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Implementing an Image Management Software for the

Armenian EyeCare Project

An Interactive Qualifying Project Report submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor of Science in cooperation with the Armenian EyeCare Project. Submitted May 3rd, 2023.

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Abstract

The Armenian EyeCare Project (AECP), a non-profit organization that works to eliminate preventable blindness in Armenia, has thousands of photos of their work that are not easily locatable but are useful in promotional materials. We identified an image management software from best practices to help better organize these photos and then we created a workflow guide to help them use this software proficiently. Finally, we recommended a way for them to manage their devices so they can utilize their licenses.

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Authorship

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Executive Summary

We were tasked with researching, selecting, and integrating an image management software for the Armenian EyeCare Project (AECP). The AECP has large amounts of visual data such as photographs and videos that are not organized well. Our goal was to choose an image management software that can easily keep track of all the images produced by the AECP such that they may use the images for marketing and spreading awareness about their mission. An image management system is a method of categorizing, sorting, and storing images for future use. This is paramount for organizations that require quick exchanges of data or need to use images to build a positive reputation to attract potential donors.

To achieve our goal, we developed two objectives that satisfied the AECP's requirements. Then to achieve our objectives we used a handful of different methods to ensure we identified practical solutions. While doing so we remained in touch with the staff to ensure we tailored this system to fit the AECP's needs perfectly so they can use the system without our aid.

Our first objective was to conduct research and select the best software for the AECP's needs based on a list of requirements they gave to us. The requirements included filtering systems, duplicate identification, the ability to create customs tags, and accessibility through the internet. To complete the AECP's request we used a decision matrix to weigh the strengths and weaknesses of four different software platforms (Adobe Bridge, Adobe Elements Organizer, Phototheca, and Excire Foto). In this decision matrix, Excire Foto scored the highest, and after a presentation to the AECP on the pros and cons of each software, as well as a live demo, they ultimately agreed to move forward with Excire Foto.

Excire Foto's ability to detect and delete duplicates, customizable tagging options, and powerful search functionality make it an attractive option to the AECP. The software was also the most intuitive out of the four, which made it easier for us to teach the AECP how to use it. However, the software has limitations such as cluttered automatic tagging, the inability to search for photo metadata, and unnecessary sort and filter options. Despite the limitations, Excire Foto turned out to be the most well-rounded software, while still being cost-efficient at a $99 one-time payment, however, major software updates cost an extra $30 a year. The software will still work even without the updates.

Our second objective was to develop a workflow to ensure the AECP will be proficient in the selected software. The Workflow is a set of instructions that will cover all scenarios about which the AECP must learn to use the software to its fullest capabilities. After we tested the software ourselves, we designed a standardized workflow to teach users how to use the software effectively. We continued to refine the Workflow by using participant observations through our pilot program to make sure the chosen software worked as intended. The pilot program was run concurrently with creating the Workflow and was tested by members of the AECP public relations team and other volunteers. It consisted of completing common tasks while using the Workflow as a guide, and after completion, we would ask the user for their experience and any other feedback they had. Most of this feedback related to the length and detail of the Workflow, that some sections were wordy, and that a 50-page document can be daunting. By using this feedback we were able to include instructions on how to complete the most common tasks the AECP will run into whilst using the software. This was crucial as the user must be able to navigate the software with ease and be able to troubleshoot common issues they might run into while using the software. The Workflow we designed will help the AECP integrate their photos into the image management software efficiently and facilitate easy use and software navigation.

In the end, we also developed the Quick Reference Guide (Appendix A), a document that is made for experienced users of the software that has hyperlinks to the main Workflow documentation. This way the user has the option to read the more detailed Workflow only if they chose to and are not subjected to reading through a large document just to answer a simple question. We also created a Glossary (Appendix B) and a Standardization Guide (Appendix C). The Glossary contains relevant definitions that will help the user understand the Workflow, popular keyboard shortcuts that allow the user to navigate the software faster, and a Workflow Key that explains the naming convention of the Workflow. The Standardization Guide is a small document that includes precautions to ensure the AECP remains consistent as they integrate their photos into the system. For example, the guide also includes a list of abbreviated tags so any user who adds photos knows what tags to use. This way they'll be no duplicated that may clutter the system and make images harder to find.

The AECP's main image storage method is currently a 1.5 TB hard drive they keep in their main office in Armenia. In this system, each photo is named based on location, and the project name. The drive also includes the date the photo was taken. The use of the new image

management software made sure all of these images were integrated into the hardware. In this case that would mean that all of the AECP's photos were placed in the hard drive. This would mean any other photo that was not in the hard drive would have to be transferred over. By having everything in one place, all images can be sorted through and no images will be lost to time. Furthermore, there are differences in the tags used by AECP and the photographer, and this software will assist in standardizing these tags.

Introduction

The Armenian EyeCare Project (AECP) is an organization formed to combat the abundant issues regarding eye disease in the different regions of Armenia. The AECP works with local experts and volunteers to help the people of Armenia by preventing blindness and increasing other aspects of general eye care. Running such an organization generates lots of information, such as documents and visual data. Organizing the data can be challenging and slows down the process of relocating this data.

Carefully selected images of the organization's work that are strategically placed on websites or other services such as social media platforms can help promote an organization, build its credibility, and improve its overall reputation. This in turn can lead to the AECP having a greater influence in spreading their mission and receiving more funding from donors and other groups that want to support a successful organization. Therefore, being able to easily locate all of their photos will help the AECP promote their organization more efficiently. Additionally, it is worth noting that poor image management can negatively impact the organization, as choosing photos that do not accurately represent the organization can prevent promotional campaigns from reaching their full potential.

In this project, we set out to solve the AECP's current problems with image management. As of now, the AECP has a large number of photos that capture the work and success of the organization, however, these photos are not easily locatable. Most of their photos are saved on a single hard drive without a consistent method of naming or tagging these photos. We picked an image management software for the AECP to help them easily locate their photos and solve this organizational problem. In doing so the organization will be able to manage their important visual data quickly and easily, without the struggle of sorting through hundreds of folders.

Background

      After Armenia gained independence from the USSR, its economy transitioned from communism to capitalism, which meant that medical services that were once free and accessible to the public were not free anymore. This led to an immense burden on not only Armenia's economy but also the population of Armenia that needed to access these services. The Armenian population's inability to pay for these medical services out of pocket became one of their main concerns about primary care services (Hovhannisyan, 2004). Even today, because of the privatization of the healthcare sector, the cost of healthcare and accessibility to decent healthcare remains an issue. One of the solutions that the Armenian government tried to implement was introducing voluntary health insurance. A major issue that came up with implementing health insurance was that the people of Armenia do not have enough money to spend on health insurance and this solution only makes sense for corporate clients (Lilit, 2016). Furthermore, in recent years the Armenian government has taken steps to ensure that all of its population will be insured under voluntary health insurance by the year 2027 (Ghazanchyan, 2023). Although some progress was made by the Armenian government between the years 2000 and 2008 to improve its healthcare system post-independence, it still hasn't provided any noticeable results for the people of Armenia. The shortcomings of Armenia's healthcare system, like its expense and lack of accessibility, outweigh the progress that it has made over the years to address health disparities, especially when it comes to eye care.

