El desposado,

Clifford Marville

La desposada,

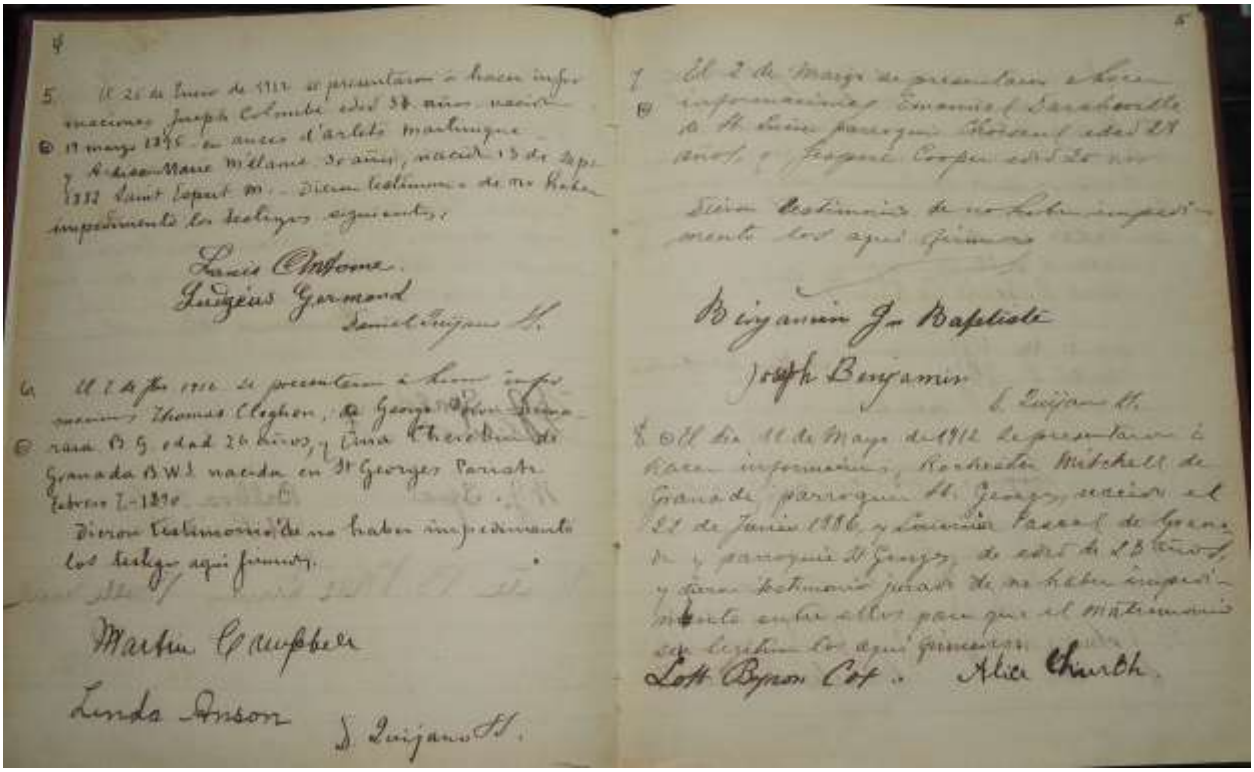
Modestine Thomas

Testigos,

Thomas St Clair

Emerencia Lagonteré

22 de Abril de 1944.



4

5 El 26 de Junio de 1912 se presentaron a hacer informaciones Joseph Columbi edad 38 años nacido el 19 marzo 1875 en Anses d'Arlets Martinique y Adèle-Marie Mélanie de años, nacida 13 de Agosto 1882 Saint Esprit M. - Dieron testimonio de no haber impedimento los testigos siguientes:

Lucie Antoine.
Benjamin Germond
Samuel Benjamin S.

6 El 8 de Julio 1912 se presentaron a hacer informaciones Thomas Cleghorn, de George Town Granada B.W.I. edad 26 años, y Anna Theresa de Granada B.W.I. nacida en St Georges Parroquia Febrero 7-1890

Dieron testimonio de no haber impedimento los testigos aquí firmados.

Martin Campbell
Linda Anson
S. Benjamin H.