      Among the Armenian population, vision-related problems seem to be one of the most pressing issues. For example, myopia or nearsightedness affects about 34% of the Armenian population. However, one outcome of the 2020 war between Armenia and Azerbaijan was the heightened prevalence of eye care-related issues in the Armenian population due to an already prevalent lack of accessibility to healthcare resources (Master, 2022). The severity of eye care problems in Armenia can be seen in their longevity and the variety of ailments that adults and children alike experience (Markosian, 2014). Eye diseases ranging from glaucoma to diabetes-related eye diseases to blindness are spread among adults and children in Armenia. To counter the many eye care-related problems in Armenia, the Armenian EyeCare Project (AECP) was started in 1992. The AECP is a non-profit organization funded almost entirely by its donors

to ensure the Armenian population has adequate access to eye care services by providing them with mobile hospitals and ophthalmic assessments in rural and urban areas.

The AECP was founded by an ophthalmologist from California, Roger Ohanesian, M.D., after a trip with other eye doctors to help treat those affected by both the First Nagorno-Karabakh War with Azerbaijan and an earthquake that caused damage across the country in 1988. Currently, the AECP holds biannual trips for American ophthalmologists to travel to Armenia to help continue this mission, which in 2002 became known as "Bringing Sight to Armenian Eyes". In the past 30 years of the project, there have been over 50 missions consisting of American ophthalmologists and reconstructive surgeons, seeking the goals of "eliminating preventable blindness in Armenia" and "making quality eye care accessible to everyone in the country" (Armenian EyeCare Project, 2022).

To accomplish these goals, the AECP has a focused, five-point strategy. This strategy involves Direct Patient Care, Medical Education and Training, Public Education, Research, and Capacity Building. Some examples of accomplishments that the AECP has made regarding each of these five points are providing 70,000 prescription glasses for free, developing ophthalmology residency programs in Armenia, giving Armenian physicians fellowships in the United States, as well as organizing field trips for students and creating public education booths for the annual World Sight Day in October.

Another one of the AECP's accomplishments is the introduction of their mobile eye hospital (MEH). Started in 2003, the hospital is a tractor-trailer that features state-of-the-art medical equipment, including two full exam rooms and one full operating room. It has served over 35,000 Armenians in remote areas by providing them with free eye care and continues to travel through Armenia every year. It is specifically designed to treat patients in "socially vulnerable" situations as defined by the Armenian government (Armenian EyeCare Project, 2022). The MEH is important because giving treatment is typically a race against the clock, as without any form of care, many patients will have a very high risk of worsening symptoms (Hill, et al., 2003). They have also been able to treat over 70,000 diabetic patients for diabetic eye disease, and in a 2021 initiative, the AECP gave basic screenings to 3,000 schoolchildren in six of the eleven Armenian provinces they serve (Armenian Eye Care Project, 2022).

The AECP has not only made an impact in Armenia, they have also had worldwide influence as an organization. In 2020, they partnered with the Children's Hospital of Los Angeles

and hosted international virtual training conferences to keep the medical world connected during the pandemic (Gaolyan, et al., 2022). They have also partnered with Lumière Française to create a Franco-Armenian Ophthalmic School in Armenia, where they have implemented a fellowship program for Armenian eye-care physicians.

The AECP has thousands of photos of the work that they have accomplished that are all currently saved either on hard drives or cloud storage. However, they are not easily locatable and accessible. Through the use of an image management software, finding and organizing their photos will help showcase the success this nonprofit has achieved. Before delving into image management software it is important to understand why these pictures hold such great importance to the AECP.

With the AECP being a non-profit organization, they rely on their photos for advertising to show the world the work they have accomplished to promote donations, fundraisers, and government aid. There are several ways to donate to the AECP. One of their most prominent ways is through a program they call "Planned Giving". A planned gift is any donation given to the AECP that will benefit the organization for a specific purpose. Planned giving has such a large impact on the AECP due to the methods in which one could give. These types of donations do not just involve paying with cash or check, which directly go to the organization. When one partakes in gift planning, one's donations could be multidimensional. These donations could be in the form of assets, such as land or stock and bonds which can be liquidated for the benefit of the AECP. One can also make a bequest to the organization in their will.

It's also important to note that when donating through planned giving, the donor would know exactly what they're donating for. On the AECP website, a donor can pay for a specific cause. Each payment amount correlates to a specific focus of support that the AECP requires. For example, for $100, one can grant eyeglasses to five children, and for $800, one can give someone a corneal transplant surgery. This creates a greater desire for donations because people know what they are giving to.

Another innovative way for people to donate to the project is through the "Adopt A Village" program. In this program, people pledge money to help fund the MEH to visit a selected village for some time. While the eye hospital is there, they take photos and collect stories of the impact of the AECP from those who live in the village. (Armenian EyeCare Project, 2022).

The AECP's photos also play a key role in securing government aid by effectively showcasing the impact of the organization's work and the needs of the communities it serves. In 2004 the AECP received a $750,000 grant from the USAID to improve their eye care services. Thomas Adams, the Coordinator for the U.S. Assistance to Europe and Eurasia, came to visit the AECP site in Armenia and stated, "*You know I am so glad to have the chance to finally see this site because we see the images, read the stories in the newsletter. But it is very-very impressive to be here at the actual location, to see the surgeries in progress. I think it is very important work and a very commendable effort*" (Armenian EyeCare Project, 2022).

Whichever way a person chooses to donate, these photos are important because, without them, the donors would have no idea of the impact they are having on the lives of those to whom they are donating. Therefore, the AECP must have an effective way to collect all these images, and then distribute them in a quick manner.

Image management is a multi-layered system that stores, retrieves, and categorizes images and other visual data for future use. Many people use image management in their everyday lives without even realizing it. Taking a picture of something one likes and storing it in an album is image management. Also, having a smartphone automatically back up a video to cloud storage is image management. But for larger groups such as organizations, institutions, and businesses, this process is more than just keeping track of memories and cataloging photos. Efficient data retrieval and storage are crucial for organizations or businesses that rely on accuracy and convenience; utilizing effective image management methods can greatly help with maintaining these goals (Tikekar, 1995). But what is the most effective way to store and manage visual data? This all depends on many conditions, but in general, there are two major types of storage techniques: physical storage and digital storage.

One of the oldest ways of managing images is what we will call 'simple storage,' as it is the simplest way to store images cohesively. This can be something as simple as using physical folders and filing compartments to store and categorize physical images. Simple storage is something that works on a small scale or when computers or other necessary equipment like scanners are not available. For reference, after speaking briefly with our sponsors, we discovered that the AECP is storing some of their images physically from decades ago when the organization was founded. This makes categorizing and searching for images very difficult. Additionally, we can't ignore the fact that these photographs are not immune to damage.

Whether that be due to humidity, temperature, or time, by converting these images to a digital space (such as .PNG or .JPG files) they can be preserved and searched for more easily. We will not be scanning their physical photos but this is something the AECP can do to preserve their valuable older photos.

The better option for storing images is to digitize images and store them on either physical drives like hard disk drives (HDD) or solid-state drives (SSD) or upload the data to a cloud storage system. From now on, we will refer to the storage method of storing digital data on physical devices as 'physical storage'. By digitizing the photos, they can be condensed down and stored on a single, conveniently sized device. This would allow for easier use and clear a lot of clutter. Digitizing data also allows for tagging and the use of metadata. Tagging can be manual or automatic details that can be applied to images directly. An example would be tagging an image as "outside" so that if a person searches in an image database for images that are outside, relevant images will come up. Metadata on the other hand is information about the image itself, rather than what the image contains. Some examples would be the image's author, the date and time it was captured, etc. These two different digital storage methods are incredibly powerful and we can weigh both options against each other to come to a decision that will best suit the AECP's needs.

To start, physical storage conceptually is simpler and is a great solution to image management. An effective way to store data physically is through something called "data warehouses," which are large storage centers for data. These could be a collection of hard drives or a hallway of filing cabinets. This quote from Rahul V. Tikekar, a member of the Department of Computer Science at Wayne State University, on the storage and retrieval of medical images explains the use and effectiveness of data warehouses: "*We regard the warehouse as a pyramid with fast storage devices at the top and slower storage devices at the bottom. Our approach is to store the most needed information abstract at the top of the pyramid and more detailed and storage-consuming data toward the end of the pyramid. This information is linked for browsing purposes. In a similar fashion, during the retrieval of data, the user is given a sample representation with a browse option of the detailed data and, as required, more and more details are made available*" (Tikekar, 1995). This quote is a prime example of companies using digital storage techniques to manage photos that all may need to be referenced someday. We chose to reference this source even though it may be old because it is still relevant to what other

organizations do today. Even if the technology changed drastically the concept is still widely used and considered in data management.

       Figure 1 demonstrates an effective way to store images and other visual data with physical devices. Physical data can be stored effectively in SSDs and HDDs in a similar format. SSDs are faster but more expensive while HDDs are slower but cheaper. The top of this pyramid is cloud storage, which is the quickest for immediate access but is separated from the main pyramid as its logistics are slightly different.
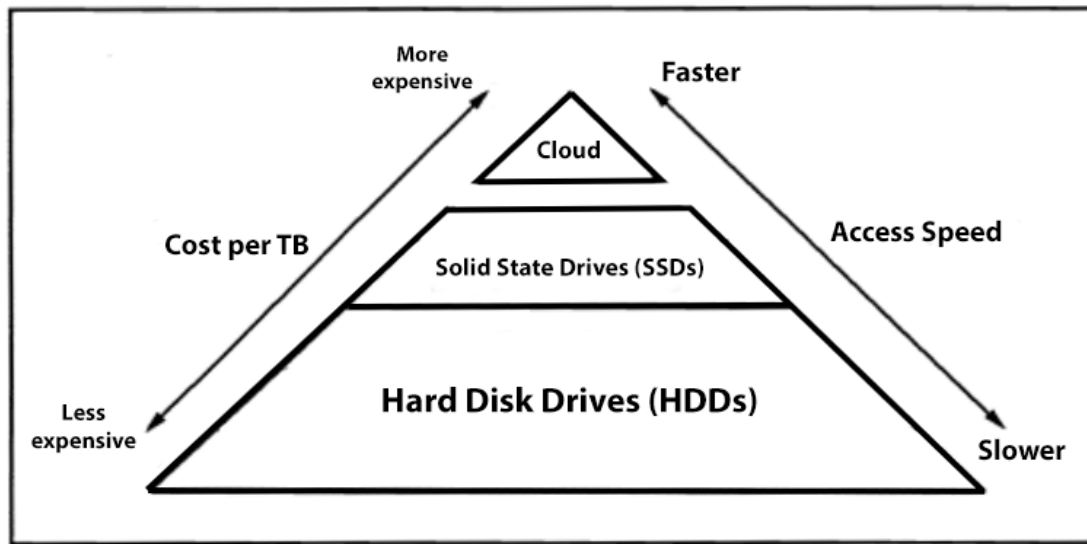
Figure 1: The Updated Storage Pyramid (Based on: Tikekar, 1995)

       Figure 2 explains the differences between a SSD and HDD and we can use these differences to our advantage. As HDDs are cheaper and slightly slower, we can place them at the bottom of our data warehouse and keep the faster SSDs on the top. By storing more actively referenced data towards the top of the pyramid, and older data that are less important at the bottom, we can increase the speed with which the images are stored and found.

Figure 2: SSD vs. HDD (*SSD vs HDD: Which Do You Need?*, 2022)

Cloud storage is the other potential path for image management. Cloud storage is the process of uploading images and other data to an online server where it can be stored elsewhere. While convenient, as images can be stored anywhere as long as an internet connection is available, it still relies on the speed and reliability of the internet connection. Clo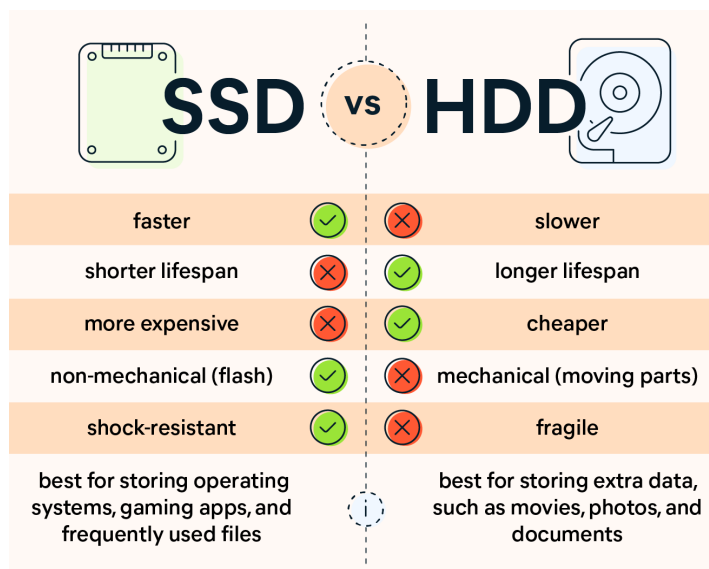ud storage is very lightweight, which means that it's fast and doesn't require a lot of computing power, unlike physical storage which can take up lots of memory space. The physical storage in turn can slow the computer down and make using it effectively more difficult. However, cloud storage can potentially store as much information as physical storage, and can be accessible by practically any device with an internet connection. But as seen in Figure 1, cloud storage is very expensive when compared to physical devices for storing a large amount of data. This means depending on an organization's budget and preferences, both cloud and physical methods can be very effective in storing and organizing data.

We also included cloud storage in our data warehouse, but keeping the way we store images consistent is incredibly important. For example, if one wanted to find a certain photograph, it would take extra time to check both the cloud and physical storage system, instead, we wanted a single place to hold all the visual data. This would make a divide between images that are stored on the cloud vs. images that are stored on physical devices with the main software. As consistency is key, we will need to adapt a workflow to standardize this process.