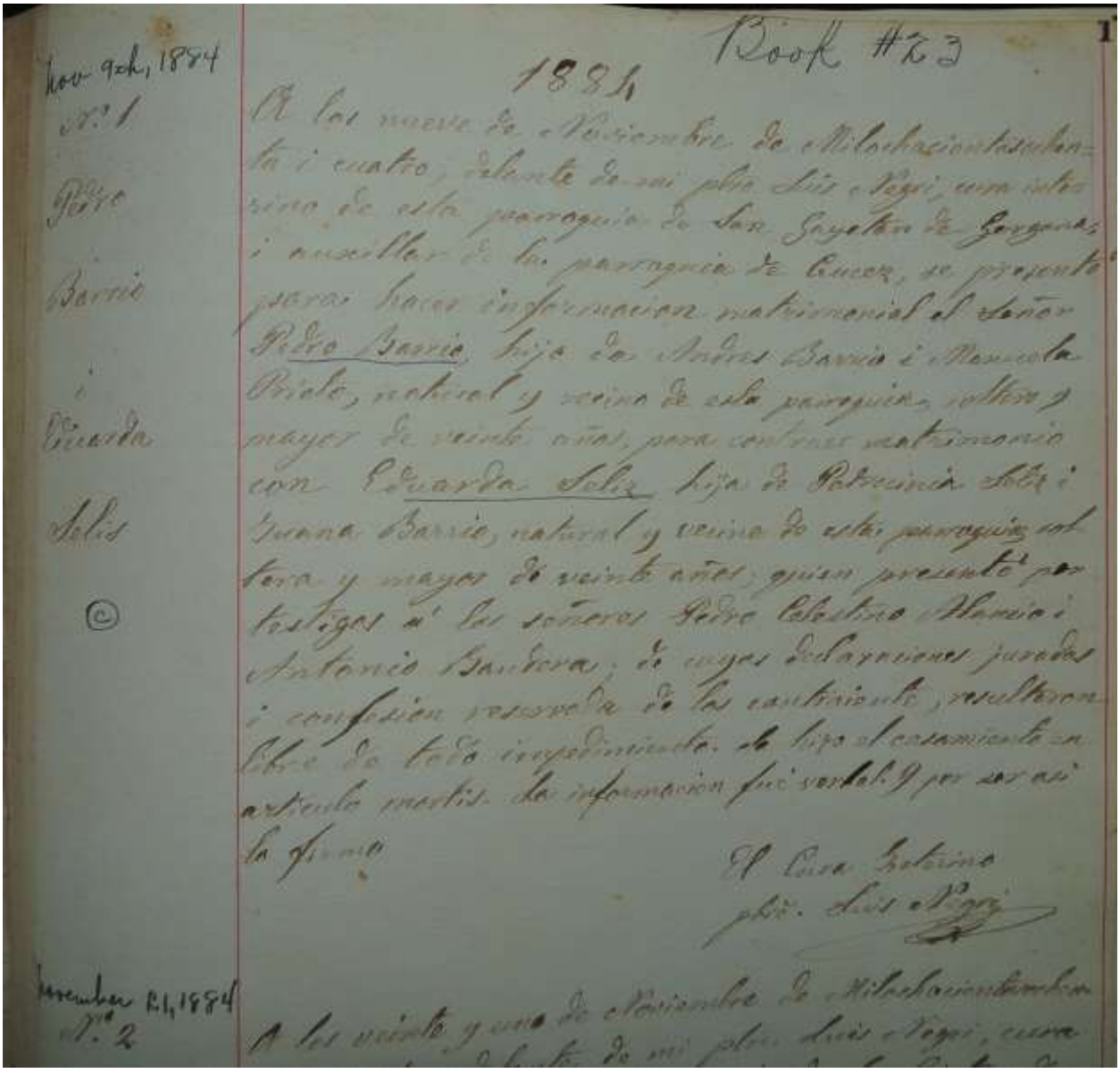
7 El 2 de Mayo se presentaron a hacer informaciones Emanuel Sarabonde de St Lucia parroquia Castries edad 29 años, y Eugenie Cooper edad 26 años

Sirvan testimonio de no haber impedimento los aquí firmados

Benjamin Jn Baptiste
Joseph Benjamin
S. Benjamin H.

8 El dia 11 de Mayo de 1912 se presentaron a hacer informaciones, Rochester Mitchell de Granada parroquia St. Georges, soltero el 21 de Junio 1886 y Lavinia Pascal de Granada y parroquia St Georges, de edad de 18 años, y dieron testimonio jurado de no haber impedimento entre ellos para que el Matrimonio sea legalmente aquí firmados.

Lott Byron Col. Alice Church.