One of the most time-consuming parts of image management is forming a workflow and transitioning into a new system. Even so, image management is crucial to increasing the reputation, credibility, and general output of organizations that are dependent on visual data. So much so that a conference named the Image Management and Communication (IMAC) conference was held in Washington, D.C. in 1989 addressing the importance of image management in patient care. In the opening remarks of the conference, Dr. Seong K. Mun, the co-chairman of the IMAC, stated "*As we are trying to implement this image management technology on a larger scale, we have learned that the technology is only a small part of the problem. What we are learning is that we do not even know at times the types of problems we are trying to address using rather expensive, sophisticated technology*" (Mun, 1989). In the late 1980s and 1990s the movement of implementing image management was a daunting task, but it was still completed. This conference demonstrated that smaller, independent organizations can confidently adopt an image management system, even if the task seems overwhelming.

However, some other specific concerns with image management must be considered. Some of the main concerns are 'temporal factors', 'data volume', and 'data redundancy'. These three factors were developed and considered in the study "*Better management of Western blotting results using professional photo management software,*" where scientists used an image management software to sort and analyze photos of their blotting results. Temporal factors involve older data that are not as needed as current data and can be allocated to slower/older storage devices or backlogged (Iorio-Morin et al., 2013). For instance, the bottom of our storage pyramid can include these older images that may not be as necessary today. Data volume is the concern of taking up lots of space with the general file sizes. Depending on the data type (e.g. images, image sequences, video, and audio clips) the file size can vary greatly so these will require more space and can be optimized with compression methods. Some image management software will likely include this automatically, as it is easier to store and access data that have a smaller size (Iorio-Morin et al., 2013). Finally, data redundancy concerns the existence of duplicate images. In images and other visual data, there exists a lot of redundancy. This can be necessary as data backups are very important, but in general too much can slow down the computer's processing power and increase the time it takes to find images. As an example, having ten photos of one's dog for the sole purpose of portraying what the dog looks like is

unnecessary as just one or two would suffice. To combat this, redundant data could either be cleared or stored on slower devices as backups (Iorio-Morin, et al., 2013).

To consider these factors it is important to have an effective and efficient workflow. For example, the scientists Iorio-Morin, Germain, and Parent from the aforementioned study developed and used the workflow seen in Figure 3 below.
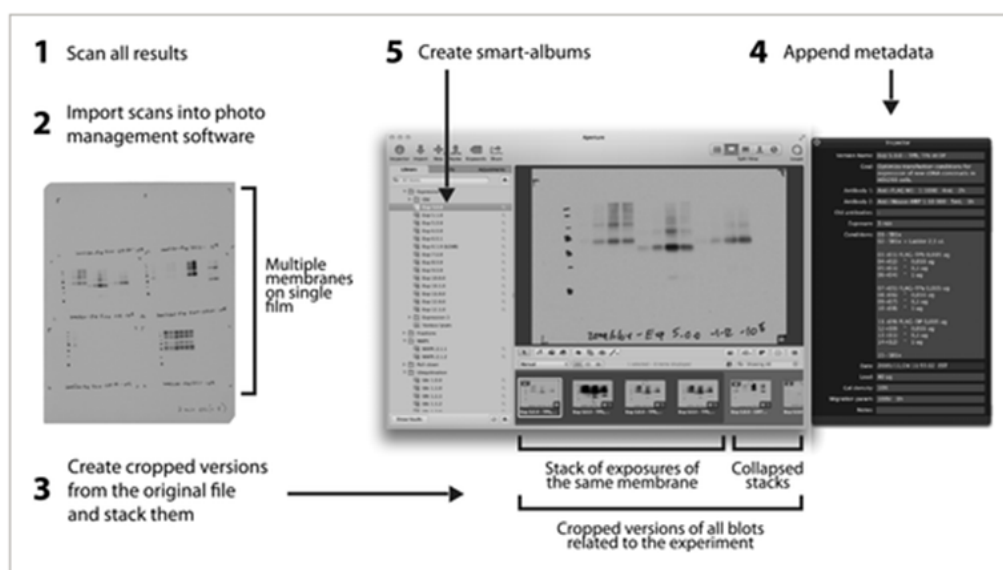
Figure 3: Workflow Example (Iorio-Morin, et al., 2013)

Their method of digitizing, importing, cropping, categorizing, and tagging images is simple and effective in managing visual data. The scientists involved in the study used Apple's Aperture photo management software (now discontinued), but this can be done in different softwares, both physical and cloud-based. Some examples of Cloud storage are Google Photos, iDrive, iCloud, Dropbox, and Microsoft OneDrive (Dekerlegand, 2020). Examples of Physical storage-based software are Adobe Bridge, Adobe Lightroom, and ACDSee (DesignRush, 2023).

With this modern image management software and using the techniques and methods that have worked since the early days of image management, we can select the best fit for the AECP and develop a workflow to effectively influence the company with real, long-lasting effects.

Methodology

The goal of our project was to assist the AECP to choose an image management software to help them store, sort, filter, and tag their photos to easily keep track of all the images they produce.

We established two objectives that streamlined the project's progression and allowed for an understanding of how we seek to achieve our project's goal. Our objectives were as follows:

1. Choose an image management software that meets the AECP's needs based on input from current AECP employees.
   - → Methods: Extensive background research, interviews, and decision matrices.
2. Through a pilot program, create a refined workflow to ensure the AECP becomes proficient in using the selected image management software.
   - → Methods: Participant observation, interviews with the AECP, learn the software ourselves then teach the program to the AECP using the Workflow.

We used a variety of methods in these objectives to produce desired outcomes to meet our goal. They will also aid the AECP's positive influence on the country of Armenia and set an example for other organizations that may be struggling with similar issues.

Objective 1

To better understand image management software, we conducted extensive research on image management best practices. We reached out to the American University of Armenia's (AUA's) Communications Department, which is well-versed in image management for the use of the university's promotion materials. By observing the photo organization and retrieval practices of the AUA's Communications Department, we gained valuable insights to better support the AECP in improving their photo management. We also reached out to and interviewed the Worcester Polytechnic Institute (WPI) Media Team to talk about how they store their pictures and how they archive them. We conducted these interviews to understand how organizations as big as the AUA and WPI manage and store their images and talk about any other tools they use to do the same.

Our second method was to conduct interviews with the AECP's staff to get a better understanding of their needs. In these interviews, we aimed to assess the present state of usability

of the software. In addition to gathering information about image management software, we also aimed to understand common problems they encounter while trying to locate their photos and how they might impact the AECP's use of a software. By acquiring this information, we enhanced our understanding of the particular features to consider while selecting an image management software.

Once we knew the features the AECP were looking for as well as the features they didn't want, we then chose four image management software platforms we thought would suit the AECP. After compiling the list of the AECP's desired and the available features from each image management software, we created a decision matrix to choose the best image management software that fits their needs. With this decision matrix, we considered multiple factors that the AECP desires to have in the software including photo tagging, sharing options, and affordability, rating them on a scale of 0-3. A score of 0 means that the feature doesn't exist in the software, 1 means that the feature is there but unintuitive, 2 means it is intuitive but could be improved, and 3 means that the feature can be used intuitively. We then presented to the AECP the decision matrix, the pros and cons of each software, as well as a live demo.

Objective 2

In our second objective, we taught the AECP staff how to use the software. To do this we switched back and forth from creating a pilot program and revising a workflow to ensure that the AECP becomes proficient in using the software. The Workflow is a set of instructions that will cover all scenarios for which the AECP must learn to use the software to its fullest capabilities. The pilot program, which were test runs of the Workflow, verified the effectiveness of the Workflow itself. The Workflow we designed will help the AECP integrate their photos into the image management software efficiently and facilitate navigation and utilization of the storage system. To conduct these usability tests we provided users with our Workflow and the software, gave them sample photos to work with, and saw if they can complete the provided task without difficulty and within a reasonable amount of time.

The first steps we took to formulate the Workflow were to interview Art Simon, one of the AECP's main photographers, to learn how he organizes and tags new photos before adding them into his system. This gave us valuable insight as understanding a professional photographer's workflow helped us create our own Workflow. By considering his methods, we

located the potentially confusing steps and knew to pay extra attention to how to work through them.

We then learned the software ourselves and used an iterative process where we created a draft of the Workflow, found what worked well and observed participants unrelated to the AECP using the Workflow, then revised it and repeated the process. After we revised the Workflow we handed it over to the AECP team so they could test it. We then met with the team again and gathered their feedback on the Workflow and answered any questions they had about the software and the Workflow. We also briefly went over the searching, tagging, and installation because we felt it was necessary to provide in person detail.

The details on this are that we gave the first draft of the Workflow and the software with some sample photos to a volunteer, and we asked them to complete some tasks related to the software. We watched how they interacted with the software, and then at the end asked for feedback on revisions that may have needed to be made. There are two main groups with whom we ran the pilot program: our peers and staff members of the AECP who will be using the software. By not constantly asking the AECP to go over every Workflow iteration, we were able to avoid interfering with the AECP's staff schedule. It was also important to gather feedback from people with all different backgrounds and technical experiences, so by testing it with our peers, we could gather another perspective on how to use the software. We met with our project advisor from WPI, Prof. Aaron Sakulich, and our project advisor from the AUA, Mr. Norayr Ben Ohanian, to go through a handful of tasks to get an initial impression of how our Workflow will read and perform. We then repeated this same process with several members of our cohort, and after each use, we made improvements based on the feedback provided. Lastly, we gave the Workflow to the AECP for them to use, and after a week, in another meeting, they gave us feedback on the Workflow, and we helped them clarify some parts of the Workflow in person.

The biggest task in this objective was making sure we used the correct tags that the AECP had specified and determining the quickest way to apply those tags to each photo. This was the biggest task because we needed to find a way to make tagging photos less time-consuming for the AECP. Some of these tags we made ourselves based on the ones already used by the AECP. For example, if a lot of photos were in a folder labeled '2015', then we recommended the AECP to bulk tag all of those photos with the tag '2015'. Additionally, many of the folders the AECP uses to store their images are labeled with a few keywords such as

events or people of interest in the photos. We applied these same keywords to the images inside the photos as tags to save the AECP time. To standardize the tags, we developed a 'tag table' that contains all of the abbreviations used in the tags (Appendix C). This way tagging will be as easy as possible and anyone who uses the software will tag consistently with the rest of the users. This is how we learned the software ourselves, and we referred to the user manual that came with the software as needed and emailed the support team at Excire Foto for any questions that could not be answered simply.

While doing this, we edited the Workflow by finding what we can do easily, and what requires more time and thought. Effectively in this case refers to how well the AECP can navigate the software and find the exact images they're looking for. Additionally, by standardizing each image's tags and metadata, all the data needed to provide the user with the image's context and relevant information will be available.

The faster and more accurately the image can be found, the more efficient the system will be to use. We used the data gathered from the pilot program to record the most common mistakes and potential negative habits that can reduce the process's efficiency. By creating this workflow, we ensure that anyone at the AECP who picks up the software can use the Workflow to add and export pictures without creating new problems or having any questions. In the event questions should arise, they can consult either an 'FAQ' of the official Excire Foto user manual, or ask someone that has used it more frequently.

Results

As we implemented our methods outlined in the previous section for the first and second objectives, we formulated the following results.

Objective 1

During our initial communication with the AECP, they gave us a list of the most desirable features they needed the image management software to have. The desirable features of the software included that it has checkboxes where necessary to facilitate search, can identify duplicates and the possibility to remove or keep them, can filter photos, have the possibility of customized tagging, and possibly have AI features to make it easier to detect faces.

We met with the AUA Communications Department and with the AECP's main photographer, Art Simon. During these meetings, we discussed the image management software each of them uses to see if it meets the needs the AECP has laid out. The AUA Communications Department uses a network server system that includes not only an image management software but also a university-wide intranet. As for Art Simon, he uses Adobe Bridge to manage his photos. The advice that Art gave us was that when looking for an image management software, "as long as [the AECP] stays consistent with the way they sort and tag their photos, any software they choose to go with will suffice".

We researched a wide variety of image management software, however, based on the software that fit the AECP's needs best, we narrowed it down to four: Excire Foto, Adobe Bridge, Adobe Elements Organizer, and Phototheca. After testing the usability and performance of each software we created our decision matrix, scoring each (Table 1). In addition to the decision matrix, we identified some pros and cons for each software.

Table 1: Software Selection Decision Matrix

AECP Criteria	Adobe Bridge	Adobe Elements	Phototheca	Excire Foto
Searching	1	2	1	2
Duplicates	1	1	3	3
Filter and Sort	2	2	1	1
Tagging	3	3	3	3
Unique Features	3	0	2	2
Total	**10**	**8**	**10**	**11**
Price - Payment Type	*Free*	*$99 - One-time Pay*	*$55 - Pay every year*	*$99 - One-time Pay*

Adobe Bridge's advantages include the ability to tag and search images by a wide range of criteria, smart collections, and bulk editing capabilities. This software is also free, which is convenient for the AECP as they are a non-profit organization with a limited budget. However, some drawbacks include the lack of a duplicate finder, a somewhat unintuitive keyword tagging system, limited filtering options, and the software's storage of images on the hard drive without a cloud connection. Adobe Bridge also includes a collage-making feature that is a nice addition, however, it is not useful for the AECP as they aim to organize their photos. Although there are a lot of unique features that Adobe Bridge has to offer, it lacks the required features, like finding duplicates that the AECP is looking for. The additional features also make Adobe Bridge very hard to learn.

As for Adobe Elements Organizer, its key advantages are its ability to distinguish between .RAW file types (original unedited images) and edited images to prevent duplicate uploads. However, the software's advantages are outweighed by the disadvantages. Some drawbacks include its inability to edit photo metadata and the need to tag each image individually. Additionally, there is no search function available, which is an important requirement for the AECP. Overall, Adobe Elements Organizer is a useful tool for those intending to use it with Adobe Photoshop, but the AECP is more focused on just the organization of their photos. Additionally, its lack of features and limited sorting options did not justify its price of $99.