Nov 9th, 1884
N.º 1

Pedro
Barrio
i
Eduarda
Solis

©

Book #23

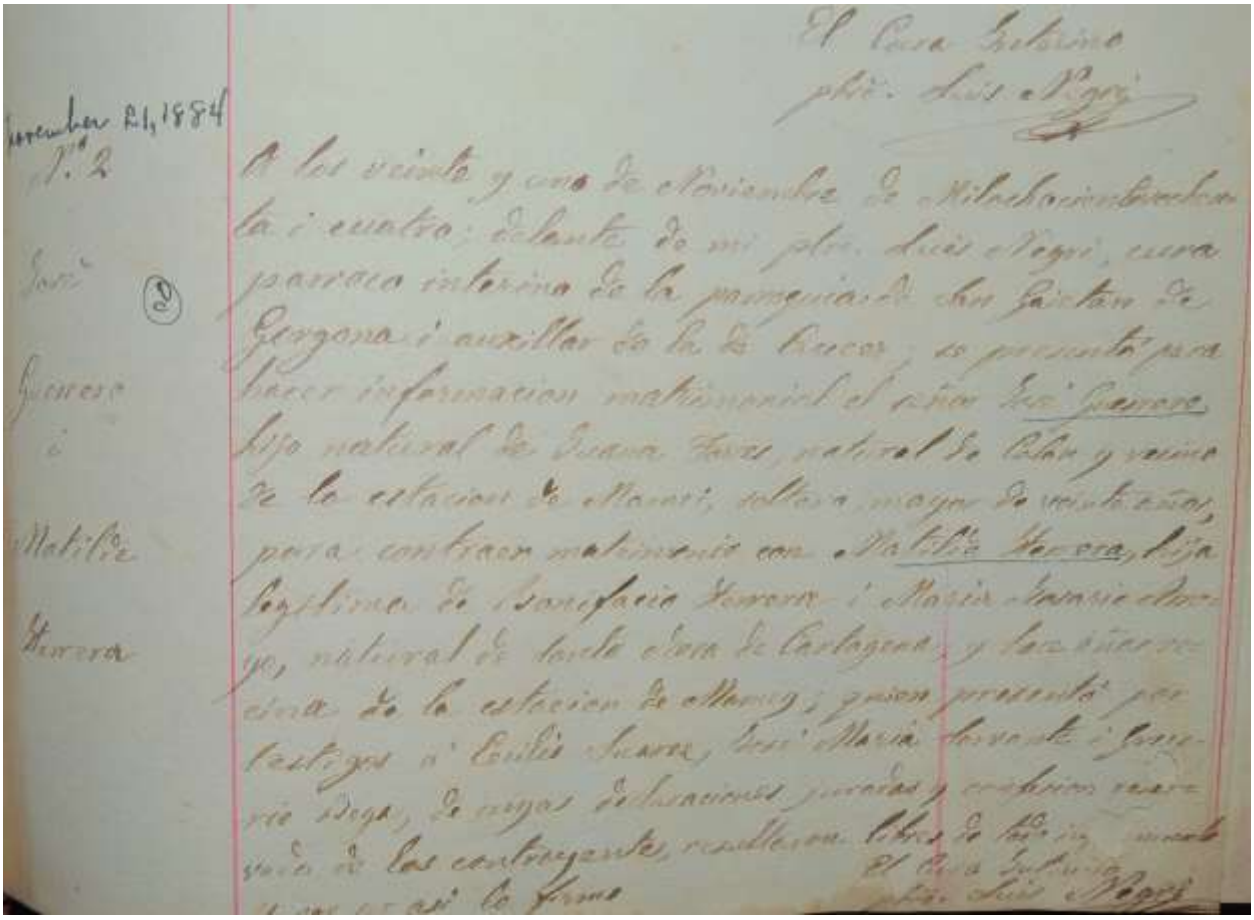
1884

A los nueve de Noviembre de Mil ochocientos ochenta i cuatro, ante mi pbro. Luis Vigil, cura interino de esta parroquia de San Joaquin de Gorgonas i ausiliar de la parroquia de Cucer, se presento para hacer informacion matrimonial el señor Pedro Barrio, hijo de Andres Barrio i Rosenda Prado, natural y vecino de esta parroquia, soltero y mayor de veinte años, para contraer matrimonio con Eduarda Solis hija de Petronila Solis i Juana Barrio, natural y vecina de esta parroquia soltera y mayor de veinte años; quien presento por testigos a los señores Pedro Celestino Blanco i Antonio Sanchez; de cuyas declaraciones juradas i confesion reservada de los contrayentes, resultaron libres de todo impedimento. de lo que el escribiente da fe. Dicha informacion fue verbal. Y por ser asi la firmo.

El Cura Interino
pbro. Luis Vigil

December 11, 1884
N.º 2

A los veinte y uno de Noviembre de Mil ochocientos ochenta



Diciembre 21, 1884
Nº 2

José
Guerra
i
Matilde
Herrera

El Cura Interino
Pbro. Luis Vigo

A los veinte y uno de Diciembre de mil ochocientos ochenta i cuatro; delante de mi Pbro. Luis Vigo, cura parroco interino de la parroquia de San Gaetano de Gergona i auxiliar de la de Nueva, se presentó para hacer informacion matrimonial el señor José Guerra hijo natural de Juana Nuez, natural de Olot y vecino de la estacion de Manresa, soltero mayor de veinte años, para contraer matrimonio con Matilde Herrera, hija legitima de Buenaventura Herrera i María Ramis ambos, natural de esta villa de Cartagena, y vecinos esta de la estacion de Manresa; y para presentó por testigos a Emilio Suarez, José María Serrate i José Vera Vega, de cuyas declaraciones juradas y contestes resulta: de los contrayentes, resultaron libres de todo impedimento

El Cura Interino
Pbro. Luis Vigo

lo que así lo firmo

Death Records