Phototheca has a duplicate detection feature, an easy-to-use and intuitive tagging system, and a robust search function that allows for keyword and caption/description searches. It also offers timeline and events features and allows for captions and descriptions to be added to photos. However, the software has some drawbacks, such as a less intuitive filtering system, difficulty in manually adding locations, and a higher annual price ($65). This would mean that the AECP would have to budget for the software long-term, instead of buying it once. The software has a unique location tagging feature that can show the location of all photos on a map, although most of the AECP's photos do not contain the location in the metadata, so this feature would not be helpful. Overall, Phototheca is a useful tool for organizing and managing photo collections, but some of its features may require a learning curve, and the cost was not feasible for the AECP.

Excire Foto's ability to detect and delete duplicates, customizable tagging options, and powerful search functionality made it an attractive option to the AECP. The software was also the most intuitive out of the four, which made it easier for us to teach the AECP how to use it. However, the software has limitations such as cluttered automatic tagging, the inability to search for photo metadata, and unnecessary sort and filter options. Despite the limitations, Excire Foto turned out to be the most well-rounded software, while still being cost-efficient at a $99 one-time payment, however, major software updates cost an extra $30 a year. The software will still work even without the updates.

Finally, once we had created the decision matrix and listed the pros and cons, we gave a presentation to the two main employees that will be working with the software, as well as the director of the AECP. Through this presentation, the AECP staff was very impressed by Excire Foto, which also scored the highest in our decision matrix. After giving them a few days they decided to buy the license for the software.

Objective 2

Once the software was bought, we started implementing both a pilot program and workflow as part of the second objective. To ensure that the Workflow is as detailed and useful as possible, we created a first draft based on what we have learned through our testing of the Workflow. We separated our Workflow into two main sections: a glossary section and a tasks section. The glossary section had definitions to any terms in the software that the AECP staff may not understand, as well as common keyboard shortcuts they may use. The tasks section includes detailed step-by-step instructions with accompanying GIFs (animated photos) to aid the user in fully understanding how to complete the tasks, which in turn will teach them the software. Each section was selected based on the most helpful features of Excire Foto and the situations we knew the AECP will run into while integrating their photos into the software. The sections include Installation and Administration, Uploading, Tagging, Collections, Searching, and Backups.

Installation and Administration include instructions on how to begin. This includes steps on installing the software from scratch and using the purchased activation license to use the full version of the software. It also includes a guide on how to manage the licenses so the users can change that devices have access to the software at any time. As there is only an allowance of

three active licenses at a time, this will be important as they may want to give other users access to the database or software.

Uploading includes a guide on how to upload the images from the storage device (this can be a CD, hard drive, local files, etc.) into Excire Foto. It also includes a guide on how to analyze the photos in Excire Foto, this will add the AI-Generated Tags to the photos.

Tagging includes instructions on how to tag photos both individually and in bulk, and recommendations on how to tag the photos effectively. This means the user should be using tags that any user of the software will be able to understand off the top of their head or by consulting the tag list. This will also include a standardized list of tags the AECP should be using. For example, a user should always tag images of the AECP's mobile eye hospital 'MEH' and not tags like 'Mobile Eye Hospital'. This ensures that there is a lower possibility for typos and keeps from redundancy where one person may add the tag 'Mobile Eye Hospital', and another may add 'MEH'. In this case, they would not be found together, even when someone is searching for all pictures of the Mobile Eye Hospital.

Collections include a guide on how to create collections and groups, as well as how to share the albums created by the users with one another by uploading them to the cloud.

Searching includes a detailed guide on the different search-related features Excire Foto contains. It gives instructions on how to find duplicate photos, search by tags, search by different faces, and more. This will allow users to find the exact image they're looking for and make use of all their tags.

Lastly, the backup section is a guide on how to create and restore backups. This will allow the users to save their work and make backups of the database in the case of a user error or software corruption. It will also allow the users to transfer and share the databases.

While conducting the pilot program, we noticed that some of our peers gave us feedback saying that we should condense our Workflow. They reported that although there was a lot of detail for each task, some of the information was unnecessary or redundant. The main takeaway was that the Workflow was very wordy. Some steps may not need as detailed of an explanation as others and, overall, cut the Workflow down to make it more digestible to read and comprehend. We also received feedback on how best to organize our Workflow, leading to our final iteration of one Workflow that includes in one document a quick reference guide (Appendix A), a glossary (Appendix B), and a standardization guide (Appendix C). Note that the Quick

Reference Guide has access to fully-detailed task sections, given in separate documents. This allows the user to use the Quick Reference Guide and the Workflow in tandem easily if needed. In addition, it is a more approachable seven-page document compared to our original 43-page full Workflow. However, within this Workflow are links to the very detailed documents that reference the tasks that the AECP would be doing with the software. This way, whoever is reading it only has to read seven to eight pages at a time, rather than a full 43-page document, just to complete a single task.

The final result was a refined Workflow that is fine-tuned to ensure the AECP can become proficient in the software so they can continue to use it after the delivery of the project. We also understand that as the AECP staff use the software they will become more proficient in it and will not require a large amount of detail in the Workflow, but we created something that appeals to the largest spectrum of tech-savvy people as possible. By doing so we can teach anyone the AECP desires to use the software easily and quickly.

We also received direct feedback from the AECP before they were able to use the software, but after they had read the Workflow. Their public relations team appreciated the level of detail in the Workflow and task sections. After showing them some photos they gave us to tag as an example, they also recommended that we add to search by color and explain in greater detail the purpose of the AI-generated tags and how they are used, which we did shortly thereafter.

Recommendations

Following our results, our main recommendation is that the AECP uses Excire Foto as their main form of image management software as they continue their operations. To go along with this recommendation, we have also made some recommendations to help make sure the AECP uses Excire Foto to its highest capability. These include first reading the detailed task section found in another document before using the Quick Reference Guide to tag any photos. The Workflow is formatted like an instruction manual and includes everything from installation to making collections and tagging photos. The Quick Reference Guide is structured as a manual that can be referenced when one is proficient in using the software. Reading the Workflow would allow the team that will be using the software to understand the features of the software and how to use them efficiently. We also wanted to make sure that whoever uses the Workflow uses it in the same way. These recommendations include:

- Before creating a new keyword (tag), ensure that a similar one is not already in use by checking the custom section of the keyword hierarchy on the right side of the screen.
- When creating a keyword of one or multiple words, capitalize the first letter of every word, to avoid issues regarding the case-sensitivity of keywords in the software.
- Use abbreviations wherever possible, as shown in the Sample Tag Abbreviations section (Appendix C).
- After they upload and tag a folder of photos from an event, they should make a backup of the database in Excire Foto and upload it to a shared cloud folder such as Google Drive.
- Link the AECP Google Drive account to Excire, as shown in the Workflow.

Another recommendation we have involves ways to ensure that Excire Foto remains updated through the time that the AECP uses it. While the initial version of Excire comes at a price point of $99, the yearly update for the software costs an additional $30. We do not recommend that the AECP purchase this yearly, rather they check each year for new features the software might add or update. If they find features they believe would benefit them, then we recommend they purchase the update for that year. The software will continue to work without each update, and minor feature updates and bug fixes are done automatically, however, the update may include valuable new features.

We are also recommending that the AECP implement something the WPI Media Team and the AUA Communications Department use, known as a hot/cold storage system. A hot/cold storage system implies that pictures taken within the last five years would be stored in the hot storage for easy retrieval, while pictures that are older than five years be stored in the cold storage for archive purposes. The hot storage can be a cloud-based system while the cold storage can be Excire Foto. This way, all photos, no matter how old, are tagged and organized properly, whereas the more recent photos can be found on any computer at any time, the contents of which are easier to remember for whoever is using it. Going along with this, we recommend that AECP digitize their physical photos and add them to the database. Doing so will preserve the physical photographs and prevent them from getting damaged by natural hazards like moisture or sunlight. We also recommend moving all of the photos that may be stored on other digital devices, like CDs or flash drives, to the main storage hard drive so that they may be accounted for and not lost.

Additionally, another recommendation we have is that AECP could utilize the full power of cloud storage methods in the future. As cloud storage is more robust when compared with physical storage, more complex methods can be applied to how data is stored over the internet. For example, using virtual machines (VMs) in cloud computing, referring to using not physical software on a computer but web-based software and computing, would allow for the lightweight use of advanced technologies (Kimovski, et al., 2018). Technologies such as VMs and Virtual Machine Images (VMIs) can be used to run things like image management software at high speeds without relying on the hardware limitations of the user's device. It is worth noting however that VMIs are not images in the sense that they are photographs, but are 'snapshots' of storage systems that keep track of metadata, the current status of a computer, and general data from VMs themselves (Machine images | Compute Engine Documentation, 2023).VMs can be thought of as the computer and VMIs are different selectable 'states' the computer could be in. This means that VMIs can be used for a lot more than just storing images, and can be used to demonstrate the potential that cloud-computing and cloud-based softwares hold. For example, if an organization was lacking in computing power, they could implement VMs to compute high volumes of data through a cloud service. In simpler terms, if the AECP required a stronger computer for their image management software or other needs, they could look into utilizing a VM to harness the computing power of another computer somewhere else in the world through

the internet. The drawback of using VMs is that they can be overkill for just implementing an image management software for the AECP. As image management software is usually not demanding on the hardware and using VMs can be very expensive to utilize.

One possible objective we had originally considered for our project was to create a series of curated photo galleries the AECP could use to quickly reference the best photos they have for any event they may have coming up, whether it is to send to donors, a gala, or a medical conference. We eventually found that this can be detailed enough to be its own separate IQP, rather than an add-on to our project. Therefore, we recommend that in the following years, the AECP continues to work with WPI students and implement a project involving the marketing aspect of the AECP, where they can continue to use the image management software put forth by us.

Conclusion

For years the AECP has done meaningful work across Armenia and our project aimed at preserving and showcasing their efforts by helping manage the photographs that they have. Our project not only made the AECP's image management easier but also helped them to effectively portray their story and the stories of the hundreds of thousands of Armenians they have helped over the last 30 years. It also gives them easier access to photos they may need to use in conferences or workshops, without spending a lot of time to find them.

Following the implementation of the image management software, when the AECP needs to form a presentation or provide images to donors or other organizations, they don't need to sift through countless photos, but instead can just search directly for the ones they want. After speaking with our sponsors, they were very glad to see the power of the software firsthand. For example, they often receive a request for only a few photos but are unsure of where they are located. Now with the software, they can use the search system to find them quickly and easily. This will allow them to always show their best photos, which will in turn continue to boost their reputation and presence among other potentially influential people who can continue to spread the word of their work. This will create a snowball effect as they are able to help more people and they will continue to grow which in turn will give them more resources to promote their mission to provide accessible eyecare across Armenia.

Throughout the project, our objectives and ideas fluctuated. The project went from four, to three, then to two objectives. We discovered hardware and software limitations that threw away promising ideas. But through carefully approaching every problem and utilizing the feedback we received we were able to create something the AECP can use for years to come.

By helping the AECP manage their photos effectively, our project would not only support their mission but also preserve their legacy for future generations. Our research and recommendations can contribute to the success of the AECP and inspire other organizations to adopt efficient photo management practices as well. Every organization should have some sort of image-sorting system that works best for them. Images tell a story that a thousand words can't fully portray, so by using them carefully, any organization can tell the story of their efforts and give inspiration for other organizations to grow and make a positive difference.

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Appendix A: Quick Reference Guide

Quick Reference Guide

It is strongly encouraged that you use the hyperlinks when doing each task for the first time.

Installation and Administration:

- Reference this link for information on Installation, License, and Cloud Connection.

Uploading:

- Upload your images from a hard drive or your local device by selecting the "Add" option from the left side menu and select the folders that you wish to upload. Ensure that you select the "Analyze Photos" option to auto generate keywords.

  [Reference **Importing Photos from a Local Device** in Workflow].

Tagging:

1. To remove all AI generated tags, once the folders are added and analyzed, select all folders with CTRL+A. In the keyword area on the right side of the screen, press the small 'x' next to each of the bright blue keywords (there will be a lot of them).

   [Reference **Deleting AI Generated Tags** in the Workflow].

2. Click on the folder you would like to organize on the left side of the screen. Ensure the folder has been Analyzed by Excire. There should be a green checkmark to the right of the folder.

   [Reference **Tagging in Bulk** in the Workflow].

3. Once in the folder, select all the photos at once using CTRL+A.

   [Reference **Tagging in Bulk** in the Workflow].

4. In the Keyword area on the right side of the screen, type in the main parts of the folder name as separate keywords. For instance, 'MEH_2015_Gyumri' would tag all pictures with 'MEH', '2015', and 'Gyumri'. Press ENTER or the '+'.

   [Reference **Tagging in Bulk** in the Workflow].

5. Do this starting at the main folder, and working your way through each subfolder, down to individual photos.

6. To tag each photo individually, select one photo or multiple photos using the keyboard shortcuts (See **Glossary** section) and repeat the same process.

      [Reference **Tagging in Bulk** in the Workflow].

Searching:

1. Once photos are tagged, use the search option in the top right to search by either duplicates or keywords.

2. To search by keywords, select the search by keywords option in the top right of the screen and choose "Custom". This allows you to search through tags you have created.

    a. You can also use the search bar to search by a specific keyword

    b. You can choose to search by either the whole database or a specific folder or your '*current view*'.

      [Reference **Searching: Keyword** in the Workflow]

3. To search by duplicates, open the find duplicates button in the top right of your screen, which will show many options to choose from. For more detail, reference the task **Searching: Duplicates** in the Workflow

    a. We recommend either using sequences or bursts, which allows you to find multiple photos taken within the same time frame, or near duplicates, which allows you to adjust the *'strictness'* of the duplicates. 'Very strict' is almost exact duplicates and *'very loose'* is photos that are just similar.

    b. Choose the Filter Option

      [Reference **Searching: Duplicate** in the Workflow]

Collections:

1. To create a collection on the bottom left of the screen, press the *'+ collection'* button.

      [Reference **Creating Groups and Collections.]**

2. To add photos to the collection, select the photos you would like to add and then right click. This brings up a menu where you can press 'add to collection', and then simply select the collection you would like them to be added to.

    a. You can also drag the pictures to the collection square in the bottom right of the screen.

[Reference **Adding Images to Collections].**

3. To create a group, which is a group of collections, press the *'+ group'* button next to the collections one mentioned in step 10, and repeat that same process.

   [Reference **Creating Groups and Collections**].

4. To add a collection to a group, drag the collection into the group in the bottom left corner.

   [Reference **Moving/Editing Collections**].

Backups:

1. When you are satisfied with your progress we recommend that you create a Backup to save your work. To start, go to the top left corner of the screen and go to File > Manual Backup.

   a. Select a folder where you want to save the Backup. We recommend noting where this folder is located on your device.

      [Reference **Selecting a Backup Location].**

   b. When complete you will get a confirmation prompt.

      [Reference **Creating Backups**].

2. If you want to transfer information such as the tags or thumbnails to another device or if you make a mistake and want to restore your work, you can Restore the Backup.

   a. Go to the top left corner of the screen and click Files>Open database folder>Select database folder. This will then prompt you to pick the folder you want to restore.

   b. Find the location where you saved the Backup.

   c. Select the desired Backup you want to restore. It will be a folder with the name in the format: "YYYY-MM-DD_HOUR-MINUTE-SEC". This is the exact time the Backup was created.

      [Reference both **Restoring Backups** and **Moving Data to Another Device**].

Appendix B: Glossary

Glossary

Definitions

- **AI Generated Tags**: Keywords that are tagged to photos using AI. When uploading photos, the "Analyze" feature creates the tags automatically.

- **Backups:** A backup in Excire Foto is **not** a backup of the images on the hard drive. Backups in this case refers to making a file that stores the database data in a separate file that can be saved in case of emergencies or transferring data to other devices. Backups include the following data: tags, thumbnails, and other generic cache data that isn't as relevant.

- **Cache:** A cache is a temporary storage area for the most used data in a system. This helps a computer or device run faster as it doesn't have to constantly access the main memory which takes more time. A good example is like a grocery store, the main memory is the back storage while the cache stores the most popular items right at the front of the store. This way a customer can grab what they need right by the register without having to go all the way to the back of the store.

- **Cloud Storage:** Also known as "the Cloud" or "Cloud Storage Devices", Cloud Storage refers to using services that are typically free for uploading small amounts of data online to. We recommend Google Drive or Dropbox as they have a free storage space, can connect to Excire Foto directly, and are popular so sharing files with others is easy. As mentioned in the Database definitions, the Backups will be smaller files so uploading them to a Cloud service for safekeeping is recommended.

- **Collection:** a folder of multiple photos (i.e. a photo album).

- **Current View:** The view of photos you are currently looking at

- **Database:** The Database is a separate file that contains all the data the user will add to the images whilst using the software. For every image in the hard drive, Excire stores a correlating piece of information that contains that image's tags, location (Collection or Group), thumbnail, preview, etc. For every 100,000 photos the database will increase by ~250 MB, meaning 1 million photos only requires 2.5 GB of cache space.

- **Device:** The computer or hard drive running the software. This will most likely be your computer.

- **Directory**: A file directory is like the file's address on your device. You can use the directory to quickly find the file in your File Explorer.

- **File Explorer:** File Explorer is the basic file browsing application that comes with every Windows computer. Its icon is a manilla folder and can be seen to the right.

- **GridView** - This is the default view of all the photos when they are in a "grid" formation. See photo for reference.

- **Group:** a folder of multiple collections (i.e group of collections).

- **Hard Drive:** The primary external or internal storage device that contains all of the visual data such as images, videos, etc.

- **Keyword:** This is just Excire's name for a tag. Can be used interchangeably with 'tag'. For example "tagging a photo" is the same as "adding keywords to a photo".

- **Metadata :** The data stored in a photo that describes the time a photo was taken, the camera used, and possibly even the location

- **Previews:** Larger more detailed Thumbnails, closer in quality to the original images stored on the hard drive.

- **Register:** Used to add images to the Excire Foto database

- **Share:** A function used to upload Collections to a cloud storage device, Excire Foto supports both Google Drive and Dropbox.

- **Thumbnails:** Small sample photos Excire Foto uses to show the user what photos they are working with.

Popular Keyboard Shortcuts

"In Excire Foto there are several shortcuts available to make working with Excire Foto more comfortable and faster. All shortcuts are given in the Excire Foto help menu."

-Excire Foto User Manual

- *CTRL + A:* Select all
- *SHIFT + LEFT CLICK*: Selects all photos between two selected photos
- *CTRL + LEFT CLICK*: Select/deselect multiple photos without losing the current selection
- *CTRL + D*: Deselect all selected photos
- *RIGHT CLICK*: Opens photo options

Note: "Click" on its own means to *LEFT CLICK*.

Workflow Key

- **Bold:** Definitions found in glossary.
  - Ex: When you finish your work, make sure to create a **Backup**.
- **Bold Large Font**: Name of Workflow.
  - Ex. **Workflow: Tagging**
- <u>Underline Large Font</u>: Name of task.
  - Ex: See <u>Creating Groups and Collections</u> for more detail on how to create a **Group.**
- *Italics*: Name of software feature. To avoid confusion, features that are already included in the Glossary already are not italicized and are instead bolded.
  - Ex: By searching by different tags, the *current view* has changed to only show those tags you searched for.
- *'Italics with single quote'*: Name of specific button on the U.I.
  - Ex: To create a **Group** press the '*+ Group'* button in the bottom left.
- *ITALICS ALL CAPS*: Name of button on keyboard. The + means you press both keys at the same time
  - Ex: To select all the photos in the **Collection**, press *CTRL + A*.
- [Blue with underline](): Hyperlink, will take you to another document/website when clicked.
  - Ex: For further details, reference the Workflow pertaining to uploading [here]().

Appendix C: Standardization Guide

Standardization Guide

To ensure that all pictures are consistently easy to locate, we recommend:

- Before creating a new tag, ensure that a similar one is not already in use by checking the custom section of the keyword hierarchy on the right side of the screen.
- When creating a keyword capitalize the first letter of every word, to avoid issues regarding the case-sensitivity of keywords in the software.
- Use abbreviations wherever possible, as shown in the Sample Tag Abbreviations section to make locating photos easier.

Sample Tag Abbreviations

WSD	World Sight Day
MEH	Mobile Eye Hospital
CHLA	Children's Hospital of Los Angeles
WDF	World Diabetes Foundation
WSD	World Sight Day
IHI	Institute for HealthCare International